

FINAL

OPERATION AND MAINTENANCE PLAN
FOR THE SEBASTIAN INLET DISTRICT'S
DREDGE MATERIAL MANAGEMENT AREA,
SEBASTIAN INLET STATE PARK,
BREVARD COUNTY, FLORIDA

Prepared for
Sebastian Inlet District

December 2021



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Glossary

DMMA	Dredge Material Management Area
ERP	Environmental Resource Permit
FDEP	Florida Department of Environmental Protection
FLEPPC	Florida Exotic Pest Plant Council
FWC	Florida Fish and Wildlife Conservation Commission
PLAN	Operation and Maintenance Plan for the Sebastian Inlet District's Dredge Material Management Area, Sebastian Inlet State Park
SID	Sebastian Inlet District
SISP	Sebastian Inlet State Park

OPERATION AND MAINTENANCE PLAN FOR THE SEBASTIAN INLET DISTRICT

Dredge Material Management Area, Sebastian Inlet State Park

1 Introduction

The Sebastian Inlet District (SID) desires to implement an adaptive Operation and Maintenance Plan (Plan) for the dredge material management area (DMMA), located within the Sebastian Inlet State Park (SISP) – North Gate Entrance, in Brevard County, Florida (**Exhibit 1, DMMA Location**). It is understood that the DMMA location is under Jurisdiction of the Florida Department of Environmental Protection (FDEP) Division of Recreation and Parks and State Lands Easement No. 32057, where operations and management activities described within this document, should be in accordance with FDEP’s Sebastian Inlet State Park (SISP), Approved Unit Management Plan (**Appendix A**).

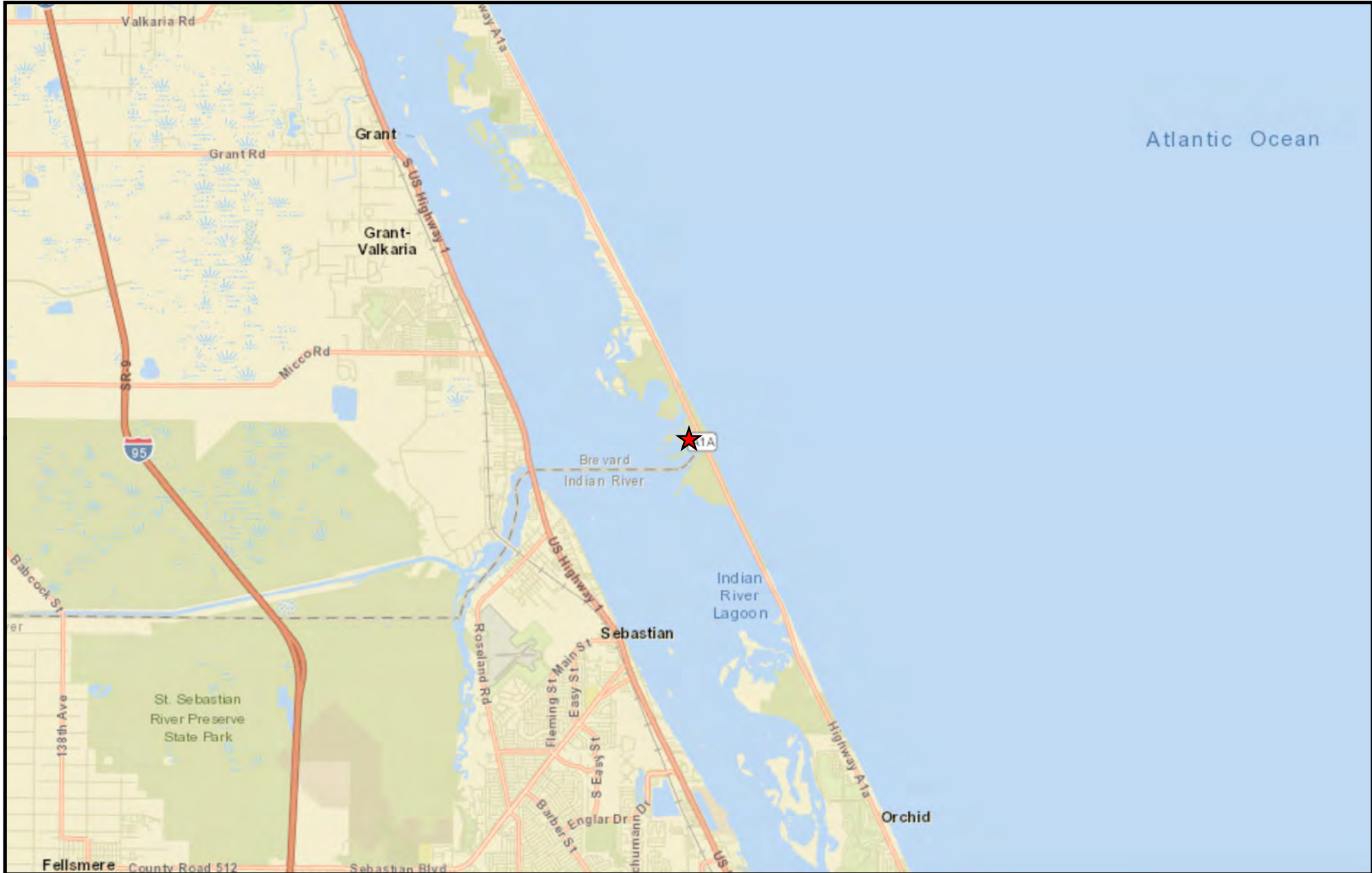
The approval and implementation of this Plan – *Operation and Maintenance Plan for the Sebastian Inlet District’s Dredge Material Management Area* is intended to meet SID’s long term requirements for both operation and maintenance objectives, specific to the DMMA facility. With SID approval, the use of this document is expected to provide a standardized, yet adaptive approach that provides a clear, consistent and accountable process. This “Plan” depicts the long term operation and maintenance framework to be provided within the DMMA footprint (**Exhibit 2, DMMA Footprint**), and is considered a living document to be updated regularly in order to record completed actions and inform the actions for the future.

1.0 Background

The DMMA was designed, permitted (**Appendix B, FDEP – ERP05-0264486-004-ES**) and constructed to give SID the ability to hydraulically dredge and dewater sediment from the Sebastian Inlet, in order to maintain the channel depth and the existing sand trap, at any given time. The dewatered sediment is then screened (if-needed) to meet stringent “beach quality” specifications and trucked to specified beach locations, south of the inlet for placement when it is outside of sea turtle nesting season. This process provides a flexible, yet environmentally sound schedule, in order to stockpile sediment from May to October, during sea turtle nesting season, while placing beach quality sediment in areas of greatest need, from November through April, when sea turtles are not nesting, and beach nourishment is permitted. In addition, the flexibility of the DMMA also allows SID the ability to respond to issues that may occur, utilizing a variety of approaches, as well as the capacity to conduct emergency operations if a tropical storm or hurricane causes shoaling in the

inlet. In the event of a storm, the DMMA could serve as a staging area or stockpiling area to respond to natural or man-made disasters. SID can also utilize the DMMA to dewater non-beach quality sand or rock dredged from the sand trap, channel, SISP's marina channel and/or the SISP boat ramp channel, if needed.

In an effort to meet land and resource management objectives, protect and enhance the surrounding natural resources, work in land stewardship with SISP, and operate the DMMA as designed and permitted; SID proposed the creation of an adaptive management plan, specific to the DMMA. This document, once approved, provides strategic guidance to efficiently and appropriately improve and maintain the conditions of the DMMA. The following section identifies and addresses the elements considered for the Plan.



Atlantic Ocean



SEC: 20, TWP: 30S, RNG: 39E



DMMA Location
Sebastian Inlet District
Dredge Material Management Area (DMMA)
Sebastian Inlet, Florida

★ DMMA Location

Exhibit 1

1 inch = 2 miles






DMMA Boundary
Sebastian Inlet District
Dredge Material Management Area (DMMA)
Sebastian Inlet, Florida

 **DMMA Boundary**

Exhibit 2

 1 inch = 75 feet

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2 Operation and Management Plan Overview

The following Section provides the operation and management elements of the Plan. At this time, the initial objectives of the Plan will include the following elements.

- Site Access and Coordination
- Land Management
- Berm Maintenance and Engineering Initiatives
- Wildlife Management
- Site Inspections
- Scheduling

However, this document is considered a living document to be updated on an annual basis. Amendments to the document, once approved by SID, will become part of the overall Plan through the addition of new appendices at the end of each calendar year. Although this Plan is specific to the DMMA, at the discretion of SID, elements of this Plan will be included for additional SID projects.

2.0 Site Access and Coordination

The main access to the DMMA is through the North Gate Entrance of SISP (9700 South Highway A1A), in Melbourne Beach, Florida. Once access is provided through the front gate, the DMMA can be found taking a right at the second paved road (**Exhibit 3**). Work to be conducted at the DMMA shall follow the ingress and egress routes, as illustrated in Exhibit 3. All vehicular traffic to conduct work within the DMMA, shall at all times abide SISP rules and regulations, specific to vehicular movement within SISP. In addition, all vehicles, including equipment accessing the DMMA, should be thoroughly cleaned prior to entrance into SISP. In particular, undercarriages and wheel wells should be power washed prior to site utilization, in order to reduce the potential of nuisance and exotic seed dispersion.

Should a clean, fresh water source be required for work at the DMMA, two areas are provided within SISP (illustrated in Exhibit 3). The first area is located directly across from the North Gate Guard House. Water from this location can be utilized from a small outside faucet, where a garden hose can be utilized. The second water source is located at a secured well location, directly under A1A off the main entrance road. This location is secured, therefore, SISP staff will need to be notified in order to provide access to the well. The well structure is outfitted with a 2" cam-lock fitting, therefore, a firehose outfitted with a grooved cam fitting that supports locking arms, is recommended at this location.

All work activities at the DMMA shall be conducted within the fenced, six-acre site. ANY work conducted outside the security fencing will need prior authorization by SID and SISP. SID manages the DMMA including the stockpile of sand, containment berms, perimeter security fencing and stormwater control structures within the DMMA. SID retained a DMMA Management Consultant for professional engineering and biological consulting services



Park Access and Features
Sebastian Inlet District
Dredge Material Management Area (DMMA)
Sebastian Inlet, Florida






-  DMMA Entrance
-  Water Sources
-  North Gate Entrance
-  Entrance/Exit Routes
-  DMMA Boundary

Exhibit 3
 1 inch = 250 feet

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to assist with the management goals and objectives established for the DMMA. The DMMA Management Consultant is currently responsible for the oversight of sub-consultant and contractor management/maintenance work, approved by SID to occur within the DMMA facility.

In most cases, at least one week of notification should be provided to SID and SISP, prior to the commencement of work. It is intended that work notifications will help reduce scheduling conflicts with SISP authorized work (such as prescribed fire events where access roads and water resources should be kept clear, for use by SISP personnel only). Work notifications should be sent to the following individuals, at a minimum:

Executive Director Sebastian Inlet District 114 Sixth Avenue Indialantic, Florida 32903 321-724-5175 (office phone)	Park Manager/North Entrance Gate House Sebastian Inlet State Park 9700 S. Highway A1A Melbourne Beach, FL 32951 321-984-4852 (office phone)
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Although SISP is open 24 hours a day, 365 days a year, work that is performed within the DMMA should be conducted during daylight hours (from 8 AM to 6 PM Eastern Standard Time), Monday through Friday, unless authorized and approved by SID and SISP. Access to the DMMA (combination lock) will be provided by SID. At the end of the workday, the DMMA gate shall be securely locked and SISP staff notified that work within the DMMA has been completed and the site is secured. As part of the security measures, GT exclusionary devices should be reattached and/or reset as part of this process (please see Section 2.1.3 Wildlife Management, below). Should an emergency arise, 911 shall be the main point of contact, followed by the SISP Park Manager/North Entrance Gate House for coordination with emergency services.

2.1 Land Management

The DMMA was originally constructed utilizing Seashore paspalum (*Paspalum vaginatum*) sod and then supplemented with Coastal Bermuda grass (*Cynodon dactylon*) seed along the exterior of the berm structure. These species of grass were utilized to better maintain berm integrity due to the existing salty/sandy soil conditions. Since its' implementation, the DMMA has experienced the growth of nuisance and exotic vegetation, which overtime has become established on-site. As with most active management areas, noxious vegetation, if left unchecked, will out-compete native and beneficial vegetation to rapidly establish on-site populations. Biotic and abiotic vectors constantly distribute seeds, and therefore noxious vegetative control and vigilance must occur to maintain or restore a desired vegetative coverage and to limit exotic seed transfer to project sites that utilize DMMA sediments.

In addition, the DMMA may support gopher tortoises (*Gopherus polyphemus*) that have found access to the site through holes in the security fencing, open gaps in the gate structures and potentially through the actual fence itself (hatchlings - under 2 ½ inches in size). The gopher tortoise is listed as Threatened by the Florida Fish and Wildlife Conservation Commission (FWC). Gopher tortoises are ectotherms that depend on their burrows to provide a stable temperature and humidity year-round. They dig multiple burrows throughout their life and forage on low-growing

herbaceous plants, which unfortunately, makes the DMMA a desirable location for tortoises to forage and construct burrows. The DMMA is considered an active construction zone, where sand is stockpiled and removed, as needed, typically in emergency situations.

Gopher tortoises that have constructed burrows near the edge of road structures and / or within the stockpiled material risk entombment by burrow collapse due to the movement of material to and from the site. Therefore, FWC's 100 percent gopher tortoise burrow survey protocol is preformed, and burrows are permitted for excavation and relocation activities, prior to all work related to the movement of the material. Further, during heavy storm events, large burrows create washouts along the berm structure. Due to the continued utilization of the site by the gopher tortoise, washouts and rills are very common and will continue to be problematic within the DMMA, if exclusionary measures are not implemented and maintained, to reduce gopher tortoise access to the site.

Components of a successful land management application typically includes: identifying goals and objectives, providing resources to accomplish those goals and objectives, scheduling, and accurate evaluations. Given the current DMMA conditions, Land Management activities are focused on: Vegetation Management, Berm Management and Wildlife Management. Land Management goals and objectives identified for each of these activities includes:

1. Creating and maintaining a healthy, beneficial – herbaceous vegetation coverage,
2. Restoring and maintaining the integrity of the berm and stormwater structures,
3. Reducing the impact of the current SISP population of gopher tortoises to the DMMA.

In an effort to meet and exceed these goals and objectives, the following management activities are recommended.

2.1.1 Vegetation Management

At this time, the DMMA contains a healthy population of nuisance and exotic vegetation that includes species such as: natalgrass (*Melinis repens*), Durban's crowfoot grass (*Dactyloctenium Aegyptium*), and sporadic growth of largely guinea grass (*Megathyrus maximus*) and cogongrass (*Imperata cylindrica*). These species, as well as, additional vegetation identified within the Florida Exotic Pest Plant Council (FLEPPC) Category I and II, Exotic Plant list (provided as **Appendix C**) shall be targeted for removal from within the DMMA. In order to target, maintain and/or eliminate noxious species from within the DMMA limits, it is suggested that herbicide applications be utilized in combination with additional mechanical cutting and/or mowing activities. Overtime, these routine maintenance events should facilitate the establishment and growth of desired vegetation, combined with plant growth that is common to the area and habitat.

2.1.1.1 Herbicide Applications

FDEP and SID approved herbicides should be applied within the DMMA, in order to reduce the growth of noxious vegetation that has become established. Routine treatments will help target noxious vegetation, which produces seeds throughout the year. Herbicide applications will also need to target vegetation along the fence and gate structures. Woody noxious vegetation such as

Brazilian pepper (*Schinus terebinthifolius*) and nuisance vegetation such as fish poison vine (*Dalbergia ecastaphyllum*) and gray nickerbean (*Caeslpina bonduc*) have been observed growing on and directly adjacent to the DMMA security fencing. It is recommended that herbicide treatments be applied along both the security fencing and interior toe-of-slope (to approximately one foot along the outer perimeter of the security fencing) in order to control/eliminate nuisance/exotic vegetation growing on and towards the fence structure. It is anticipated that applications of appropriate herbicides will reduce vegetative growth that can damage the integrity of the security fencing, as well as, assist in reducing the spread of exotic plant species within the DMMA and SISF. In addition, ALL canopy and shrub species should be targeted within the DMMA to maintain the integrity of the berm slopes. The name and photograph of both beneficial and non-beneficial plant species occurring within the DMMA at this time, can be found as **Appendix D**.

Applications of **ALL HERBICIDES MUST** follow the product label. **THE LABEL IS THE LAW**. When herbicides are applied within the DMMA, a record of the treatment event should be recorded on a Daily Treatment Log (**Appendix E**) and provided to SID for their files (to be included within Appendix E). The Daily Treatment Log records: the date, time of day, weather, applicator(s) name, name of herbicide(s) and rate(s) utilized, and targeted vegetative species, for each application. Equally important is the addition of adjuvants to the herbicide mix. Surfactants, a type of adjuvant, are added to the herbicide mixture in order to increase the spread and contact of herbicide onto the plant parts (leaves and stems). Successful treatments require that all of the vegetative parts must be coated with herbicide, therefore, surfactants are added to increase herbicide spread and attachment of the herbicide. Surfactants are extremely beneficial when treating plant species that contain stiff hairs and waxy cuticles. For each herbicide and adjuvant applied on site, a copy of the product's label should be kept in **Appendix F**. Based on advancements in herbicides, the utilization of new products within the DMMA is anticipated, therefore Appendix F will need to be updated frequently.

For this Plan, the main goal is to focus on promoting desirable vegetative coverage through implementing comprehensive management techniques and over the timeframe of this contract, reducing herbicide utilization. As routine inspections identify a reduction in noxious plant coverage and an increase in the establishment of desirable, low-growing vegetation, a re-evaluation of the herbicide application schedule will be performed. Given the type of noxious vegetation existing within the DMMA, a minimum of four (4) treatments a year should be considered, at this time. At all times, applications of herbicides within the DMMA should be overseen by an Aquatic Herbicide Applicator, licensed to apply herbicides within the State of Florida and a license for Natural Areas Weed Management. The City of Sebastian's Integrated Pest Management Plan (IPM) was reviewed and new methods of exotic and nuisance vegetation control will be implemented at the DMMA, if approved by the State of Florida and SISF.

2.1.1.2 Mechanical Applications

In conjunction with herbicide treatments, routine mechanical applications including mowing and hand-trimming activities are recommended to help reduce the vertical composition of the existing vegetation, and in some instances creating an opportunity for beneficial vegetation to grow and expand, as well as, providing a cheaper alternative to reduce nuisance and exotic seed source

production and spread. Due to the size and pitch of the berm configuration, utilization of mowing equipment, such as a side slope mower, with an arm extension or boom, is recommended as to reduce rutting and uneven cutting. Since this piece of mowing equipment may not be readily available, utilization of a small bush hog mower can be utilized, however, rutting should be quickly regraded, and bare open soils should be re-seeded with Bahiagrass within five (5) working days. Mowing cycles should occur on a quarterly basis, unless the weather dictates otherwise (reduce mowing activities when the site is experiencing drought or drought-like conditions and increase mowing cycles during periods of increased rain opportunities, especially during the growing season (May to September). Mechanical applications should occur approximately two (2) to three (3) weeks after a scheduled herbicide event.

Since the site has historically supported a gopher tortoise population, it is important to note that if a bush-hog mower is utilized for mowing purposes, it is recommended that a 100 percent FWC gopher tortoise burrow survey be performed. Should burrows be observed during the survey, flagging or pin flags should be utilized to mark their locations for the mower. Line trimmers or weed eaters should be used around identified gopher tortoise burrows and along steep sloping areas that are adjacent to the existing burrows, in order to prevent incidental impacts to burrow entrances. It is anticipated that the current on-site gopher tortoise population will be permitted for excavation/relocation activities and the implementation of exclusionary devices (discussed in Section 2.1.3 Wildlife Management) will help in reducing/eliminating the construction of new burrows along the berm structure.

Once desired vegetation has established appropriate coverage, the number of mowing cycles can be re-evaluated, and potentially reduced. All equipment, including vehicles, utilized at the DMMA should be washed thoroughly, especially the undercarriage and wheel wells, prior to entering the DMMA site in order to reduce the spread of nuisance and exotic vegetation. During the mowing events, it is suggested that light weight, rubber-tire or rubber-tracked mowers be utilized, due to the potential that a mower could incidentally impact the berm slope configuration.

2.1.1.3 Vegetative Trimming / Removal

During the mowing events, dead and dying vegetation should be removed from the perimeter fence and gate structures to lengthen their usable lifespan. Vegetation occurring on and around the fence and gate structures should be trimmed back within a six-foot buffer to discourage reattachment. Given the amount of woody vegetation directly adjacent to and growing over the security fencing, two (2) annual treatments should be conducted until vegetation is reduced and is no longer on or hanging over the security fencing. Annual applications can occur once the desired condition has been achieved.

2.2 Berm Management and Engineering Initiatives

The DMMA facility was designed for the dewatering and decanting of effluent water from SID dredge projects. The dewatered sediment is then screened and the beach compatible portion is transferred south via truck haul for final placement in beach and dune nourishment projects, which also meets SID's annual bypass requirements. Any non-beach compatible material is either re-used in berm maintenance activities or truck hauled to other public-use final disposal locations such as

St. Sebastian River Preserve State Park, St. Johns River Water Management District's (SJRWMD) Sebastian River Dredge Material Containment Facility (DMCA) or utilized by Brevard County or Indian River County for mosquito berm maintenance. The Sebastian Inlet DMMA containment berms were built in part by utilizing sediment mechanically dredged from the Tide Pool and the remainder of the berm material was from approved sediments from SJRWMD's Sebastian River DMCA. The dredge projects that have utilized the DMMA over the past decade were completed for widening and maintenance of the navigation channel as well as expansion and maintenance of the sand trap. The DMMA's primary future use will be for maintenance of the navigation channel, sand trap and tide pool and dewatering of sediments that predominantly meet the beach compatible requirements for final placement on Indian River or Brevard County's beaches. Dredging projects such as the SISP Marina Channel and SISP Boat Ramp Channel could also utilize the DMMA, but there would be a greater fraction of the material that would not meet the requirements for beach placement and therefore another final placement location would be required. These projects and alternative final placement locations, may also require review and permit modification through FDEP prior to construction.

The DMMA containment berms which consist of compacted fill material, with an impervious geotextile liner along the inside slope, are integral to the facility's ability to safely dewater and stockpile sediment. Due to the large amount of rills and erosion issues that currently exist along the DMMA slopes, berm restoration and stormwater rehabilitation should be considered a priority for the site.

2.2.1 Restoration / Rehabilitation

Typically, the location of the sand trap dredge effluent outfall pipe is placed along the eastern end of the DMMA. Therefore, coarse sediment falls out of suspension in the eastern half of the facility and fine sediment collects within the western portion of the DMMA that is not suitable for placement on the beach. This non-beach compatible material will need to be removed to restore the DMMA to its full capacity. While Brevard County (County) has expressed interest in taking the material out of the DMMA for use on County projects one immediate use for these fine sediments is identified at the DMMA for slope maintenance. Currently, slope maintenance is required to restore the 3:1 slope around the inner and outer perimeter for ease of future maintenance efforts, such as mowing events. If slopes are steeper than 3:1, specialized mowing equipment may be required for safety reasons.

Given the numerous rills and gullies that have formed from high rainfall events (**Figure 1**), removal and placement of the fine sediment along the inner and outer slopes of the perimeter berm may generate enough material to fill the rills and gullies near the entrance ramps to the perimeter road. Fine sediments should be tested to insure the 95% modified proctor densities can be achieved as specified in the original berm construction. If needed, additional clean fill can be purchased from a local upland mine and trucked to the DMMA to aid in restoring additional rill areas. The additional clean fill can be mixed with existing material in the DMMA to help increase the grain-size, organic content, and stability of the inside and outside berms.



Figure 1. Berm Rill Created from a High Rainfall Runoff Event

It is suggested that 18”-24” of cover be maintained over top of the existing impermeable geotextile liner to protect the liner from exposure to the elements. In recent investigations, a portion of the liner is exposed in locations along the top of the eastern berm and along the toe of slope at the western berm. This may be due to inherent errors in the as-built survey location and/or inconsistent grading control that has led to tears in the existing liner. An additional layer of impermeable geotextile liner will need to be added to prevent water from stormwater and/or dredge effluent, from saturating the berm. The original liner was constructed using a product called, NicoTarp 100 by Tencate®. This product is no longer in production, and therefore, a suitable product of equal or better specifications will need to be utilized.

In addition to restoring the berm slopes, the creation of a swale around the outside of any stockpiled material, along the inner perimeter of the berm, could be constructed to direct runoff towards the west water control structure, creating a more efficient stormwater management system by reducing the potential for erosive conditions to occur. The flat top of the DMMA berm is stabilized with limerock base for added stability for dump trucks and other construction equipment. This material is not as permeable and rainfall runs off the sides of the berm with significant sediment carrying capacity.

The last dredging event showed evidence of leaks around the junction box, therefore the stormwater structures should be monitored and clear of excessive sediments, in order to maintain function. Annual visual inspections of the stormwater structures should be incorporated into this Plan. Should inspection notes confirm that the junction box needs repair or replacement, it is recommended that SID installs a larger junction box with a taller riser to increase gravity flow, which may improve DMMA dewatering during dredging operations. The new junction box and riser should be installed on a concrete footer designed to spread the additional weight of the box, collar and water, as well as resist settlement.

The existing aluminum stop logs show the effects of exposure to the salt and sand with pitting, corrosion and warping. The stop log control structures should be removed and replaced if the SID decides that gravity flow is still a viable option for return of the decanted water to the inlet. If SID prefers to continue to use a mechanical pump to control water levels in the DMMA while under operation, the stormwater system could be left in the existing configuration. The mechanical pump and gravity flow methods for DMMA decant water/stormwater are subject to turbidity/water quality monitoring. Per the DMMA permit, the facility must be in compliance with State Water Quality Standards (Section 401, PL 92-500) and since Sebastian Inlet is considered Outstanding Florida Waters (OFW), no degradation of water quality is allowed. Turbidity must be controlled to prevent violations of water quality pursuant to Rule 62-302.530(69), Florida Administrative Code.

2.2.2 Best Management Practices

The DMMA should be kept close to its maximum capacity for as long as possible to provide additional protection to the liner and inner slopes. When the DMMA is full, it holds approximately 28,000 cubic yards of sediment. On past projects, additional sediment was piled above the top elevation of the perimeter berm or even on the outside slope of this berm to expand capacity. Additional stockpiled sediment may present additional stormwater runoff challenges, therefore, exceeding the design capacity must be authorized by SID and the DMMA Management Consultant. Every attempt should be made to dewater and remove sediment in excess of the DMMA's 28,000 cubic yard capacity. If project dredge quantities exceed DMMA capacity, the project should be carefully coordinated and planned with the offsite movement and storage of material, or a separate plan developed for any quantity of non-beach compatible material.

Once the DMMA is emptied, the slopes and the top of the berm should be seeded, per Section 2.1.2.2, within five (5) days of the completion of excavations and grading in any given section of the DMMA. Slope work should be completed during periods of low to moderate rainfall. In addition, bulldozer tracks, on the final grading pass, should leave horizontal track markings to discourage the formulation of rills. Machinery should move in an up and down configuration along the slope (NEVER sideways), in order to reduce the creation of tracks that could provide small pathways for runoff to occur.

It is suggested that 18"-24" of cover be maintained over top of the existing impermeable geotextile liner to protect the liner from exposure to the elements. As-built survey data and centimeter-accuracy, survey-grade, real-time kinematic (RTK) global positioning (GPS) shall be used to maintain this amount of cover in coordination with SID's surveyor. If SID's contractor, consultant, or other entity (County, State Park, etc.) should impact the impervious liner, work shall stop and SID, SID's Engineer and Surveyor shall be notified so corrective actions can be made.

At all times the security fence and gate structures should be sound and fully functional. Holes or gaps in either of these features should be reported immediately to SID and repaired.

2.2.2.1 Seeding/Planting

Areas within the DMMA, destabilized by the gopher tortoise relocation efforts, mowing events, trimming events, sediment deposition/excavation events, and general maintenance events such as herbicide applications, should be revegetated immediately, to provide erosion protection. In addition to the coastal Bermuda grass/Bahia (*Paspalum notatum*) mix, it is suggested that native, low growing herbaceous vegetation such as dune or beach sunflower (*Helianthus debilis*) and salt tolerant species such as Ipomoea could be added to the seed mixture for distribution on site. Additional native, herbaceous species to be considered for groundcover can be found as **Appendix G**.

It is also suggested that once exotic/nuisance vegetation is under control, the establishment of additional native vegetation be considered along the toe-of-slope, adjacent to the security fence, within the DMMA. Proposed vegetation for the planting event may include native species, such as Elliot's love grass (*Eragrostis elliottii*) and sand cordgrass (*Spartina bakeri*), in addition to other species that have shown to thrive within and adjacent to the DMMA.

2.3 Wildlife Management

Due to the gopher tortoises' protective status, FWC rules and regulations establishes a twenty-five-foot protective buffer around all identified potentially active burrows, which reduces SID's ability to operate the DMMA effectively. Therefore, the installation of exclusionary devices along the



Figure 2. Dig Defence®

security fencing and gate structures are recommended to deter gopher tortoise utilization of the DMMA. Exclusionary devices, currently includes the installment of below ground tines (Dig Defence® Animal Control – Please refer to **Figure 2**) to reduce the size of the original wire slotted fence openings to further eliminate the movement of hatchling and juvenile tortoises into the DMMA. Dig Defence® was installed in January 2021, please refer to **Figures 3, 4, and 5**, below.



Figure 3. Preparation & Installation of Exclusionary Devices (January 7, 2021)



Figure 4. Dig Defence® to remain Approximately three (3) inches above ground elevation and woven into the existing fence structure



Figure 5. Installation Complete, January 8, 2021

Due to the potential for large gaps to occur along the undercarriage of both the main entrance and side gate structures, additional exclusionary devices should be implemented. In order to further secure these areas, at this time, the entrance areas were regraded and recycled parking blocks (6' long x 6" wide at base x 4" high) were placed along the undercarriage of the fence structures and a 6" piece of conveyor belting was fastened along the base of the fence to further discourage gopher tortoises from entering the site (**Figures 6, 7, 8 and 9**). These exclusionary devices are meant to be removable and re-attachable, for both inspection and maintenance events, as well as immediate work objectives that may occur within the DMMA.

It is recommended that the installed deterrent measures be included with the inspection status of the security fencing, in order to identify potential breaches and where corrective actions can occur readily.

It should be noted that maintenance activities, including mowing, seeding, and tree trimming, are all activities that are specifically exempt from gopher tortoise permit requirements, per FWC's Gopher Tortoise Management Guidelines. However, gopher tortoise permits are required if soil disturbance due to the movement of material within the DMMA, occurs within 25 feet of a gopher tortoise burrow. Therefore, restoration or engineering activities may only occur upon completion of gopher tortoise permitting and relocation activities, should gopher tortoise burrows occur within the DMMA.



Figure 6. Re-grading at Main DMMA Entrance Gate



Figure 7. Recycled Plastic Parking Blocks



Figure 8. Conveyor Installed at Main Gate Entrance



Figure 9. Conveyor Belt Installed at Side Gate

2.4 Site Inspections

This section is provided in order to establish an Annual DMMA Inspection Schedule. This Inspection Schedule should review, at a minimum, all management activities addressed within this Plan. Inspection sheets detailing specific structures and features to be reviewed during each site review is included as **Appendix H**. The condition of each reviewed area/item will be documented and items that need immediate attention will be addressed to SID. Drone flights may be used to take aerial photographs documenting the site conditions, upon SISP coordination and approval. Inspection sheets will be provided to SID upon completion of each site review.

The DMMA Inspection Schedule should initially include quarterly reviews of:

- Vegetation height,
- Overall beneficial vegetation coverage,
- Nuisance and exotic vegetation coverage (specific areas denoted on map),
- Slope stabilization (including erosion issues and areas that need to be seeded),
- Debris and/or trash buildup
- Noted wildlife utilization,
- Site security fencing,
- Gate structures,
- Installed exclusionary devices (Dig Defence®),
- Existing piping and infrastructure, and
- Geotextile liner inspections.

2.5 Lessons Learned

At the end of each calendar year, a Lessons Learned Memorandum (Memorandum) should be produced by the current DMMA Management Consultant and submitted to SID. Each Memorandum should capture on-going management efforts, identifying management failures as well as management successes to capitalize on implementing advantageous and sound management techniques. All annual Memorandums should be included within **Appendix I**, in order to assist future SID staff and the future DMMA Management Consultant.

2.6 Scheduling

A “Schedule of Events” has been created and included as part of this Plan. The Schedule of Events is provided based on both completed actions during the 2020 and 2021 fiscal years and then the proposed actions listed above, in order to stay on-task with the proposed events from 2022 and lasting through 2027. It is important to note, that the schedule must allow for unplanned or unexpected results, therefore, the schedule should be flexible to allow for adjustments and necessary items such as fast-tracking repairs if emergency truck haul or dredging operations are needed. Therefore, during the implementation phase of the Plan, schedules and timelines should be followed carefully, but that changes can always be made if problems arise.

Since this Schedule of Events is considered flexible, scheduled actions and timing of those actions can be adjusted based on annual evaluations of the Plan, moving forward.

Tasks	2020												2021											
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Herbicide Treatments																								
Mowing Events																								
Plantings and Seeding																								
Site Inspections																								
Gopher Tortoise Permitting																								
Gopher Tortoise Relocations																								
Gopher Tortoise Exclusionary Install																								
Stormwater Inspection																								
Restoration of Berm																								
Beach Renourishment Projects																								
Inlet Dredging Projects																								

Tasks	YEAR 1 - 2022												YEAR 2 - 2023											
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Herbicide Treatments																								
Mowing Events																								
Plantings and Seeding																								
Site Inspections																								
Gopher Tortoise Permitting	AS NEEDED																							
Gopher Tortoise Relocations	AS NEEDED																							
Stormwater Inspection																								
Restoration of Berm																								
Beach Renourishment Projects																								
Inlet Dredging Projects																								

Tasks	YEAR 3 - 2024												YEAR 4 - 2025												
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	
Herbicide Treatments			■	■		■	■		■	■					■	■		■	■		■	■			
Mowing Events				■					■							■					■				
Plantings and Seeding	AS NEEDED																								
Site Inspections			■			■			■			■			■			■			■			■	
Gopher Tortoise Permitting	AS NEEDED																								
Gopher Tortoise Relocations	AS NEEDED																								
Stormwater Inspection				■					■							■				■				■	
Restoration of Berm	AS NEEDED																								
Beach Renourishment Projects																								■	■
Inlet Dredging Projects	■	■	■	■																					

Tasks	YEAR 5 - 2026												YEAR 6 - 2027											
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Herbicide Treatments			■	■		■	■		■	■					■	■		■	■		■	■		
Mowing Events				■					■							■					■			
Plantings and Seeding	AS NEEDED																							
Site Inspections			■			■			■			■			■			■			■			■
Gopher Tortoise Permitting	AS NEEDED																							
Gopher Tortoise Relocations	AS NEEDED																							
Stormwater Inspection				■					■							■				■				■
Restoration of Berm	AS NEEDED																							
Beach Renourishment Projects	■	■	■	■																				
Inlet Dredging Projects																								

Appendix A
**Sebastian Inlet State Park Unit
Management Plan (FDEP)**



SEBASTIAN INLET STATE PARK

Unit Management Plan

APPROVED

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Division of Recreation and Parks
DECEMBER 12, 2008

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INTRODUCTION

Sebastian Inlet State Park is located in Brevard and Indian River counties (see Vicinity Map) on a barrier island between the Atlantic Ocean and the Indian River Lagoon. Access to the park is from State Road A1A, 12 miles north of Vero Beach or 18 miles south of Melbourne (see Reference Map).

Acquisition of the park began in 1966, with a donation from Robert P. McLarty and Dodo W. McLarty. The State of Florida acquired Sebastian Inlet State Park to protect, develop, operate and maintain the property for public outdoor recreational, park, conservation, historic and related purposes.

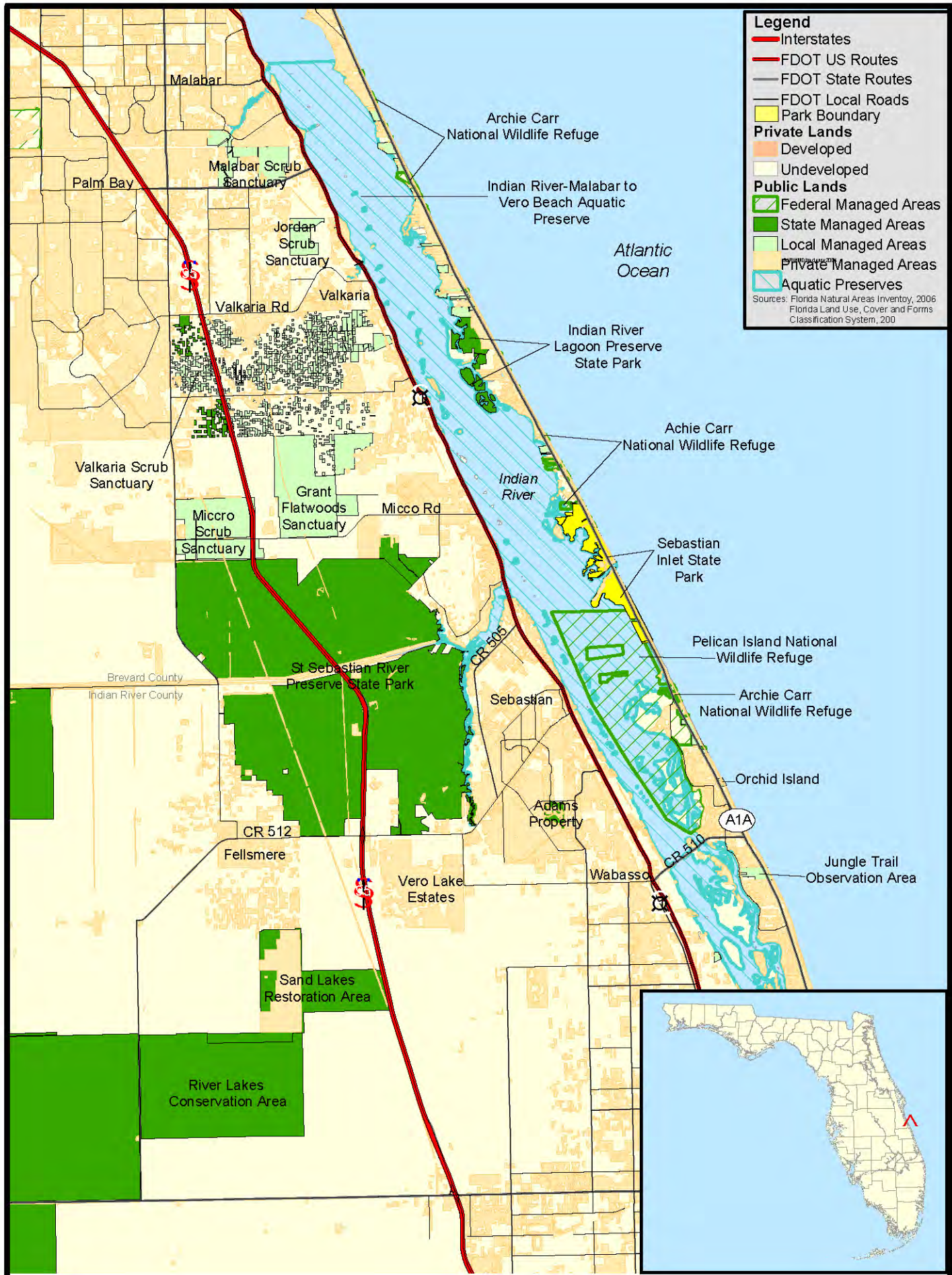
At Sebastian Inlet State Park, public outdoor recreation is the designated single use of the property (see Addendum 1). There are no legislative or executive directives that constrain the use of this property. The park contains 971.01 acres, as reflected on the current Properties under Jurisdiction of the Division of Recreation and Parks (Division) report.

PURPOSE AND SCOPE OF THE PLAN

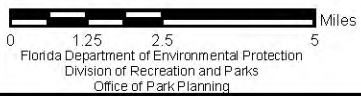
This plan serves as the basic statement of policy and direction for the management of Sebastian Inlet State Park as a unit of Florida's state park system. It identifies the objectives, criteria and standards that guide each aspect of park administration, and sets forth the specific measures that will be implemented to meet management objectives. The plan is intended to meet the requirements of Sections 253.034 and 259.032, Florida Statutes, Chapter 18-2, Florida Administrative Code, and intended to be consistent with the State Lands Management Plan. With approval, this management plan will replace the January 25, 2001 approved plan. All development and resource alteration encompassed in this plan is subject to the granting of appropriate permits; easements, licenses, and other required legal instruments. Approval of the management plan does not constitute an exemption from complying with the appropriate local, state or federal agencies. This plan is also intended to meet the requirements for beach and shore preservation, as defined in Chapter 161, Florida Statutes and Chapters 62B-33, 62B-36 and 62R-49, Florida Administrative Code.

The plan consists of two interrelated components. Each component corresponds to a particular aspect of the administration of the park. The resource management component provides a detailed inventory and assessment of the natural and cultural resources of the park. Resource management problems and needs are identified, and specific management objectives are established for each resource type. This component provides guidance on the application of such measures as prescribed burning, exotic species removal and restoration of natural conditions.

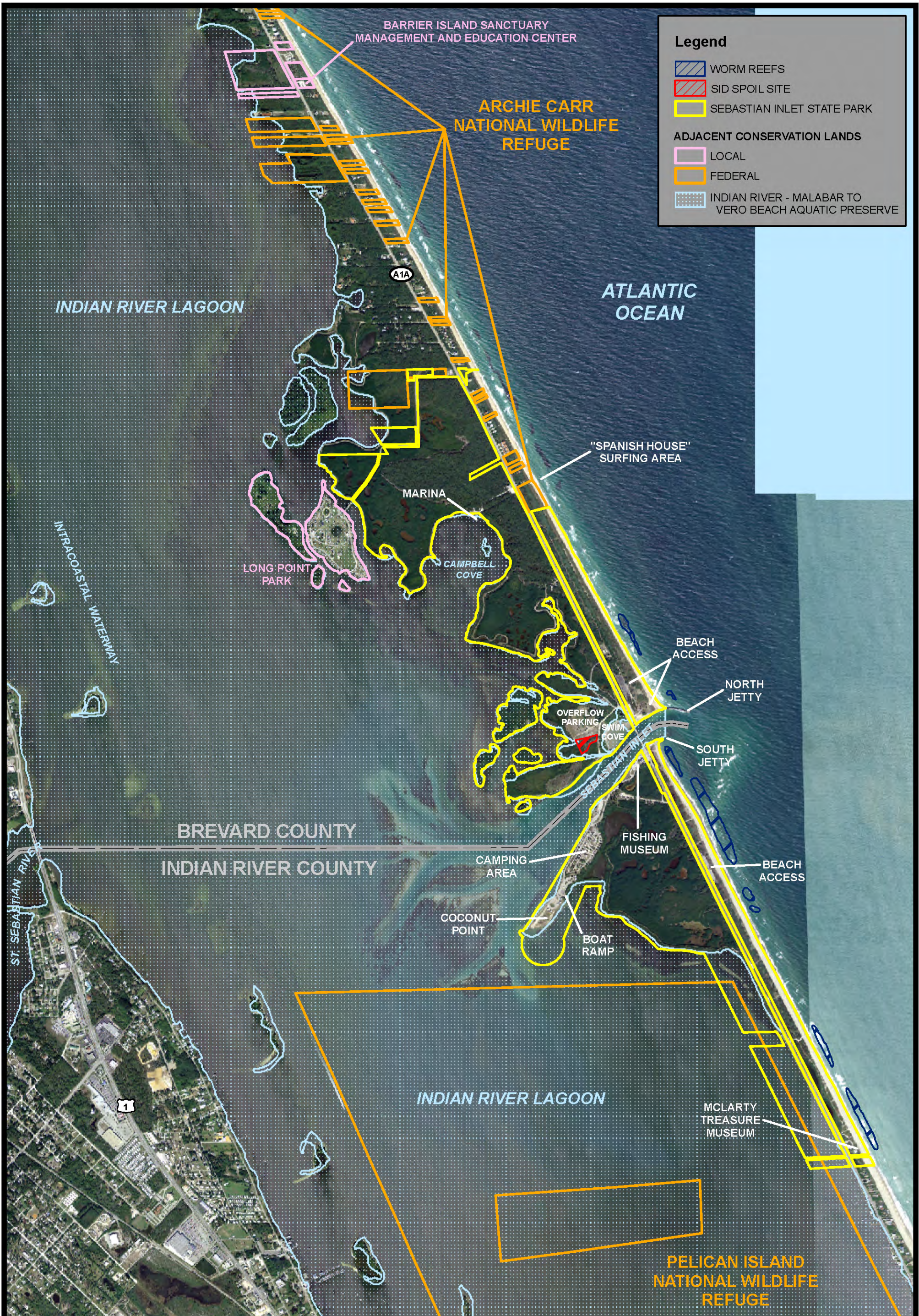
The land use component is the recreational resource allocation plan for the unit. Based



**SEBASTIAN INLET
STATE PARK**



**VICINITY
MAP**



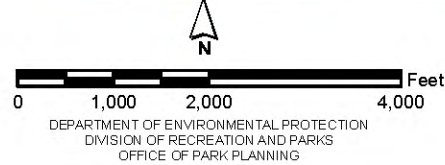
Legend

- WORM REEFS
- SID SPOIL SITE
- SEBASTIAN INLET STATE PARK

ADJACENT CONSERVATION LANDS

- LOCAL
- FEDERAL
- INDIAN RIVER - MALABAR TO VERO BEACH AQUATIC PRESERVE

SEBASTIAN INLET STATE PARK



REFERENCE MAP

on considerations such as access, population and adjacent land uses, an optimum allocation of the physical space of the park is made, locating use areas and proposing types of facilities and volume of use to be provided.

In the development of this plan, the potential of the park to accommodate secondary management purposes (“multiple uses”) was analyzed. These secondary purposes were considered within the context of the Division’s statutory responsibilities and an analysis of the resource needs and values of the park. This analysis considered the park natural and cultural resources, management needs, aesthetic values, visitation and visitor experiences.

For this park, it was determined that no secondary purposes could be accommodated in a manner that would not interfere with the primary purpose of resource-based outdoor recreation and conservation. Uses such as water resource development projects, water supply projects, stormwater management projects, linear facilities and sustainable agriculture and forestry (other than those forest management activities specifically identified in this plan) are not consistent with this plan.

The potential for generating revenue to enhance management was also analyzed. Visitor fees and charges are the principal source of revenue generated by the park. It was determined that multiple-use management activities would not be appropriate as a means of generating revenues for land management. Instead, techniques such as entrance fees, concessions and similar measures will be employed on a case-by-case basis as a means of supplementing park management funding.

MANAGEMENT PROGRAM OVERVIEW

Management Authority and Responsibility

In accordance with Chapter 258, Florida Statutes and Chapter 62D-2, Florida Administrative Code, the Division is charged with the responsibility of developing and operating Florida's recreation and parks system. These are administered in accordance with the following policy:

It shall be the policy of the Division of Recreation and Parks to promote the state park system for the use, enjoyment, and benefit of the people of Florida and visitors; to acquire typical portions of the original domain of the state which will be accessible to all of the people, and of such character as to emblemize the state's natural values; conserve these natural values for all time; administer the development, use and maintenance of these lands and render such public service in so doing, in such a manner as to enable the people of Florida and visitors to enjoy these values without depleting them; to contribute materially to the development of a strong mental, moral, and physical fiber in the people; to provide for perpetual preservation of historic sites and memorials of statewide significance and interpretation of their history to the people; to contribute to the tourist appeal of Florida.

The Trustees have also granted management authority of certain sovereign submerged lands to the Division under Management Agreement MA 68-086 (as amended January 19, 1988). The management area includes a 400-foot zone from the edge of mean high water where a park boundary borders sovereign submerged lands fronting beaches, bays, estuarine areas, rivers or streams. Where emergent wetland vegetation exists, the zone extends waterward 400 feet beyond the vegetation. The agreement is intended to provide additional protection to resources of the park and nearshore areas and to provide authority to manage activities that could adversely impact public recreational uses. In addition, the park borders the Indian River Aquatic Preserve. Therefore, the management authority is jointly shared within the boundary of the aquatic preserve.

Many operating procedures are standard system wide and are set by policy. These procedures are outlined in the Division's Operations Manual (OM) and cover such areas as personnel management, uniforms and personal appearance, training, signs, communications, fiscal procedures, interpretation, concessions, camping regulations, resource management, law enforcement, protection, safety and maintenance.

In the management of Sebastian Inlet State Park, a balance is sought between the goals of maintaining and enhancing natural conditions and providing various recreational opportunities. Natural resource management activities are aimed at management of natural systems. Development in the park is directed toward providing public access to and within the park, and to providing recreational facilities, in a balance, that are both convenient and safe. Depletion of a resource by any recreational activity is not permitted. Program emphasis is on interpretation on the park's natural, aesthetic and educational attributes.

Park Goals and Objectives

The following park goals and objectives express the Division's long-term intent in managing the state park. At the beginning of the process to update this management plan, the Division reviewed the goals and objectives of the previous plan to determine if they remain meaningful and practical and should be included in the updated plan. This process ensures that the goals and objectives for the park remain relevant over time.

Estimates are developed for the funding and staff resources needed to implement the management plan based on these goals, objectives and priority management activities. Funding priorities for all state park management and development activities are reviewed each year as part of the Division's legislative budget process. The Division prepares an annual legislative budget request based on the priorities established for the entire state park system. The Division also aggressively pursues a wide range of other funds and staffing resources, such as grants, volunteers and partnerships with agencies, local governments and the private sector, for supplementing normal legislative appropriations to address unmet needs. The ability of the Division to implement the specific goals, objectives and priority actions identified in this plan will be determined

by the availability of funding resources for these purposes.

Natural Resources

- 1.** Conserve, protect and manage natural communities, significant habitat and ecological systems.
 - A.** Survey for exotic plant and animal species and continue the exotic species removal program.
 - B.** Continue and expand the prescribed fire program to maintain fire as an ecosystem process with emphasis on maintaining the current condition of the coastal strand and beach dune habitats south of the inlet while restoring these communities to the north of the inlet.
 - C.** Seek funding for additional staff to aid in the preparation, implementation and evaluation of resource management.
 - D.** Monitor natural community restoration projects to adaptively manage habitats
 - E.** Close unauthorized footpaths that occur throughout the beach dune and coastal strand habitat to the north and south of the inlet and replant with native herbaceous vegetation.
 - F.** Control unauthorized access and prevent additional erosion.
 - G.** Educate visitors on all projects and changes to the park to promote the park and park programs.
- 2.** Restore, monitor and protect the hydrology of the park to the greatest extent practicable.
 - A.** Work with St. Johns River Water Management District to obtain ground and surface water quality and quantity data.
 - B.** Determine the feasibility of restoring the original hydroperiod to the tidal swamps by working with local mosquito control districts.
 - C.** Control and limit stormwater runoff into adjacent wetlands along State Road A1A, park drives, easements and other areas.
- 3.** Maintain or increase populations of listed plant and animal species occurring on the park.
 - A.** Explore opportunities for reintroducing the southeastern beach mouse to the north side of the inlet.
 - B.** Expand and restore beach mouse habitat.
 - C.** Survey and monitor for wintering and nesting shorebirds and establish protected resting, loafing and nesting areas where needed throughout the year. Work with FWC and local agencies on shorebird protection issues.
 - D.** Prohibit pets from all park beach areas.
 - E.** Control access to Coconut Point during shorebird breeding season and after enhancement.
 - F.** Work with SID to encourage more appropriate timing and frequency for future renourishment projects that allow for successful sea turtle nesting and to protect sensitive beach mouse and shorebird habitat
 - G.** Survey and monitor populations of gopher tortoises.

- H. Protect gopher tortoises in the field west of the cove by controlling access and developing a plan for this area.
- I. Continue flora and fauna surveys.
- 4. Restore highly altered or severely impacted natural communities.
 - A. Mechanically treat severely overgrown, fire suppressed coastal strand communities to the north of the inlet. A narrow buffer may be needed to control unauthorized access.
 - B. Seek funding to initiate the enhancement of the Coconut Point protected zone for beach-nesting birds according to the developed plan.
 - C. Develop a written plan for the field west of the cove that takes into consideration all demands for this parcel.
 - D. Restore the area around the cove by removing exotics and replanting with natives to give a more natural appearance for visitors to enjoy.
- 5. Provide environmental education and enhance public appreciation for elements of natural and cultural diversity.
 - A. Continue to operate both the McLarty Treasure Museum and the Sebastian Fishing Museum
 - B. Expand interpretive programs and field trips for the public and school groups to raise awareness of the local flora and fauna, including what is needed for management.
 - C. Train additional volunteers as tour guides.
 - D. Universal Trail Assessment Process (UTAP) designated park trails and update interpretive signage as appropriate.

Cultural Resources

- 1. Develop and implement an archaeological site condition-monitoring program.
 - A. Establish a reasonable site visit schedule.
 - B. Train staff or volunteers to conduct condition assessments.
 - C. Adopt a standardized condition assessment form to ensure data collection consistency.
 - D. Maintain permanent files for each site for condition data, and other documentation related to the physical change or treatment of sites.
- 2. Protect recorded and unrecorded archaeological sites.
 - A. Prioritize avoiding or minimizing site disturbance during improvement and resource management projects.
 - B. Reduce or eliminate other threats to the extent possible.
 - C. Apply approved treatment to preserve or stabilize sites.
- 3. Conduct archaeological surveys in order to locate sites, determine boundaries, document condition, assess significance, evaluate the archaeological sensitivity of the coast and distinguish between historic and non-historic surface remains.
 - A. Prioritize archaeological survey needs.
 - B. Identify what can be accomplished in-house.
 - C. Pursue grant funding for additional professional work.

- D.** Solicit volunteer support where appropriate.
- 4.** Coordinate preservation, research and interpretation efforts for archaeological sites with local entities.
 - A.** Encourage permitted research by accredited regional universities and colleges.
 - B.** Encourage volunteer work by local chapters of the Florida Anthropological Society.
 - C.** Foster a relationship with the new regional office of the Florida Public Archaeology Network.
 - D.** Solicit support from Brevard and Indian River Counties for archaeological surveys and pursuit of grant money.
- 5.** Develop a Museum Manual for the Sebastian Inlet Fishing Museum.
 - A.** Clarify roles and responsibilities of the park and the Citizens Support Organization.
 - B.** Clarify operational procedures.
 - C.** Clarify collection management arrangements.
- 6.** Develop an Interpretive Plan and Scope of Collection Statement for the Sebastian Inlet Fishing Museum.
 - A.** Revisit the purpose of the museum and identify additional interpretive goals.
 - B.** Consult with individuals with ties to the local commercial fishing industry.
 - C.** Evaluate current exhibits based on the new interpretive plan.
 - D.** Evaluate current museum collection, and identify collecting priorities based on the new interpretive plan.
- 7.** Address preservation, conservation and interpretation issues at the McLarty Museum
 - A.** Purchase equipment to produce a continuous record of temperature and humidity, and evaluate and remedy significant fluctuations.
 - B.** Replace UV-protective sleeves on lights; reconfigure or replace current lighting as needed to protect photographic material.
 - C.** Consult with Department Of State, Division of Historical Resources for permission to and instructions on touching up conserved metal artifacts.
 - D.** Secure funds for a general conservation assessment, via the Conservation Assessment Program or a private conservator, to assess the collection and museum environment, and for specific evaluation of the paintings.
 - E.** Develop a written security plan for the museum.
- 8.** Recognize and interpret the significance of the park's cultural resource and stewardship activities.
 - A.** Solicit the involvement of associated living communities in the development of related preservation and interpretive projects.
 - B.** Post protective signage near heavily trafficked archaeological sites if useful.
 - C.** Nominate significant sites to the National Register of Historic Places.
 - D.** Keep permanent park history files on the park's development and history of surfing, fishing and other traditional uses; Park Interpretive plans should be updated to promote public education of these activities, the park's history and

prehistory, archaeological research of the peninsula, and preservation issues.

Recreational Goals

1. Continue to provide quality resource based outdoor recreational and interpretive programs and facilities at the state park.
 - A. Provide facilities and use areas to support beach recreation, fishing, surfing, camping, picnicking, hiking, biking, boating, kayaking and birding.
 - B. Regularly monitor impacts to park resources and the visitor experience and address through appropriate management action.
 - C. Provide controlled public access to the beach.
 - D. Deliver ranger led interpretive programs and provide static interpretive displays and educational materials to educate visitors and encourage responsible use of park resources.
2. Seek funding to expand recreational and interpretive opportunities through the improvement of programs and the development of new use areas and facilities, as outlined in this management plan.
 - A. Expand and enhance the “Spanish House” parking area.
 - B. Evaluate and renovate the entire marina area.
 - C. Evaluate and redesign the concession area at the north jetty beach use area.
 - D. Enhance the swimming cove area and provide stabilized parking.
 - E. Add a primitive group camp.
 - F. Explore the feasibility of developing a cabin area along the north inlet shoreline.
 - G. Replace the fishing dock along the inlet’s south shoreline.
 - H. Improve and expand the camping area.
 - I. Improve and control beach access areas south of the inlet.
 - J. Evaluate the McLarty Treasure Museum for possible renovations.
 - K. Explore ability to extend paved bike paths along park roads.

Park Administration/Operations

1. Provide efficient and effective management of park resources and facilities while maintaining a high level of visitor service.
 - A. Pursue funding to acquire additional FTE positions as the parks operation grows in complexity.
 - B. Seek funding to accomplish goals and objectives set forth in this management plan.
 - C. Assure compliance with Division, state and federal safety guidelines and training requirements by providing training to all staff in visitor services, park information and emergency services.
 - D. Maintain high maintenance standards and conduct routine safety inspections to provide clean safe facilities and use areas.
 - E. Seek funding to meet staff residence needs and construct/upgrade support facilities.

- F.** Recruit and maintain volunteer support to assist park staff with the maintenance of park facilities, protection of park resources and implementation of park programs.
- G.** Establish and maintain effective park boundaries through fencing and posting of signs.
- H.** Work with Florida Park Police and other state and local Law Enforcement Agencies to protect natural and cultural resources while protecting park visitors.
- I.** Maintain and expand an active public relations program that increases public awareness and support for the park including resource management activities such as prescribed burning, exotic removal, listed species protection.

Management Coordination

The park is managed in accordance with all applicable Florida Statutes and administrative rules. Agencies having a major or direct role in the management of the park are discussed in this plan.

The Department of Agriculture and Consumer Services, Division of Forestry (DOF), assists Division staff in the development of wildfire emergency plans and provides the authorization required for prescribed burning. The Florida Fish and Wildlife Conservation Commission (FFWCC), assists staff in the enforcement of state laws pertaining to wildlife, freshwater fish and other aquatic life existing within park boundaries. In addition, the FFWCC aids the Division with wildlife management programs, including the development and management of Watchable Wildlife programs. The Department of State, Division of Historical Resources (DHR) assists staff to assure protection of archaeological and historical sites. The Department of Environmental Protection (DEP), Office of Coastal and Aquatic Managed Areas (CAMA) aids staff in aquatic preserves management programs and advises staff of Environmental Resource Permitting (ERP) requirements and mitigation options. The DEP, Bureau of Beaches and Wetland Resources aids staff in planning and construction activities seaward of the Coastal Construction Line. In addition, the Bureau of Beaches and Wetland Resources aid the staff in the development of erosion control projects. Emphasis is placed on protection of existing resources as well as the promotion of compatible outdoor recreational uses.

Sebastian Inlet State Park is closely related to management issues and activities by the Sebastian Inlet District (SID), Indian River and Brevard County governments, CAMA, local water management districts, and the U.S. Fish and Wildlife Service's Archie Carr National Wildlife Refuge. The park is also involved in local initiatives to designate State Road A1A as a Florida Scenic Highway and to designate portions of the barrier island as a National Historic District. Division staff will continue its involvement with each of these groups to insure that management activities within the state park are consistent with the goals, objectives and activities of the other programs, as necessary

and appropriate.

Division staff will encourage staff of the Florida Forever acquisition program to evaluate those areas the Indian River Blueways project to identify important shorebird nesting habitats within the project boundary, and recommend that important habitat areas be given priority for acquisition.

Division of Recreation and Parks staff has reviewed the SID's management plan for the Sebastian Inlet. Staff considers the goals and objectives of that plan to be generally consistent with the Division's interests in management of the state park. Erosion of the Atlantic beach shoreline south of the Sebastian Inlet has been a resource management problem for decades, and will continue to be in the future. The development of a sand transfer system at Sebastian Inlet is suggested as a primary measure to address this ongoing problem. Division staff agrees that a sand transfer system should continue to be considered as a part of the solution to the problem, with the understanding that decisions on beach renourishment and sand transfer must be based on a comprehensive understanding of the options and their relative impacts to the physical, biological and recreational resources and operation of the state park. The Division will continue to work with the SID, Indian River and Brevard Counties and the DEP Bureau of Beaches and Coastal Systems to evaluate all options available to address beach erosion and renourishment south of the inlet.

Public Participation

The Division provided an opportunity for public input by conducting a public meeting and an advisory group meeting to present the draft management plan to the public. A public meeting was held on May 13, 2008. An Advisory Group meeting was held May 14, 2008. The purpose of this meeting was to provide the Advisory Group members an opportunity to discuss the draft management plan.

Other Designations

Sebastian Inlet State Park has not been designated as an Area of Critical State Concern as defined in section 380.05, Florida Statutes. Currently it is not under study for such designation. The park is a component of the Florida Greenways and Trails System.

This unit is adjacent to the Indian River Aquatic Preserve, which was designated under provision of the Florida Aquatic Preserve Act of 1975 (section 258.35, Florida Statutes). All waters within the unit have been designated as Outstanding Florida Waters, pursuant to Chapter 62-302 Florida Administrative Code. Administered by the Department of Environmental Protection, this program was created by Section 403.061, Florida Statutes, and protects lakes, rivers and streams against degradation of existing ambient water quality. Surface waters in this unit are also classified as Class III waters by DEP.

RESOURCE MANAGEMENT COMPONENT

INTRODUCTION

The Division of Recreation and Parks has implemented resource management programs for preserving for all time the representative examples of natural and cultural resources of statewide significance under its administration. This component of the unit plan describes the natural and cultural resources of the park and identifies the methods that will be used to manage them. The stated management measures in this plan are consistent with the Department's overall mission in ecosystem management. Cited references are contained in Addendum 2.

The Division's philosophy of resource management is natural systems management. Primary emphasis is on restoring and maintaining, to the degree practicable, the natural processes that shape the structure, function and species composition of Florida's diverse natural communities as they occurred in the original domain. Single species management may be implemented when the recovery or persistence of a species is problematic provided it is compatible with natural systems management.

The management goal of cultural resources is to preserve sites and objects that represent all of Florida's cultural periods as well as significant historic events or persons. This goal may entail active measures to stabilize, reconstruct or restore resources, or to rehabilitate them for appropriate public use.

Because park units are often components of larger ecosystems, their proper management is often affected by conditions and occurrences beyond park boundaries. Ecosystem management is implemented through a resource management evaluation program (to assess resource conditions, evaluate management activities and refine management actions), review of local comprehensive plans and review of permit applications for park/ecosystem impacts.

RESOURCE DESCRIPTION AND ASSESSMENT

Natural Resources

Topography

Sebastian Inlet State Park is located on the Atlantic coast of Florida on a barrier island, which is bounded on the east by the Atlantic Ocean, and on the west by the Indian River Lagoon. Elevations at the unit range from sea level along the coast to approximately 5 feet above mean sea level.

This unit is found within the Eastern Flatwoods District (Brooks 1981a). Within this district, the park lies along the Central Atlantic Coastal Strip physiographic division, which was created or modified by shoreline processes during the Late Pleistocene when

sea levels were at about 18 feet (12 to 15 feet above its present level). In this division, the park lies along the Cocoa-Sebastian Ridge (Brooks 1981b); in addition, this unit is situated along the Silver Bluff Terrace, which formed during the Pleistocene. During the formation of this terrace, sea level was approximately 8 to 10 feet higher than the current level (Healy 1975).

Geology

This unit is underlain by at least two different geological deposits (Wettstein et al. 1987). The majority of the park consists of Hawthorn Group deposits of interbedded limestone, dolomite, sand and clay, laid down in the Miocene (25 to 13 million years before the present). The Anastasia Formation, which overlies the Hawthorn Group, is composed of quartz sand and shell material; it was laid during the Pleistocene, 1.6 to 0.1 million years before the present.

Soils

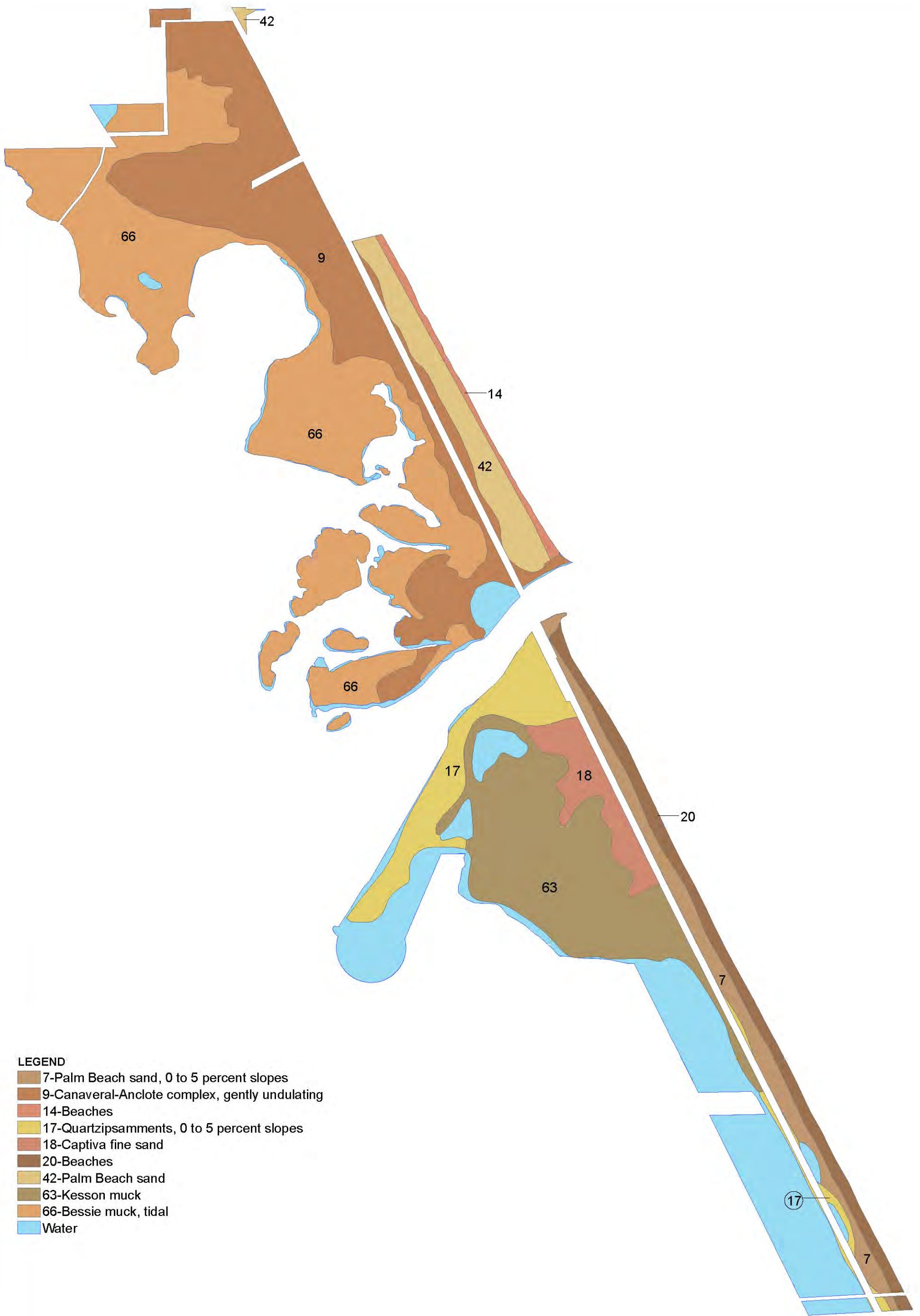
There are nine different soil types in addition to spoil banks occurring in Sebastian Inlet State Park (see Soils Map). This soil survey was compiled by the U. S. Department of Agriculture, Soil Conservation Service (SCS) in the soil surveys of Brevard County (Huckle et al. 1974) and Indian River County (Wettstein et al. 1987). Management activities will follow generally accepted best management practices to prevent soil erosion and conserve soil and water resources on site. Addendum 3 contains complete descriptions of park soil types.

Soil erosion occurs primarily in two areas of the park: 1) along the shoreline of the Atlantic Ocean 2) and in the beach dune community, south of inlet. Along the shoreline of the Atlantic, the erosion is caused by seasonal storms; the inlet exacerbates erosion in the southern part of the park. Beach renourishment projects have occurred south of the inlet on a periodic basis; in recent years, the frequency of the projects has increased. Following these projects, moderate to severe escarpments (3-6 feet or higher) has formed; on some occasions, the contractor has removed the escarpment. Numerous footpaths exist south of inlet which transverse the coastal strand and beach dune communities. These areas are devoid of vegetation because they are heavily used by visitors to access the beach. Over time, sand has been dispersed, leaving a trench like gully through the dune. Closing these foot paths and redirecting visitors to the designated parking areas will correct these issues before the paths can be restored.

In 1975, riprap was placed seaward of the McLarty Museum to protect the building and the historic site from beach erosion. This has stabilized the shoreline and does not appear to be negatively affecting sea turtle nesting and erosion in the immediate vicinity of the Museum.

Minerals

No deposits of commercially valuable minerals are evident.



LEGEND

- 7-Palm Beach sand, 0 to 5 percent slopes
- 9-Canaveral-Anclote complex, gently undulating
- 14-Beaches
- 17-Quartzipsamments, 0 to 5 percent slopes
- 18-Captiva fine sand
- 20-Beaches
- 42-Palm Beach sand
- 63-Kesson muck
- 66-Bessie muck, tidal
- Water

Hydrology

The principal drainage from this unit is to the Atlantic Ocean and the Indian River, a shallow estuarine lagoon separating the barrier island from the mainland.

Groundwater is available from the shallow surficial aquifer and the upper Floridan aquifer (Hyde 1975). Average annual rainfall at the park is approximately 52 inches. Though much of the rain filters into the shallow aquifer, some remains on the surface, adding to the Indian River Lagoon system.

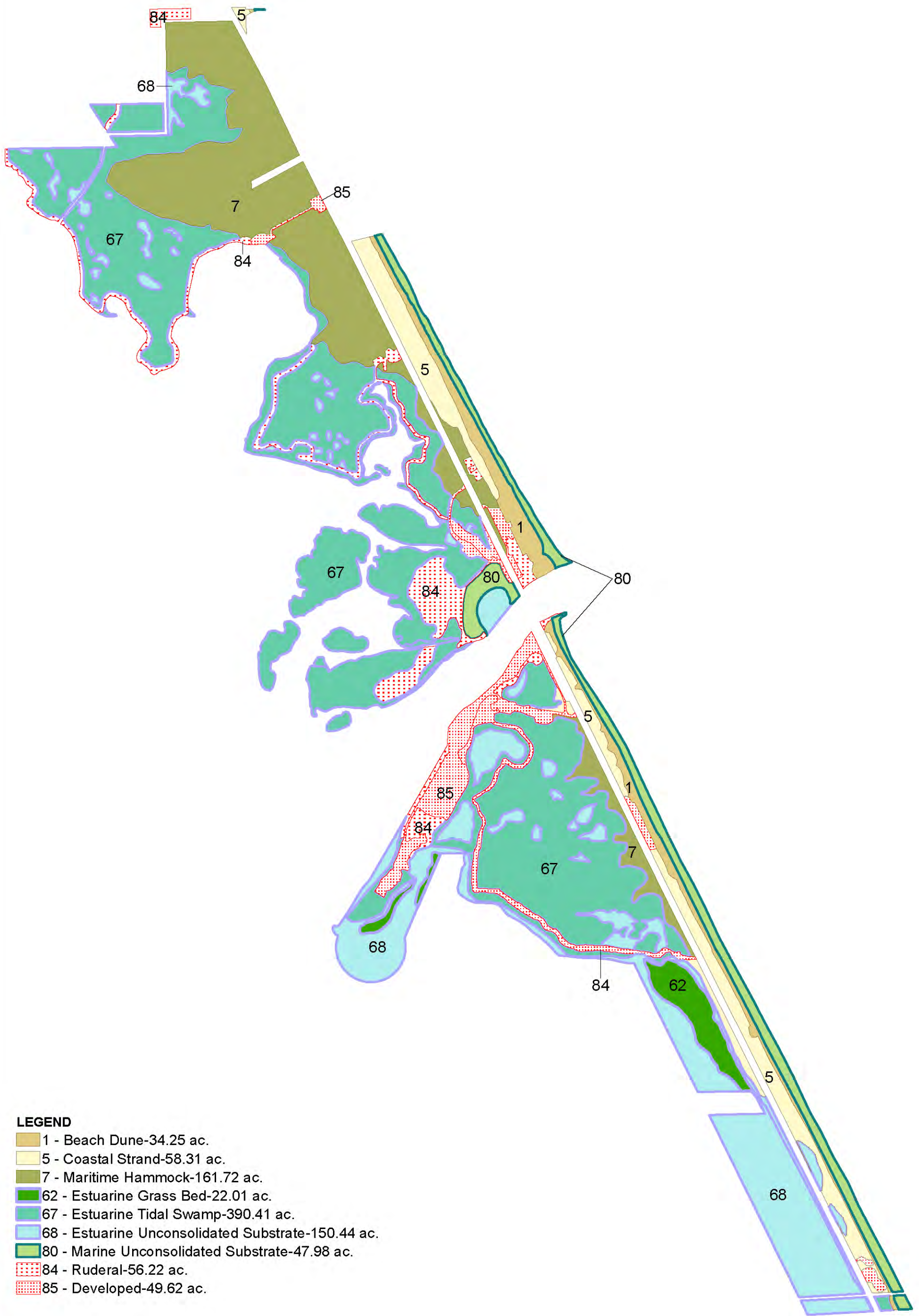
Past mosquito ditching practices along the western side of the park have altered the historical hydrologic flow. Studies should be conducted to determine the feasibility of backfilling mosquito ditches and removing the levees to restore the altered hydrology and near shore communities along the Indian River Lagoon. Most of the Indian River, including that portion adjacent to this unit, has been designated as an aquatic preserve and has received a Class II water quality designation by the Department. The waters of the aquatic preserve and the park are designated as Outstanding Florida Waters.

Natural Communities

The system of classifying natural communities employed in this plan was developed by the Florida Natural Areas Inventory (FNAI). The premise of this system is that physical factors, such as climate, geology, soil, hydrology and fire frequency generally determine the species composition of an area, and that areas which are similar with respect to these factors will tend to have natural communities with similar species compositions. Obvious differences in species composition can occur, despite similar physical conditions. In other instances, physical factors are substantially different, yet the species compositions are quite similar. For example, coastal strand and scrub--two communities with similar species compositions--generally have quite different climatic environments, and these necessitate different management programs.

The park contains eight distinct natural communities (see Natural Communities Map—marine worm reef is not mapped) in addition to ruderal and developed areas. The Natural Communities Map is a graphic representation of the existing vegetative conditions in the park at the time this management plan was developed. Park specific assessments of the existing natural communities are provided in the narrative below. A list of plants and animals occurring in the unit is contained in Addendum 4.

Beach dune. This community exists as a strip of land along the eastern border of the unit between the beach and the coastal strand communities. The condition of this community varies along its length. North and immediately south of the inlet, the community is generally in fair to good condition; erosion is minimal, and vegetative cover is largely intact. The dominant vegetation on the foredunes is sea oats (*Uniola paniculata*); other plants include railroad vine (*Ipomoea pes-caprae*), beach morning glory (*Ipomoea imperati*), east coast dune sunflower (*Helianthus debilis* var. *debilis*), baybean



(*Canavalia rosea*), bitter panicgrass (*Panicum amarum*) with scattered sea grape (*Coccoloba uvifera*) encroaching from the coastal strand community in areas of infrequent fire.

South of the day-use area, to the southern end of the park, the beach dune community is in poor to fair condition. The community has been negatively impacted by recent beach renourishment projects: several vehicular access ramps were constructed to allow dump trucks to deposit fill material on the beach, and many areas of the community were covered by the fill. To date, the ramps have not been completely revegetated; they are regularly used by visitors for access to the beach. These areas are more susceptible to blowouts and erosion due to the lack of vegetative cover. The park has obtained ownership of one of the access ramps and has begun to mitigate for the impacts caused by foot traffic. There is a high amount of erosion along this area; in some cases, very little of the original foredune still exists. Where vegetation occurs, sea oats are dominant. Numerous footpaths and access ramps are used by visitors to access the beach. Vegetation is being trampled, leaving large areas of foredune devoid of vegetation leading to erosion and possible blowouts. Access to the beach should be controlled by directing visitors to the parking areas, allowing restoration of the footpaths to begin. With the exception of revegetation of the ramp areas and footpaths, no special management actions are needed at this time.

Coastal strand. Coastal strand exists inland of the beach dune community. North of the inlet, this community grades into maritime hammock. Several boardwalks have been constructed through this community north of the inlet for access to the beach. In this area of the park, the community is in fair condition. The dominant vegetation consists primarily of shrubs and trees consisting of saw palmetto (*Serenoa repens*), sea grape, cabbage palm (*Sabal palmetto*), coralbean, and beachberry (*Scaevola plumieri*). Areas devoid of shrubs are dominated by sea oats, marshhay cordgrass (*Spartina patens*), bitter panicgrass, seacoast marshelder (*Iva imbricata*), erect pricklypear (*Opuntia stricta*), gulf croton (*Croton punctatus*), and east coast dune sunflower.

South of the inlet, the community is in good condition and is highly fragmented; beach facilities, a boardwalk, footpaths, a staff residence, a museum, and State Road A1A were sited in the coastal strand. While grasses predominate, sea grape, wax myrtle (*Myrica cerifera*), saw palmetto and cabbage palm are present. Several vehicular access roads for beach renourishment projects (also referenced above) were constructed through this community; to date, the roads have not been revegetated. They are regularly used by visitors for access to the beach. These areas are more susceptible to blowouts and erosion due to the lack of vegetative cover. In 1997, a prescribed burning program was initiated in this area of the park to reduce the amount of hardwood encroachment and increase the coverage of grasses to benefit a population of southeastern beach mice (*Peromyscus polionotus niveiventris*). Additional prescribed burning, mowing and periodic exotic removal efforts will be necessary to maintain this community.

Maritime hammock. At this unit, the maritime hammock community is considered to be in good to excellent condition. It is composed of a mixture of temperate and subtropical plant species, such as sand live oak (*Quercus geminata*), red bay (*Persea borbonia* var. *borbonia*), marlberry (*Ardisia escallonioides*), Florida swamp-privet (*Forestiera segregata*), wild lime (*Zanthoxylum fagara*), twinberry (*Myrcianthes fragrans*), white stopper (*Eugenia axillaris*), Spanish stopper (*Eugenia foetida*), strangler fig (*Ficus aurea*), wild coffee (*Psychotria nervosa*), shortleaf wild coffee (*Psychotria sulzneri*), and gumbo-limbo (*Bursera simaruba*).

In some areas of the park, this community has been invaded by exotic plant species, including Brazilian pepper (*Schinus terebinthifolius*) and Australian pines (*Casuarina equisetifolia*). An aggressive exotic control effort, which has been underway for the past several years, has resulted in a significant reduction in the coverage of these and other exotic plants within the maritime hammock.

This community type is considered by the Florida Natural Areas Inventory (FNAI) to be imperiled due to its rarity of because of vulnerability to extinction due to natural or human-caused factors. It should be protected from future development to the greatest extent practicable. This community is essentially self-maintaining; with the exception of exotic removal efforts, no special management actions are needed at this time.

Estuarine tidal swamp. The condition of this community varies within the park from excellent to good to fair. Historically, some of this community was likely estuarine tidal marsh before extensive ditching and impoundment for mosquito control. Over time, the marshes dried out and the community succeeded to estuarine and marine tidal swamp. In submerged areas, red mangrove (*Rhizophora mangle*) became dominant, while Brazilian pepper and Australian pine are dominant along the dikes. In other areas of the park, exotic encroachment is minimal. Many of these areas are dominated by red mangrove, black mangrove (*Avicennia germinans*), white mangrove (*Laguncularia racemosa*), and buttonwood (*Conocarpus erectus*). This community is essentially self-maintaining; with the exception of exotic removal efforts, no special management actions are needed at this time.

Estuarine unconsolidated substrate. The often-unvegetated portion of sand lying along the lagoon side of the park that is categorized as estuarine unconsolidated substrate. This community is tidally inundated on a daily basis, and is largely devoid of plant species; however, in areas where the substrate has been disturbed, grass and weedy species dominate. Estuarine unconsolidated substrate is utilized by shorebirds for resting, loafing and feeding, along with other invertebrate species like crabs and mollusks.

Marine unconsolidated substrate. The portion of the beach, which lies seaward of the beach dune community, is categorized as marine unconsolidated substrate. This

community is tidally inundated on a daily basis, and is largely devoid of plant species. Marine unconsolidated substrate is utilized by shorebirds for resting, loafing and feeding, and sea turtles traverse this community during nesting and emergence events. With the exception of periodic beach renourishment projects (once or twice every decade) that use sand dredged from the inlet sand trap, no other renourishment projects may be warranted. Additional actions to improve the quality of the material placed in this community should be implemented.

Estuarine grass beds. This offshore natural community is one of the smallest within the boundaries of the park but does exist outside of park within CAMA lands. Dominant species are turtle grass (*Thalassia testudinum*), shoal grass (*Halodule wrightii*), and manatee grass (*Syringodium filiforme*). Johnson's seagrass (*Halophila johnsonii*) can also be found within the park, but due to its rarity, it often not detectable. Ecologically, grass beds are important components of the estuary: they stabilize sediments and provide nurseries, food and shelter to many estuarine organisms. Grass beds are sensitive to changes in salinity and to disturbance caused by boats such as propeller scars. Due to their location within the park near the boat ramp facility, impacts caused by boats will increase as ramp becomes more heavily used. The park should continue to educate boaters on the proper protection measures to protect this valuable resource.

Marine worm reef (not mapped). This community is located just offshore of the park and is faunal-based where it is dependent on a *sabellariid polychaete*, *Phragmatopoma lapidosa*. This marine invertebrate cements sand grains together to form large colonial structures of worm tubes. The community grows as larvae attach to the substrate created by the adults. In order for the community to become established, a hard substrate must be present, such as the granitic rocks of the jetties as well as on the coquina-limestone outcrop of the Anastasia Formation south of the inlet. South of the inlet, the worm reef is covered by sand following storms and beach renourishment projects; this can result in the death of portions of the reef. At this time, the condition of the reef is unknown; no management actions are proposed at this time. Future considerations should include an initial assessment of reef conditions followed by periodic monitoring to determine if beach renourishment projects are having a negative impact on the reef systems.

Ruderal areas. These areas are characterized by having the natural substrate or the natural community overwhelmingly altered because of human activity. Native vegetation is sparse and is often replaced by weedy or exotic species. These areas require restoration efforts.

Developed areas. These areas consist of natural biological communities that have been replaced or nearly replaced by structures or permanently cleared areas such as roads, visitor facilities, campgrounds, recreation areas, parking lots or concessions.

Designated Species

Designated species are those that are listed by the Florida Natural Areas Inventory (FNAI), U.S. Fish and Wildlife Service (USFWS), Florida Fish and Wildlife Conservation Commission (FFWCC), and the Florida Department of Agriculture and Consumer Services (FDA) as endangered, threatened or of special concern. Addendum 5 contains a list of the designated species and their designated status for this park. Management measures will be addressed later in this plan.

Marine turtles. As noted previously, Sebastian Inlet State Park is located within the Archie Carr National Wildlife Refuge, which is a critical area for the nesting of loggerhead sea turtles (*Caretta caretta*). The beaches of the ACNWR support the largest nesting colony of loggerhead turtles in the western hemisphere, the second largest in the world. The park also provides important nesting habitat for green and leatherback sea turtles (*Chelonia mydas* and *Dermochelys coriacea*, respectively). In addition, hawksbills (*Eretmochelys imbricata*) have occasionally been seen at the park. In 2006, the totals were as follows: 619 loggerhead nests, 74 green turtle nests, and 1 leatherback nest. The park participates in nest surveys and monitoring as part of the index nesting beach program administered by the Florida Fish and Wildlife Conservation Commission. The park participates in nest monitoring as an index beach. The Federal recovery plan for the respective sea turtle species (loggerhead and green turtle: National Marine Fisheries Service and U.S. Fish and Wildlife Service 1991; leatherback: National Marine Fisheries Service and U.S. Fish and Wildlife Service 1992) will be closely adhered to by staff.

The greatest threat to sea turtles at this unit involves the beach renourishment projects that use sand brought in from inland sources. According to Ehrhart and Herren (1998), nesting success was reduced by 60 percent on the portion of the beach that received inland material in 1997. Reproductive success was also significantly reduced; many eggs died early in development. The smaller grain sizes, higher moisture content, lower temperatures, and higher shears resistance of the material contributed to these results. Too much material has also been placed on the beach in some areas during the past renourishment projects. Often, this leads to the formation of numerous scarps along the beach. Once escarpment occurs, a tall wall of material is created (3-6 or more feet); which can create a situation where sea turtles are unable to pull themselves up the beach to nest. The excessive amount of material placed on the beach has also covered the primary dune community in some areas, destroying habitat for beach mice and obscuring nesting cues for sea turtles. On several occasions, after the escarpment was removed by the renourishment contractor, sea turtles continued west, fell over the back of the original primary dune and were trapped. In one instance, a turtle continued heading west and was killed by an automobile on State Road A1A. The timing of the projects will likely prove detrimental to sea turtles. According to Ehrhart (pers. comm.), renourished beaches require a minimal resting period of three years before they become

optimal for sea turtle nesting. The current renourishment schedule proposed by the Sebastian Inlet District (SID) has projects occurring every year. FPS should pursue a less frequent schedule for future renourishment projects to help encourage sea turtle nesting as well as to protect sensitive beach mouse and shorebird habitat. This would also be favorable for the protection of the worm rock reef communities located just offshore.

Beach mice. The beach dune community south of the inlet supports one of the last populations of the southeastern beach mouse in the southern half of its range. Monitoring has revealed that the population is very small, but persistent. Continued habitat fragmentation and destruction by beach renourishment projects may jeopardize the continued existence of this federally threatened species at the park. Prescribed burning was initiated in beach mouse habitat south of the inlet in 1997; due to the favorable response by beach mice, burning has continued since then on a periodic basis to reduce hardwood encroachment and to increase the coverage and vigor of grasses.

Beach mice historically occurred north of the inlet, but due to predation, habitat fragmentation and habitat succession, the population no longer is present. In the late 1990s, the Florida Park Service began ongoing discussions with the United States Fish and Wildlife Service (USFWS) and university researchers of the possibility of reintroducing the species back into the northern side of the park. It was determined that habitat modification was needed to restore the beach dune and coastal strand communities before a reintroduction could be attempted. The condition of both communities at the time was determined to be fair to poor, with overgrown vegetation, exotic plant infestations and inflated native and non-native predator populations. Habitat restoration of the coastal strand community began in 2006. The goal was to mechanically treat the vegetation with mowing and follow with a prescribed fire. Mowing was completed in 2006 and a burn was conducted in February 2007. Herbaceous ground cover has already responded and exotic species have been treated and removed. Continued mowing and burning of both the coastal strand and beach dune communities will continue until all areas are managed and have reached a maintenance condition where prescribed fire and exotic removal alone will be able to maintain the natural communities in a favorable condition. The feasibility of a reintroduction of the southeastern beach mouse will be evaluated upon the response of the habitat to restoration.

Feral cats are removed as soon as they are detected. Other nuisance wildlife that are determined to be a threat to beach mouse populations will be removed on an as needed basis upon the recommendation from the park/district biologist. A Federal recovery plan for the southeastern beach mouse (U.S. Fish and Wildlife Service 1993) will be referenced and followed by staff.

Shorebirds and wading birds. The park provides important resting, feeding, and

nesting habitat for many state and federally listed shorebirds and wading birds, including but not limited to Roseate Spoonbill (*Ajaia ajaja*), Little Blue Heron (*Egretta caerulea*), Reddish Egret (*E. rufescens*), Snowy Egret (*E. thula*), Tricolored Heron (*E. tricolor*), Wood Stork, White Ibis (*Eudocimus albus*), Least Tern (*Sterna antillarum*), Black Skimmer (*Rynchops niger*), Wilson's Plover (*Charadrius wilsonia*), and the Piping Plover (*Charadrius melodus*). Standard Resource Management Procedure Number 13 and Resource Management Guideline Number 3, concerning the protection of colonial breeding birds, will continue to be followed by park staff. These procedures are currently being revised to include protection of loafing and resting birds year round along with nesting birds. The current and new procedures and guidelines will be strictly followed.

With over 3 miles of beach habitat within a sea of development, Sebastian Inlet State Park should be a magnet for beach-nesting birds, but unfortunately, no nesting activity has been observed on the beach itself within the last few years. The only nesting activity that has been documented on the park has occurred on a spoil deposition area west of the campground. This lack of bird nesting activity on relatively untouched, natural beach can be attributed to: 1) heavy use by visitors 2) presence of predators 3) presence of dogs 4) beach renourishment activities. To date, no areas have been closed to public access for the purpose of protecting and encouraging nesting of shorebirds. The beach is restricted to pets year round; however, dogs are frequently seen. Dogs can run through congregations of resting birds and destroy nests of nesting birds. Research studies have shown that shorebirds can detect an animal on the beach from a distance of 500 ft and greater, depending on the species. Beach renourishment projects occur yearly and cause considerable disturbance to the birds during crucial periods prior to nesting. Sand is pumped onto shorebird habitat at the toe of the primary dune where most nesting shorebirds nest.

A population of least terns historically nested on Coconut Point, west of the campground. In 1978, a use agreement for a portion of this area was granted to the SITD for the placement of non-beach quality fill dredged from the inlet. Following the placement of material in this area and the resultant erosion, least tern nesting ceased. In spring 2000, park staff scraped ruderal vegetation off the westernmost portion of Coconut Point; following this, tern nesting was observed, and the area was temporarily closed to public access. Additional habitat enhancement and seasonal restrictions of visitor access (March 15 to September 1) to this area will be necessary to protect future nesting of least terns and other beach-nesting birds. Future facility or campground development on Coconut Point will need to be planned with consideration of sensitive area. The tip of the point (1.5 ac) has been set aside for protection and enhancement will begin when funds are secured. Other areas throughout the park should be investigated for the possibility of being potential nesting sites for beach-nesting birds. Areas that are determined to be suitable nesting/resting areas may be temporarily closed.

In response to high numbers of road-killed birds, especially royal terns (*Sterna maxima*) on the State Road A1A bridge over Sebastian Inlet, bird mortality reduction structures were installed on the bridge in 1994 (Egensteiner, pers. comm.). These structures consisted of 10-foot poles erected vertically and placed 12 feet apart on both sides of the bridge. The intent of this action was to direct the birds up and away from the bridge, thus reducing road-kill. To date, the structures appear to be successful in reducing bird mortality on the bridge.

Gopher tortoise. A population of gopher tortoises (*Gopherus polyphemus*) can be found in several of the upland communities of the park. Currently, a marking program exists to allow for long-term monitoring of the population. Continued prescribed fire activities will benefit the tortoise population at the park as well. A population occurs in a field on the north side of the inlet, west of the cove. The field is often used as an overflow parking area during peak visitation that creates a problem with protection of tortoises. A plan for this area should be developed to take into account all visitor and wildlife uses for this area. This topic will be discussed in the management measures section.

Diamondback terrapin. The Indian River Lagoon historically supported a large population of diamondback terrapins (*Malaclemys terrapin*). Due to habitat loss, overharvesting, mortality in crab traps, predation, and stochastic factors, populations of diamondback terrapins have declined throughout the species' range (Roosenburg et al. 1997; Forstner, pers. comm. 1998). Although terrapin sightings in the area surrounding the park were numerous until the mid-1980s, few have been seen in recent years.

Special Natural Features

The park is located within the Archie Carr National Wildlife Refuge, which is recognized as the most important region of nesting beaches for the loggerhead sea turtle within the Western Hemisphere.

Cultural Resources

Evaluating the condition of cultural resources is accomplished using a three part evaluative scale, expressed as good, fair, and poor. These terms describe the present state of affairs, rather than comparing what exists against the ideal, a newly constructed component. Good describes a condition of structural stability and physical wholeness, where no obvious deterioration other than normal occurs. Fair describes a condition in which there is a discernible decline in condition between inspections, and the wholeness or physical integrity is and continues to be threatened by factors other than normal wear. A fair judgment is cause for concern. Poor describe an unstable condition where there is palpable, accelerating decline, and physical integrity is being compromised quickly. A resource in poor condition suffers obvious declines in physical integrity from year to year. A poor condition suggests immediate action to reestablish physical stability.

The Florida Master Site File (FMSF) lists 13-recorded sites within the unit.

Sebastian Inlet State Park contains many cultural resources, and many types, remnants of the daily life of the area's former inhabitants, or representative of typical activities specific to this locale, from the prehistoric period to the mid-20th century. For several millennia, people have inhabited this narrow peninsula seasonally and permanently, drawn by the area's unique natural resources that make it an ideal place to harvest marine and riverine resources and to recreate. The park also contains the exceptional material associated with survivors and salvagers of the Spanish Plate Fleet destroyed just offshore by a hurricane in 1715. Archaeological sites and artifacts; historic objects, archives and photographs; oral histories, and works of art document and illuminate the peninsula's rich and varied history. Additionally, the park has ties to living communities, including fishers and surfers, for whom park lands figure strongly into their sense of identity or (past) way of life; thus its cultural resources also include associated peoples and related ethnographic material.

Archaeological resources. Sebastian Inlet State Park's archaeological resources include thirteen recorded sites, four in the northern half of the peninsula in Brevard County and nine in the southern half in Indian River; an unknown number of unrecorded sites; and recovered artifacts on display at the park's McLarty Museum. Additionally, there are eight recorded sites, similar and related, just off shore and to the north and south of the park, and artifacts excavated from sites now in the park in storage at other institutions in Florida and elsewhere. The park's archaeological resources represent many facets of the larger area's history, including the Indian River Lagoon's pre-contact and proto-historic native population, the 1715 Spanish Plate Fleet wreck and salvage operations, French colonial activity on Florida's northern Atlantic seaboard, and the inlet's 19th and 20th century fish camps.

All thirteen of the recorded sites represent Sebastian Inlet's lengthiest yet least well-understood history –that of the peoples who lived here before European arrival. Eleven of the thirteen sites are prehistoric, shell middens and one sand mound, while the two historic sites also contain shell middens. Archaeological evidence suggests cultural continuity in the area, from the Orange Period (circa 2000 – 500 B.C.) through the Malabar 1 and 2 Periods (circa 500 B.C. to 800 A.D. and 800 A.D. to 1763 A.D.), including the colonial-period Ais Indians. The Malabar tradition ceramics include both the chalky, plain and decorated St. Johns pottery found to the north, and the plain sand-tempered Glades pottery to the south, reflecting an area of transition or interaction between the neighboring Glades and St. Johns cultures (Milanich 1994). Shell middens that run the length of the peninsula indicate that inhabitants of the Indian River Lagoon were foragers, unlike the St. Johns agriculturalists to the north, living in larger villages near wetlands while harvesting marine and riverine resources from single-use or seasonal campsites in the surrounding area. Sand mounds and human burials reflect some degree of ceremonialism and ritualism, although not as elaborate as found in

South Florida. Excavated sites in and nearby the park have contained shellfish and other faunal remains, hearths, ceramics, human remains, and utilitarian and decorative worked shell and bone. Four of the five terrestrial sites just outside park boundaries are prehistoric sites.

According to the Florida Master Site File, ten of the thirteen prehistoric sites lay along the coastline in the beach dune, coastal strand and maritime hammock natural communities. Highway realignment since original recordation of the sites makes their exact location uncertain. The other three-recorded sites lie along coves on the Indian River Lagoon coastline. The park also contains known but unrecorded sites, and additional sites in unsurveyed areas are suspected. It is unknown how representative this site distribution pattern is given the lack of a systematic archaeological survey of the area. Known sites may simply correlate with areas that have already been examined, or represent chance discoveries encountered during other activities. A predictive model of archaeological site location developed for Brevard County determined that the entire peninsula possessed a high probability for containing archaeological sites and furthermore, that every type of physiographic environment in the peninsula, except the surf zone, possessed this probability (Bense and Phillips 1990). The swampy nature of the Indian River Lagoon shoreline may have dissuaded investigators to date; however, one of the oldest known sites in the Indian River area is located along the lagoon just outside the park, dating to the Orange Period with its fiber-tempered ceramics, now partially inundated by higher sea levels. According to State Archaeologists, the high numbers of sites on the peninsula indicate a concentrated pre-Columbian occupation (CARL 2003).

Two of the park's thirteen recorded sites are historic sites with prehistoric components. One is a tentatively identified homestead or mosquito control ditch located near the Indian River Lagoon, and the other is the renowned 1715 Spanish survivors' camp that stretches across a narrow portion of the peninsula near the park's southern boundary. The park's McLarty Museum is located on-site, interpreting the catastrophe and recovery efforts, and the larger historical and political context, including Native American and European interactions evidenced by the mix of historic and aboriginal archaeological material. There are three underwater shipwreck sites just offshore, not under Division management; two are remnants of wrecked Spanish Plate Fleet ships, and one an early 20th century vessel. The park also contains structural remains and debris associated with late 19th through mid 20th century fishing camps and squatter habitations. It is uncertain at this time which qualify as historic, or what significance any possess. See Addendum 6 for basic site information.

Many of the prehistoric sites along the peninsula, including ones now within park boundaries, were documented by Irving Rouse during his 1944 "survey of Indian River archaeology," sponsored by the Yale Peabody Museum (Rouse 1951). Rouse compiled all available data on known sites, based largely on local informants, and from his own

limited reconnaissance survey, site visits and study of private and museum collections. Of the nine sites in the park that Rouse recorded, two were brought to his attention by Albert T. Anderson, a local landowner, and five by Charles D. Higgs, a winter resident of the area. Both men had conducted amateur excavations of a number of these sites, as had other amateurs from the late 19th century on, the type, extent and documentation of which are unknown. Several artifact collections associated with these early investigations are housed at the Florida Museum of Natural History in Gainesville, Florida, (formerly the Florida State Museum); a collection may also exist at the Museum of Natural History as well, associated with Charles S. Allen's excavations of 8BR124 in 1893. Archaeologists Rouse, John Goggin, and Hale Smith, a student field crew, and local amateurs visited several of the park sites during the mid to late 1940s in connection with the Indian River survey, documenting sites' observable extent and conducting very limited subsurface testing, with the exception of the more substantial trenching of a shell midden north of the inlet (8BR125). The information from this survey comprises the bulk of what we know to this day about most of the sites in the park.

Three sites received greater attention in the late 1960s. In 1966, midden and human remains eroding from a beach deposit exposed by low tides prompted excavations by individuals associated with the company that held salvage rights to the area. In 1967, the Central Florida Archaeological Society, a local branch of the Florida Anthropological Society, systematically excavated a large shell midden (8BR125) north of the inlet to sterile ground with permission from then owner Jack Foote (CFAS 1969). The site revealed evidence of habitation, including a possible hearth, postholes and *in situ* deposits of ceramic sherds dating to the Malabar 2 period. Also in 1966 – 1967, State Archaeologist Carl Clausen excavated the 1715 Spanish Fleet Survivors and Salvagers Camp, donated to the state by local landowner Robert McLarty, recovering artifacts and data from this and nearby sites and shipwrecks to develop interpretive exhibits for the park's new treasure museum.

There has not been an intensive, systematic archaeological survey of the Indian River Lagoon. In the half century since Rouse's seminal work, amateur and professional archaeologists, as well as treasure hunters, have identified more sites and excavated a few, counties have developed predictive site location models, CRM firms have surveyed sites slated for development, and state archaeologists have helped public land managers protect sites. The Division has conducted or sponsored no further research, survey or excavation in the park since Clausen in the late 1960s, with the exception of limited shovel testing during archaeological monitoring of park improvements. Eleven of the park's thirteen recorded archaeological sites were recorded before the state park was established; the two since were recorded in the 1990s by agency staff who encountered them while in the field on other business.

With the exception of the National Historic Landmark 1715 Survivors' and Salvagers'

Camp, the significance of sites in the park is mostly unknown. The 2003 CARL (Conservation and Recreational Land) Survey of the Archie Carr Sea Turtle Refuge just to the north of the park found that the prehistoric sites in the refuge, and other similar sites nearby, appeared to “form a settlement complex strategic to exploiting resources from the Atlantic and the Indian River.” State Archaeologists stated that this complex of sites is likely eligible for listing on the National Register of Historic Places (Glowacki, Newman and Gensler 2003).

The size and current condition are also unknown for most sites, and for a few, their location too. During a 1997 assessment of recorded sites, park staff relocated as many sites as possible, updated location and condition information, identified observable threats, and noted recent activity in the area. At that point, some sites were vegetated while others had recently been cleared of exotics; sites to the south of the inlet were eroding along their coastal edge, while areas to the north were accreting; some had long ago been impacted by road and parking lot construction; and one had recently been looted after being covered in a local newspaper article. It is unknown, however, how seriously the park’s archaeological sites have been impacted by these various phenomena and how much decline, if any, sites have suffered over the years.

In addition to archaeological sites, the park also possesses artifacts excavated from sites in the park, related nearby sites, and sites further afield along Florida’s Atlantic coast. Almost all of the park’s archaeological artifacts are located in interpretive exhibits in the McLarty Treasure Museum. The artifact collection is primarily related to the 1715 Spanish Plate Fleet, recovered from nearby underwater shipwreck sites, the park’s Survivors and Salvagers Camp (8IR26), and the Higgs site (8IR24) just south of the park. Many of these artifacts are on loan to the park from the Division of Historic Resources (DHR), Florida Department of State. Loan renewal is based on conducting periodic inventory and condition assessment, and ensuring the safety of artifacts via sufficient security and housekeeping measures. Other artifacts are on loan from private collectors, or have been donated to the museum by such. The artifacts are in a climate-controlled environment, and are in relatively stable condition. An exception is a large anchor conserved years ago by DHR, whose protective coating is starting to fail. See the Museum Collection sections for related information.

Metal detecting is a popular sport in the area. The public is presently permitted to metal detect in the park between the high water mark and the toe of the dune along the coast. Two issues associated with metal detecting in the park are the unknown archaeological sensitivity of the coastline and conflicts between metal detectors and offshore treasure salvagers. As permitted by Division policy, park management has banned metal detecting in coastal areas with known archaeological sites, including the Cato Site and the 1715 Spanish Shipwreck and Salvagers Camp. The park’s coast has never been surveyed to assess its archaeological sensitivity, however; future survey, which should be prioritized, may support restricting the activity in even more areas of

the park. This stretch of Florida is known as the Treasure Coast because of the Spanish shipwrecks just offshore; however, the park does not promote metal detecting in the park for historic artifacts. Per state law, any artifacts found on state lands belong to the State of Florida and cannot be removed from the park, including those located by metal detectors in areas where the activity is permitted. Three state-issued, offshore treasure salvage contracts are presently held by private entities that each extend to the park's mean high water mark. In the past, metal detectors have inadvertently trespassed over this line into areas that these companies hold exclusive salvage rights. Some mechanism is needed to inform metal detectors of restrictions in regards to archaeological sites, and salvage companies' control of certain areas.

Ethnographic resources. Sebastian Inlet is renowned as a top fishing location. In addition to attracting sport and local fisherman, park lands have an historic association with a once thriving commercial fishing industry. This history and these lands have cultural significance for still living local communities. With construction of the Sebastian Inlet Fishing Museum in 2000, the park formally assumed a role in the preservation and interpretation of this history. In the process of developing interpretive displays for the museum, the park established or strengthened relationships with local families with ties to the industry, conducted oral history interviews, and collected objects and photographs that illuminate various aspects of the industry. The park manages the tangible material related to this history and culture as part of its museum collections, including oral history tapes and transcripts, fishing poles and other equipment, photographs and miscellaneous memorabilia. Museum staff actively collects additional material to round out its collection and augment its interpretation, and routinely interacts with individuals who have connections to this past.

Sebastian Inlet is also renowned as a top surfing location. The north jetty creates breaks that draw surfers from around the world; the park hosts an annual surf competition. While a much newer phenomenon in the area than fishing, surfing predates creation of the park, as does the sometimes contentious relationship between surfers and fishers. The park does not formally recognize surfing as a cultural or historical resource; in another decade or so, however, use of the area for this activity by this subculture will segue way into the historic, worthy of consideration as a candidate for preservation efforts.

Historic structures. The park does not presently contain any historic structures. While not historic yet, the McLarty Treasure Museum is unique for its 'starfish' design, with finger-like projections from a central hub. Preservation of this character-defining design should be considered during the planning of any new additions or alterations. Sebastian Inlet's jetties date to the first half of the 20th century, qualifying as historic structures whose significance, particularly as an example of engineering, is unknown. Because the Division's jurisdiction does not include them, however, responsibility for compliance lies elsewhere.

Museum collections. The park contains two museums –the McLarty Treasure Museum and the Sebastian Inlet Fishing Museum. The McLarty Museum was built in 1969 on land donated by Robert McLarty, on a portion of the site whose history it interprets, the 1715 Spanish Plate Fleet Survivors and Salvagers’ Camp. It was the donor’s intent that this facility be used to exhibit a certain percentage of the State’s share of treasure recovered from local Florida waters by permitted salvage companies. Security concerns have tempered the scale of the original endeavor. The museum still exhibits representative artifacts from the string of such camps and shipwrecks along the peninsula, however, as well as artifacts related to Florida’s French colonial activity that are displayed in separate cases, donated and loaned to the park by private collectors. Members of the museum’s Citizen Support Organization have donated some of this material, and embellished some displays with interpretive props. Artifact displays, narrative text and illustrations, paintings, an acclaimed documentary, and special event presentations are used to tell the story of the Treasure Coast. The park directly manages and oversees development of the museum building, collection and interpretative programming. Dedicated staff handles collection care, including loan and donation transfers and paperwork, the collection catalog and the cyclical cleaning of artifact cases and exhibit areas.

The Sebastian Inlet Fishing Museum was built in 2000 with sponsorship by Representative Sembler to commemorate, preserve and interpret the history of commercial fishing in the area. Because this history is of the recent past, this museum has the extra dynamic of being staffed and visited by people connected specifically to this local history and seafaring generally. Interpretation is largely accomplished through signage and reproduced historic images and industrial settings and equipment. Several exhibits incorporate authentic objects whose historical and cultural value differentiates them from interpretive props. These museum collection objects are mostly owned and managed by the museum’s Citizen Support Organization, who handle new acquisitions and donor stipulations. This museum, unlike the McLarty Museum, is directly overseen, operated and staffed by volunteers. Volunteer staff has augmented interpretive programming by new tours, exhibit cases, displays and hands-on activities.

RESOURCE MANAGEMENT PROGRAM

Special Management Considerations

Timber Management Analysis

Chapters 253 and 259, Florida Statutes, require an assessment of the feasibility of managing timber in land management plans for parcels greater than 1,000 acres if the lead agency determines that timber management is not in conflict with the primary management objectives of the land. The feasibility of harvesting timber at this park during the period covered by this plan was considered in context of the Division’s statutory responsibilities, and an analysis of the park’s resource needs and values. The

long-term management goal for forest communities in the state park system is to maintain or re-establish old-growth characteristics to the degree practicable, with the exception of early successional communities such as sand pine scrub and coastal strand.

A timber management analysis was not conducted for this park. The total acreage for the park is below the 1,000-acre threshold established by Florida Statutes.

Additional Considerations

Since Sebastian Inlet State Park represents one of the last remaining populations of southeastern beach mice (SEBM), monitoring will continue, and all suitable habitats for this endemic subspecies should be burned periodically. This would include both the beach dune and coastal strand communities. The opportunities to reintroduce beach mice north of the inlet should be investigated for feasibility and desirability. In 2006, discussions occurred with USFWS about a possible reintroduction of mice, north of the park on USFWS property and on park property. In order for the reintroduction to be successful, habitat at the park is needed. A number of recommendations were made: 1) continue to control possible predators and feral cats, 2) increase herbaceous ground cover through mechanical treatment and prescribed fire and 3) improve suitable habitats, which would include both the beach dune and coastal strand communities where possible. The park follows all USFWS procedures for beach mice outlined in the Federal recovery plan for SEBM.

Increased protection and management for threatened and endangered shorebird species should continue and should expand into other areas of the park where habitat is available. Cooperation with local, state and federal agencies along with law enforcement is needed to ensure that resting, loafing and nesting birds are protected on the beaches within the park, especially in the cove west of the bridge, on the north side of the inlet, and on Coconut Point. The beach is heavily used by visitors for fishing, swimming, sunbathing, surfing and fitness. Often visitors will bring their pets to the beach with them even though pets are prohibited on the beach. Enforcement of the no pets on the beach policy is necessary in order to have successful shorebird nesting.

Enhancement of the protected zone at the tip of Coconut Point should begin as soon as possible since this area has proven to be a suitable area for beach-nesting birds. A plan has been written for this area and can be put into action when funds are secured. In order for the project to be a success, visitor access to the site will need to be restricted and enforced.

Biotically diverse Sabellariid worm reefs occur east of the park boundary, within the 400-foot sovereign submerged areas. Juvenile green turtles are known to use these reefs for protection and foraging. Research to determine faunal composition has been conducted and additional research should be encouraged. The condition of the reefs is not well known; however, they do appear to be affected by beach renourishment

projects. Following beach renourishment projects and storms, sand has covered them; this may result in death to some portions of the reef. With respect to beach renourishment projects, measures should be taken to insure that beach quality sand with a minimum of fine material is used; in addition, the amount of material placed on the beach and its slope should be minimized. The park needs to stress the importance of monitoring the reefs during renourishment projects. The best reefs within the vicinity of the park should be protected and are shown on the Reference Map.

Protection of archeological resources. The spit of land that Sebastian Inlet bisects is heavily impacted by natural forces, including tidal action and inclement weather. The resulting flooding, accretion, and erosion pose some of the most serious threats to archaeological sites given the coastal location of most. Three areas of active erosion have been identified in the park, including the Coconut Point area west of the campground, the entire Atlantic shoreline and the beach dune community south of the inlet. Archaeological sites in these areas require closer monitoring than more sheltered sites. The park's dynamic natural conditions routinely precipitate substantial beach renourishment projects that entail the addition of sand, heavy vehicle traffic, and occasional earth moving. As with any anticipated potential impact to archaeological sites, coordination with the Division of Historical Resources regarding compliance requirements is needed. Other potential impacts to monitor and mitigate as needed include erosive foot and ATV traffic across areas with known sites, vegetation removal and prescribed burns.

Management Needs and Problems

- 1.** The interaction between gopher tortoises and vehicles in the overflow parking area west of the cove will continue to be a problem with the demand for additional parking to meet the high recreational demands. Vehicles should be prohibited in portions of the field where tortoises are present according to FWC protection guidelines. A plan will need to be written for this area outlining all demands for this area such as species protection, groundcover enhancement and visitor use in the area.
- 2.** Unauthorized access to the beaches along A1A south of the inlet continues to be a problem and may be a problem on the north side of the inlet following habitat restoration efforts. Access must be controlled by closing the numerous footpaths and directing visitors to authorized parking areas and park entrances. Fencing may be needed to control access and to allow restoration of the eroded footpaths to take place. Signage along State Road A1A and the primary dune may be necessary. The use of ATVs on park beaches is proving to be a problem. Those needing access to the beach using ATVs should receive permission from the park manager beforehand.
- 3.** Funding needs to be secured in order to begin enhancement of the protected area at tip of Coconut Point for beach-nesting birds. Ruderal and exotic vegetation needs to be removed and access controlled. This may require fences, native

- plantings and public education.
4. The cove west of the bridge and north of inlet is a swimming beach; therefore, pets should be restricted from this area for public health and safety, water quality, and listed species protection. Law enforcement will be necessary in order to restrict pets from the area.
 5. Areas on the beach, around the cove, and on Coconut Point may be occasionally closed if the areas prove to be possible nesting and resting areas for listed shorebird species. The recreational demands at the park are so great that birds may not have the opportunity to begin to nest. Birds and visitors can both be in or on these areas if done according to FWC, USFWS, and the Florida Park Service's rules and guidelines.
 6. A professional archaeological survey is needed to re-locate previously recorded sites, identify not yet recorded sites and determine site boundaries, so that the park can know what to protect. Priority areas for this kind of archaeological survey work are the areas most impacted by erosion, exotic vegetation removal and beach renourishment projects.
 7. Regularly scheduled site visits to archeological sites are needed to monitor site condition, track condition changes over time and generate data useful for planning any needed preservation treatment. Baseline condition information should be compiled for the park's archaeological sites so that site decline can be measured and detected.
 8. Impacts to sea grass beds within the park boundaries should be limited to the extent possible due to their sensitive nature and rarity and the habitat for which they provide to wildlife. The park should work with CAMA to determine the appropriate protection measures that would take into consideration current and future visitor use.
 9. An interpretive plan is needed for the fishing museum to evaluate current exhibits and to guide future improvements.

Management Objectives

The resources administered by the Division are divided into two principal categories: natural resources and cultural resources. The Division primary objective in natural resource management is to maintain and restore, to the extent possible, to the conditions that existed before the ecological disruptions caused by man. The objective for managing cultural resources is to protect these resources from human-related and natural threats. This will arrest deterioration and help preserve the cultural resources for future generations to enjoy.

Natural Resources

1. Conserve, protect and manage natural communities, significant habitat and ecological systems.
 - A. Survey for exotic plant and animal species and continue the exotic species removal program

- B.** Continue and expand the prescribed fire program to maintain fire as an ecosystem process with emphasis on maintaining the current condition of the coastal strand and beach dune habitats south of the inlet while restoring these communities to the north of the inlet
 - C.** Seek funding for additional staff to aid in the preparation, implementation, and evaluation of resource management
 - D.** Monitor natural community restoration projects to adaptively manage habitats
 - E.** Close unauthorized foot paths which occur throughout the beach dune and coastal strand habitat to the north and south of the inlet and replant with native herbaceous vegetation
 - F.** Control unauthorized access and prevent additional erosion
 - G.** Educate visitors on all projects and changes to the park to promote the park and its programs
- 2.** Restore, monitor and protect the hydrology of the park to the greatest extent practicable.
- A.** Work with SJRWMD to obtain ground and surface water quality and quantity data
 - B.** Determine the feasibility of restoring the original hydroperiod to the tidal swamps by working with local mosquito control districts
 - C.** Control and limit stormwater runoff into adjacent wetlands along A1A, park drives, easements, and other areas
- 3.** Maintain or increase populations of listed plant and animal species occurring on the park.
- A.** Explore opportunities for reintroducing the southeastern beach mouse to the north side of the inlet
 - B.** Expand and restore beach mouse habitat
 - C.** Survey and monitor for wintering and nesting shorebirds and establish protected resting, loafing and nesting areas where needed throughout the year. Work with FWC and local agencies on shorebird protection issues.
 - D.** Prohibit pets from all park beach areas
 - E.** Control access to Coconut Point during shorebird breeding season and after enhancement
 - F.** Work with SID to encourage more appropriate timing and frequency for future renourishment projects that allow for successful sea turtle nesting and to protect sensitive beach mouse and shorebird habitat
 - G.** Survey and monitor populations of gopher tortoises
 - H.** Protect gopher tortoises in the field west of the cove by controlling access and developing a plan for this area
 - I.** Continue flora and fauna surveys
- 4.** Restore highly altered or severely impacted natural communities.
- A.** Mechanically treat severely overgrown, fire suppressed coastal strand communities to the north of the inlet. A narrow buffer may be needed to control unauthorized access

- B. Seek funding to initiate the enhancement of the Coconut Point protected zone for beach-nesting birds according to the developed plan
 - C. Develop a written plan for the field west of the cove that takes into consideration all demands for this parcel
 - D. Restore the area around the cove by removing exotics and replanting with natives to give a more natural appearance for visitors to enjoy
5. Provide environmental education and enhance public appreciation for elements of natural and cultural diversity.
- A. Continue to operate both the McLarty Treasure Museum and the Sebastian Fishing Museum
 - B. Expand interpretive programs and field trips for the general public and school groups to raise awareness of the local flora and fauna, including what is needed for management
 - C. Train additional volunteers as tour guides
 - D. UTAP designated park trails and update interpretive signage as appropriate

Cultural Resources

1. Develop and implement an archaeological site condition-monitoring program.
 - A. Establish a reasonable site visit schedule
 - B. Train staff or volunteers to conduct condition assessments
 - C. Adopt a standardized condition assessment form to ensure data collection consistency
 - D. Maintain permanent files for each site for condition data, and other documentation related to the physical change or treatment of sites.
2. Protect recorded and unrecorded archaeological sites.
 - A. Prioritize avoiding or minimizing site disturbance during improvement and resource management projects
 - B. Reduce or eliminate other threats to the extent possible
 - C. Apply approved treatment to preserve or stabilize sites
3. Conduct archaeological surveys in order to locate sites, determine boundaries, document condition, assess significance, evaluate the archaeological sensitivity of the coast and distinguish between historic and non-historic surface remains.
 - A. Prioritize archaeological survey needs
 - B. Identify what can be accomplished in-house
 - C. Pursue grant funding for additional professional work
 - D. Solicit volunteer support where appropriate
4. Coordinate preservation, research and interpretation efforts for archaeological sites with local entities.
 - A. Encourage permitted research by accredited regional universities and colleges
 - B. Encourage volunteer work by local chapters of the Florida Anthropological Society, as appropriate
 - C. Foster a relationship with the new regional office of the Florida Public Archaeology Network

- D. Solicit support from Brevard and Indian River Counties for archaeological surveys and pursuit of grant money
- 5. Develop a Museum Manual for the Sebastian Inlet Fishing Museum.
 - A. Clarify roles and responsibilities of the park and the CSO
 - B. Clarify operational procedures
 - C. Clarify collection management arrangements
- 6. Develop an Interpretive Plan and Scope of Collection Statement for the Sebastian Inlet Fishing Museum.
 - A. Revisit the purpose of the museum and identify additional interpretive goals
 - B. Consult with individuals with ties to the local commercial fishing industry
 - C. Evaluate current exhibits based on the new interpretive plan
 - D. Evaluate current museum collection, and identify collecting priorities based on the new interpretive plan
- 7. Address preservation, conservation and interpretation issues at the McLarty Museum.
 - A. Purchase equipment to produce a continuous record of temperature and humidity, and evaluate and remedy significant fluctuations
 - B. Replace UV-protective sleeves on lights; reconfigure or replace current lighting as needed to protect photographic material
 - C. Consult with DHR for permission to and instructions on touching up conserved metal artifacts
 - D. Secure funds for a general conservation assessment, via the Conservation Assessment Program or a private conservator, to assess the collection and museum environment, and for specific evaluation of the paintings.
 - E. Develop a written security plan for the museum
- 8. Recognize and interpret the significance of the park's cultural resource and stewardship activities.
 - A. Solicit the involvement of associated living communities in the development of related preservation and interpretive projects
 - B. Post protective signage near heavily trafficked archaeological sites if useful.
 - C. Nominate significant sites to the National Register of Historic Places
 - D. Keep permanent park history files on the park's development and history of surfing, fishing and other traditional uses; Park Interpretive plans should be updated to promote public education of these activities, the park's history and prehistory, archaeological research of the peninsula, and preservation issues

Management Measures for Natural Resources

Hydrology

The St. Johns River Water Management District (SJRWMD) is responsible for water control in the unit as well as in the surrounding drainage basin. SJRWMD monitors quality and quantity of ground water in the park. Management will comply with best management practices to maintain and improve the existing water quality on site and

will take measures to prevent soil erosion and other impacts to water resources.

Discussions with the local mosquito control districts should be initiated to address the altered hydroperiod for the tidal swamp caused by the levees. The tidal swamps are not influenced by the natural tidal influx, possibly affecting water quality, flora and fauna, and other unknown aspects of the park. A feasibility study should be done to determine if any of the mosquito ditches and levees could be removed to restore hydrologic conditions to near shore communities.

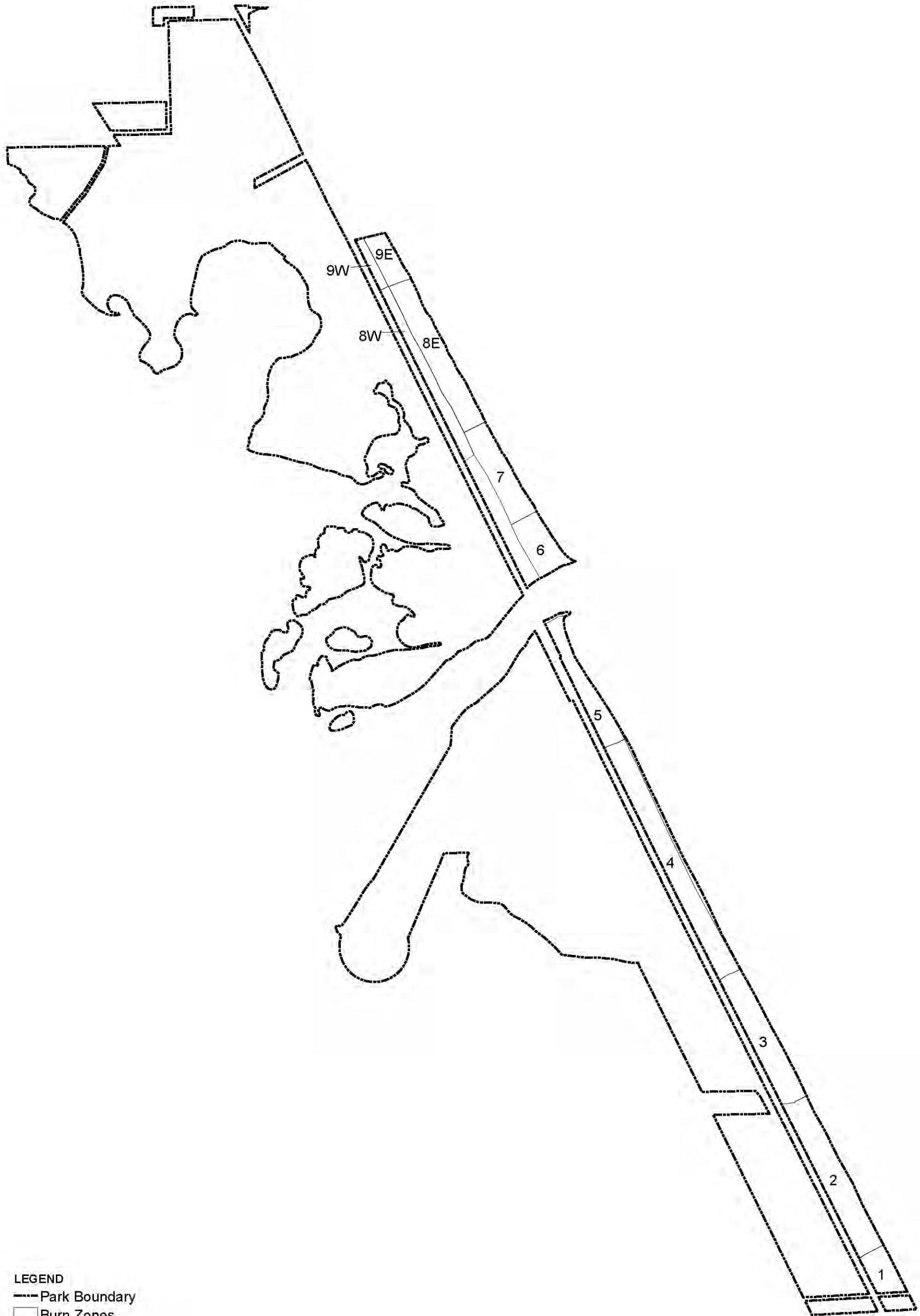
Prescribed Burning

The objectives of prescribed burning are to create those conditions that are most natural for a particular community, and to maintain ecological diversity within the unit's natural communities. To meet these objectives, the park is partitioned into burn zones, and burn prescriptions are implemented for each zone. The park burn plan is updated annually to meet current conditions. All prescribed burns are conducted with authorization from the Department of Agriculture and Consumer Services, Division of Forestry (DOF). Wildfire suppression activities will be coordinated between the Division and the DOF.

There are 92 total burn acres at this unit divided into 11 burn zones (see Burn Zone Map). Both fuel reduction and restoration burns are necessary. Since a majority of the burn acres is dominated by coastal strand and beach dune, all zones will have a target fire return interval of five to seven years. Shorter intervals may be necessary to help restore overgrown zones to a more natural state based on desired herbaceous cover and densities. Fire will be the main restoration tool, but mechanical removal of hardwoods and palmettos and the use of herbicides will be used when needed. These issues will be addressed in the annual burn proposal developed by the park manager and biologist.

Restoration of the coastal strand community north of the concession building on the north side of the inlet began in January 2007. Only a portion of the habitat was mowed in preparation of a prescribed fire and for a possible reintroduction of the southeastern beach mouse. A burn was performed a month later and the results were impressive. This had been the first time that this zone had ever been burned and fuel loading was a concern as well as vertical structures of the habitat. The vertical structure before mowing was on average 6 to 15 ft but after mowing, the average height was 18 in with a few unmowed patches. When other zones north of the inlet are treated, unauthorized access will be a concern. It may be necessary to leave a visual barrier and/or fence along A1A to prevent access.

The USFWS manages a small portion of habitat directly north of the park, west of A1A, located within the Archie Carr National Wildlife Refuge. Due to budget cutbacks and staff reductions, it has been difficult for the Service to find resources to restore this portion of coastal strand and dune to its historic condition. As the park continues to



LEGEND
--- Park Boundary
□ Burn Zones

SEBASTIAN INLET
STATE PARK



BURN ZONE
MAP

restore portions of habitat immediately adjacent to the USFWS, it will become more and more difficult to conduct prescribed burns. The Park Service and the USFWS have begun to discuss the possibilities of how the park can aid in the management of this parcel.

Restoration has been ongoing on the south side of the inlet in the coastal strand community. Numerous burns have been conducted with the vegetation responding favorably. Sea grape is dense around the base of the bridge and in some areas south of the day use parking area. Mowing may be needed to reduce the height of the sea grape and encourage the reproduction of grasses and forbs as long as the removal of the vegetation does not cause disorientation of nesting sea turtles.

Future development and placement of facilities should consider the prescribed fire program. The existing concession building and restrooms are located within burn zones and that may be difficult to burn around. Resource management would be much improved if future facilities were placed within existing footprints or in disturbed areas.

Designated Species Protection

The welfare of designated species is an important concern of the Division. In many cases, these species will benefit most from proper management of their natural communities. At times, however, additional management measures are needed because of the poor condition of some communities, or because of unusual circumstances that aggravate the particular problems of a species. To avoid duplication of efforts and conserve staff resources, the Division will consult and coordinate with appropriate federal, state and local agencies for management of designated species. Specifically, data collected by the FWC and USFWS as part of their ongoing research and monitoring programs will be reviewed periodically to inform management of decisions that may have an impact on designated species at the park.

Surveys to monitor the distribution and abundance of the southeastern beach mouse at Sebastian Inlet will continue. At this time, the population appears to be concentrated in the most recently burned areas of coastal strand habitat on the southern part of the park.

Surveys to monitor the population of gopher tortoises should also continue, as should road kill surveys to document the impact of roads on wildlife, particularly State Road A1A that bisects the park going from north to south and is known to be a significant source of wildlife mortality in the park.

Sea turtle nest monitoring and index nesting beach surveys will also be continued following the statewide protocols established by the FWC. Additionally, predator removal projects will be implemented if it is determined that excessive predator populations are having negative impacts on sea turtles and their nests as well as other

listed species such as beach mice and shorebirds.

Shorebird surveys will also be conducted. Staff will continue to follow Standard Resource Management Procedure Number 13 and Resource Management Guideline Number 3, concerning the protection of colonial breeding birds. Under this procedure and guideline, recommended setback distances from colonies will be implemented, boundary signs will be posted and the area will be monitored. The recommended setback distance for least tern colonies is 180 meters (590 feet) from the perimeter of the outermost nests or individual birds. Important bird resting areas may also be protected under this resource management procedure and guideline. Fencing to exclude visitors may be necessary during the nesting season. On Coconut Point, mechanical removal of vegetation may be required before shorebird nesting season. Where nesting occurs on spoil areas, both the resource management procedure and guideline allow for the deposition of new spoil if necessary, well in advance of the expected onset of breeding.

Exotic Species Control

Exotic species are those plants or animals that are not native to Florida, but were introduced because of human-related activities. Exotics have fewer natural enemies and may have a higher survival rate than do native species, as well. They may also harbor diseases or parasites that significantly affect non-resistant native species. Consequently, it is the strategy of the Division to remove exotic species from native natural communities.

Plants. All exotic species pose real or potential threats to the integrity of the unit's natural communities and are in conflict with the Division goal of preserving and maintaining examples of the natural Florida. Brazilian pepper is the invasive exotic plant species that currently poses the greatest threat to the resources of this unit. Other invasive exotics, such as Australian pine, simpleleaf chastetree (*Vitex trifolia*), golden pothos (*Epipremnum pinnatum*), chandelier plant (*Kalanchoe tubiflora*), castorbean (*Ricinus communis*), creeping oxeye (*Wedelia trilobata*), papaya (*Carica papaya*), mother-in-law's tongue (*Sansevieria hyacinthoides*), and balsampear (*Momordica charanita*) also occur at this unit and should be removed to prevent further infestations. Brazilian pepper and Australian pine are the main priorities for removal activities; an exotic removal plan is updated annually and is actively carried out by park staff. Grants and other sources of funding must be sought to hire contractors in order to aid in the control of exotic plant infestations. Staff time is limited so the park often relies on seasonal employees to scout for and to treat infestation in difficult locations.

Animals. Several exotic animal species are found at this unit, including black rat (*Rattus rattus*), nine-banded armadillo (*Dasypus novemcinctus*), brown anole (*Anolis sagrei*), Indo-pacific gecko (*Hemidactylus garnotii*), and northern curlytail lizard (*Leiocephalus carinatus armouri*). Of these, the black rat is the most widespread. It occurs in and around buildings, the jetties and the coastal strand habitat, primarily where

Brazilian pepper has been established. Black rats could compete with southeastern beach mice and eastern wood rats for similar food sources; therefore, rats should be removed whenever possible. Feral cats are occasionally a problem and are removed immediately upon detection. It may prove beneficial to the park to hire private contractors to deal with hard to capture species when funds are available to do so.

Problem Species

Problem species are defined as native species whose habits create specific management problems or concerns. Occasionally, problem species are also a designated species, such as alligators. The Division will consult and coordinate with appropriate federal, state and local agencies for management of designated species that are considered a threat or problem.

Raccoons (*Procyon lotor*) are problem species during sea turtle and shorebird nesting season when they predate nests and destroy eggs, nestlings and hatchlings. They are also problematic in the campground where they scavenge for food from campers. Education of the park visitor about the consequences of feeding wildlife should continue. Periodically, the least cautious and most destructive raccoons may need to be removed from the beach dune areas and the campground.

Management Measures for Cultural Resources

The management of cultural resources is often complicated because these resources are irreplaceable and extremely vulnerable to disturbances. The advice of historical and archaeological experts is required in this effort. Managers of state lands must coordinate any land clearing or ground disturbing activities with the Division to allow for review and comment on the proposed project. Recommendations may include, but are not limited to approval of the project as submitted, pre-testing of the project site by a certified archaeological monitor, cultural resource assessment survey by a qualified professional archaeologist, modifications to the proposed project to avoid or mitigate potential adverse effects.

Projects such as additions, exterior alteration or related new construction regarding historic structures must also be submitted to the Division of Historical Resources for review and comment by the Division's architects. Projects involving structures fifty years of age or older, must be submitted to this agency for a significance determination. In rare cases, structures under fifty years of age may be deemed historically significant. These must be evaluated on a case-by-case basis.

Adverse impacts to significant sites, either archaeological sites or historic buildings, must be avoided. Furthermore, managers of state property should prepare for locating and evaluating historic resources, both archaeological sites and historic structures.

The significance of most archaeological sites in the park is unknown. Evaluation of

significance enables a park to know the cultural and historical value, and research potential, of the archaeological resources in its charge. As relates to the practical matter of site protection, the park is unable to prioritize and concentrate its protection efforts to sites of known significance versus those with no remaining integrity. As relates to the role of preserving and interpreting Florida's heritage, the park possesses a largely unevaluated and untapped resource.

Many of the archaeological artifacts on display are metal objects, much of which has undergone conservation treatment in the past. Protective coatings have a life span, and may require periodic touch-up. Other collection-related concerns related to archaeological artifacts are included in the Museum Collection section.

Ethnographic resources. The park is, to some extent, a steward of a living group's heritage. The Sebastian Inlet Fishing Museum is the primary mechanism through which the park researches, preserves and interprets the area's commercial fishing history, and maintains connection to the local fishing community. Development of new interpretive displays tends to drive the collection of historic and ethnographic objects, photographs and other material. At present, the museum does not possess a plan to guide interpretive program development beyond the original exhibits installed for its grand opening. These exhibits were based, in part, on the contributions of families that had once been prominent in the local industry. An interpretive plan is needed to evaluate current exhibits, and to guide future improvements. The planning process should identify what other aspects of this history are significant to the local community and warrant interpretation, and what additional museum collections are needed for effective interpretation. This process can honor the park's associated communities by calling on them not just to contribute content, but participate in design.

The park should consider broadening its scope of collection to include material related to the history of surfing in the area. The park does not presently interpret this history to the public, nor does it have available interpretive facilities to do so. While collecting objects may be beyond the interpretive plans and resource management capacity of the park, collecting archival material can preserve record of this long-time recreational use of the area and distinct subculture.

Museum collections. The McLarty Museum's artifact collection is at the museum's core, and in addition to the direct care regime, is affected by interpretive and structural issues. Interpretation, which makes artifacts meaningful to visitors, needs further development for subsets of the collection. This includes additional research, consideration of rotating displays and living history events, refurbishment and correction of existing signage and displays, and installation of new interpretive media. The building itself, its envelope, systems and displays, also directly affect the physical wellbeing of artifacts. While the interior is climate controlled, summers are extremely hot and humid. The door from the main gallery to the boardwalk overlooking the site

is opened frequently during business hours, having an unknown affect on the desired temperature and humidity inside the museum. Some mechanism is needed to produce a continuous record of temperature and humidity fluctuations in order to assess the impact of the door on the gallery, and the functioning of the HVAC generally. If indicated by monitoring results, corrective action should be taken to stabilize the environment inside to protect artifacts. Other environmental threats to the collection are mold and UV light. Visible patches of mold on the ceiling, and reports of carpenter ants, indicate possible moisture problems with the roof that need identification and remedy. Displayed artwork requires examination by a conservator, particularly the large rendition of a hurricane-tossed ship, as it has been treated for mold in the past and may be molding again. Fading of displayed historic photographs signifies the need to assess and remedy the harmful affects of light, and/or replace the original photos with copies.

The Sebastian Inlet Fishing Museum is newer and less well established, and its collection is smaller. From its start, the museum has been dependent on FPS collaboration with locals and volunteers, both for interpretive program development and for staffing. Volunteers from the museum's Citizen Support Organization (CSO) handle the day-to-day operation of the gallery, and have expanded the scope of its interpretation and collection via the addition of new displays and narrative. The CSO accepts, owns and manages most of the museum's historic object collection. The museum is where the CSO and the park's purview overlap; no formal agreement exists, however, between the park and CSO regarding the museum. A Museum Manual is needed that clarifies the roles and responsibilities of each, and delineates procedures, in regards to different aspects of the museum's operation and development. Additionally, an interpretive plan is needed to identify and prioritize the museum's goals; its development can honor and bring together the input and contributions of volunteers and associated local communities with the park's preservation and interpretive goals. Both of these documents will have a direct bearing on museum collections management and care, and are necessary to proceed in development of a Scope of Collection Statement.

Research Needs

Natural Resources

Any research or other activity that involves the collection of plant or animal species on park property requires a collecting permit from the Department of Environmental Protection. Additional permits from the Florida Fish and Wildlife Conservation Commission, the Department of Agriculture and Consumer Services, or the U.S. Fish and Wildlife Service may also be required.

Research on sea turtles and sea turtle nesting has been ongoing at the park for many years; due to the importance of this area to nesting sea turtles, current and future

research should be encouraged. Monitoring of the physical attributes of nourished and natural beaches has been conducted since the mid-1990s; this information continues to yield valuable information for management purposes. Some limited geological research has also been conducted; more should be encouraged. Research on marine invertebrates, seagrass and worm reefs has been ongoing, in some cases since the late 1980s. Further research should be done to document the effects of beach renourishment on the worm rock reefs. A feasibility study should be done to determine if any of the mosquito ditches and levees could be removed to restore hydrologic conditions and nearshore communities. Some recent research on mangrove planting techniques within the park may prove to be valuable for mangrove community restoration. Research has also been conducted on royal tern migration based on band recoveries.

Surveys to monitor gopher tortoise population size and status should continue, as should monitoring of the southeastern beach mouse, shorebirds, and marine turtles. Additional surveys to determine the presence and population size of diamondback terrapin and eastern wood rat should be conducted when possible.

Cultural Resources

In the past, there have been several very limited or narrowly focused cultural resource research projects at the park. There are no current or ongoing cultural resource research projects. Further research and survey opportunities should be pursued when possible, especially if the recommended combined Level I and Level II archaeological survey locates any prehistoric or historic sites.

Staff should draft a proposal for a combined Level I and Level II archaeological survey to identify, protect and preserve currently unknown prehistoric and historic cultural resources at the park and to resurvey the known recorded archaeological sites, utilizing GPS to fix locations.

Research is needed on the cultural periods that occupied the park or the surrounding area throughout prehistory and history: Archaic, perhaps Mount Taylor, Orange, Transitional, St. Johns and Glades, First Spanish, British, Second Spanish, Territorial, and Seminole.

Research is also needed on the history of the Spanish treasure fleets, the 1715 shipwreck, the survivors and salvors camp, the settlement of the Indian River Lagoon and the Sebastian area, the development and decline of the commercial fishing industry, and the various inlet projects.

Research is also needed to document the history of land acquisition, development and operation of the park and its two unique museums.

Resource Management Schedule

A priority schedule for conducting all management activities that is based on the purposes for which these lands were acquired, and to enhance the resource values, is contained in Addendum 7. Cost estimates for conducting priority management activities are based on the most cost effective methods and recommendations currently available.

Land Management Review

Section 259.036, Florida Statutes, established land management review teams to determine whether conservation, preservation, and recreation lands titled in the name of the Board of Trustees of the Internal Improvement Trust Fund (board) are being managed for the purposes for which they were acquired and in accordance with a land management plan adopted pursuant to s. 259.032, the board of trustees, acting through the Department of Environmental Protection (department). The managing agency shall consider the findings and recommendations of the land management review team in finalizing the required update of its management plan.

This park was subject to a land management review on April 27, 2006. The review team made the following determinations:

1. The land is being managed for the purpose for which it was acquired.
2. The actual management practices, including public access, complied with the management plan for the park.

LAND USE COMPONENT

INTRODUCTION

Land use planning and park development decisions for the park system are based on the dual responsibilities of the Division of Recreation and Parks. These responsibilities are to preserve representative examples of original natural Florida and its cultural resources, and to provide outdoor recreation opportunities for Florida's citizens and visitors.

The general planning and design process begins with an analysis of the natural and cultural resources of the unit, and then proceeds through the creation of a conceptual land use plan that culminates in the actual design and construction of park facilities. Input to the plan is provided by experts in environmental sciences, cultural resources, park operation and management, through public workshops, and environmental groups. With this approach, the Division objective is to provide quality development for resource-based recreation throughout the state with a high level of sensitivity to the natural and cultural resources at each park.

This component of the unit plan includes a brief inventory of the external conditions and the recreational potential of the unit. Existing uses, facilities, special conditions on use, and specific areas within the park that will be given special protection, are identified. The land use component then summarizes the current conceptual land use plan for the park, identifying the existing or proposed activities suited to the resource base of the park. Any new facilities needed to support the proposed activities are described and located in general terms.

EXTERNAL CONDITIONS

An assessment of the conditions that exist beyond the boundaries of the unit can identify any special development problems or opportunities that exist because of the unit's unique setting or environment. This also provides an opportunity to deal systematically with various planning issues such as location, regional demographics, adjacent land uses and park interaction with other facilities.

Existing Use of Adjacent Lands

The lands north and south of Sebastian Inlet State Park include a mix of single family residential and condominium developments, a few commercial areas, and numerous conservation lands. The Atlantic coastal area of east-central Florida has been a focus of conservation land acquisition programs for many years. The Archie Carr National Wildlife Refuge, which is composed of multiple units along a twenty-mile stretch of coast north and south of the park, was established to protect sea turtles that nest here. South of the park is the country's first national wildlife refuge, Pelican Island National Wildlife Refuge. This refuge was created in 1903 by Theodore Roosevelt to protect its bird rookeries. To the west of the park is the Indian River – Malabar to Vero Beach

Aquatic Preserve that was established to protect the living waters of the Indian River Lagoon, a shallow lagoon estuary. Also near the park are various protected lands acquired and managed by Brevard and Indian River Counties, some of which provide public beach access. Of note, Brevard County opened the Barrier Island Sanctuary Management and Education Center in 2008 that is located less than two miles north of the park. This new educational facility will focus on the habitats of the barrier island, sustainable living and the sea turtles found in the Archie Carr Refuge. Brevard County also operates a large camping area at Long Point Park on an island in the Indian River Lagoon adjacent to the northwest corner of the park.

Collectively, these managed areas protect a significant range of natural communities and habitats and support an important sample of Florida's natural biodiversity. In addition to their importance to the protection of natural habitat, the Division of Recreation and Parks recognizes the importance of these diverse natural and cultural resource areas as assets to the growing success of nature and heritage based tourism in this area of the state.

Planned Use of Adjacent Lands

Continued development of residential and commercial properties north and south of the park is expected, to a limited extent. Future development will likely result in additional traffic along State Road A1A, increased threat of exotic species invading the park, additional constraints on the prescribed burning program within the park, and higher demand for the park's recreational resources. Generally, the growth management regulations now in place in both Brevard and Indian River Counties will serve to protect the natural resources and surface and ground water systems of the park.

In recent years, a paved bicycle path along State Road A1A was completed that connects to the park entrances from both the north and south. An increase in bicycle and pedestrian activities has resulted. Division staff will advocate for a safe bike/pedestrian crossing when the Florida Department of Transportation designs a replacement bridge scheduled for 2015. In addition, as part of the recent Scenic Highway designation, signage along the state road within the park may need to be altered to comply with guidelines adopted with the Scenic Highway management plan. Staff will coordinate these activities with the appropriate parties, as needed.

PROPERTY ANALYSIS

Effective planning requires a thorough understanding of the unit's natural and cultural resources. This section describes the resource characteristics and existing uses of the property. The unit's recreation resource elements are examined to identify the opportunities and constraints they present for recreational development. Past and present uses are assessed for their effects on the property, compatibility with the site, and relation to the unit's classification.

Recreation Resource Elements

This section assesses the unit's recreation resource elements those physical qualities that, either singly or in certain combinations, supports the various resource-based recreation activities. Breaking down the property into such elements provides a means for measuring the property's capability to support individual recreation activities. This process also analyzes the existing spatial factors that either favor or limit the provision of each activity.

Land Area

Sebastian Inlet State Park provides the typical recreational resources of Florida's coastal barrier islands with beach frontage on the Atlantic Ocean. The primary recreational activities of fishing, surfing, swimming and boating occur along the shoreline and within the surrounding waters. The upland communities of the park consist of beach dune, coastal strand, maritime hammock and estuarine tidal swamp. These areas provide numerous opportunities for land-based recreation including camping, hiking, biking, picnicking, bird watching and interpretive programs.

Water and Shoreline Area

The waters bordering the park include three miles of shoreline on the Atlantic Ocean, the Indian River Lagoon along its western boundary, and the Sebastian Inlet that bisects the park. The beach shoreline is extremely popular for surfing. The north jetty creates breaks that draw surfers from around the world. The beach is also popular for swimming, sunbathing, shoreline fishing, snorkeling and strolling. Bordering the lagoon side of the park is mangrove tidal swamp. The marina and boat ramp area provide access to this water body that is used by fishermen, pleasure boaters and canoe/kayakers. Along the 500-foot wide inlet, the park's shoreline is heavily used by fishermen. In particular, the jetties at the mouth of inlet that extend into the ocean have produced many impressive catches.

Natural Scenery

The outstanding natural scenery of the park includes views from the beach, the jetties north and south of the inlet, and the bridge that crosses the inlet.

Significant Wildlife Habitat

The beach dunes, coastal hammock community and the mangrove shoreline along the Indian River Lagoon provide excellent wildlife habitat. In winter, thousands of birds gather to feed on the wide tidal flats. In summer, sea turtles nest along the park beach, and on adjacent beachfronts. Manatees can be seen feeding in the Indian River. In addition, rare worm reefs can be found in certain areas just off the beach. Interpretive programs in the park attempt to capitalize on these recreational resources, while protecting the animal species through visitor management and education.

Archaeological and Historical Features

Sebastian Inlet State Park is also a significant cultural resource site, with prehistoric

components and the site of the salvage camp from the hurricane wreck of the 1715 Spanish treasure fleet. The McLarty Treasure Museum provides an exceptional collection of artifacts from the Spanish wreck site, and interprets both the wreck and the subsequent salvage operation. In addition, the Sebastian Fishing Museum is devoted to the rich cultural history of the local fishing industry.

Assessment of Use

All legal boundaries, significant natural features, structures, facilities, roads and trails existing in the unit are delineated on the base map (see Base Map). Specific uses made of the unit are briefly described in the following sections.

Past Uses

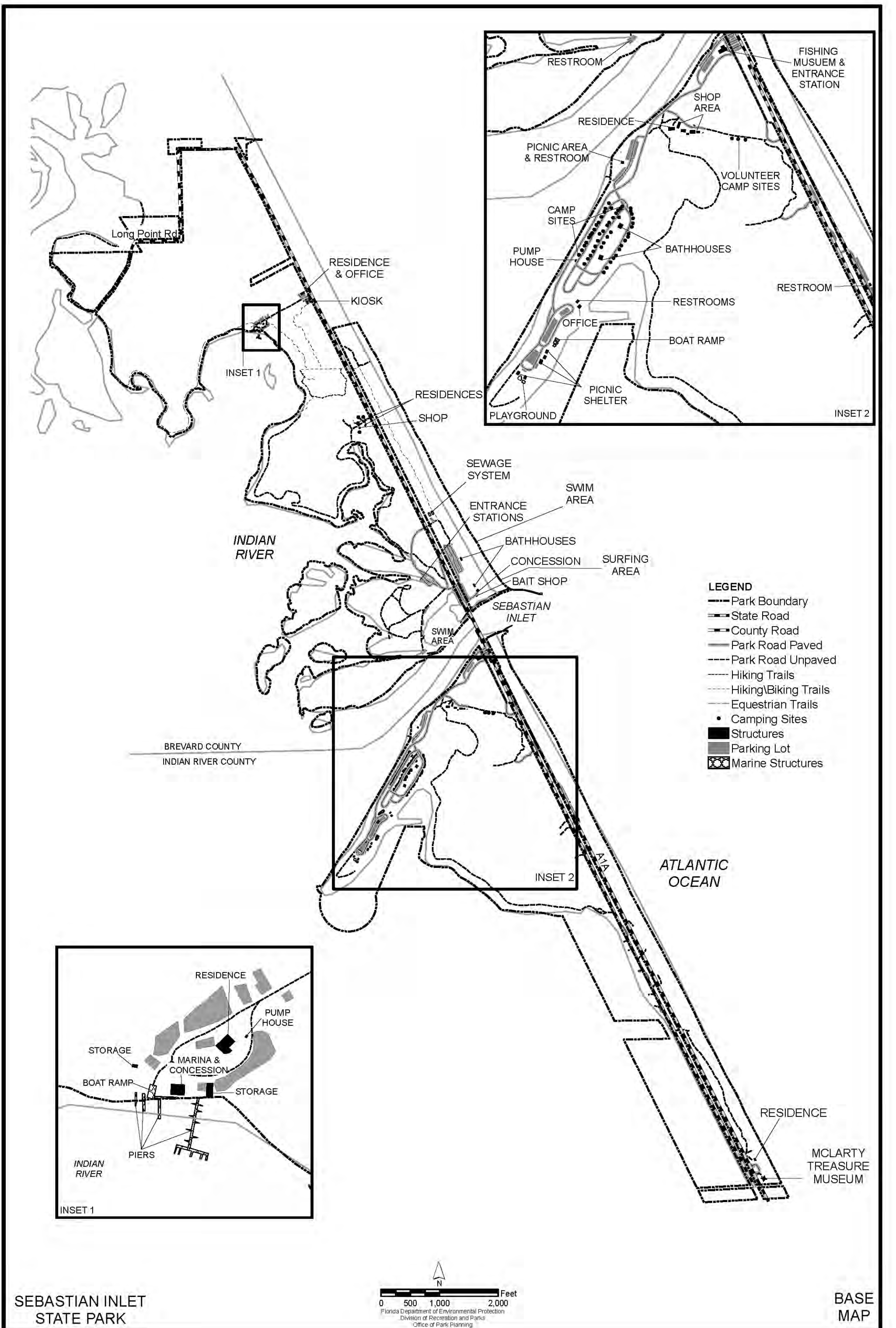
Before state acquisition, portions of the park were private lots used for mobile home sites. Indian River County managed a camping area at the same location currently developed for that purpose before the inception of the park.

Future Land Use and Zoning

The Division works with local governments to establish designations that provide both consistency between comprehensive plans and zoning codes and permit typical park uses and facilities necessary for the provision of resource-based recreation opportunities.

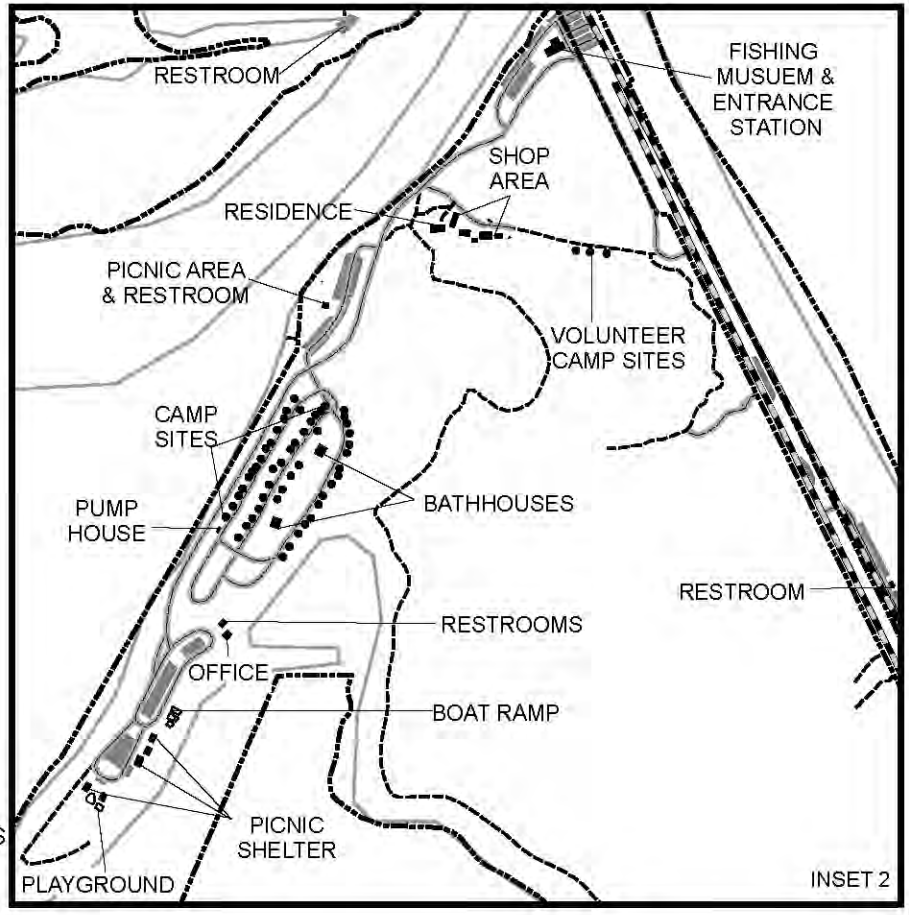
The Future Land Use designations for the park property within Brevard County include Recreation, Public Conservation and Residential 1 (Brevard County, 2005). The zoning classifications for the park property within Brevard County include Government Managed Lands (GML), General Use (GU) and Environmental Areas (EA). The permitted uses within the GML – Parks and Conservation designation allows active and passive recreation as well as temporary or permanent conservation uses. The areas of the park designated as GML include the administration office area, marina area, and beach concession area. The estuarine tidal swamp areas of the park are classified EA. The purpose of this classification is to conserve natural resource functions and features by retaining lands and waters in their pristine character and condition, but permit uses which are compatible with or which shall enhance or restore the functions and features of such natural resources. The remainder of the park within Brevard County is classified as GU. This zoning classification encompasses rural single-family residential development, or unimproved lands for which there is no definite current proposal for development, or land in areas lacking specific development trends. Parks and public recreational facilities are permitted uses in both GML and GU.

The park property within Indian River County is designated Recreation on the Future Land Use Map (Indian River County, 2007). The local zoning for almost all of the park property within Indian River County, RS-1, allows public parks as an administrative permit use and retreats and camps as a special exception. At the extreme southern end of the park, there are a few parcels including the McLarty Treasure Museum zoned as



Long Point Rd

INSET 1

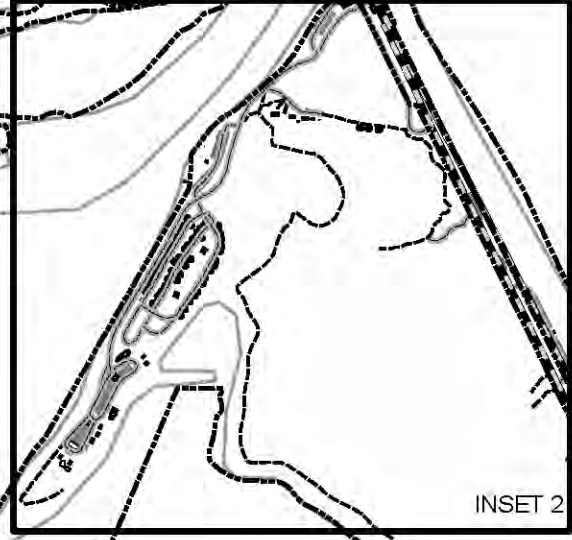


INSET 2

INDIAN RIVER

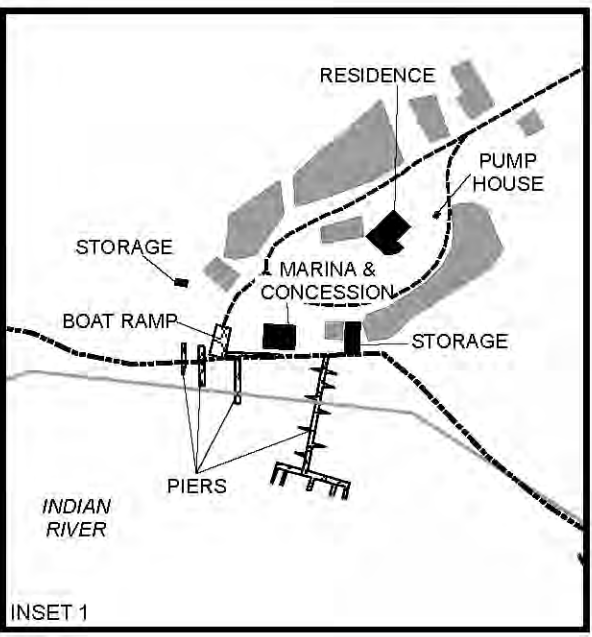
BREVARD COUNTY
INDIAN RIVER COUNTY

- LEGEND**
- Park Boundary
 - == State Road
 - - - County Road
 - Park Road Paved
 - - - Park Road Unpaved
 - Hiking Trails
 - - - Hiking/Biking Trails
 - Equestrian Trails
 - Camping Sites
 - Structures
 - ▒ Parking Lot
 - ⊗ Marine Structures



INSET 2

ATLANTIC OCEAN

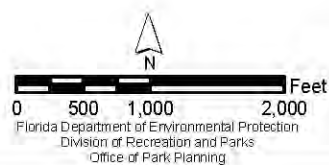


INSET 1

RESIDENCE

MCLARTY
TREASURE
MUSEUM

SEBASTIAN INLET
STATE PARK



BASE
MAP

RS-3 and A-1 which also allow public parks as an administrative permit use.

Current Recreational Use and Visitor Programs

Sebastian Inlet State Park is an extremely popular location for saltwater fishing and surfing. Since the area directly north of the north jetty is favored by both fishermen and surfers, conflicts do arise on occasion. Other available recreational uses at the park include swimming, sunbathing, camping, hiking, biking, picnicking, shelling, snorkeling, scuba diving, boating, canoe/kayaking, bird watching, and interpretive programs. The park also contains two museums, the McLarty Treasure Museum and the Sebastian Fishing Museum. In addition, several major surfing competitions are held here every year.

The park recorded 712,256 visitors in fiscal year 2006/2007 ranking it sixth among all the parks in Florida. Visitation remains heavy throughout the year but peaks March through July. This park is unique in that it remains open 24 hours a day to allow fishing access to the jetties. By Division estimates, the FY 2006/2007 visitors contributed \$32.3 million in direct economic impact and the equivalent of 645 jobs to the local economy (Florida Department of Environmental Protection, 2007).

Other Uses

The original Sebastian Inlet was dug by hand between 1886 and 1895, but closed by a storm soon after. A permanent inlet was opened in 1924, allowed to close during World War II and reopened after the war. Today, the inlet is maintained by the Sebastian Inlet District (SID). The two jetties, which are very popular with fishermen and other park visitors, are managed under agreements between the Division and the SID. Spoil and pipeline easements are in place to support the periodic dredging operations necessary to maintain the inlet. Division staff meets with the SID frequently to coordinate inlet work with the resource management and visitor service responsibilities of the park.

State Road A1A traverses the full length of the park, and a paved bicycle path has been constructed within the state road right-of-way through the park.

During the summer, an overnight surf camp for children utilizes the volunteer campsites adjacent to the maintenance area on the south side of the inlet. The remainder of the year the campsites are reserved for park volunteers.

Protected Zones

A protected zone is an area of high sensitivity or outstanding character from which most types of development are excluded as a protective measure. Generally, facilities requiring extensive land alteration or resulting in intensive resource use, such as parking lots, camping areas, shops or maintenance areas, are not permitted in protected zones. Facilities with minimal resource impacts, such as trails, interpretive signs and boardwalks are generally allowed. All decisions involving the use of protected zones are made on a case-by-case basis after careful site planning and analysis.

At Sebastian Inlet State Park, the beach dunes, marine unconsolidated substrate, coastal strand, maritime hammock, tidal swamp and offshore worm reef communities have been designated as protected zones. The western portion of Coconut Point is an additional protected zone established for nesting shorebirds (see the Conceptual Land Use Plan).

Existing Facilities

Most of the facilities at this park are 20 to 35 years old and require considerable maintenance due to heavy use and the harsh coastal environment. Ongoing maintenance and repair budgets sufficient to deal with these factors are needed to provide a quality park experience for visitors. The following is a list of existing facilities.

Recreation Facilities

Administrative Office/"Spanish House" Area

Administrative office	Portable toilet
Interpretive kiosk	Stabilized parking (48 spaces)

Sebastian Inlet Marina

Marina office/store	Storage building
Boat slips (22)	Stabilized parking (14 spaces)
Boat ramp	

North Jetty/Beach Use Area

Ranger station	Bait and tackle store
Beach restrooms (2)	Medium shelter
Dune boardwalks (3)	Scattered picnic tables
Snack bar/gift shop building	Parking (226 spaces)

Swimming Cove/Overflow Area

Swimming area	Unimproved parking (approximately 40 spaces)
Portable toilets (2)	Overflow parking field (approximately 200 spaces)

South Inlet Shoreline

Sebastian Fishing Museum	Fish cleaning table
Camper registration office	Scattered picnic tables
Fishing dock	Restroom
	Parking (190 spaces)

Camping Area

Standard campsites (51)	Bathhouses (2)
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Coconut Point Area

Boat ramp (3 lanes)
 Non-motorized watercraft launching beach
 Large picnic shelters (4)

Playground
 Restrooms (2)
 Office
 Parking (66 spaces)

South Beach Use Area

Bathhouse
 Dune boardwalk

Parking (80 spaces)

McLarty Treasure Museum

Museum building
 Dune boardwalk w/overlook

Parking (28)

Trails

Hammock Nature Trail (1 mi.)

Bike trail (4 miles)

Support Facilities**North Maintenance Area**

Equipment storage building

South Maintenance Area

Shop building
 Equipment storage buildings (3)

Sheds (2)
 Greenhouse

Residences (6)**Miscellaneous**

Sewage treatment plant

Park Roads

Paved (1.25 mile)

Unpaved (0.5 mile)





CONCEPTUAL LAND USE PLAN

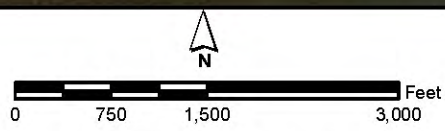
The following narrative represents the current conceptual land use proposal for this park. As new information is provided regarding the environment of the park, cultural resources, recreational use, and as new land is acquired, the conceptual land use plan may be amended to address the new conditions (see Conceptual Land Use Plan). A detailed development plan for the park and a site plan for specific facilities will be developed based on this conceptual land use plan, as funding becomes available.

Site Planning and Design Process

During the development of the unit management plan, the Division assesses potential impacts of proposed uses on the resources of the property. Uses that could result in

Legend

-  PROPOSED FACILITIES
-  DEVELOPMENT AREAS
-  PARK BOUNDARY
-  PROTECTED ZONE



unacceptable impacts are not included in the conceptual land use plan. Potential impacts are more thoroughly identified and assessed through the site planning process once funding is available for the development project. At that stage, design elements, such as sewage disposal and stormwater management, and design constraints, such as designated species or cultural site locations, are more thoroughly investigated. Advanced wastewater treatment or best available technology systems are applied for on-site sewage disposal. Stormwater management systems are designed to minimize impervious surfaces to the greatest extent feasible, and all facilities are designed and constructed using best management practices to avoid impacts and to mitigate those that cannot be avoided. Federal, state and local permit and regulatory requirements are met by the final design of the projects. This includes the design of all new park facilities consistent with the universal access requirements of the Americans with Disabilities Act (ADA). After new facilities are constructed, the park staff monitors conditions to ensure that impacts remain within acceptable levels.

Potential Uses and Proposed Facilities

The existing recreational activities provided to the public at Sebastian Inlet State Park are appropriate and should be continued. As with all of the older units of the park system, improvements to park facilities and infrastructure are needed for the Division to fulfill its responsibilities to provide outdoor recreation, protect, and enhance the natural and cultural resources of the park. Renovations, replacements and other improvements of the facilities and use areas are recommended by this plan to enhance visitor experience. In addition, this plan also recommends the expansion of certain use areas, as described below.

Recreation Facilities

Administrative Office/"Spanish House" area. Across State Road A1A from the park's administrative office is a very popular and well-known surfing destination called "Spanish House." Surfers park their vehicles in the stabilized parking area adjacent to the administrative office and walk across the highway to the beach. As discussed in the Optimum Boundary section, this particular stretch of beach is not within the park boundary, but instead, is part of the Archie Carr National Wildlife Refuge. The Division will work towards establishing a Memorandum of Understanding with the U.S. Fish and Wildlife Service to manage this property. If such a management arrangement is established, this plan recommends creating a new beach access a short distance to the south of the existing foot trail, expanding and redesigning the parking area to accommodate up to 100 vehicles, constructing a restroom with outdoor shower, and providing scattered picnic tables adjacent to the parking area. Coordination with the Florida Department of Transportation is also needed to provide flashing signals, a marked pedestrian crosswalk and reduced speed limit on State Road A1A at this location for visitor safety.

Sebastian Inlet Marina. The facilities at Sebastian Inlet Marina are in disrepair and in

need of a complete overhaul. In addition, this area has not reached its potential for visitor use. Future planning and design should determine how best to improve this area to support its intended recreational use. A site plan is recommended.

Consideration should be given to revamping the marina buildings, docking facilities, seawall, boat ramp, residence, road, septic system and increasing the capacity of the boating facilities and parking area. The possibility of providing a marine pump-out station, establishing some tent camping in this area and providing dockage for a rescue/law enforcement vessel will also be explored. Ideally, the marina structures should be constructed in a vernacular architectural style in keeping with the rustic character associated with the many small “fish camps” that once flourished along the Indian River. The services to be offered in the marina area should include expanded boat and kayak rentals, snacks and sales area, a designated area for fishing and manatee observation, and possible boat tours and fishing trips. Commercial uses of the marina should be limited to those related to the recreational programs of the park. Long-term slip rentals and boat storage are not uses appropriate to this facility.

Several factors will influence the new design of the docking facilities, including the lack of a dredged channel and draft limitations within Campbell Cove, the hard coquina surface bottom and the desire to analyze the needs of park visitors.

North Jetty/Beach use area. The beach use area at the north jetty is the most popular location in the park. This area is attractive to surfers, fishermen, and beach goers. The park’s main concession operation is located here, consisting of a small snack bar/gift shop and bait and tackle store. These concession buildings are showing serious signs of aging and are no longer adequate to accommodate customer growth and serve their expanding needs. This plan recommends developing a site plan for this area and replacing these structures with new, expanded facilities. Services to be provided in this area should continue to offer food service with a dining area, retail sales, beach equipment rentals and fishing supplies.

A complete redesign of the boardwalk system including outdoor shower stations should be incorporated into the site plan for the area. The two beach restrooms in this area of the park also require some attention; appropriate renovations are recommended.

Swimming Cove/overflow parking area. The small swimming cove on the north shoreline of the inlet is very popular and should be improved for public access to enhance its use as a sheltered swimming area suitable for families with small children. Recommended facilities include up to eight small and medium-sized picnic shelters, two restrooms with outdoor showers, universal access to the picnic facilities and the shoreline, and native landscaping. The road leading to the cove swimming area should be either stabilized or paved and parking should be established along the road shoulder for up to 100 vehicles.

The overflow-parking field, north of the swimming cove, is used regularly during weekends and holidays. During large special events, nearly the entire field can be full of vehicles. The organization and efficiency of this parking area could be greatly improved if sections were stabilized, circulation route established, and wheel stops added. Barriers for vehicles should also be placed around gopher tortoise burrows that occupy this area. Improvement of this area should follow the recommendations of the proposed plan discussed in the Resource Management Component that will evaluate all the demands for this specific area such as species protection, groundcover enhancement, SID easements and visitor use.

South Inlet shoreline. In recent years, many amenities have been added along the south inlet shoreline to enhance the visitors' fishing experience. This plan recommends replacing the small, L-shaped fishing dock with a longer dock that parallels this portion of the inlet shoreline. The existing, adjacent parking lot is currently underutilized and could accommodate the increased use of the dock. Potential also exists for providing a park store near this fishing facility and the adjacent camping area. This location could service fishermen, campers and other day-use visitors. A decision on the park store requires further market analysis.

Camping area. Complete renovation of the existing 51-site camping area is recommended to bring the infrastructure up to modern standards, enhance the size and slope of each site, and improve the buffer between the sites. In addition, this plan recommends expanding the campground to the southwest into a previously disturbed area to provide an additional 20 to 25 campsites and a bathhouse. Approximately five of these new sites should be designed for tent camping only. This area had contained campsites in the past but those sites were relocated in preparation to construct rental cabins, a concept approved in the previous management plan. The Division has since decided not to proceed with cabin development at this location and believes camping expansion would result in greater public benefit for this area. As part of the camping area renovations and expansion, landscaping is recommended, where possible, to provide better separation, privacy and shade for each campsite.

North Inlet Shoreline/new use area. In the previous approved management plan, cabins were proposed for the western end of the existing camping area. During the planning process for this management plan, a location that is better suited for cabin development was identified within an old spoil deposition site along the north inlet shoreline. This new location is preferable because it is located within a previously disturbed area that would not affect an established use area while still providing scenic views of the inlet. An engineering study is recommended to determine the feasibility of building on this site and providing vehicular access. If feasible, six rental cabins are proposed along with the necessary utilities and access. Since development of the cabins is not likely in the near future, this plan recommends making the site available to serve as a primitive group camp in the interim. This group camp should be able to

accommodate organized groups of up to 30 campers. Recommended facilities include a campfire circle, designated tent area, large shelter, restroom facilities and boardwalk access.

Coconut Point area. The shoreline north of the picnic area on Coconut Point provides a stabilized beach for launching non-motorized watercraft. This shoreline area is currently being repaired following hurricane damage. As part of future concession operations, this location would be ideal for renting catamarans and other non-motorized vessels.

South Beach use areas. Proposed improvements to the existing beach use area south of the inlet include replacing the beach restroom and dune crossover as well as formalizing the two existing footpaths at the corner of the parking lot. The remaining informal footpaths in the vicinity will be eliminated.

Despite the availability of this 80-vehicle beach parking lot, many visitors choose to park along State Road A1A south of the inlet and access the beach through numerous, unauthorized foot paths that cross over the dunes. Consequently, these areas are more susceptible to blowouts and erosion due to the lack of vegetative cover. In an effort to discourage the use of these unauthorized paths, fencing and signage is proposed to control beach access and direct visitors to established parking areas. In addition, one new beach parking area is recommended south of the inlet with parking for up to 40 vehicles. This new beach access area should utilize one of the more popular footpaths located between the existing beach parking lot and the McLarty Museum.

McLarty Treasure Museum. The museum should be evaluated for possible upgrades and renovations. Consideration should be given to exhibit content, ADA compliance, improving the gift shop area and dedicating space for revolving exhibits and guest lectures.

Miscellaneous. As noted above, a paved bicycle path along State Road A1A now connects to the park entrances from both the north and south thus resulting in an increase in bicycle and pedestrian activity around the park. Unfortunately, the bike path ends at the park gates. This plan recommends exploring the ability to provide a separate bike path along the park roads at both park entrances to deliver bikes/pedestrians to each use area within the park.

Support Facilities

Administrative office area. A 3-bay equipment storage building is recommended within the fenced compound adjacent to the administrative office.

North maintenance area. The 2-bay equipment storage building located in the maintenance area north of the inlet needs to be replaced.

South maintenance area. Most of the structures within the large maintenance area located south of the inlet need replacement. The list of proposed structures includes a 6-bay equipment storage building, 4-bay shop building, and another 4-bay equipment storage building.

Residences. Either two additional permanent residences or one duplex residence is needed at the north residence area to replace existing mobile homes.

Miscellaneous. Water and sewage collection systems are available both north and south of the park. Engineering studies are needed to determine the feasibility of connecting the park to these systems, and to determine the costs involved. A long-term goal of the park is to shift these infrastructure needs to off-site systems to reduce maintenance responsibilities and discontinue operation of the existing water wells, a sewage treatment plant and septic tank/drainfield disposal systems.

Facilities Development

Preliminary cost estimates for the following list of proposed facilities are provided in Addendum 7. These cost estimates are based on the most cost-effective construction standards available at this time. The preliminary estimates are provided to assist the Division in budgeting future park improvements, and may be revised as more information is collected through the planning and design processes.

The following is a summary of facilities needed to implement the conceptual land use plan for Sebastian Inlet State Park:

Administrative Office/"Spanish House" Area

Medium restroom w/ outdoor showers	Stabilized parking expansion (up to 50 additional spaces)
Scattered picnic tables (8)	
Crosswalk and signs	

Sebastian Inlet Marina

Site plan	Evaluate boat ramp
Renovate/replace marina buildings	Evaluate residence
Repair seawall	Evaluate septic system
Replace docking facility	Parking expansion
	Road paving (0.25 mile)

North Jetty/Beach Use Area

Site plan	Redesign dune boardwalk system
Renovate/replace concessions buildings	Renovate beach restrooms (2)

Swimming Cove/Overflow Parking Area

Small picnic shelters (4)	Medium picnic shelters (4)
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Swimming Cove/Overflow Parking Area

Small restrooms (2)
Boardwalks (3)
Stabilized parking (up to 100 spaces)

Road stabilize/paving (0.25 mile)
Native landscaping
Overflow parking field enhancements

North Inlet Shoreline/New Use Area

Primitive group camp w/ pedestrian access

Cabin development (6) w/ vehicular access

South Inlet Shoreline

Replace fishing dock

Camping Area

Renovate camping area (51 sites)
Upgrade electric/water/sewer connections
New full-facility campsites (approximately 20 sites)

New tent sites (approximately 5)
New bathhouse
Native landscaping

Coconut Point Area

Potential non-motorized watercraft rental station

South Beach Use Areas

Replace restroom
Replace dune crossover

New stabilized beach parking area (40 cars)
Fencing (as needed)

McLarty Treasure Museum

Evaluate exhibit area

Miscellaneous

Bike paths (0.5 mile)

Support Facilities

3-bay equipment shelter
2-bay equipment shelter
4-bay shop building
6-bay equipment shelter

4-bay equipment shelter
Ranger residences (2)
Engineering study (water & sewer systems)

Existing Use and Recreational Carrying Capacity

Carrying capacity is an estimate of the number of users a recreation resource or facility can accommodate and still provide a high quality recreational experience and preserve the natural values of the site. The carrying capacity of a unit is determined by identifying the land and water requirements for each recreation activity at the unit, and then applying these requirements to the unit's land and water base. Next, guidelines are applied which estimate the physical capacity of the unit's natural communities to

withstand recreational uses without significant degradation. This analysis identifies a range within which the carrying capacity most appropriate to the specific activity, the activity site and the unit's classification is selected (see Table 1).

The recreational carrying capacity for this park is a preliminary estimate of the number of users the unit could accommodate after the current conceptual development program has been implemented. When developed, the proposed new facilities would approximately increase the unit's carrying capacity.

Table 1--Existing Use And Recreational Carrying Capacity

Activity/Facility	Existing Capacity		Proposed Additional Capacity		Estimated Recreational Capacity	
	One Time	Daily	One Time	Daily	One Time	Daily
Beach Use						
Swim, Sunbath, etc.	800	1600	80	160	880	1760
Surfing	300	600	100	200	400	800
Fishing	352	704			352	704
Camping						
Standard	408	408	200	200	608	608
Group Camp			30	30	30	30
Picnicking	220	440			220	440
Trails						
Hiking	10	40			10	40
Biking	32	64			32	64
Boating						
Motorized Vessels	242	242			242	242
Non-Motorized	80	160			80	160
McLarty Museum	60	240			60	240
Fishing Museum	60	240			60	240
Cabins			36	36	36	36
TOTAL	2564	4738	446	626	3010	5364

Note: Under the Beach Use category, the "Swim, Sunbath, etc." capacity includes swimming, sunbathing, beachcombing, snorkeling, and other beach related activities. For the two boating categories, the capacity figures refer to the number of people, not boats. In addition, occasional special events can draw large crowds in excess of 6,000 people.

Optimum Boundary

As additional needs are identified through park use, development, research, and as adjacent land uses change on private properties, modification of the unit's optimum boundary may occur for the enhancement of natural and cultural resources, recreational values and management efficiency.

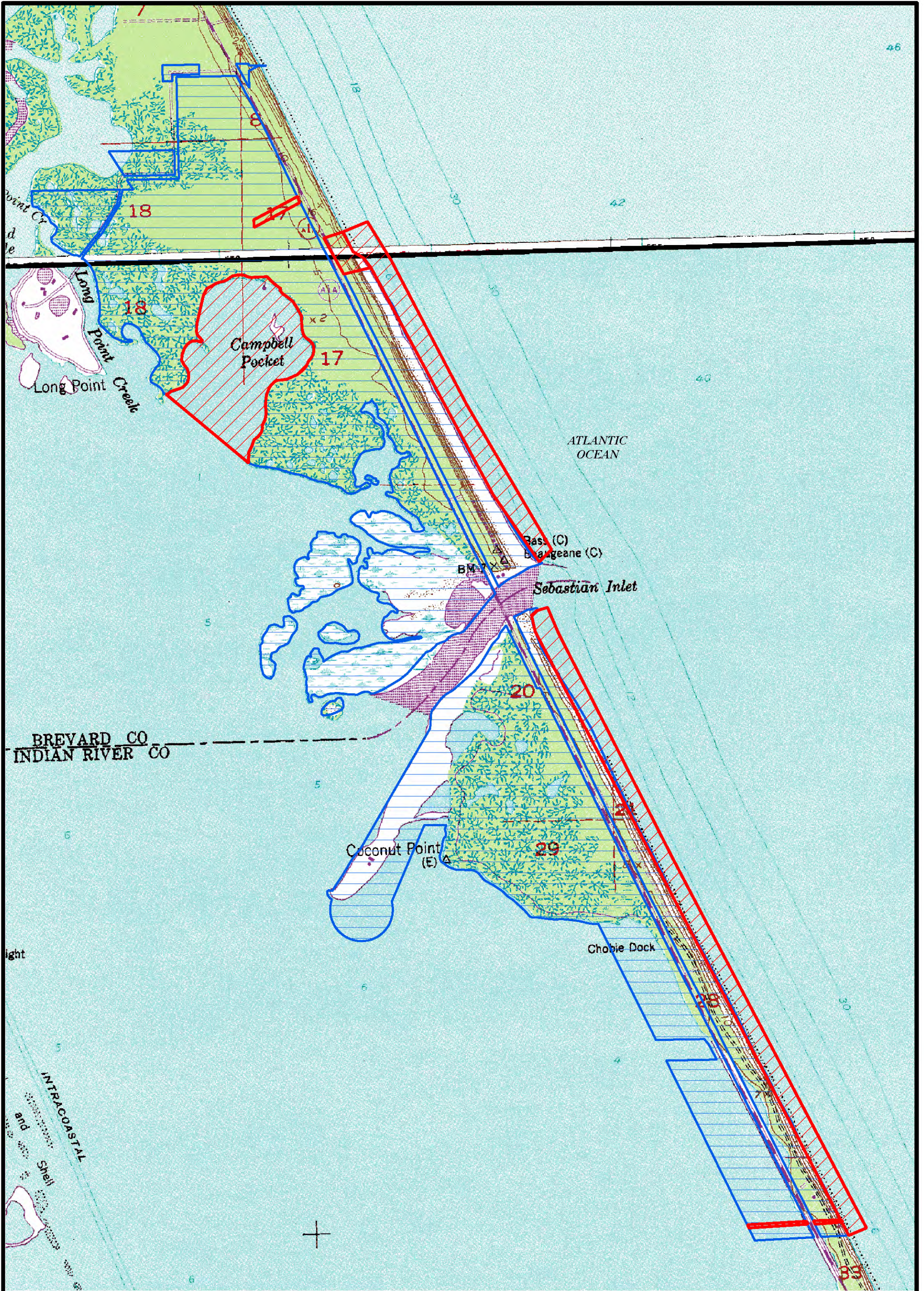
Identification of lands on the optimum boundary map is solely for planning purposes and not for regulatory purposes. A property's identification on the optimum boundary recreational activities.

The submerged land within Campbell Pocket is recommended for addition to the park boundary. This cove is home to the park's marina and supports ongoing recreational use such as boating, canoe/kayaking, fishing and manatee observation. The Optimum Boundary Map also identifies two, small out parcels for addition to the park.

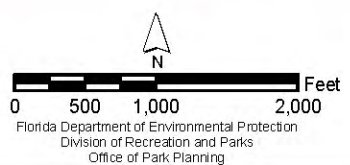
The beachfront property north of the current boundary, which is a non-contiguous parcel of the Archie Carr National Wildlife Refuge, should be considered for cooperative management through the implementation of a Memorandum of Understanding between the two agencies. As discussed under *Potential Uses and Proposed Facilities*, this section of beach is a popular destination for surfers and having management authority for this area would allow the Division to enhance its recreational use as well as coordinate resource management efforts.

The submerged lands along the Atlantic Ocean shoreline are recommended for including in the park boundary. The placement of these submerged lands within the boundaries of the park would allow park staff to enforce Florida Administrative Code 62D-2 within this new boundary that is proposed to stretch approximately 400 feet waterward of the mean high water line.

And, consideration may be given to releasing the two, small disjunct parcels at the north end of the park near the intersection of Long Point Road and State Road A1A. Due to their remoteness, these parcels might be better served under the management of another agency or entity, such as Brevard County or the USFWS.



SEBASTIAN INLET
STATE PARK



LEGEND
 [Blue outline] Park Boundary
 [Red outline with hatching] Optimum Boundary

OPTIMUM BOUNDARY MAP

Addendum 1 – Acquisition History and Advisory Group Staff Report

Sebastian Inlet State Park Acquisition History

Purpose of Acquisition. The State of Florida acquired Sebastian Inlet State Park to restore, conserve, protect and develop the property for the greatest good and benefit of the citizens of the state.

Sequence of Acquisition. On February 14, 1969, the Board of Trustees of the Internal Improvement Trust Fund (Trustees) obtained title to a 7-acre property constituting the initial area of Sebastian Inlet State Park. This property was donated to the State by Robert P. McLarty and his wife Dodo W. McLarty. Since this initial acquisition, the Trustees have acquired several individual parcels through a lease as well as through different land acquisition programs such as EEL, LATF, SOC and P2000 and added them to Sebastian Inlet State Park. Currently, the park is comprises 971.01 acres.

On September 4, 1970, the Trustees leased Sebastian Inlet State Park to the Florida Department of Environmental Protection, Division of Recreation and Parks (Division), under Lease Number 2457. Lease Number 2457 is a ninety-nine (99)-year lease and will expire on September 3, 2069.

According to Lease Number 2457, the Division manages Sebastian Inlet State Park for the purpose of preserving, developing, operating, and maintaining said lands and property for outdoor recreational, park, conservation and related purposes.

Title Interest. The Trustees holds fee simple title to Sebastian Inlet State Park.

Special Conditions on Use. Sebastian Inlet State Park is designated single-use to provide public recreation and other related uses. Uses such as water resource development projects, water supply projects, stormwater management projects, linear facilities and sustainable agriculture and forestry (other than those forest management activities specifically identified in this plan) are not consistent with this plan.

Outstanding Reservations. The Division's lease from the Trustees stipulates that all the property shall be used for public outdoor recreation and related purposes. Following is a listing of outstanding rights, reservations and encumbrances that apply to Sebastian Inlet State Park.

Sebastian Inlet State Park Acquisition History

Instrument:Amended and Restated Memorandum of Agreement

Instrument Holder:Sebastian Inlet Tax District

Beginning Date:.....December 21, 2000

Ending Date:.....There is no specific ending date given.

Outstanding Rights, Uses, Etc.:The memorandum of agreement summarizes and restates all easements including, but not limited to, maintenance, construction, ingress and egress, and spoil disposal granted to Sebastian Inlet Tax District to use certain portions of Sebastian Inlet State Park.

Instrument:Lease Agreement (Right-of-way lands along State Road A-1-A and beneath the Sebastian Inlet Bridge)

Instrument Holder:State of Florida Department of Transportation

Beginning Date:.....April 23, 1976

Ending Date:.....April 22, 2071

Outstanding Rights, Uses, Etc.:The lease is subject to the rights of the owners and operators of utility lines existed within the leased premises at the time of the lease agreement.

Instrument:Special Warranty Deed

Instrument Holder:Indian River County

Beginning Date:.....November 4, 1970

Ending Date:.....No specific ending date given.

Outstanding Rights, Uses, Etc.:The special warranty deed is subject to that :

- (1) The property in question be used forever and continuously used and maintained for a public park for recreational purposes and no part of this property is confined or used as a restricted campground or other restricted area.
- (2) The South shoreline of the Sebastian Inlet, the fishing pier, under the Sebastian Inlet Bridge and the South Jetty of the Sebastian Inlet shall be accessed by all people day or night at no specific charge.

Sebastian Inlet State Park Advisory Group Members

The Honorable Truman Scarborough
Chairperson
Brevard County Board of
Commissioners
400 South Street, Suite 1-A
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The Honorable Sandra Bowden
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Indian River County Board of
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Terence Coulliette, Park Manager
Sebastian Inlet State Park
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Paul Tritaik, Manager
Archie Carr National Wildlife Refuge
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Sharon Tyson, Manager
Indian River – Malabar to Vero Beach
Aquatic Preserve
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Sebastian Inlet State Park Advisory Group Members

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David Barney, Chairman
Indian River Chapter
Surfrider Foundation
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Dr. Blair Witherington
Floridana Beach Homeowner's
Association
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Melbourne Beach, Florida 32951

Mr. Bob Bruce
12396 North Highway A1A
Vero Beach, Florida 32963

Sebastian Inlet State Park Advisory Group Staff Report

The Advisory Group meeting to review the proposed land management plan for Sebastian Inlet State Park was held in the park's conference room on May 14, 2008 at 9am. Commissioner Chuck Nelson (Brevard County), Bud Crisafulli (Brevard Soil and Water Conservation District), David Gunter (Indian River Soil and Water Conservation District) and Rob Varley (Brevard County Tourism Development Council) did not attend. Alex Pries (Florida Fish and Wildlife Conservation Commission) and Dale Armstrong (Florida Division of Forestry) sent written comments in lieu of attending. All other appointed Advisory Group members were present. Attending staff from the Division of Recreation and Parks included Larry Fooks, Clif Maxwell, Ron Johns, Terry Coulliette, Jason DePue, Phil Rand and Brian Burket.

Mr. Burket began the meeting by explaining the purpose of the Advisory Group and reviewing the meeting agenda. He provided a brief overview of the Division's planning process and summarized public comments received during the previous evening's public workshop. He then asked each member of the advisory group to express his or her comments on the plan.

Summary of Advisory Group Comments

Richard Baker (Pelican Island Audubon Society) recommended that more effort be made to get local citizens active in the park. He encouraged the park to provide more birding and kayak trips and suggested that they be free. He initiated a discussion about recent efforts to protect sea grass beds around the park. He commented that the Audubon Society contributed to the Eagle Scout project at the tip of Coconut Point to enhance and interpret this shorebird nesting area. He recommended a more proactive exotic plant removal effort.

Chairman Sandra Bowden (Indian River County Board of County Commissioners) suggested that the park may become more popular with local citizens as a consequence of the slumping economy. She commented that the park is a glorious place and she would like to invite Park Manager Terry Coulliette to an upcoming BOCC meeting to recognize and help raise support for the park. She also offered her support to publicize the park to local citizens.

Jenny Lawton-Seal (Sebastian Inlet District) recommended including language in the management plan about the current SID proposal. The SID has requested exchanging their existing spoil deposit site for a larger, previously disturbed area. In compensation, the SID has offered to dredge the boat ramp, replace the L-dock, provide a new canoe/kayak launch area and maintain the channel markers to the boat ramp. She offered the assistance of the SID to help advertise and market the park. She mentioned that SID has recently developed a touch-screen kiosk that needs a secure home and suggested that an appropriate area might be found in the park.

Sebastian Inlet State Park Advisory Group Staff Report

Jon Bates (Indian River County Tourist Development Council) remarked that the plan was an interesting read. He commented that more effective methods are needed to inform residents and tourists about the park. He requested that park staff provide brochures to local hotels to help encourage visitation. He inquired about where revenue generated at the park goes and how the park is funded. He suggested that park staff work with the TDC to develop a marketing plan.

“Sachi” Sachidanandan (Turtle Coast Sierra Club) expressed appreciation for the staff and their work put into the development of the management plan. He commented that the plan is ambitious and will require additional staffing and volunteers. He suggested that the management plan clarify that the bike trail is for bicycles and not motorized bikes. He recommended that all beach access areas include a restroom and shower. He commented that the existing beach concession buildings are not attractive and requested that the future concession building be aesthetically pleasing.

He later sent written comments where he suggested that water conservation be considered in the renovation or construction of new restrooms and shower facilities. He recommended installing waterless urinals and water conserving showerheads in an effort to minimize water usage at the park.

Justin Stovall (Whitey’s Bait & Tackle) commented that he talked with many local boaters and fishermen to hear their comments about the park. He shared that many are concerned about the conflict between boaters navigating the inlet and fishermen who cast in their path. He commented that boats moving through the inlet have the right-of-way. He suggested that the creation of an offshore, artificial reef could lure some boaters away from fishing at the congested, north jetty. He requested more law enforcement at the jetties due to indecent behavior by some park visitors and the taking of illegal fish. He suggested that all park visitors who pay taxes to the SID should be allowed into the park at no cost. He congratulated the SID for the new seagrass signage around the inlet. He requested that the channel markers for the marina be extended to the inlet channel and to Long Point Park. He commented that closing the unauthorized footpaths to the beach will be difficult to enforce since each path leads to a popular fishing hole. After the meeting, he suggested that 10-20 tent campsites with a restroom and showers be considered for the marina area to support this use of this area by boaters and surfers.

Blair Witherington (Floridana Beach Homeowner’s Association) commented that the plan was well written. He recommended that the plan recognize the draft limitations within the marina channel. He commented that the plan provides a good discussion of the natural resource impacts of sand bypass and beach renourishment. A discussion followed about the impacts of the most recent beach renourishment project. He questioned whether the SID’s management plan for the inlet was consistent with the Division’s interests in management of the state park. A compromise was reached that

Sebastian Inlet State Park Advisory Group Staff Report

the plan is “generally consistent.” He encouraged the park staff to strengthen their relationship with the SID and improve coordination of SID projects that could result in impacts to the park resources and visitor experience. He requested that the management plan reinforce the need for park staff to be involved in decision making process regarding SID projects. He commented that the dog policy for the park is confusing and suggested identifying specific areas where dogs are allowed rather than providing signage everywhere dogs are not allowed. He commented that the Coconut Point shorebird protection area is rather small and recommended exploring the potential to establish/enhance other areas of the park for shorebird habitat. He recommended increasing the volume of parking at the existing beach parking lot south of the inlet rather than establishing a new beach access area. He voiced support for closing all unauthorized footpaths to the beach. He remarked that a stable and well-managed sand footpath to the beach is better than a boardwalk. He commented that future boat tours from the marina should be encouraged. He commented that the area suggested for a kayak launch by the SID is a destination for paddlers and therefore should not be an access point. He suggested the development of a marked kayak trail from the marina to this area. He provided a few recommendations for the species list.

Steven Webster (Citizens for Florida’s Waterways) asked about the proposed budget for the marina redevelopment and requested that this be a priority project. He commented that the county is lacking a sufficient number of boat ramps and boat trailer parking spaces so therefore requested that consideration be given to expanding the boating capacity at the marina as part of the redevelopment project. He suggested that the Division look into establishing boat trips between the park and the City of Sebastian across the lagoon. He asked for clarification of the carrying capacity table regarding the number of motorized boaters the park is able to support now and in the future following the marina redevelopment.

Jim Egan (Marine Resources Council) commented that funding sources are available for establishing boat tours to and from the park. He encouraged the Division staff to include a list of all potential projects, studies, research, etc. in the management plan to increase the likelihood of them being supported and funded. He suggested lobbying for a bicycle path to be included on the bridge once FDOT begins planning its replacement. He commented that Scenic Highway grants may be available to improve destination areas within the park.

David Barney (Surfrider Foundation, Indian River Chapter) recommended that the management plan mention the legal obligation of the SID to transfer a certain volume of sand on Indian River beaches each year. He recommended that smaller beach renourishment projects be pursued that build-up the dunes instead of larger projects that impact hard bottom. He commented that recent studies indicate that Sebastian Inlet is becoming a mature inlet and that some sand is beginning to naturally bypass the inlet. He suggested that the park manager and/or biologist attend the monthly

Sebastian Inlet State Park Advisory Group Staff Report

meetings of the Indian River Beach and Shore Preservation Advisory Committee. He commented that the park has amazing resources and acknowledged the hard work and dedication of outgoing Park Manager Ron Johns and Archie Carr NWR Manager Paul Tritaik. He asked about the relationship between park visitation and funding for the park. He commented that many tourists know more about the park than local citizens and recommended that the Division aggressively promote the park locally. He remarked that the desire for free beach access is a big issue at the park. He suggested creating a new beach access area at "Monster Hole." He commented that surfers/beachgoers recently lost a beach access near Long Point Road due to the elimination of roadside parking there. He requested that the Division consider providing a beach access parking lot at the north end of the park adjacent to Long Point Road in exchange for scaling down the proposed improvements at the "Spanish House" parking area. He commented that the Surfrider Foundation can be a huge resource for volunteer recruitment especially for surf competitions and other special events. He suggested that the park staff attend the FDOT workgroup meetings. He identified the need to enforce the separation of surfers and jet skis at "Monster Hole" for safety reasons.

Sharon Tyson (Indian River-Malabar to Vero Beach Aquatic Preserve) suggested that a committee of experts be established to review SID projects before the permitting phase. She commented that recent studies indicate that beach renourishment projects around the state are linked to the increasing frequency of red-tide blooms around Florida. She mentioned that FWC is researching least terns in Brevard County and are working to establish Critical Wildlife Areas. She recommended that the Division inquire about the park's CWA status. She commented that her office has a tremendous relationship with the park staff and complimented the management plan. She requested that the plan clarify that CAMA shares management authority for all submerged lands within the park boundary and within the 400 foot zone waterward of MHW. She mentioned that CAMA might be able to assist with native plantings around the swim cove area, including mangroves. She recommended that the tidal connection near the south maintenance area should be improved. She requested that the Division coordinate any projects with CAMA that take place within submerged lands around the park, such as the proposed fishing dock replacement. She requested that seagrass beds around the park be identified on a map in the plan. She commented that healthy seagrass beds are located in the area of the proposed dock replacement within the inlet. She recommended including a small rescue/law enforcement boat at the proposed fishing dock. She commented that CAMA has been actively surveying for diamondback terrapins around the park.

She also provided the following additional comments in written form. She recommended a management objective to prepare a plan for the occurrence of aquatic invasive species. She recommended an objective to encourage permitted research by universities and institutions. She recommended an objective to limit disturbance (trails)

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through tidal wetlands on the north side of the park adjacent to the inlet. In addition to controlling access to the shorebird protection area at Coconut Point, she requested that waterward access to seagrass beds and shoreline habitat also be limited. She suggested the use of Island designations and Universal Island signage be adopted. She recommended the surveying of submerged archaeological sites. She proposed that park staff comment on State and Federal treasure requests and re-authorizations. She commented that the camping area is surrounded by tidal wetlands so the proposed improvements will probably require ERP permitting. She recommended implementing educational signage allowances for the protection of dolphin, manatee, woodstorks, etc. She provided some language about CAMA to include under the Management Coordination section. She commented that the Natural Communities Map does not reflect all tidal habitats near developed areas or natural mangrove fringe habitat. She provided a description of seagrass habitat for possible inclusion in the plan. She suggested coordinating with utility companies about any future placement of electrical poles and wires which could result in bird fatalities. She recommended that the Management Needs and Problems section mention seagrass impacts by boats, sand removal and construction. She requested that shorebird data be reported on the FWC website.

Bob Bruce (adjacent landowner) commented that the inlet is manmade and has deleterious impacts; however, the inlet is also what makes this area so special and popular. He remarked that a lot of work was put into getting the Scenic Highway designation so the park and others could benefit from this funding source which could be used for beach access improvements.

Paul Tritaik (Archie Carr National Wildlife Refuge) highlighted the benefits of establishing a disposal site for material dredged from the inlet, i.e. identifying an area for material not suitable for the beach but useable for the creation of shorebird habitat. He commented that a boardwalk to the beach can be problematic for prescribed burns and is not necessary if the sand footpath is stable and not prone to dune blowout. He thanked Ron Johns and his staff for their support and hard work over the years and complimented the management plan. He expressed appreciation for the commitment to sea turtle surveys and attention to shorebirds, gopher tortoises, beach mice and diamondback terrapins. He recommended the plan include a discussion of land crabs occurring in the park. He commented that the USFWS is interested in establishing a management agreement with the Division for their property at "Spanish House." He identified one small beach parcel at the north end of the park that he believes is owned by the State and not USFWS. He provided a couple of suggestions for the exotic species list. He expressed appreciation for the coordination of efforts pertaining to the beach mice. He suggested that a management agreement between the park and USFWS be established to share management resources.

Dave Pasley (Friends of Sebastian Inlet State Park, Inc.) suggested a mulch and sand

Sebastian Inlet State Park Advisory Group Staff Report

footpath for the new beach access at “Spanish House” instead of a boardwalk structure. He strongly recommended that the management plan include a comprehensive “wish list” of potential projects likely to be funded and approved.

He also provided the following additional comments in written form. In regards to channel dredging and beach renourishment projects, he recommended that the management plan focus on the Division’s advisory role and allow the process to work in resolving permitting issues, etc. He stated that the management of these issues is both political and beyond the scope of this management plan. He recommended that the plan address the Division’s role in working with SID, ACOE, FIND, DEP, etc. in managing the wetlands, shorelines, beaches, etc. He pointed out that it would be inaccurate to identify “restoration” plans for Coconut Point and the overflow parking field since these areas didn’t exist prior to the creation of the inlet. He recommended that pictures and documents of local historical significance that have been collected by SID Commissioner Jim Culbertson be directed to state archives. He suggested that park volunteers also help with park operations and security. He recommended that the paragraphs regarding the impact of beach renourishment projects on park resources be removed from the plan. He recommended that a comprehensive plan, funding, etc. be provided for Coconut Point to help establish a shorebird nesting area. He questioned whether there exists a Document of Understanding that outlines who owns which collection items at the Sebastian Fishing Museum and what items can be displayed, etc. He commented that the issue of the worm reef and beach renourishment is highly controversial and suggested removing some of the text in the plan regarding this topic. He requested that the SID proposal to develop the fill area west of the swim cove and overflow parking field be reviewed and incorporated into the management plan. He also supported the SID’s proposal to develop a kayak launch in the old inlet channel area. He recommended that a brief description of the SID/Park agreements be included in the management plan. He recommended that the plan also acknowledge the various agencies and research groups that are managing land and collecting important data in and around the park. He commented that expanding the use at “Spanish House” will result in a variety of issues including liability, security and inability to collect fees. He recommended that the existing marina buildings should be demolished and seawall replaced. He recommended adding more boat slips, parking and boat ramps at the marina. He recommended that the beach concession building should also be demolished and suggested that it be replaced with a structure that the community can use for weddings and other functions in addition to hosting surfing events, etc. He requested that serious consideration be given to the SID proposal to replace the inlet fishing dock with a larger structure that can be used for emergency/law enforcement vessels and mooring of a 60 foot barge for inlet construction and dredging activities. He stated his strong support for upgrading and expanding the camping area. He requested consideration for expanding the gift shop at the McLarty Treasure Museum in any remodeling plans. He commented that much of the ongoing boardwalk renovation at the north jetty beach use area is being funded by the CSO. He commented that the

Sebastian Inlet State Park Advisory Group Staff Report

swim cove is highly susceptible to storm damage; therefore, investing in anything but the barest essentials here will be futile. He requested permission to open a small gift counter in the Sebastian Fishing Museum. He mentioned that the majority of the park's 225 picnic tables were built by volunteers and funded by the CSO.

Summary of Written Comments

Dale Armstrong (Florida Division of Forestry) stated that due to the location of the park, timber management is not a consideration. He commented that beach renourishment projects have greatly impacted the worm reefs from Sebastian Inlet down to MacArthur Beach. He offered the assistance of DOF staff for prescribed burns at the park. He stated that park staff does a commendable job in balancing natural resource management with intensive recreation. He commented that over the last eleven years he has seen the park improve both naturally and recreationally.

Alex Pries (Florida Fish & Wildlife Conservation Commission) stated that overall the management plan provides adequate consideration for wildlife and wildlife needs on-site. He commented that the discussion of using prescribed fire in dune habitats was confusing since fire is not typically needed in dune communities. However, he stated prescribed fire is useful in the coastal strand community and should continue to enhance habitat for beach mice and bird species. He stated support for the closing of unauthorized footpaths to the beach and recommended planting a mixture of native coastal vegetation when attempting to rebuild the dunes. He recommended keeping FWC informed of any improvements in beach mouse habitat or potential for translocation. He suggested coordinating survey and monitoring actions for nesting shorebirds with FWC personnel. He strongly recommended coordination with SID to develop beach nourishment projects that minimize impacts to nesting sea turtles/beach mouse habitat. He encouraged the removal of feral cats and educating surrounding landowners on being responsible pet owners. He suggested that FWC staff could help with closing shorebird nesting areas. He expressed support for actions to protect the population of gopher tortoise within the overflow parking field. He commented that the monitoring efforts for listed species discussed in the plan are appropriate. He suggested alternative methods to determining the relative abundance of beach mice.

Staff Recommendations

The staff recommends approval of the proposed management plan for Sebastian Inlet State Park as presented with a few minor edits and clarifications as well as the changes below. Some of the other suggestions voiced at the meeting are not appropriate for inclusion in the management plan but are appreciated and will be taken into consideration as it affects park operations.

Sebastian Inlet State Park Advisory Group Staff Report

- In regards to the recent SID request to exchange their spoil easement site, the Division is carefully considering their proposal. The specifics of their proposal do not need to be included in the management plan since it is part of the regular coordination between the Division and the SID.
- In addition to Coconut Point, the Division will explore the potential to establish/enhance shorebird habitat elsewhere in the park.
- Consideration for potential seagrass impacts will be evaluated when determining appropriate recreational activities in these areas.
- The request for an offshore, artificial reef is not within the jurisdiction of the Division and, therefore, will not be included in the management plan.
- The Natural Communities Map will be evaluated for possible improvements, including the identification of seagrass beds within the park boundary.
- Staff agrees that a boardwalk to provide beach access may not always be necessary and will pursue the best available management option for providing beach access in the future.
- As part of the site planning for the marina redevelopment project, consideration will be given to expanding the boating capacity, providing a marine pump-out station, exploring the possibility of establishing some tent camping, and providing dockage for a rescue/law enforcement vessel.
- The Division does not support the recommendation to establish a new beach access area at the north end of the park adjacent to Long Point Road. This area is composed of maritime hammock which is included in the park's protected zone due to its rarity in the state. In addition, Sebastian Inlet State Park already provides multiple beach access points along its shoreline.
- The carrying capacity table will be edited to clarify the number of motorized boaters (people) the park is currently able to support.
- Park staff has identified the need for an additional 3-bay equipment storage building within the fenced area adjacent to the Administrative Office.

Addendum 2 – References Cited

Sebastian Inlet State Park References Cited

- American Ornithologists' Union. 1997. Forty-first supplement to the American Ornithologists' Union Checklist of North American Birds. Auk 114:542-552.
- Andrews, E.W. and C.M. Andrews. 1985. Jonathan Dickinson's Journal, or God's Protecting Providence: Being the Narrative of a Journey from Port Royal in Jamaica to Philadelphia between August 23, 1696 and April 1, 1697. Port Salerno, Florida. Florida Classics Library. 109 pp.
- Brevard County. 2005. Brevard County Future Land Use Map. Brevard County, Florida.
- Brooks, H. K. 1981a. Geologic Map of Florida. FL Coop. Ext. Serv., Inst. Food Agric. Sci., Univ. of Florida, Gainesville, FL.
- Brooks, H. K. 1981b. Physiographic Divisions of Florida. FL Coop. Ext. Serv., Inst. Food Agric. Sci., Univ. of Florida, Gainesville, FL. 12 pp.
- Bullen, R.P., A.K. Bullen, and C.J. Clausen. 1968. The Cato Site near Sebastian Inlet, Florida. Florida Anthropology 21(1): 14-16.
- Bureau of Economic and Business Research (BEBR), University of Florida. 2006. Florida Statistical Abstract 2006. Gainesville, Florida.
- Burgess, R.F. and C.J. Clausen. 1982. Florida's Golden Galleons: the Search for the 1715 Spanish Treasure Fleet. Port Salerno, Florida. Florida Classics Library. 195 pp.
- Egensteiner, E.D. Pers. comm. Florida Department of Environmental Protection.
- Ehrhart, L.M. and R.M. Herren. 1998. The relationship between marine turtle nesting and reproductive success and the beach renourishment projects at Sebastian inlet, Florida, in 1997. Report submitted to Florida Institute of Technology. 48 pp.
- Ehrhart, L.M. 1999. Pers. comm. University of Central Florida.
- Florida Department of Environmental Protection. 2007. Florida State Park System Economic Impact Assessment for Fiscal Year 2006/2007. Tallahassee, Florida.
- Florida Department of Environmental Protection. N.D. MS. on file. Sebastian Inlet State Recreation Area.
- Florida Department of Natural Resources. 1988. Ms. on file. Sebastian Inlet State Recreation Area Unit Management Plan. Tallahassee, Florida.
- Florida Department of State. Florida Master Site Files: 8BR124, 8BR125, 8BR168, 8BR770, 8IR11, 8IR25, 8IR26, 8IR30, 8IR34, 8IR35, 8IR36, 8IR37, 8IR38, 8IR39, 8IR40, and 8IR42.
- Forstner, M.R.J. 1998. Pers. comm. Florida Atlantic University.

Sebastian Inlet State Park References Cited

- Gannon, M. 1996. The New History of Florida. Gainesville, Florida. University Press of Florida. 480 pp.
- Healy, H.G. 1975. Terraces and Shorelines of Florida. Map Series No. 71. U.S. Geological Survey in cooperation with the Bureau of Water Resources Management, FL Dept. of Environmental Regulation, and Bureau of Geology, FL Dept. of Natural Resources, Tallahassee, FL.
- Huckle, H.F., H.D. Dollar, and R.F. Pendleton. 1974. Soil Survey of Brevard County, Florida. U.S. Dept. of Agric., Soil Cons. Serv. in cooperation with Univ. of Florida, Agric. Exper. Stations. Florida. 123 pp.
- Hyde, L.W. 1975. Principal Aquifers in Florida. Map Series No. 16. U.S. Geological Survey in cooperation with Bureau of Geology, FL Dept. of Natural Resources, Tallahassee, FL.
- Indian River County. 2007. Indian River County Future Land Use Map. Indian River County, Florida.
- Jones, Jr., J.K., D.C. Carter, H.H. Genoways, R.S. Hoffmann, D.W. Rice, and C. Jones. 1986. Revised checklist of North American Mammals north of Mexico, 1986. Occasional papers of the Museum, Texas Tech University. No. 107. 22 pp.
- Larson, L.H. 1980. Aboriginal Subsistence Technology on the Southeastern Coastal Plain during the Late Prehistoric Period. Gainesville, Florida. University Press of Florida. 260 pp.
- Milanich, J.T. and C.H. Fairbanks. 1980. Florida Archaeology. New York, New York. Academic Press, Inc. 290 pp.
- Milanich, J.T. 1995. Florida Indians and the Invasion from Europe. Gainesville, Florida. University Press of Florida. 290 pp.
- Morison, S.E. 1974. The European Discovery of America: The Southern Voyages, 1494-1616. New York, New York. Oxford University Press. 758 pp.
- National Marine Fisheries Service and U.S. Fish and Wildlife Service. 1991. Recovery Plan for U.S. Population of Loggerhead Turtle. National Marine Fisheries Service, Washington, D.C. 64 pp.
- National Marine Fisheries Service and U.S. Fish and Wildlife Service. 1991. Recovery Plan for U.S. Population of Atlantic Green Turtle. National Marine Fisheries Service, Washington, D.C. 52 pp.
- National Marine Fisheries Service and U.S. Fish and Wildlife Service. 1992. Recovery Plan for Leatherback Turtles in the U.S. Caribbean, Atlantic and Gulf of Mexico. National Marine Fisheries Service, Washington, D.C. 65 pp.

Sebastian Inlet State Park References Cited

- O'Toole, T. 1997. Memo on File. Florida Department of Environmental Protection.
- O'Toole, T. 1999. Pers. comm. Florida Department of Environmental Protection.
- Robins, C.R., R.M. Bailey, C.E. Bond, J.R. Brooker, E.A. Lachner, R.N. Lea, and W.B. Scott. 1991. Common and scientific names of fishes from the United States and Canada. Am. Fisheries Soc. Special Publication 20. 183 pp.
- Roosenburg, W.M., W. Cresko, M. Modesitte, and M.B. Robbins. 1997. Diamonback terrapin (*Malaclemys terrapin*) mortality in crab pots. *Conservation Biology* 11(5): 1166-1172.
- Sears, W.H. 1982. Fort Center: An Archaeological Site in the Lake Okeechobee Basin. Gainesville, Florida. University Press of Florida. 212 pp.
- U. S. Department of Commerce, Bureau of the Census. 2000. U. S. Census 2000.
- U.S. Fish and wildlife Service. 1993. Recovery Plan for the Anastasia Island and Southeastern Beach Mouse. Atlanta, Georgia. 30 pp.
- Westfahl, A. and G. Keyes. 1996. A Historic Tour of the Sebastian Area. Sebastian, Florida. Sebastian Area Historical Society, Inc. 24 pp.
- Wettstein, C.A., C.V. Noble, and J.D. Slabaugh. 1987. Soil Survey of Indian River County, Florida. U.S.Dept. of Agric., Soil Cons. Serv. in cooperation with Univ. of Florida, Agric. Exper. Stations. Florida. 217 pp.
- Widmer, R.J. 1988. The Evolution of the Calusa: A Nonagricultural Chiefdom on the Southwest Florida Coast. Tuscaloosa, Alabama. University of Alabama Press. 334 pp.
- Wunderlin, R.P. 1998. Guide to the Vascular Plants of Florida. University Presses of Florida, Gainesville. 806 pp.

Sebastian Inlet State Park References Cited

Addendum 3 – Soils Descriptions

Sebastian Inlet State Park Soils Descriptions

(Ca) Canaveral complex, gently undulating - This complex consists of nearly level and gently sloping soils that are mixtures of sand and shell fragments. It is along the Atlantic Coast on narrow ridges interspersed with parallel narrow sloughs. The water table is between depths of 10 and 40 inches for 2 to 4 months of the year; in dry seasons it is below a depth of 60 inches.

(Ck) Coastal beaches - This soil type consists of narrow strips of nearly level or gently sloping sand, along the Atlantic Ocean, that is covered with salt water at daily high tides and of low dunes adjacent to the tide-washed sands. This material is a mixture of quartz sand and fragments of sea shells. It is subject to movement by the wind and the tide and is bare of vegetation.

(7) Palm Beach sand, 0 to 5 percent slopes - This soil type is nearly level to gently sloping and well-drained to excessively drained. It occurs on dunelike ridges that are parallel to the coastline. This map unit is adjacent to the beach. Slopes are mainly 0 to 5 percent but can range from 0 to 8 percent.

Typically, the surface layer is very dark gray sand about 4 inches thick. The underlying material to a depth of 65 inches is sand that has stratified layers of shell fragments throughout. The upper 16 inches of the underlying material is grayish brown sand, and the lower 45 inches is pale brown sand. Below that to a depth of 80 inches or more is very pale brown sand.

This soil is low in organic matter content; it is moderately alkaline throughout. Permeability is very rapid, and the available water capacity is very low. It has no water table within a depth of 80 inches.

(Pb) Palm Beach sand - This is a nearly level and gently sloping, excessively drained soil on dunelike ridges that roughly parallel the Atlantic Ocean. It consists of mixed sand and shell fragments. Slopes are mostly 2 to 5 percent. The water table is at a depth of more than 10 feet.

(17) Quartzipsamments, 0 to 5 percent slopes - This soil type is nearly level to gently sloping and moderately well-drained to somewhat poorly drained. It consists of thick deposits of sand and of mixed sand and shell fragments.

One of the most common profiles has a surface layer of light yellowish brown fine sand that has brownish yellow mottles about 17 inches thick. The next layer, to a depth of about 30 inches, is yellowish-brown fine sand that has very dark grayish-brown mottles. Below that, to a depth of about 60 inches, is dark grayish-brown fine sand that has very dark gray streaks and yellowish-brown splotches and is mixed with 10 percent shell fragments. The underlying material to a depth of 80 inches or more is gray sand.

Sebastian Inlet State Park Soils Descriptions

Permeability is very rapid, and the available water capacity is very low. Reaction is slightly acid to alkaline. The content of shell fragments ranges from about 5 to 50 percent.

(18) Captiva fine sand - This soil is nearly level and poorly drained. It is in narrow, elongated sloughs that are between low, dunelike ridges and mangrove swamps. Slopes are smooth and range from 0 to 1 percent.

Typically, the surface layer is very dark gray fine sand mixed with about 2 percent shell fragments. It is about 8 inches thick. The underlying material to a depth of 80 inches or more is grayish-brown, olive gray, and greenish-gray fine sand mixed with about 2 to 15 percent shell fragments. In most years, under natural conditions, the water table is at a depth of 10 to 40 inches for 6 to 9 months or more and within a depth of 10 inches of the surface for 1 to 3 months during the wet season. In some years, the soil is covered by standing water for about 1 month.

Permeability is rapid in the surface layer and very rapid in the underlying layers. The available water capacity is medium in the surface layer and low to very low in the subsurface layer.

(20) Beaches - This map unit consists of nearly level to sloping, narrow strips of tide and surf-washed sands and shell fragments. Beaches occur along the Atlantic Ocean shoreline. They commonly are a mixture of moderately alkaline sand and fine shell fragments. Beaches are generally devoid of vegetation, although some sparse growth of sea oats, railroad vine, or other salt-tolerant plants occurs near the inland edges.

Depth to the water table is highly variable depending on distance from the shore, elevation of the beach, and the tidal condition. Commonly, the water table ranges from a depth of 0 to 6 feet.

(63) Kesson muck - This soil is nearly level and very poorly drained and is frequently flooded. It occurs in tidal swamps and marshes. This soil formed in thick marine deposits of sand and shell fragments. These swamps and marshes are at or near sea level and are adjacent to the Indian River. Tidal water inundates most of these areas at high tide.

Typically, the surface layer is about 6 inches thick; it is a dark reddish-brown muck that is about 30 percent unrubbed fiber and less than 5 percent rubbed. The underlying material is grayish-brown and dark greenish-gray fine sand mixed with about 15 to 25 percent sand-sized shell fragments to a depth of 80 inches or more.

Under natural conditions, this soil is flooded during normal high tides. Permeability is moderately rapid. The available water capacity is high in the surface layer and low in

Sebastian Inlet State Park Soils Descriptions

the underlying materials. The native vegetation consists of red, black, and white mangroves; searocket, saltwort, perennial glasswort, seashore saltgrass, and seashore paspalum occur in some areas.

(Tm) Tidal marsh - Tidal marsh consists of nearly level areas of soils that are regularly covered with salt water or brackish water at high tide. It occurs along the edge of salt water in several places. Many areas are isolated by deep, wide canals. The soils are highly variable; some are shallow mucky sands over marl or limestone, some are irregularly stratified mixed sand and shell fragments, some are silty or clayey layers over sand sand shells, and some are deep organic material. Any one area of tidal marsh can be one kind of soil material or a mixture.

(Ts) Tidal swamp - This soil type consists of nearly level areas at about mean sea level that are covered with a dense, tangled growth of mangrove trees and roots. It occurs along the edge of the Banana and Indian rivers and in smaller areas adjacent to salt water. The soil material ranges from mixed sand and shells to organic materials.

Sebastian Inlet State Park Soils Descriptions

Addendum 4-Plants And Animals List

Sebastian Inlet State Park Plants

Common Name	Scientific Name	Primary Habitat Codes (for designated species)
Spiny redweed.....	<i>Acanthophora</i> sp.	
Mermaid's wine glass.....	<i>Acetabularia crenulata</i>	
Giant leather fern.....	<i>Acrostichum danaeifolium</i>	
False sisal.....	<i>Agave decipiens</i>	
Wild century plant*	<i>Agave sisalana</i>	
Silktree*.....	<i>Albizia julibrissin</i>	
Aloe*.....	<i>Aloe vera</i>	
Yellow joyweed.....	<i>Alternanthera flavescens</i>	
Common ragweed.....	<i>Ambrosia artemisiifolia</i>	
Bastard indigobush.....	<i>Amorpha fruticosa</i>	
Sea torchwood.....	<i>Amyris elemifera</i>	
Marlberry.....	<i>Ardisia escallonioides</i>	
Bluestem.....	<i>Andropogon</i> sp.	
Red algae.....	<i>Anotrichium tenue</i>	
Sprenger's asparagus-fern*.....	<i>Asparagus densiflorus</i>	
White oldfield aster.....	<i>Aster pilosus</i>	
Crested saltbush.....	<i>Atriplex cristata</i>	
Algae.....	<i>Audounella</i> sp.	
Algae.....	<i>Audouinella</i> sp.	
Black mangrove.....	<i>Avicennia germinans</i>	
Groundsel tree.....	<i>Baccharis halimifolia</i>	
Herb-of-grace.....	<i>Bacopa monnieri</i>	
Saltwort.....	<i>Batis maritima</i>	
Beggarticks.....	<i>Bidens alba</i> var. <i>radiata</i>	
Bushy seaside oxeye.....	<i>Borrichia frutescens</i>	
Algae.....	<i>Botyrocledia occidentalis</i>	
Bouganvillea*.....	<i>Bouganvillea spectabilis</i>	
Red algae.....	<i>Bryocledia cuspidata</i>	
Red algae.....	<i>Bryothamnium seaforthii</i>	
Fungus.....	<i>Buellia lauricassiae</i>	
Fungus.....	<i>Buellia rappii</i>	
Fungus.....	<i>Buellia</i> sp.	
Gumbo-limbo.....	<i>Bursera simaruba</i>	
Gray nicker.....	<i>Caesalpinia bonduc</i>	
American beautyberry.....	<i>Callicarpa americana</i>	
Algae.....	<i>Caloglossa leprieurii</i>	
Santa Maria*.....	<i>Calophyllum antillanum</i>	
Fungus.....	<i>Caloplaca</i> sp.	
Baybean.....	<i>Canavalia rosea</i>	
Garden canna*.....	<i>Canna</i> x <i>generalis</i>	
Lichen.....	<i>Canoparmelia amazonica</i>	

* Non-native Species

Sebastian Inlet State Park Plants

Common Name	Scientific Name	Primary Habitat Codes (for designated species)
Lichen.....	<i>Canoparmelia cryptochlorophaea</i>	
Jamaican capertree	<i>Capparis cynophallophora</i>	
Papaya*	<i>Carica papaya</i>	
Natal plum*	<i>Carissa macrocarpa</i>	
Chaffhead	<i>Carphephorus</i> sp.	
Australian-pine*	<i>Casuarina equisetifolia</i>	
Madagascar periwinkle*	<i>Catharanthus roseus</i>	
Green algae	<i>Caulerpa cupressoides</i>	
Green algae	<i>Caulerpa mexicana</i>	
Green algae	<i>Caulerpa prolifera</i>	
Green algae	<i>Caulerpa racemosa</i> var. <i>macrophyssa</i>	
Green algae	<i>Caulerpa vickersiae</i>	
Southern sandbur.....	<i>Cenchrus echinatus</i>	
Coast sandbur.....	<i>Cenchrus incertus</i>	
Sanddune sandbur	<i>Cenchrus tribuloides</i>	
Sandbur	<i>Cenchrus</i> sp.	
Algae	<i>Centroceras clavulatum</i>	
Spurred butterfly pea	<i>Centrosema virginianum</i>	
Algae	<i>Ceramium fastigiatum</i>	
Green algae	<i>Chaetomorpha aerea</i>	
Partridge pea.....	<i>Chamaecrista fasciculata</i>	
Pillpod sandmat	<i>Chamaesyce hirta</i>	
Hyssopleaf sandmat	<i>Chamaesyce hyssopifolia</i>	
Spotted sandmat.....	<i>Chamaesyce maculata</i>	
Coastal beach sandmat.....	<i>Chamaesyce mesembryanthemifolia</i>	
Snowberry	<i>Chiococca alba</i>	
Algae	<i>Chondra collinsiana</i>	
Red algae	<i>Chondra</i> sp.	
Coco plum.....	<i>Chrysobalanus icaco</i>	
Lichen.....	<i>Chrysothrix candelaris</i>	
Sorrelvine	<i>Cissus trifoliata</i>	
Florida fiddlewood	<i>Citharexylum spinosum</i>	
Sour orange*	<i>Citrus aurantium</i>	
Lemon*.....	<i>Citrus limon</i>	
Lime*	<i>Citrus</i> sp.	
Green algae	<i>Cladophora</i> sp.	
Tread-softly	<i>Cnidocolus stimulosus</i>	
Lichen.....	<i>Coccocarpia palmicola</i>	
Seagrape	<i>Coccoloba uvifera</i>	
Domestic croton*	<i>Codiaeum variegatum</i>	
Green algae	<i>Codium decortcatum</i>	

* Non-native Species

Sebastian Inlet State Park Plants

Common Name	Scientific Name	Primary Habitat Codes (for designated species)
Algae	<i>Colopomenia sinuosa</i>	
Whitemouth dayflower	<i>Commelina erecta</i>	
Buttonwood	<i>Conocarpus erectus</i>	
Canadian horseweed	<i>Conyza canadensis</i> var. <i>pusilla</i>	
Showy rattlebox*	<i>Crotalaria spectabilis</i>	
Gulf croton	<i>Croton punctatus</i>	
Red algae	<i>Cryptonemia</i> sp.	
Lichen.....	<i>Cryptothecia striata</i>	
Christmas lichen.....	<i>Cryptothecia rubrocincta</i>	
Dodder.....	<i>Cuscuta</i> sp.	
Sago palm*	<i>Cycas circinalis</i>	
Leafless swallowwort	<i>Cynanchum scoparium</i>	
Flatsedge.....	<i>Cyperus</i> sp.	
Beach star	<i>Cyperus pedunculatus</i>	
Flatleaf flatsedge	<i>Cyperus planifolius</i>	
Pinebarren flatsedge	<i>Cyperus retrorsus</i>	
Durban crowfootgrass*	<i>Dactyloctenium aegyptium</i>	
Coinvine	<i>Dalbergia ecastophyllum</i>	
Algae	<i>Dasya collinsiana</i>	
Ticktrefoil	<i>Desmodium incanum</i>	
Witchgrass.....	<i>Dichantheium</i> sp.	
Sixangle foldwing	<i>Dicliptera sexangularis</i>	
Algae	<i>Dictyopteris delicatula</i>	
Algae	<i>Dictyota dichotoma</i>	
Brown algae	<i>Dictyota</i> spp.	
Algae	<i>Dilophus guineensis</i>	
Air potato*.....	<i>Dioscorea bulbifera</i>	
Lichen.....	<i>Dirinaria applanata</i>	
Lichen.....	<i>Dirinaria picta</i>	
Lichen.....	<i>Dirinaria purpurascens</i>	
Twinflower.....	<i>Dyschoriste</i> sp.	
Devil's potato.....	<i>Echites umbellata</i>	
Florida butterfly orchid.....	<i>Encyclia tampensis</i>	7
Hair algae	<i>Enteromorpha</i> spp.	
Golden pothos*	<i>Epipremnum pinnatum</i>	
Coralbean	<i>Erythrina herbacea</i>	
White stopper	<i>Eugenia axillaris</i>	
Spanish stopper	<i>Eugenia foetida</i>	
Dogfennel	<i>Eupatorium capillifolium</i>	
Throughwort.....	<i>Eupatorium</i> sp.	
Crown-of-thorns*	<i>Euphorbia milii</i>	

* Non-native Species

Sebastian Inlet State Park Plants

Common Name	Scientific Name	Primary Habitat Codes (for designated species)
Pinewoods fingergrass	<i>Eustachys petraea</i>	
Marshgentian.....	<i>Eustoma exaltatum</i>	
Strangler fig.....	<i>Ficus aurea</i>	
Hurricanegrass	<i>Fimbristylis cymosa</i>	
Narrowleaf yellowtops	<i>Flaveria linearis</i>	
Florida swampprivet	<i>Forestiera segregata</i>	
Firewheel.....	<i>Gaillardia pulchella</i>	
Downy milkpea.....	<i>Galactia volubilis</i>	
Southern beeblossom.....	<i>Gaura angustifolia</i>	
Algae	<i>Gelidopsis gracilis</i>	
Red algae	<i>Gigartina acicularis</i>	
Rose mock vervain.....	<i>Glandularia canadensis</i>	
Mock vervain.....	<i>Glandularia sp.</i>	
Globe amaranth*	<i>Gomphrena serrata</i>	
Red algae	<i>Gracilaria cervicornis</i>	
Red algae	<i>Gracilaria mammillaris</i>	
Red algae	<i>Gracilaria sp.</i>	
Lichen.....	<i>Graphis sp</i>	
Lichen.....	<i>Graphis striatula</i>	
Algae	<i>Gratelupia filicina</i>	
Red algae	<i>Griffithsia sp.</i>	
Beef tree	<i>Guapira discolor</i>	
Lichen.....	<i>Haematomma accolens</i>	
Lichen.....	<i>Haematomma persoonii</i>	
Bloodstain lichen.....	<i>Hafellia bahiana</i>	
Red algae	<i>Haliptilon cubense</i>	
Shoalweed	<i>Halodule wrightii</i>	
Johnson's seagrass.....	<i>Halophila johnsonii</i>	
Algae	<i>Halymenia sp.</i>	
Simpson's applecactus.....	<i>Harrisia simpsonii</i>	
Clustered mille graine	<i>Hedyotis uniflora</i>	
East coast dune sunflower	<i>Helianthus debilis ssp. debilis</i>	
Seaside heliotrope	<i>Heliotropium curassavicum</i>	
Heliotrope	<i>Heliotropium sp.</i>	
Algae	<i>Helminthocladia calvadosii</i>	
Algae	<i>Herposiphonia secunda</i>	
Camphorweed	<i>Heterotheca subaxillaris</i>	
Rosemallow*	<i>Hibiscus rosa-sinensis var. rosa-sinensis</i>	
Mangrove spiderlily	<i>Hymenocallis latifolia</i>	
St. John's wort.....	<i>Hypericum sp.</i>	
Algae	<i>Hypnea musciformis</i>	

* Non-native Species

Sebastian Inlet State Park Plants

Common Name	Scientific Name	Primary Habitat Codes (for designated species)
Algae	<i>Hypnea</i> sp.	
Moonflowers.....	<i>Ipomoea alba</i>	
Tievine	<i>Ipomoea cordatotriloba</i>	
Beach morningglory	<i>Ipomoea imperati</i>	
Railroad vine.....	<i>Ipomoea pes-caprae</i>	
Saltmarsh morningglory	<i>Ipomoea sagittata</i>	
Ornamental iris*	<i>Iris</i> sp.	
Seacoast marshelder	<i>Iva imbricata</i>	
Algae	<i>Jania rubens</i>	
Star jasmine*	<i>Jasminum multiflorum</i>	
Chandelier plant*	<i>Kalanchoe tubiflora</i>	
Virginia saltmarsh mallow	<i>Kosteletskya virginica</i>	
Black ironwood	<i>Krugiodendron ferreum</i>	
Crapemyrtle*	<i>Lagerstroemia indica</i>	
White mangrove.....	<i>Laguncularia racemosa</i>	
Lantana*.....	<i>Lantana camara</i>	
Buttonsage.....	<i>Lantana involucrata</i>	
Lichen.....	<i>Lecanora hybocarpa</i>	
Lichen.....	<i>Lecanora</i> sp.	
Lichen.....	<i>Lecanora strobilina</i>	
Duckweed	<i>Lemna</i> sp.	
Lichen.....	<i>Leptogium austroamericanum</i>	
Algae	<i>Liagora ceranoides</i>	
Algae	<i>Liagora</i> sp.	
Gopher apple	<i>Licania michauxii</i>	
Carolina sealavender	<i>Limonium carolinianum</i>	
Creeping cucumber.....	<i>Melothria pendula</i>	
Poorman's patch.....	<i>Mentzelia floridana</i>	
Climbing hempvine	<i>Mikania scandens</i>	
Indian chickweed*	<i>Mollugo verticillata</i>	
Balsampear*	<i>Momordica charantia</i>	
Spotted beebalm.....	<i>Monarda punctata</i>	
Red mulberry	<i>Morus rubra</i>	
Common banana*.....	<i>Musa x paradisiaca</i>	
Twinberry	<i>Myrcianthes fragrans</i>	
Southern bayberry	<i>Myrica cerifera</i>	
Tuberous sword fern*	<i>Nephrolepis cordifolia</i>	
Oleander*	<i>Nerium oleander</i>	
Lancewood.....	<i>Ocotea coriacea</i>	
Seabeach eveningprimrose	<i>Oenothera humifusa</i>	
Clustered mille graine	<i>Oldenlandia uniflora</i>	

* Non-native Species

Sebastian Inlet State Park Plants

Common Name	Scientific Name	Primary Habitat Codes (for designated species)
Erect pricklypear	<i>Opuntia stricta</i>	
Algae	<i>Padina gymnosperma</i>	
Algae	<i>Padina jamaicensis</i>	
Algae	<i>Padina sanctae-crucis</i>	
Algae	<i>Padina</i> spp.	
Bitter panicgrass	<i>Panicum amarum</i>	
Panic grass.....	<i>Panicum</i> spp.	
Lichen.....	<i>Parmotrema dilatatum</i>	
Lichen.....	<i>Parmotrema gardneri</i>	
Lichen.....	<i>Parmotrema michauxianum</i>	
Lichen.....	<i>Parmotrema perforatum</i>	
Lichen.....	<i>Parmotrema praesorediosum</i>	
Lichen.....	<i>Parmotrema rigidum</i>	
Virginia creeper	<i>Parthenocissus quinquefolia</i>	
Purple passionflower.....	<i>Passiflora incarnata</i>	
Corkstem passionflower	<i>Passiflora suberosa</i>	
Redbay	<i>Persea borbonia</i> var. <i>borbonia</i>	
Volcano wart lichen	<i>Pertusaria xanthodes</i>	
Red algae	<i>Peyssonnelia inamoena</i>	
Lichen.....	<i>Phaeographis</i> sp.	
Lichen.....	<i>Phaeographis subfulgurata</i>	
Tree philodendron*	<i>Philodendron selloum</i>	
Golden polypody	<i>Phlebodium aureum</i>	
Turkey tangle fogfruit	<i>Phyla nodiflora</i>	
Chamber-bitter*	<i>Phyllanthus urinaria</i>	
Groundcherry	<i>Physalis</i> sp.	
Walter's groundcherry	<i>Physalis walteri</i>	
American rosette lichen.....	<i>Physcia americana</i>	
Rosette lichen.....	<i>Physcia atrostriata</i>	
Rosette lichen.....	<i>Physcia neogaea</i>	
American pokeweed.....	<i>Phytolacca americana</i>	
Resurrection fern.....	<i>Pleopeltis polypodioides</i> var. <i>michauxiana</i>	
Camphorweed	<i>Pluchea</i> sp.	
Paintedleaf.....	<i>Poinsettia cyathophora</i>	
Rustweed.....	<i>Polypremum procumbens</i>	
Little hogweed.....	<i>Portulaca oleracea</i>	
Pink purslane	<i>Portulaca pilosa</i>	
Purselane	<i>Portulaca</i> sp.	
Black cherry	<i>Prunus serotina</i> var. <i>serotina</i>	
Wild coffee	<i>Psychotria nervosa</i>	
Shortleaf wild coffee	<i>Psychotria sulzneri</i>	

* Non-native Species

Sebastian Inlet State Park Plants

Common Name	Scientific Name	Primary Habitat Codes (for designated species)
Red algae	<i>Pterocladia bartletti</i>	
Red algae	<i>Pterocladia</i> sp.	
Wart lichen	<i>Pyrenula cruenta</i>	
Wart lichen.....	<i>Pyrenula microcarpa</i>	
Wart lichen.....	<i>Pyrenula ochaceoflava</i>	
Wart lichen.....	<i>Pyrenula ochaceoflavens</i>	
Wart lichen.....	<i>Pyrenula</i> sp.	
Wart lichen.....	<i>Pyrenula thelomorpha</i>	
Sand live oak.....	<i>Quercus geminata</i>	
Lichen.....	<i>Ramalina complanata</i>	
Lichen.....	<i>Ramalina montagnei</i>	
Lichen.....	<i>Ramalina paludosa</i>	
Lichen.....	<i>Ramalina peruviana</i>	
Lichen.....	<i>Ramalina stenospora</i>	
Lichen.....	<i>Ramalina willeyi</i>	
White indigoberry.....	<i>Randia aculeata</i>	
Myrsine.....	<i>Rapanea punctata</i>	
Rubbervine.....	<i>Rhabdadenia biflora</i>	
Red mangrove	<i>Rhizophora mangle</i>	
Winged sumac	<i>Rhus copallinum</i>	
Rose natalgrass*	<i>Rhynchelytrum repens</i>	
Castorbean*	<i>Ricinus communis</i>	
Rougeplant.....	<i>Rivina humilis</i>	
Britton's wild petunia*	<i>Ruellia tweediana</i>	
Curly dock*	<i>Rumex crispus</i>	
Wedgeleaf dock*	<i>Rumex frutescens</i>	
Cabbage palm.....	<i>Sabal palmetto</i>	
Annual glasswort.....	<i>Salicornia bigelovii</i>	
Carolina willow	<i>Salix caroliniana</i>	
Tropical sage.....	<i>Salvia coccinea</i>	
American elder.....	<i>Sambucus canadensis</i>	
Bowstring hemp*.....	<i>Sansevieria hyacinthoides</i>	
Sargassum weed.....	<i>Sargassum</i> sp.	
Beachberry.....	<i>Scaevola plumieri</i>	
Australian umbrella tree*	<i>Schefflera actinophylla</i>	
Brazilian pepper*	<i>Schinus terebinthifolius</i>	
Algae	<i>Scinaia</i> sp.	
Saw palmetto	<i>Serenoa repens</i>	
Shoreline seapurslane.....	<i>Sesuvium portulacastrum</i>	
Common wireweed	<i>Sida acuta</i>	
Fanpetals	<i>Sida</i> sp.	

* Non-native Species

Sebastian Inlet State Park Plants

Common Name	Scientific Name	Primary Habitat Codes (for designated species)
Saffron plum	<i>Sideroxylon celastrinum</i>	
Tough bully	<i>Sideroxylon tenax</i>	
False mastic	<i>Sideroxylon foetidissimum</i>	
Earleaf greenbrier	<i>Smilax auriculata</i>	
Seaside goldenrod	<i>Solidago sempervirens</i>	
Algae	<i>Solieriacae sp.</i>	
Common sowthistle*	<i>Sonchus oleraceus</i>	
Yellow necklacepod	<i>Sophora tomentosa</i>	
Marshhay cordgrass	<i>Spartina patens</i>	
Algae	<i>Spatoglossum schroederi</i>	
Creeping oxeye*	<i>Sphagneticola trilobata</i>	
Coral dropseed	<i>Sporobolus domingensis</i>	
Smutgrass*	<i>Sporobolus indicus</i>	
Seashore dropseed	<i>Sporobolus virginicus</i>	
Red algae	<i>Sporolithon spp.</i>	
White oldfield aster	<i>Symphotrichum pilosum</i>	
Manateegrass	<i>Syringodium filiforme</i>	
Turtlegrass	<i>Thalassia testudinum</i>	
Spanish moss	<i>Tillandsia usneoides</i>	
Red algae	<i>Titanoderma sp.</i>	
Eastern poison ivy.....	<i>Toxicodendron radicans</i>	
Purple queen*	<i>Tradescantia pallida</i>	
Oyster-plant*.....	<i>Tradescantia spathacea</i>	
Wandering-jew*	<i>Tradescantia zebrina</i>	
Burrnut*	<i>Tribulus cistoides</i>	
Forked bluecurls.....	<i>Trichostema dichotomum</i>	
Southern cattail.....	<i>Typha domingensis</i>	
Algae	<i>Ulva lactuca</i>	
Algae	<i>Ulva rigida</i>	
Seaoats	<i>Uniola paniculata</i>	
Sandpaper vervain.....	<i>Verbena scabra</i>	
White crownbeard	<i>Verbesina virginica</i>	
Giant ironweed.....	<i>Vernonia gigantea</i>	
Ironweed	<i>Vernonia sp.</i>	
Hairy pod cowpea.....	<i>Vigna luteola</i>	
Simpleleaf chastetree*.....	<i>Vitex trifolia</i>	
Summer grape	<i>Vitis aestivalis</i>	
Muscadine	<i>Vitis rotundifolia</i>	
Shoestring fern.....	<i>Vittaria lineata</i>	
Tallow wood	<i>Ximenia americana</i>	
Spanish bayonet*	<i>Yucca aloifolia</i>	

* Non-native Species

Sebastian Inlet State Park Plants

Common Name	<i>Scientific Name</i>	Primary Habitat Codes (for designated species)
Florida arrowroot.....	<i>Zamia pumila</i>	7,82
Hercules'-club.....	<i>Zanthoxylum clava-herculis</i>	
Wild lime.....	<i>Zanthoxylum fagara</i>	

Sebastian Inlet State Park Plants

Common Name	<i>Scientific Name</i>	Primary Habitat Codes (for designated species)
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Sebastian Inlet State Park Animals

Common Name	Scientific Name	Primary Habitat Codes (for all species)
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INVERTEBRATES

Lepidoptera

Gulf fritillary	<i>Dione vanillae nigrior</i>	1,5,81
Common sulphur	<i>Colias philodice</i>	1,5,81
Great southern white	<i>Ascia monuste phileta</i>	1,5,81
Zebra long wing	<i>Heliconius charitonius tuckeri</i>	1,5,81
Composia moth	<i>Composia fidelissima</i>	5,81,82
Cecropia moth	<i>Hyalophora cecropia</i>	5,81,82
Luna moth	<i>Actias luna</i>	5,81,82
Io moth	<i>Automeris io io</i>	5,7,81,82
Imperial moth	<i>Eacles imperialis imperialis</i>	5,7,81,82
Bella moth	<i>Utetheisa bella</i>	5,81
Palamedes swallowtail	<i>Papilio palamedes</i>	
Cloudless sulfur butterfly	<i>Phoebis sennae eubule</i>	
Oak hairstreak	<i>Satyrium liparops</i>	

Porifera

Sponge	<i>Callyspongia vaginalis</i>	66/78
Sponge	<i>Cinachyra alloclada</i>	66/78
Sponge	<i>Cliona caribbea</i>	66/78
Sponge	<i>Cliona celata</i>	66/78
Sponge	<i>Cliona lampa</i>	66/78
Sponge	<i>Halichondria</i> sp.	66/78,81
Sponge	<i>Hymeniacidon</i> sp.	66/78
Sponge	<i>Leucetta floridana</i>	66/78
Sponge	<i>Lissodendoryx</i> sp.	66/78,81
Sponge	<i>Microciona prolifera</i>	66/78,81
Sponge	<i>Microciona spinosa</i>	66/78
Sponge	<i>Mycale</i> sp.	66/78
Sponge	<i>Tethya</i> sp.	66/78

Cnidaria

Hydroid	<i>Obelia hyalina</i>	66/78
Hydroid	<i>Sertularia amplexens</i>	66/78
Hydroid	<i>Sertularia exigua</i>	66/78
Hydroid	<i>Sertularia flowersi</i>	66/78
Hydroid	<i>Sertularia inflata</i>	66/78

Sebastian Inlet State Park Animals

Common Name	<i>Scientific Name</i>	Primary Habitat Codes (for all species)
Hydroid	<i>Sertularia mayersi</i>	66/78
Hydroid	<i>Sertularia stookeyi</i>	66/78
Hydroid	<i>Telmactis</i> sp.....	66/78,81
 Ctenophora		
Comb jellies.....	<i>Mnemiopsis leadyi</i>	59/71
 Chordata		
.....	<i>Botryllus</i> sp.	66/78,81
 Bryozoa		
Bryozoan.....	<i>Amathia alternata</i>	66/78
Bryozoan.....	<i>Amathia vidivici</i>	66/78
Bryozoan.....	<i>Beania hirtissima</i>	66/78
Bryozoan.....	<i>Bugula</i> sp.....	66/78,81
Bryozoan.....	<i>Bugula stolonifera</i>	66/78
Bryozoan.....	<i>Bugula turrita</i>	66/78
Bryozoan.....	<i>Cryptosula pallasiana</i>	66/78
Bryozoan.....	<i>Exechonella antillea</i>	66/78
Bryozoan.....	<i>Membranipora arborescens</i>	66/78
Bryozoan.....	<i>Membranipora savartii</i>	66/78
Bryozoan.....	<i>Membranipora</i> sp.	66/78,81
Bryozoan.....	<i>Pasythea tulipifera</i>	66/78
Bryozoan.....	<i>Schizoporella unicornis</i>	66/78
Bryozoan.....	<i>Thalamoporella floridana</i>	66/78
Bryozoan.....	<i>Watersipora subovoidea</i>	66/78
 Polychaeta		
Polychaete	<i>Cirriformia</i> sp.	66/78
Polychaete	<i>Dialychone</i> sp.	66/78
Polychaete	<i>Dodecaceria</i> sp.	66/78
Polychaete	<i>Eulalia</i> sp.....	66/78
Polychaete	<i>Eunice websteri</i>	66/78
Polychaete	<i>Filograna</i> sp.....	66/78
Polychaete	<i>Hermenia</i> sp.	66/78,81
Polychaete	<i>Hermodice carunculata</i>	66/78,81
Polychaete	<i>Hesione</i> sp.....	66/78

* Non-native Species

Sebastian Inlet State Park Animals

Common Name	Scientific Name	Primary Habitat Codes (for all species)
Polychaete	<i>Hydroides dianthus</i>	66/78
Polychaete	<i>Hydroides protulicola</i>	66/78
Polychaete	<i>Lepidonotus</i> sp.	66/78
Polychaete	<i>Loimia medusa</i>	66/78,81
Polychaete	<i>Lumbrinereis inflata</i>	66/78
Polychaete	<i>Marphysa</i> sp.	66/78
Polychaete	<i>Megalomma bioculatum</i>	66/78
Polychaete	<i>Mystides</i> sp.	66/78
Polychaete	<i>Naineris</i> sp.	66/78
Polychaete	<i>Nereiphylla</i> sp.	66/78
Polychaete	<i>Nereis</i> sp.	66/78
Polychaete	<i>Nothria</i> sp.	66/78
Polychaete	<i>Onuphis</i> sp.	66/78,81
Polychaete	<i>Ophiodromus</i> sp.	66/78
Polychaete	<i>Phragmatopoma lapidosa</i>	66/78
Polychaete	<i>Phyllodoce</i> sp.	66/78
Polychaete	<i>Platynereis</i> sp.	66/78
Polychaete	<i>Polydorella</i> sp.	66/78
Polychaete	<i>Pseudovermillia occidentalis</i>	66/78
Polychaete	<i>Pseudovermiliopsis</i> sp.	66/78
Polychaete	<i>Pterocirrus</i> sp.	66/78
Polychaete	<i>Pycnogonum littorale</i>	66/78
Polychaete	<i>Rhynchospio</i> sp.	66/78
Polychaete	<i>Sabella</i> sp.	66/78,81
Polychaete	<i>Sabellaria</i> sp.	66/78
Polychaete	<i>Sabellastarte</i> sp.	66/78,81
Polychaete	<i>Syllides</i> sp.	66/78
Polychaete	<i>Syllis</i> sp.	66/78
Polychaete	<i>Trypanosyllis</i> sp.	66/78
Pycnogonida		
Sea spider	<i>Achelia spinosa</i>	66/78
Sea spider	<i>Anoplodactylus parvus</i>	66/78
Sea spider	<i>Pycnogonum</i> sp.	66/78,81
Sea spider	<i>Tanystylum orbiculare</i>	66/78
Cirripedia		
Barnacle	<i>Balanus amphitrite amphitrite</i>	66/78
Barnacle	<i>Balanus</i> sp.	66/78,81
Barnacle	<i>Balanus trigonus</i>	66/78
Barnacle	<i>Balanus venustus</i>	66/78

Sebastian Inlet State Park Animals

Common Name	Scientific Name	Primary Habitat Codes (for all species)
Barnacle	<i>Chthamalus</i> sp.....	66/78,81
Cumacea		
.....	<i>Cyclaspis pustulata</i>	66/78
.....	<i>Oxyurostylis smithi</i>	66/78
Isopoda		
Isopod	<i>Bagatus bermudensis</i>	66/78
Isopod	<i>Cirolana gracilis</i>	
Isopod	<i>Cirolana parva</i>	66/78
Isopod	<i>Cleantis planicauda</i>	66/78
Isopod	<i>Dynamella quadripunctata</i>	66/78
Isopod	<i>Dynamella</i> sp.....	66/78
Isopod	<i>Erichsonella filiformis</i>	66/78
Isopod	<i>Excorallana sexticornis</i>	66/78
Isopod	<i>Excorallana tricornis</i>	66/78
Isopod	<i>Exosphaeroma</i> sp.	66/78
Isopod	<i>Janira minuta</i>	66/78
Isopod	<i>Jaeropsis rathbunae</i>	66/78
Isopod	<i>Jaeropsis</i> sp.	66/78
Isopod	<i>Laeropsis</i> sp.	
Isopod	<i>Mesanthura decorata</i>	66/78
Isopod	<i>Paracerceis caudata</i>	66/78
Isopod	<i>Sphaeroma destructor</i>	66/78
Isopod	<i>Sphaeroma quadridentatum</i>	66/78
Isopod	<i>Sphaeroma</i> sp.....	66/78,81
Isopod	<i>Sphaeroma walkeri</i>	66/78
Amphipoda		
Amphipod	<i>Acanthohaustorius shoemakei</i>	66/78
Amphipod	<i>Ampelisca agassizi</i>	66/78
Amphipod	<i>Ampithoe marcuzzii</i>	66/78
Amphipod	<i>Ampithoe pollex</i>	66/78
Amphipod	<i>Ampithoe</i> sp.....	66/78
Amphipod	<i>Caprella equilibra</i>	66/78
Amphipod	<i>Caprella penantis</i>	66/78
Amphipod	<i>Cerapus tubularis</i>	66/78
Amphipod	<i>Corophium acherusicum</i>	66/78
Amphipod	<i>Corophium acutum</i>	66/78
Amphipod	<i>Corophium tuberculatum</i>	66/78
Amphipod	<i>Elasmopus levis</i>	66/78

Sebastian Inlet State Park Animals

Common Name	Scientific Name	Primary Habitat Codes (for all species)
Amphipod.....	<i>Elasmopus pectinicus</i>	66/78
Amphipod.....	<i>Elasmopus rapax</i>	66/78
Amphipod.....	<i>Elasmopus</i> sp.....	66/78
Amphipod.....	<i>Erichthonius brasiliensis</i>	66/78
Amphipod.....	<i>Gammaropsis</i> sp.....	66/78
Amphipod.....	<i>Gammarus</i> sp.....	66/78,81
Amphipod.....	<i>Gitanopsis tortugae</i>	66/78
Amphipod.....	<i>Hyale</i> sp.....	66/78
Amphipod.....	<i>Jassa falcata</i>	66/78
Amphipod.....	<i>Lembos</i> sp.....	66/78
Amphipod.....	<i>Listriella</i> sp.....	66/78
Amphipod.....	<i>Lysianassa</i> sp.....	66/78
Amphipod.....	<i>Lysianopsis</i> sp.....	66/78,81
Amphipod.....	<i>Microdeutopus myersi</i>	66/78
Amphipod.....	<i>Microprotopus raneyi</i>	66/78
Amphipod.....	<i>Milita nitida</i>	66/78
Amphipod.....	<i>Orchestia</i> sp.....	66/78,81
Amphipod.....	<i>Podocerus brasiliensis</i>	66/78
Amphipod.....	<i>Stenothoe</i> spp.....	66/78
Crustacea		
Speckled crab.....	<i>Arenaeus cribrarius</i>	1,65/77
Crab.....	<i>Clibanarius</i> sp.....	66/78,81
Brown shrimp.....	<i>Farfantepenaeus aztecus</i>	66/78
Crab.....	<i>Homola</i> sp.....	66/78
Crab.....	<i>Libinia</i> sp.....	66/78,81
Crab.....	<i>Macrocoeloma subparallelum</i>	66/78,81
Crab.....	<i>Menippe mercenaria</i>	66/78,81
Crab.....	<i>Microphrys bicornutus</i>	66/78,81
Crab.....	<i>Neopanope sayi</i>	66/78
Ghost crab.....	<i>Ocypode quadrata</i>	1,65/77
Mottled shore crab.....	<i>Pachygrapsus transversus</i>	66/78
Crab.....	<i>Panopeus herbstii</i>	66/78,81
Crab.....	<i>Panopeus occidentalis</i>	66/78
Spiny lobster.....	<i>Panulirus argus</i>	66/78
Spanish lobster.....	<i>Panulirus guttata</i>	66/78
Crab.....	<i>Percnon gibbesi</i>	66/78,81
Crab.....	<i>Pelia mutica</i>	66/78
Crab.....	<i>Petrolisthes galathinus</i>	66/78,81
Crab.....	<i>Pilumnus dasypodus</i>	66/78

* Non-native Species

Sebastian Inlet State Park Animals

Common Name	Scientific Name	Primary Habitat Codes (for all species)
Crab.....	<i>Pilumnus floridanus</i>	66/78
Crab.....	<i>Speleophorus pontifer</i>	66/78
Florida shovelnose.....	<i>Scyllarus americanus</i>	66/78
Mollusca		
Mollusk.....	<i>Abra aequalis</i>	66/78
Mollusk.....	<i>Anomia antillensis</i>	66/78,81
Mollusk.....	<i>Anomia simplex</i>	66/78,81
Mollusk.....	<i>Barbatia domingensis</i>	66/78,81
Mollusk.....	<i>Barbatia candida</i>	66/78,81
Mollusk.....	<i>Barleeia</i> sp.....	66/78
Mollusk.....	<i>Bittium varium</i>	66/78,81
Mollusk.....	<i>Brachidontes exustus</i>	66/78,81
Mollusk.....	<i>Bulla striata</i>	66/78,81
Mollusk.....	<i>Caecum pulchellum</i>	66/78,81
Mollusk.....	<i>Caecum nitidum</i>	66/78,81
Mollusk.....	<i>Cerithiopsis greeni</i>	66/78
Mollusk.....	<i>Cerithiopsis subulata</i>	66/78,81
Mollusk.....	<i>Cerithium atratum</i>	66/78,81
Mollusk.....	<i>Cerithium eburneum</i>	66/78,81
Mollusk.....	<i>Chama congregata</i>	66/78,81
Mollusk.....	<i>Chama macerophylla</i>	66/78,81
Mollusk.....	<i>Chione grus</i>	66/78,81
Mollusk.....	<i>Costoanachis avara</i>	66/78,81
Mollusk.....	<i>Costoanachis floridana</i>	66/78,81
Mollusk.....	<i>Crassispira leucocyma</i>	66/78,81
Mollusk.....	<i>Crepidula aculeata</i>	66/78,81
Mollusk.....	<i>Crepidula fornicata</i>	66/78,81
Mollusk.....	<i>Cylindrobulla beauii</i>	66/78
Mollusk.....	<i>Dendrodoris krebsi</i>	66/78,81
Mollusk.....	<i>Diodora cayenensis</i>	66/78,81
Mollusk.....	<i>Diodora listeri</i>	66/78,81
Mollusk.....	<i>Diplothyra smithi</i>	66/78
Mollusk.....	<i>Epitonium multistriatum</i>	66/78
Mollusk.....	<i>Epitonium</i> sp.....	66/78,81
Mollusk.....	<i>Fargoa bartschi</i>	66/78,81
Mollusk.....	<i>Fargoa bushiana</i>	66/78,81
Mollusk.....	<i>Fargoa dianthophila</i>	66/78,81
Mollusk.....	<i>Haminoea antillarum</i>	66/78,81
Mollusk.....	<i>Haminoe succinea</i>	66/78

* Non-native Species

Sebastian Inlet State Park Animals

Common Name	Scientific Name	Primary Habitat Codes (for all species)
Mollusk.....	<i>Isognomon alatus</i>	66/78,81
Mollusk.....	<i>Isognomon bicolor</i>	66/78
Mollusk.....	<i>Lithophaga bisulcata</i>	66/78
Mollusk.....	<i>Littorina melagris</i>	66/78
Mollusk.....	<i>Littorina ziczac</i>	66/78,81
Mollusk.....	<i>Marginella lavalleana</i>	66/78,81
Mollusk.....	<i>Meioceras nitidum</i>	66/78,81
Mollusk.....	<i>Microphrys bicornutus</i>	66/78,81
Mollusk.....	<i>Mitrella lunata</i>	66/78
Mollusk.....	<i>Modulus modulus</i>	66/78,81
Mollusk.....	<i>Modiulus</i> sp.....	66/78
Mollusk.....	<i>Musculus lateralis</i>	66/78
Mollusk.....	<i>Nassarius albus</i>	66/78,81
Mollusk.....	<i>Nerita fulgurans</i>	66/78,81
Mollusk.....	<i>Noetia ponderosa</i>	66/78
Mollusk.....	<i>Odostoma</i> sp.....	66/78
Mollusk.....	<i>Odostomia babylonica</i>	66/78,81
Mollusk.....	<i>Odostomia</i> sp.....	
Mollusk.....	<i>Ostrea equestris</i>	66/78,81
Mollusk.....	<i>Ostreola equestris</i>	66/78
Mollusk.....	<i>Parviturboides interruptus</i>	66/78,81
Mollusk.....	<i>Peristicha agria</i>	66/78,81
Mollusk.....	<i>Pteria colymbus</i>	66/78
Mollusk.....	<i>Rissoina bryerea</i>	66/78,81
Mollusk.....	<i>Rissoina catesbyana</i>	66/78,81
Mollusk.....	<i>Seila adamsi</i>	66/78,81
Mollusk.....	<i>Selia pectinata</i>	
Mollusk.....	<i>Siphonaria pectinata</i>	66/78,81
Mollusk.....	<i>Sphenia antillensis</i>	66/78,81
Mollusk.....	<i>Thais haemastoma</i>	66/78,81
Mollusk.....	<i>Tricolia affinis</i>	66/78,81
Mollusk.....	<i>Triphora decorata</i>	66/78,81
Mollusk.....	<i>Triphora nigrocincta</i>	66/78,81
Mollusk.....	<i>Triphora</i> sp.....	66/78
Mollusk.....	<i>Turbonilla</i> sp.....	66/78,81
Mollusk.....	<i>Turitella</i> sp.....	66/78
Mollusk.....	<i>Vermicularia</i> sp.....	66/78
Mollusk.....	<i>Vermicularia spirata</i>	66/78,81
Mollusk.....	<i>Vitrinella floridana</i>	66/78,81

Echinodermata

* Non-native Species

Sebastian Inlet State Park Animals

Common Name	Scientific Name	Primary Habitat Codes (for all species)
Sea urchin.....	<i>Echinometra lacunter</i>	66/78
Sea urchin.....	<i>Holothuria</i> sp.....	66/78,81
Sea urchin.....	<i>Ophiothrix</i> sp.	66/78,81
 Tunicata		
Tunicate.....	<i>Aplidium</i> sp.....	66/78
Sea squirt.....	<i>Didemnum candidum</i>	66/78
Tunicate.....	<i>Diplosoma macdonaldi</i>	66/78
Tunicate.....	<i>Distaplia bermudensis</i>	66/78
Tunicate.....	<i>Distaplia bermudia</i>	66/78
Tunicate.....	<i>Ecteinascidea turbinata</i>	66/78
Tunicate.....	<i>Eudistoma capsilatam</i>	66/78
Tunicate.....	<i>Eudistoma carolinense</i>	66/78
Tunicate.....	<i>Perophora bermudensis</i>	66/78
Tunicate.....	<i>Perophora viridis</i>	66/78
Sea squirt.....	<i>Trididemnum orbiculatum</i>	66/78
Sea squirt.....	<i>Trididemnum savignii</i>	66/78
 FISH		
Nurse shark.....	<i>Ginglymostoma cirratum</i>	59/71
Bonnethead	<i>Sphyrna tiburo</i>	59/71
Spinner shark.....	<i>Carcharhinus falciformis</i>	59/71
Bull shark.....	<i>Carcharhinus leucas</i>	59/71
Blacktip shark.....	<i>Carcharhinus limbatus</i>	59/71
Tiger shark	<i>Galeocerdo cuvier</i>	59/71
Lemon shark	<i>Negaprion brevirostris</i>	59/71
Atlantic sharpnose shark	<i>Rhizoprionodon terraenovae</i>	59/71
Scalloped hammerhead.....	<i>Sphyrna lewini</i>	59/71
Great hammerhead	<i>Sphyrna mokarran</i>	59/71
Smalltooth sawfish.....	<i>Pristis pectinata</i>	59/71,64/76
Lesser electric ray.....	<i>Narcine brasiliensis</i>	59/71,64/76
Atlantic torpedo	<i>Torpedo nobiliana</i>	59/71,64/76
Atlantic guitarfish	<i>Rhinobatos lentiginosus</i>	59/71,64/76
Clearnose skate.....	<i>Raja eglanteria</i>	59/71
Southern stingray.....	<i>Dasyatis americana</i>	59/71
Roughtail stingray	<i>Dasyatis centroura</i>	59/71
Atlantic stingray.....	<i>Dasyatis sabina</i>	59/71
Bluntnose stingray	<i>Dasyatis say</i>	59/71

* Non-native Species

Sebastian Inlet State Park Animals

Common Name	Scientific Name	Primary Habitat Codes (for all species)
Smooth butterfly ray.....	<i>Gymnura micrura</i>	59/71
Spotted eagle ray.....	<i>Aetobatis narinari</i>	59/71
Cownose ray.....	<i>Rhinoptera bonasus</i>	59/71
Manta.....	<i>Manta birostris</i>	59/71
Ladyfish.....	<i>Elops saurus</i>	59/71,64/76
Tarpon.....	<i>Megalops atlanticus</i>	59/71,64/76
Bonefish.....	<i>Albula vulpes</i>	59/71,64/76
American eel.....	<i>Anguilla rostrata</i>	59/71,66/78
Green moray.....	<i>Gymnothorax funebris</i>	66/78
Spotted moray.....	<i>Gymnothorax moringa</i>	66/78
Atlantic menhaden.....	<i>Brevoortia tyrannus</i>	59/71,64/76
False pilchard.....	<i>Harengula clupeola</i>	59/71
Scaled sardine.....	<i>Harengula jaguarana</i>	59/71,64/76
Spanish sardine.....	<i>Sardinella aurita</i>	
Atlantic thread herring.....	<i>Opisthonema oglinum</i>	59/71,64/76
Striped anchovy.....	<i>Anchoa hepsetus</i>	59/71,64/76
Bigeye anchovy.....	<i>Anchoa lamprotaenia</i>	59/71,64/76
Bay anchovy.....	<i>Anchoa mitchilli</i>	59/71,64/76
Hardhead catfish.....	<i>Arius felis</i>	64/76
Gafftopsail catfish.....	<i>Bagre marinus</i>	64/76
Inshore lizardfish.....	<i>Synodus foetens</i>	59/71
Oyster toadfish.....	<i>Opsanus tau</i>	59/71
Ballyhoo.....	<i>Hemiramphus brasiliensis</i>	59/71
Silverstripe halfbeak.....	<i>Hyporhamphus unifasciatus</i>	59/71
Atlantic needlefish.....	<i>Strongylura marina</i>	59/71
Redfin needlefish.....	<i>Strongylura notata</i>	59/71,64/76
Timucu.....	<i>Strongylura timucu</i>	59/71,64/76
Houndfish.....	<i>Tylosurus crocodilus</i>	59/71,64/76
Sheepshead minnow.....	<i>Cyprinodon variegatus variegatus</i>	59/71,64/76
Goldspotted killifish.....	<i>Floridichthys carpio</i>	64/76
Gulf killifish.....	<i>Fundulus grandis</i>	64/76
Striped/longnose killifish.....	<i>Fundulus majalis</i>	64/76
Rainwater killifish.....	<i>Lucania parva</i>	59/71,64/76
Eastern mosquitofish.....	<i>Gambusia holbrooki</i>	64/76
Sailfin molly.....	<i>Poecilia latipinna</i>	59/71,64/76
Tidewater silverside.....	<i>Menidia peninsulae</i>	
Silverside.....	<i>Menidia spp.</i>	59/71,64/76
Lined seahorse.....	<i>Hippocampus erectus</i>	66/78
Chain pipefish.....	<i>Syngnathus louisianae</i>	59/71
Gulf pipefish.....	<i>Syngnathus scovelli</i>	59/71
Spotted scorpionfish.....	<i>Scorpaena plumier</i>	59/71

Sebastian Inlet State Park Animals

Common Name	Scientific Name	Primary Habitat Codes (for all species)
Leopard searobin	<i>Prionotus scitulus</i>	59/71,66/78
Bighead searobin.....	<i>Prionotus tribulus</i>	59/71,66/78
Swordspine snook.....	<i>Centropomus ensiferus</i>	59/71
Fat snook	<i>Centropomus paralelus</i>	59/71
Tarpon snook.....	<i>Centropomus pectinatus</i>	59/71
Common snook	<i>Centropomus undecimalis</i>	59/71
Black sea bass.....	<i>Centropristis striata</i>	59/71,64/76
Jewfish	<i>Epinephelus itajara</i>	59/71,64/76
Red grouper	<i>Epinephelus morio</i>	59/71
Black grouper.....	<i>Mycteroperca bonaci</i>	59/71,64/76
Gag	<i>Mycteroperca microlepis</i>	59/71,64/76
Bluefish	<i>Pomatomus saltatrix</i>	59/71,64/76
Cobia	<i>Rachycentron canadum</i>	59/71,64/76
Blue runner	<i>Caranx crysos</i>	59/71,64/76
Crevalle jack.....	<i>Caranx hippos</i>	59/71,66/78
Horse-eye jack	<i>Caranx latus</i>	59/71,66/78
Leatherjack	<i>Oligoplites saurus</i>	59/71,66/78
Atlantic moonfish.....	<i>Selene setapinnis</i>	59/71,66/78
Lookdown.....	<i>Selene vomer</i>	59/71,66/78
Florida pompano.....	<i>Trachinotus carolinus</i>	59/71,66/78
Permit.....	<i>Trachinotus falcatus</i>	59/71,66/78
Mutton snapper.....	<i>Lutjanus analis</i>	59/71
Schoolmaster.....	<i>Lutjanus apodus</i>	59/71
Gray snapper	<i>Lutjanus griseus</i>	59/71,64/76
Lane snapper.....	<i>Lutjanus synagris</i>	59/71,64/76
Tripletail	<i>Lobotes surinamensis</i>	59/71,64/76
Irish pompano	<i>Diapterus auratus</i>	59/71,66/78
Striped mojarra.....	<i>Diapterus plumieri</i>	59/71,66/78
Silver jenny.....	<i>Eucinostomus gula</i>	59/71,64/76
Tidewater mojarra.....	<i>Eucinostomus harengulus</i>	59/71,64/76
Slender mojarra	<i>Eucinostomus jonesi</i>	
Mojarra	<i>Eucinostomus spp.</i>	59/71,64/76
Black margate	<i>Anisotremus surinamensis</i>	59/71,64/76
Porkfish.....	<i>Anisotremus virginicus</i>	59/71,64/76
Tomtate.....	<i>Haemulon aurolineatum</i>	59/71,64/76
Sailor's choice	<i>Haemulon parra</i>	
Pigfish	<i>Orthopristis chrysoptera</i>	59/71
Sheepshead.....	<i>Archosargus probatocephalus</i>	59/71
Sea bream	<i>Archosargus rhomboidalis</i>	59/71
Grass porgy.....	<i>Calamus arctifrons</i>	59/71
Spottail pinfish.....	<i>Diplodus holbrooki</i>	59/71,64/76

* Non-native Species

Sebastian Inlet State Park Animals

Common Name	Scientific Name	Primary Habitat Codes (for all species)
Pinfish	<i>Lagodon rhomboides</i>	59/71,64/76
Silver perch	<i>Bairdiella chrysoura</i>	59/71,64/76
Spotted seatrout	<i>Cynoscion nebulosus</i>	59/71,64/76
Spotted drum.....	<i>Equetus punctatus</i>	59/71,64/76
Spot.....	<i>Leiostomus xanthurus</i>	59/71,64/76
Southern kingfish.....	<i>Menticirrhus americanus</i>	59/71,65/77
Gulf kingfish	<i>Menticirrhus littoralis</i>	59/71,65/77
Atlantic croaker	<i>Micropogonias undulatus</i>	59/71,65/77
Red drum.....	<i>Sciaenops ocellatus</i>	59/71,64/76
Star drum.....	<i>Stellifer lanceolatus</i>	59/71,64/76
Atlantic spadefish	<i>Chaetodipterus faber</i>	59/71,65/77
Blackchin tilapia	<i>Tilapia melanotheron</i>	64/76,65/77
Sargeant major.....	<i>Abudefduf saxatilis</i>	59/71,64/76
Night sargeant	<i>Abudefduf taurus</i>	59/71,64/76
Dusky damsselfish.....	<i>Pomacentrus fuscus</i>	59/71,64/76
Beaugregory.....	<i>Pomacentrus leucostictus</i>	59/71,64/76
Striped mullet	<i>Mugil cephalus</i>	59/71,64/76
White mullet	<i>Mugil curema</i>	59/71,64/76
Mullet.....	<i>Mugil sp.</i>	59/71,64/76
Great barracuda.....	<i>Sphyraena barracuda</i>	65/77,66/78
Southern sennet.....	<i>Sphyraena picudilla</i>	65/77,66/78
Dwarf wrasse	<i>Doratonotus megalepis</i>	59/71,64/76
Emerald parrotfish.....	<i>Nicholsina usta</i>	65/77,66/78
Southern stargazer	<i>Astroscopus y-graecum</i>	65/77,66/78
Hairy blenny	<i>Labrisomus nuchipinnis</i>	59/71,64/76
Striped blenny	<i>Chasmodes bosquianus</i>	59/71,64/76
Florida blenny.....	<i>Chasmodes saburrae</i>	59/71,64/76
Frillfin goby.....	<i>Bathygobius soporator</i>	59/71,64/76
Violet goby	<i>Gobioides broussoneti</i>	59/71,64/76
Darter goby	<i>Gobionellus boleosoma</i>	59/71,64/76
Naked goby.....	<i>Gobiosoma bosc</i>	59/71,64/76
Code goby	<i>Gobiosoma robustum</i>	59/71,64/76
Clown goby.....	<i>Microgobius gulosus</i>	59/71,64/76
Atlantic cutlassfish.....	<i>Trichiurus lepturus</i>	59/71,64/76
King mackerel.....	<i>Scomberomorus cavalla</i>	59/71,64/76
Spanish mackerel	<i>Scomberomorus maculatus</i>	59/71,64/76
Cero	<i>Scomberomorus regalis</i>	59/71,64/76
Spotted whiff	<i>Citharichthys macrops</i>	
Bay whiff	<i>Citharichthys spilopterus</i>	59/71,64/76
Fringed flounder	<i>Etropus crossotus</i>	59/71,66/77
Gulf flounder	<i>Paralichthys albígutta</i>	59/71,65/77

* Non-native Species

Sebastian Inlet State Park Animals

Common Name	Scientific Name	Primary Habitat Codes (for all species)
Summer flounder	<i>Paralichthys dentatus</i>	59/71,65/77
Southern flounder	<i>Paralichthys lethostigma</i>	59/71,65/77
Lined sole	<i>Achirus lineatus</i>	59/71,65/77
Blackcheek tonguefish.....	<i>Symphurus plagiusa</i>	59/71,64/76
Hogchoker.....	<i>Trinectes maculatus</i>	59/71,64/76
Fringed filefish.....	<i>Monacanthus ciliatus</i>	59/71,64/76
Planehead filefish.....	<i>Monacanthus hispidus</i>	59/71,64/76
Spotted trunkfish	<i>Lactophrys bicaudalis</i>	59/71,64/76
Striped burrfish	<i>Chilomycterus schoepfi</i>	59/71,65/77
Southern puffer	<i>Sphoeroides nephelus</i>	59/71,65/77
Bandtail puffer.....	<i>Sphoeroides spengleri</i>	59/71,65/77
Checkered puffer.....	<i>Sphoeroides testudineus</i>	59/71,65/77
Ocean sunfish	<i>Mola mola</i>	66/78
Dolphin.....	<i>Coryphaena hippurus</i>	
Lyre gobi.....	<i>Evorthodus lyricus</i>	
Sargassumfish.....	<i>Histrio histrio</i>	

REPTILES

Leatherback.....	<i>Dermochelys coriacea coriacea</i>	1,66/78
Common snapping turtle.....	<i>Chelydra serpentina serpentina</i>	64/76,65/77
Striped mud turtle.....	<i>Kinosternon bauri</i>	7
Florida mud turtle.....	<i>Kinosternon subrubrum steindachneri</i>	64/76,65/77
Common musk turtle	<i>Sternotherus odoratus</i>	
Loggerhead musk turtle.....	<i>Sternotherus minor minor</i>	
Eastern chicken turtle	<i>Deirochelys reticularia reticularia</i>	
Carolina diamondback terrapin....	<i>Malaclemys terrapin centrata</i>	59/71,64/76
Florida box turtle.....	<i>Terrapene carolina bauri</i>	5,7
Florida cooter.....	<i>Pseudemys floridana floridana</i>	
Florida redbelly turtle	<i>Pseudemys nelsoni</i>	
Gopher tortoise.....	<i>Gopherus polyphemus</i>	5,81
Loggerhead	<i>Caretta caretta</i>	1,66/78
Green turtle	<i>Chelonia mydas</i>	1,66/78
Hawksbill	<i>Eretmochelys imbricata</i>	1,66/78
Atlantic ridley	<i>Lepidochelys kempii</i>	1,66/78
Florida softshell.....	<i>Apalone ferox</i>	65/77
American alligator	<i>Alligator mississippiensis</i>	64/78
American crocodile.....	<i>Crocodylus acutus</i>	
Indo-Pacific gecko*	<i>Hemidactylus garnotii</i>	82
Green anole	<i>Anolis carolinensis carolinensis</i>	5,7
Brown anole*	<i>Anolis sagrei</i>	7,81,82

* Non-native Species

Sebastian Inlet State Park Animals

Common Name	Scientific Name	Primary Habitat Codes (for all species)
Brown Basilisk*	<i>Basiliscus vittatus</i>	82
Northern curlytail lizard*	<i>Leiocephalus carinatus armouri</i>	82
Eastern slender glass lizard	<i>Ophisaurus attenuatus longicaudus</i>	
Island glass lizard	<i>Ophisaurus compressus</i>	5,7
Eastern glass lizard	<i>Ophisaurus ventralis</i>	5
Six-lined racerunner	<i>Cnemidophorus sexlineatus sexlineatus</i>	5,7,81
Southeastern five-lined skink	<i>Eumeces inexpectatus</i>	5,7
Broad-headed skink	<i>Eumeces laticeps</i>	7
Ground skink	<i>Scincella lateralis</i>	7
Red-tailed Boa*	<i>Boa constrictor</i>	82
Florida scarlet snake	<i>Cemophora coccinea coccinea</i>	5,7
Southern black racer	<i>Coluber constrictor priapus</i>	5,7,81
Southern ringneck snake	<i>Diadophis punctatus punctatus</i>	7
Eastern indigo snake	<i>Drymarchon corais couperi</i>	5,7
Corn snake	<i>Elaphe guttata guttata</i>	5,7
Yellow rat snake	<i>Elaphe obsoleta quadrivittata</i>	7
Florida kingsnake	<i>Lampropeltis getula floridana</i>	7
Eastern kingsnake	<i>Lampropeltis getula getula</i>	
Scarlet kingsnake	<i>Lampropeltis triangulum elapsoides</i>	7
Eastern mud snake	<i>Farancia abacura abacura</i>	
Eastern coachwhip	<i>Masticophis flagellum flagellum</i>	5
Atlantic salt marsh snake	<i>Nerodia clarkii taeniata</i>	64/76
Florida brown snake	<i>Storeria dekayi victa</i>	
Banded water snake	<i>Nerodia fasciata fasciata</i>	64/76
Brown water snake	<i>Nerodia taxispilota</i>	64/76
Striped crayfish snake	<i>Regina alleni</i>	
Rough green snake	<i>Opheodrys aestivus</i>	7,64/76
Florida pine snake	<i>Pituophis melanoleucus mugitus</i>	5
Pine woods snake	<i>Rhadinaea flavilata</i>	
Southeastern crowned snake	<i>Tantilla coronata</i>	7
Eastern ribbon snake	<i>Thamnophis sauritus sauritus</i>	
Eastern garter snake	<i>Thamnophis sirtalis sirtalis</i>	
Eastern hognose snake	<i>Heterodon platyrhinos</i>	
Southeastern hognose snake	<i>Heterodon simus</i>	
Eastern coral snake	<i>Micrurus fulvius fulvius</i>	7
Eastern diamondback rattlesnake	<i>Crotalus adamanteus</i>	1,5,7,81
Dusky pigmy rattlesnake	<i>Sistrurus miliarius barbouri</i>	5,81
Eastern cottonmouth	<i>Agkistrodon piscivorus</i>	

BIRDS

* Non-native Species

Sebastian Inlet State Park Animals

Common Name	Scientific Name	Primary Habitat Codes (for all species)
Red-throated Loon.....	<i>Gavia stellata</i>	59/71
Common Loon.....	<i>Gavia immer</i>	59/71
Pied-billed Grebe.....	<i>Podilymbus podiceps</i>	59/71
Horned Grebe	<i>Podiceps auritus</i>	59/71
Sooty Shearwater	<i>Puffinus griseus</i>	Open ocean
Wilson's Storm-Petrel	<i>Oceanites oceanicus</i>	Open ocean
Leach's Storm-Petrel	<i>Oceanodroma leucorhoa</i>	Open ocean
Band-rumped Storm-Petrel	<i>Oceanodroma castro</i>	Open ocean
White-tailed Tropicbird.....	<i>Phaethon lepturus</i>	Open ocean
Masked Booby	<i>Sula dactylatra</i>	Open ocean
Brown Booby	<i>Sula leucogaster</i>	Open ocean
Northern Gannet.....	<i>Morus bassanus</i>	Open water
American White Pelican.....	<i>Pelecanus erythrorhynchos</i>	Flyover/open water
Brown Pelican.....	<i>Pelecanus occidentalis</i>	Flyover/open water
Double-crested Cormorant.....	<i>Phalacrocorax auritus</i>	59/71,64/76
Anhinga	<i>Anhinga anhinga</i>	59/71,64/76
Magnificent Frigatebird	<i>Fregata magnificens</i>	Flyover
Least Bittern	<i>Ixobrychus exilis</i>	59/71,64/76
Great Blue Heron	<i>Ardea herodias</i>	59/71,64/76
Great White Heron (pop).....	<i>Ardea herodias occidentalis (pop)</i>	59/71,64/76
Great Egret	<i>Ardea alba</i>	59/71,64/76
Snowy Egret.....	<i>Egretta thula</i>	59/71,64/76
Little Blue Heron.....	<i>Egretta caerulea</i>	59/71,64/76
Tricolored Heron.....	<i>Egretta tricolor</i>	59/71,64/76
Reddish Egret	<i>Egretta rufescens</i>	59/71,64/76
Cattle Egret*	<i>Bubulcus ibis</i>	59/71,64/76
Green Heron	<i>Butorides virescens</i>	59/71,64/76
Black-crowned Night-Heron.....	<i>Nycticorax nycticorax</i>	59/71,64/76
Yellow-crowned Night-Heron.....	<i>Nyctanassa violacea</i>	59/71,64/76
White Ibis	<i>Eudocimus albus</i>	59/71,64/76
Glossy Ibis	<i>Plegadis falcinellus</i>	59/71,64/76
Roseate Spoonbill.....	<i>Platalea ajaja</i>	59/71,64/76
Wood Stork	<i>Mycteria americana</i>	59/71,64/76
Black Vulture	<i>Coragyps atratus</i>	Flyover
Turkey Vulture.....	<i>Cathartes aura</i>	Flyover
Fulvous Whistling-Duck.....	<i>Dendrocygna bicolor</i>	59/71,64/76
Canada Goose.....	<i>Branta canadensis</i>	59/71,64/76
Wood Duck	<i>Aix sponsa</i>	59/71,64/76
Green-winged Teal	<i>Anas crecca</i>	59/71,64/76
American Black Duck.....	<i>Anas rubripes</i>	59/71,64/76

* Non-native Species

Sebastian Inlet State Park Animals

Common Name	Scientific Name	Primary Habitat Codes (for all species)
Mottled Duck.....	<i>Anas fulvigula</i>	59/71,64/76
Mallard	<i>Anas platyrhynchos</i>	59/71,64/76
Northern Pintail	<i>Anas acuta</i>	59/71,64/76
Blue-winged Teal	<i>Anas discors</i>	59/71,64/76
Northern Shoveler	<i>Anas clypeata</i>	59/71,64/76
Gadwall	<i>Anas strepera</i>	59/71,64/76
American Wigeon	<i>Anas americana</i>	59/71,64/76
Canvasback	<i>Aythya valisineria</i>	59/71,64/76
Redhead.....	<i>Aythya americana</i>	59/71,64/76
Ring-Necked Duck.....	<i>Aythya collaris</i>	59/71,64/76
Greater Scaup	<i>Aythya marila</i>	59/71,64/76
Lesser Scaup.....	<i>Aythya affinis</i>	59/71,64/76
Harlequin Duck.....	<i>Histrionicus histrionicus</i>	59/71,64/76
Oldsquaw	<i>Clangula hyemalis</i>	59/71,64/76
Black Scoter	<i>Melanitta nigra</i>	59/71,64/76
Surf Scoter	<i>Melanitta perspicillata</i>	59/71,64/76
White-winged Scoter	<i>Melanitta fusca</i>	59/71,64/76
Hooded Merganser	<i>Lophodytes cucullatus</i>	59/71,64/76
Red-breasted Merganser	<i>Mergus serrator</i>	59/71,64/76
Ruddy Duck.....	<i>Oxyura jamaicensis</i>	59/71,64/76
Osprey.....	<i>Pandion haliaetus</i>	64,76
Bald Eagle.....	<i>Haliaeetus leucocephalus</i>	Flyover
Northern Harrier.....	<i>Circus cyaneus</i>	1,5
Sharp-shinned Hawk.....	<i>Accipiter striatus</i>	5,7
Cooper's Hawk.....	<i>Accipiter cooperii</i>	5,7
Red-shouldered Hawk	<i>Buteo lineatus</i>	5,7
Broad-winged Hawk	<i>Buteo platypterus</i>	5
Red-tailed Hawk	<i>Buteo jamaicensis</i>	5,7
American Kestrel.....	<i>Falco sparverius</i>	5
Merlin.....	<i>Falco columbarius</i>	5
Peregrine Falcon.....	<i>Falco peregrinus</i>	77
Northern Bobwhite	<i>Colinus virginianus</i>	5,81,82
Black Rail	<i>Laterallus jamaicensis</i>	64,76
Clapper Rail	<i>Rallus longirostris</i>	64,76
King Rail.....	<i>Rallus elegans</i>	64,76
Virginia Rail.....	<i>Rallus limicola</i>	64,76
Sora.....	<i>Porzana carolina</i>	64,76
Common Moorhen.....	<i>Gallinula chloropus</i>	64,76
American Coot.....	<i>Fulica americana</i>	64,76
Black-bellied Plover	<i>Pluvialis squatarola</i>	77
Wilson's Plover	<i>Charadrius wilsonia</i>	77

* Non-native Species

Sebastian Inlet State Park Animals

Common Name	Scientific Name	Primary Habitat Codes (for all species)
Semipalmated Plover.....	<i>Charadrius semipalmatus</i>	77
Piping Plover	<i>Charadrius melodus</i>	77
Killdeer	<i>Charadrius vociferus</i>	77
American Oystercatcher.....	<i>Haematopus palliatus</i>	77
Black-necked Stilt.....	<i>Himantopus mexicanus</i>	77
American Avocet.....	<i>Recurvirostra americana</i>	77
Greater Yellowlegs.....	<i>Tringa melanoleuca</i>	77
Lesser Yellowlegs.....	<i>Tringa flavipes</i>	77
Solitary Sandpiper	<i>Tringa solitaria</i>	77
Willet.....	<i>Catoptrophorus semipalmatus</i>	77
Spotted Sandpiper.....	<i>Actitis macularia</i>	77
Whimbrel.....	<i>Numenius phaeopus</i>	77
Long-billed Curlew.....	<i>Numenius americanus</i>	77
Marbled Godwit.....	<i>Limosa fedoa</i>	77
Ruddy Turnstone	<i>Arenaria interpres</i>	77
Red Knot.....	<i>Calidris canutus</i>	77
Sanderling	<i>Calidris alba</i>	77
Semipalmated Sandpiper.....	<i>Calidris pusilla</i>	77
Western Sandpiper	<i>Calidris mauri</i>	77
Least Sandpiper	<i>Calidris minutilla</i>	77
White-rumped Sandpiper.....	<i>Calidris fuscicollis</i>	77
Pectoral Sandpiper.....	<i>Calidris melanotos</i>	77
Purple Sandpiper	<i>Calidris maritima</i>	77
Dunlin	<i>Calidris alpina</i>	77
Stilt Sandpiper	<i>Calidris himantopus</i>	77
Short-billed Dowitcher	<i>Limnodromus griseus</i>	77
Common Snipe.....	<i>Gallinago gallinago</i>	77
Wilson's Phalarope	<i>Phalaropus tricolor</i>	77
Red-necked Phalarope.....	<i>Phalaropus lobatus</i>	77
Red Phalarope	<i>Phalaropus fulicaria</i>	77
Pomarine Jaeger	<i>Stercorarius pomarinus</i>	77
Parasitic Jaeger	<i>Stercorarius parasiticus</i>	77
Laughing Gull.....	<i>Larus atricilla</i>	77
Bonaparte's Gull.....	<i>Larus philadelphia</i>	77
Ring-billed Gull	<i>Larus delawarensis</i>	77
Herring Gull.....	<i>Larus argentatus</i>	77
Iceland Gull.....	<i>Larus glaucoides</i>	77
Lesser Black-backed Gull	<i>Larus fuscus</i>	77
Glaucous Gull	<i>Larus hyperboreus</i>	77
Great Black-backed Gull	<i>Larus marinus</i>	77
Black-legged Kittiwake	<i>Rissa tridactyla</i>	77

* Non-native Species

Sebastian Inlet State Park Animals

Common Name	Scientific Name	Primary Habitat Codes (for all species)
Gull-billed Tern	<i>Sterna nilotica</i>	77
Caspian Tern.....	<i>Sterna caspia</i>	77
Royal Tern.....	<i>Sterna maxima</i>	77
Sandwich Tern.....	<i>Sterna sandvicensis</i>	77
Roseate Tern.....	<i>Sterna dougallii</i>	77
Common Tern.....	<i>Sterna hirundo</i>	77
Arctic Tern.....	<i>Sterna paradisaea</i>	77
Forster's Tern	<i>Sterna forsteri</i>	77
Least Tern.....	<i>Sterna antillarum</i>	77
Bridled Tern	<i>Sterna anaethetus</i>	77
Sooty Tern	<i>Sterna fuscata</i>	77
Black Tern.....	<i>Chlidonias niger</i>	77
Brown Noddy	<i>Anous stolidus</i>	77
Black Skimmer	<i>Rynchops nigra</i>	77
Rock Dove *	<i>Columba livia</i>	81,82
Mourning Dove	<i>Zenaida macroura</i>	81,82
Common Ground-Dove	<i>Columbina passerina</i>	5,81,82
Black-billed Cuckoo	<i>Coccyzus erythrophthalmus</i>	5,76
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	7,76
Mangrove Cuckoo.....	<i>Coccyzus minor</i>	76
Smooth-billed Ani.....	<i>Crotophaga ani</i>	5
Barn Owl.....	<i>Tyto alba</i>	7
Eastern Screech-Owl.....	<i>Otus asio</i>	7
Great Horned Owl	<i>Bubo virginianus</i>	7
Barred Owl.....	<i>Strix varia</i>	7
Common Nighthawk.....	<i>Chordeiles minor</i>	5,Flyover
Chuck-will's-widow.....	<i>Caprimulgus carolinensis</i>	5,7
Whip-poor-will.....	<i>Caprimulgus vociferus</i>	5,7
Chimney Swift.....	<i>Chaetura pelagica</i>	Flyover
Ruby-throated Hummingbird.....	<i>Archilochus colubris</i>	5,7,81,82
Belted Kingfisher.....	<i>Ceryle alcyon</i>	64,76
Red-bellied Woodpecker.....	<i>Melanerpes carolinus</i>	5,7,81,82
Yellow-bellied Sapsucker.....	<i>Sphyrapicus varius</i>	7
Downy Woodpecker.....	<i>Picoides pubescens</i>	5,7
Hairy Woodpecker.....	<i>Picoides villosus</i>	5,7
Northern Flicker	<i>Colaptes auratus</i>	5,81,82
Pileated Woodpecker.....	<i>Dryocopus pileatus</i>	7
Eastern Wood-Pewee.....	<i>Contopus virens</i>	5,7
Eastern Phoebe	<i>Sayornis phoebe</i>	5
Great Crested Flycatcher.....	<i>Myiarchus crinitus</i>	5,7
Western Kingbird.....	<i>Tyrannus verticalis</i>	5

* Non-native Species

Sebastian Inlet State Park Animals

Common Name	Scientific Name	Primary Habitat Codes (for all species)
Eastern Kingbird	<i>Tyrannus tyrannus</i>	5
Gray Kingbird.....	<i>Tyrannus dominicensis</i>	5
Scissor-tailed Flycatcher.....	<i>Tyrannus forficatus</i>	5
Horned Lark	<i>Eremophila alpestris</i>	5
Purple Martin	<i>Progne subis</i>	5,Flyover
Tree Swallow	<i>Tachycineta bicolor</i>	5,Flyover
Northern Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>	5,Flyover
Bank Swallow	<i>Riparia riparia</i>	5,Flyover
Cliff Swallow	<i>Petrochelidon pyrrhonota</i>	5,Flyover
Barn Swallow	<i>Hirundo rustica</i>	5,Flyover
Blue Jay	<i>Cyanocitta cristata</i>	5,7,81,82
American Crow	<i>Corvus brachyrhynchos</i>	5,7,81,82
Fish Crow	<i>Corvus ossifragus</i>	5,7,81,82
Carolina Wren	<i>Thryothorus ludovicianus</i>	5,7,81,82
House Wren	<i>Troglodytes aedon</i>	5,7
Sedge Wren.....	<i>Cistothorus platensis</i>	5
Marsh Wren	<i>Cistothorus palustris</i>	5
Ruby-crowned Kinglet.....	<i>Regulus calendula</i>	5,7
Blue-gray Gnatcatcher.....	<i>Poliophtila caerulea</i>	5,7
Veery	<i>Catharus fuscescens</i>	5,7
Gray-cheeked Thrush.....	<i>Catharus minimus</i>	5,7
Swainson's Thrush.....	<i>Catharus ustulatus</i>	5,7
Hermit Thrush.....	<i>Catharus guttatus</i>	5,7
Wood Thrush.....	<i>Hylocichla mustelina</i>	5,7
American Robin.....	<i>Turdus migratorius</i>	5,7
Gray Catbird.....	<i>Dumetella carolinensis</i>	5,7
Northern Mockingbird.....	<i>Mimus polyglottos</i>	5,7,81,82
Brown Thrasher.....	<i>Toxostoma rufum</i>	5,7
Cedar Waxwing.....	<i>Bombycilla cedrorum</i>	5,7
Loggerhead Shrike.....	<i>Lanius ludovicianus</i>	5
European Starling *.....	<i>Sturnus vulgaris</i>	5,81,82
White-eyed Vireo	<i>Vireo griseus</i>	5,7
Blue-headed Vireo	<i>Vireo solitarius</i>	7
Philadelphia Vireo	<i>Vireo philadelphicus</i>	7
Red-eyed Vireo.....	<i>Vireo olivaceus</i>	7
Black-whiskered Vireo	<i>Vireo altiloquus</i>	7
Blue-winged Warbler	<i>Vermivora pinus</i>	7
Tennessee Warbler.....	<i>Vermivora peregrina</i>	7
Orange-crowned Warbler.....	<i>Vermivora celata</i>	7
Northern Parula	<i>Parula americana</i>	7

* Non-native Species

Sebastian Inlet State Park Animals

Common Name	Scientific Name	Primary Habitat Codes (for all species)
Yellow Warbler.....	<i>Dendroica petechia</i>	7
Magnolia Warbler	<i>Dendroica magnolia</i>	7
Cape May Warbler.....	<i>Dendroica tigrina</i>	7
Black-throated Blue Warbler	<i>Dendroica caerulescens</i>	7
Yellow-rumped Warbler	<i>Dendroica coronata</i>	7
Black-throated Green Warbler	<i>Dendroica virens</i>	7
Blackburnian Warbler	<i>Dendroica fusca</i>	7
Yellow-throated Warbler	<i>Dendroica dominica</i>	7
Pine Warbler	<i>Dendroica pinus</i>	7
Prairie Warbler	<i>Dendroica discolor</i>	7
Palm Warbler	<i>Dendroica palmarum</i>	7
Blackpoll Warbler.....	<i>Dendroica striata</i>	7
Cerulean Warbler.....	<i>Dendroica cerulea</i>	7
Black-and-white Warbler	<i>Mniotilta varia</i>	7
American Redstart	<i>Setophaga ruticilla</i>	7
Prothonotary Warbler	<i>Protonotaria citrea</i>	7
Worm-eating Warbler	<i>Helmitheros vermivorus</i>	7
Ovenbird	<i>Seiurus aurocapillus</i>	7
Northern Waterthrush	<i>Seiurus noveboracensis</i>	7
Louisiana Waterthrush.....	<i>Seiurus motacilla</i>	7
Common Yellowthroat.....	<i>Geothlypis trichas</i>	7
Hooded Warbler.....	<i>Wilsonia citrina</i>	7
Wilson's Warbler	<i>Wilsonia pusilla</i>	7
Yellow-breasted Chat	<i>Icteria virens</i>	7
Bananaquit	<i>Coereba flaveola</i>	7
Summer Tanager	<i>Piranga rubra</i>	7
Scarlet Tanager	<i>Piranga olivacea</i>	7
Western Tanager	<i>Piranga ludoviciana</i>	7
Northern Cardinal	<i>Cardinalis cardinalis</i>	5,7,81,82
Rose-breasted Grosbeak.....	<i>Pheucticus ludovicianus</i>	7
Indigo Bunting.....	<i>Passerina cyanea</i>	5,7
Painted Bunting.....	<i>Passerina ciris</i>	7
Eastern Towhee	<i>Pipilo erythrophthalmus</i>	5,7
Chipping Sparrow	<i>Spizella passerina</i>	5
Field Sparrow	<i>Spizella pusilla</i>	5
Savannah Sparrow	<i>Passerculus sandwichensis</i>	5
Grasshopper Sparrow	<i>Ammodramus savannarum</i>	5
LeConte's Sparrow	<i>Ammodramus leconteii</i>	5
Seaside Sparrow	<i>Ammodramus maritima</i>	5
White-throated Sparrow	<i>Zonotrichia albicollis</i>	5
Bobolink.....	<i>Dolichonyx oryzivorus</i>	5

* Non-native Species

Sebastian Inlet State Park Animals

Common Name	Scientific Name	Primary Habitat Codes (for all species)
Red-winged Blackbird.....	<i>Agelaius phoeniceus</i>	5,81,82
Boat-tailed Grackle.....	<i>Quiscalus major</i>	5,81,82
Common Grackle.....	<i>Quiscalus quiscula</i>	5,81,82
Brown-headed Cowbird.....	<i>Molothrus ater</i>	5,81,82
Baltimore Oriole.....	<i>Icterus galbula</i>	7
Pine Siskin.....	<i>Carduelis pinus</i>	5,7
American Goldfinch.....	<i>Carduelis tristis</i>	5,7
House Sparrow *.....	<i>Passer domesticus</i>	81,82

MAMMALS

Virginia opossum.....	<i>Didelphis virginiana</i>	5,7,81
Eastern mole.....	<i>Scalopus aquaticus</i>	5,7,81
Nine-banded armadillo*.....	<i>Dasyurus novemcinctus</i>	5,7,64/76,81,82
Marsh rabbit.....	<i>Sylvilagus palustris</i>	7,64/76
Eastern cottontail.....	<i>Sylvilagus floridanus</i>	5,7,81
Gray squirrel.....	<i>Sciurus carolinensis</i>	7,64/76,81
Southern flying squirrel.....	<i>Glaucomys volans</i>	5,7
Red bat.....	<i>Lasiurus borealis</i>	
Hoary bat.....	<i>Lasiurus cinereus</i>	
Northern yellow bat.....	<i>Lasiurus intermedius</i>	
Seminole bat.....	<i>Lasiurus seminolus</i>	
Evening bat.....	<i>Nycticeius humeralis</i>	
Cotton mouse.....	<i>Peromyscus gossypinus</i>	5,7
Oldfield mouse.....	<i>Peromyscus polionotus</i>	
Southeastern beach mouse.....	<i>Peromyscus polionotus niveiventris</i>	1,5
Hispid cotton rat.....	<i>Sigmodon hispidus</i>	1,5,7
Norway rat.....	<i>Rattus norvegicus</i>	
Black rat*.....	<i>Rattus rattus</i>	5,81,82
Eastern woodrat.....	<i>Neotoma floridana</i>	
Marsh rice rat.....	<i>Oryzomys palustris</i>	
House mouse*.....	<i>Mus musculus</i>	81,82
Northern short-tailed shrew.....	<i>Blarina brevicauda</i>	
Least shrew.....	<i>Cryptotis parva</i>	
Gray fox.....	<i>Urocyon cinereoargenteus</i>	1,5,7,64/76
Raccoon.....	<i>Procyon lotor</i>	1,5,7,64/76,81,82
River otter.....	<i>Lutra canadensis</i>	64/76.59/71
Eastern spotted skunk.....	<i>Spilogale putorius</i>	5,7,64/76
Striped skunk.....	<i>Mephites mephites</i>	5,7,64/76
Bobcat.....	<i>Felis rufus</i>	5,7,64/76,81
Feral cat*.....	<i>Felis catus</i>	81,82

* Non-native Species

Sebastian Inlet State Park Animals

Common Name	<i>Scientific Name</i>	Primary Habitat Codes (for all species)
Jaguarundi.....	<i>Felis yagouaroundi</i>	
West Indian manatee	<i>Trichechus manatus latirostris</i>	59/71
Atlantic bottle-nosed dolphin	<i>Tursiops truncatus</i>	Water Areas
Pygmy sperm whale	<i>Kogia breviceps</i>	Water Areas
North Atlantic right whale	<i>Balaena glacialis glacialis</i>	Water Areas
Eastern pipistrelle	<i>Pipistrelluse subflavus</i>	

Sebastian Inlet State Park Animals

Common Name	<i>Scientific Name</i>	Primary Habitat Codes (for all species)
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Habitat Codes

Terrestrial

1. Beach Dune
2. Bluff
3. Coastal Berm
4. Coastal Rock Barren
5. Coastal Strand
6. Dry Prairie
7. Maritime Hammock
8. Mesic Flatwoods
9. Mesic Hammock
10. Coastal Grasslands
11. Pine Rockland
12. Prairie Hammock
13. Rockland Hammock
14. Sandhill
15. Scrub
16. Scrubby Flatwoods
17. Shell Mound
18. Sinkhole
19. Slope Forest
20. Upland Glade
21. Upland Hardwood Forest
22. Upland Mixed Forest
23. Upland Pine Forest
24. Xeric Hammock

Palustrine

25. Basin Marsh
26. Basin Swamp
27. Baygall
28. Bog
29. Bottomland Forest
30. Coastal Interdunal Swale
31. Depression Marsh
32. Dome
33. Floodplain Forest
34. Floodplain Marsh
35. Floodplain Swamp
36. Freshwater Tidal Swamp
37. Hydric Hammock
38. Marl Prairie
39. Seepage Slope
40. Slough
41. Strand Swamp
42. Swale
43. Wet Flatwoods
44. Wet Prairie

Lacustrine

45. Clastic Upland Lake
46. Coastal Dune Lake
47. Coastal Rockland Lake

Lacustrine

48. Flatwood/Prairie Lake
49. Marsh Lake
50. River Floodplain Lake
51. Sandhill Upland Lake
52. Sinkhole Lake
53. Swamp Lake

Riverine

54. Alluvial Stream
55. Blackwater Stream
56. Seepage Stream
57. Spring-Run Stream

Estuarine

58. Estuarine Algal Bed
59. Estuarine Composite Substrate
60. Estuarine Consolidated Substrate
61. Estuarine Coral Reef
62. Estuarine Grass Bed
63. Estuarine Mollusk Reef
64. Estuarine Octocoral Bed
65. Estuarine Sponge Bed
66. Estuarine Tidal Marsh
67. Estuarine Tidal Swamp
68. Estuarine Unconsolidated Substrate
69. Estuarine Worm Reef

Marine

70. Marine Algal Bed
71. Marine Composite Substrate
72. Marine Consolidated Substrate
73. Marine Coral Reef
74. Marine Grass Bed
75. Marine Mollusk Reef
76. Marine Octocoral Bed
77. Marine Sponge Bed
78. Marine Tidal Marsh
79. Marine Tidal Swamp
80. Marine Unconsolidated Substrate
81. Marine Worm Reef

Subterranean

82. Aquatic Cave
83. Terrestrial Cave

Miscellaneous

84. Ruderal
 85. Developed
- MTC** Many Types of Communities
OF Over Flying

Habitat Codes

Addendum 5 – Designated Species List

Rank Explanations For FNAI Global Rank, FNAI State Rank, Federal Status, And State Status

The Nature Conservancy and the Natural Heritage Program Network (of which FNAI is a part) define an element as any exemplary or rare component of the natural environment, such as a species, natural community, bird rookery, spring, sinkhole, cave, or other ecological feature. An element occurrence (EO) is a single extant habitat that sustains or otherwise contributes to the survival of a population or a distinct, self-sustaining example of a particular element.

Using a ranking system developed by The Nature Conservancy and the Natural Heritage Program Network, the Florida Natural Areas Inventory assigns two ranks to each element. The global rank is based on an element's worldwide status; the state rank is based on the status of the element in Florida. Element ranks are based on many factors, the most important ones being estimated number of Element occurrences, estimated abundance (number of individuals for species; area for natural communities), range, estimated adequately protected EOs, relative threat of destruction, and ecological fragility.

Federal and State status information is from the U.S. Fish and Wildlife Service; and the Florida Game and Freshwater Fish Commission (animals), and the Florida Department of Agriculture and Consumer Services (plants), respectively.

FNAI GLOBAL RANK DEFINITIONS

- G1 = Critically imperiled globally because of extreme rarity (5 or fewer occurrences or less than 1000 individuals) or because of extreme vulnerability to extinction due to some natural or man-made factor.
- G2 = Imperiled globally because of rarity (6 to 20 occurrences or less than 3000 individuals) or because of vulnerability to extinction due to some natural or man-made factor.
- G3 = Either very rare and local throughout its range (21-100 occurrences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction of other factors.
- G4 = apparently secure globally (may be rare in parts of range)
- G5 = demonstrably secure globally
- GH = of historical occurrence throughout its range, may be rediscovered (e.g., ivory-billed woodpecker)
- GX = believed to be extinct throughout range
- GXC = extirpated from the wild but still known from captivity or cultivation
- G#? = tentative rank (e.g., G2?)
- G#G# = range of rank; insufficient data to assign specific global rank (e.g., G2G3)
- G#T# = rank of a taxonomic subgroup such as a subspecies or variety; the G portion of the rank refers to the entire species and the T portion refers to the specific subgroup; numbers have same definition as above (e.g., G3T1)
- G#Q = rank of questionable species - ranked as species but questionable whether it is species or subspecies; numbers have same definition as above (e.g., G2Q)
- G#T#Q = same as above, but validity as subspecies or variety is questioned.
- GU = due to lack of information, no rank or range can be assigned (e.g., GUT2).
- G? = not yet ranked (temporary)
- S1 = Critically imperiled in Florida because of extreme rarity (5 or fewer occurrences or less than 1000 individuals) or because of extreme vulnerability to extinction due to some natural or man-made factor.
- S2 = Imperiled in Florida because of rarity (6 to 20 occurrences or less than 3000 individuals) or because of vulnerability to extinction due to some natural or man-made factor.
- S3 = Either very rare and local throughout its range (21-100 occurrences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction of other factors.
- S4 = apparently secure in Florida (may be rare in parts of range)
- S5 = demonstrably secure in Florida
- SH = of historical occurrence throughout its range, may be rediscovered (e.g., ivory-billed woodpecker)
- SX = believed to be extinct throughout range
- SA = accidental in Florida, i.e., not part of the established biota
- SE = an exotic species established in Florida may be native elsewhere in North America
- SN = regularly occurring, but widely and unreliably distributed; sites for conservation hard to determine
- SU = due to lack of information, no rank or range can be assigned (e.g., SUT2).
- S? = not yet ranked (temporary)

Rank Explanations For FNAI Global Rank, FNAI State Rank, Federal Status, And State Status

LEGAL STATUS

N = Not currently listed, nor currently being considered for listing, by state or federal agencies.

FEDERAL (Listed by the U. S. Fish and Wildlife Service - USFWS)

LE = Listed as Endangered Species in the List of Endangered and Threatened Wildlife and Plants under the provisions of the Endangered Species Act. Defined as any species that is in danger of extinction throughout all or a significant portion of its range.

PE = Proposed for addition to the List of Endangered and Threatened Wildlife and Plants as Endangered Species.

LT = Listed as Threatened Species. Defined as any species that is likely to become an endangered species within the near future throughout all or a significant portion of its range.

PT = Proposed for listing as Threatened Species.

C = Candidate Species for addition to the list of Endangered and Threatened Wildlife and Plants. Defined as those species for which the USFWS currently has on file sufficient information on biological vulnerability and threats to support proposing to list the species as endangered or threatened.

E(S/A) = Endangered due to similarity of appearance.

T(S/A) = Threatened due to similarity of appearance.

STATE

Animals (Listed by the Florida Fish and Wildlife Conservation Commission - FFWCC)

LE = Listed as Endangered Species by the FFWCC. Defined as a species, subspecies, or isolated population which is so rare or depleted in number or so restricted in range of habitat due to any man-made or natural factors that it is in immediate danger of extinction or extirpation from the state, or which may attain such a status within the immediate future.

LT = Listed as Threatened Species by the FFWCC. Defined as a species, subspecies, or isolated population which is acutely vulnerable to environmental alteration, declining in number at a rapid rate, or whose range or habitat is decreasing in area at a rapid rate and as a consequence is destined or very likely to become an endangered species within the foreseeable future.

LS = Listed as Species of Special Concern by the FFWCC. Defined as a population which warrants special protection, recognition, or consideration because it has an inherent significant vulnerability to habitat modification, environmental alteration, human disturbance, or substantial human exploitation which, in the foreseeable future, may result in its becoming a threatened species.

Plants (Listed by the Florida Department of Agriculture and Consumer Services - FDACS)

LE = Listed as Endangered Plants in the Preservation of Native Flora of Florida Act. Defined as species of plants native to the state that are in imminent danger of extinction within the state, the survival of which is unlikely if the causes of a decline in the number of plants continue, and includes all species determined to be endangered or threatened pursuant to the Federal Endangered Species Act of 1973, as amended.

LT = Listed as Threatened Plants in the Preservation of Native Flora of Florida Act. Defined as species native to the state that are in rapid decline in the number of plants within the state, but which have not so decreased in such number as to cause them to be endangered.

Sebastian Inlet State Park Designated Species—Plants

Common Name/ Scientific Name	FDACS	Designated Species Status USFWS	FNAI
Florida butterfly orchid <i>Encyclia tampensis</i>			CE
Simpson's applecactus <i>Harrisia simpsonii</i>			LE
Johnson's Seagrass <i>Halophila johnsonii</i>			LT
Twinberry <i>Myrcianthes fragans</i>			LT
Erect pricklypear <i>Opuntia stricta</i>			LT
Beachberry <i>Scaevola plumieri</i>			LT
Coontie <i>Zamia pumila</i>			CE

Sebastian Inlet State Park Designated Species—Plants

Common Name/ <i>Scientific Name</i>	FDACS	<u>Designated Species Status</u> USFWS	FNAI
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Sebastian Inlet State Park Designated Species—Animals

Common Name/ <i>Scientific Name</i>	Designated Species Status		
	FFWCC	USFWS	FNAI
REPTILES			
American alligator <i>Alligator mississippiensis</i>	LS	T(S/A)	S4
Loggerhead turtle <i>Caretta caretta</i>	LT	LT	S3
Green turtle <i>Chelonia mydas mydas</i>	LE	LE	S2
American crocodile <i>Crocodylus acutus</i>	LE	LE	S1
Leatherback <i>Dermochelys coriacea coriacea</i>	LE	LE	S2
Eastern indigo snake <i>Drymarchon corais couperi</i>	LT	LT	S3
Hawksbill turtle <i>Eretmochelys imbricata imbricata</i>	LE	LE	S1
Gopher tortoise <i>Gopherus polyphemus</i>	LS	PT	S3
Southern hognose snake <i>Heterodon simus</i>			S2
Atlantic ridley <i>Lepidochelys kempii</i>	LE	LE	S1
Atlantic salt marsh snake <i>Nerodia clarkii taeniata</i>	LT	LT	S1
Florida pine snake <i>Pituophis melanoleucus mugitus</i>	LS		S3
Florida brown snake <i>Storeria dekayi victa</i>	LT		
BIRDS			
Cooper’s Hawk <i>Accipiter cooperii</i>			S3
Brown Noddy <i>Anous stolidus</i>			S1
Great Egret <i>Ardea alba</i>			S4
Piping Plover <i>Charadrius melodus</i>	LT	LT	S2

Sebastian Inlet State Park Designated Species—Animals

Common Name/ <i>Scientific Name</i>	Designated Species Status		
	FFWCC	USFWS	FNAI
Wilson’s Plover <i>Charadrius wilsonia</i>			S2
Mangrove Cuckoo <i>Coccyzus minor</i>			S3
Little Blue Heron <i>Egretta caerulea</i> LS	LS		S4
Reddish Egret <i>Egretta rufescens</i>	LS		S2
Snowy Egret <i>Egretta thula</i> LS	LS		S4
Tricolored Heron <i>Egretta tricolor</i> LS	LS		S4
White Ibis <i>Eudocimus albus</i>	LS		S4
Swallow-tailed Kite <i>Elanoides forficatus</i>			S2S3
Merlin <i>Falco columbarius</i>			S2
Peregrine Falcon <i>Falco peregrinus</i>	LE		
Magnificent Frigatebird <i>Fregata magnificens</i>			S1
American Oystercatcher <i>Haematopus palliatus</i>	LS		S3
Bald Eagle <i>Haliaeetus leucocephalus</i> LT	LT	LT	S3
Worm-eating Warbler <i>Helmitheros vermivorus</i>			S1
Black Scoter <i>Melanitta nigra</i>			
Wood Stork <i>Mycteria americana</i> LE	LE	LE	S2
Yellow-crowned Night-Heron <i>Nyctanassa violaceus</i>			S3
Black-crowned Night-Heron <i>Nycticorax nycticorax</i>			S3
Osprey <i>Pandion haliaetus</i>			S3S4
Painted Bunting <i>Passerina ciris</i>			S3

Sebastian Inlet State Park Designated Species—Animals

Common Name/ Scientific Name	Designated Species Status		
	FFWCC	USFWS	FNAI
Brown Pelican <i>Pelecanus occidentalis</i>	LS		S3
Hairy Woodpecker <i>Picoides villosus</i>			S3
Roseate Spoonbill <i>Platalea ajaja</i>	LS		S2
Glossy Ibis <i>Plegadis falcinellus</i>			S3
American Avocet <i>Recurvirostra americana</i>			S2
Black Skimmer <i>Rynchops niger</i>	LS		S3
Louisiana Waterthrush <i>Seiurus motacilla</i>			S2
American Redstart <i>Setophaga ruticilla</i>			S2
Least Tern <i>Sterna antillarum</i>	LT		S3
Caspian Tern <i>Sterna caspia</i>			S2
Roseate Tern <i>Sterna dougallii</i>	LT	LT	S1
Sooty Tern <i>Sterna fuscata</i>			S1
Royal Tern <i>Sterna maxima</i>			S3
Gull-billed Tern <i>Sterna nilotica</i>			S2
Sandwich Tern <i>Sterna sandvicensis</i>			S2
Black-whiskered Vireo <i>Vireo altiloquus</i>			

FISH

Snook <i>Centropomus undecimalis</i>	LS
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MAMMALS

North Atlantic right whale <i>Balaena glacialis glacialis</i>	LE	LE
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Sebastian Inlet State Park Designated Species—Animals

Common Name/ Scientific Name	Designated Species Status		
	FFWCC	USFWS	FNAI
Southeastern beach mouse <i>Peromyscus polionotus niveiventris</i>	LT	LT	S1
West Indian manatee <i>Trichechus manatus latirostris</i>	LE	LE	S2

Addendum 6 – Archaeological Site Data

Sebastian Inlet State Park Archaeological Site Data

County	Location	Site #	Site Type 1	Site Type 2	Culture	Culture	Date Recorded
Brevard	in park	8BR124	shell midden	sand mound	unspecified prehistoric		1950
Brevard	in park	8BR125	shell midden homestead or mosquito control structure		Malabar 1 and 2		1951
Brevard	in park	8BR770	shell midden	shell midden	19th - early 20th century	unspecified prehistoric	1990
Brevard	in park	8BR1694	shell midden		unspecified prehistoric		1997
Indian River	in park	8IR34	shell midden		Malabar 1		1953
Indian River	in park	8IR37	shell midden	sand mounds	Malabar 2		1951
Indian River	in park	8IR38	shell midden				1950
Indian River	in park	8IR39	shell midden				1950
Indian River	in park	8IR35	sand mound				1950
Indian River	in park	8IR36	shell midden				1950
Indian River	in park	8IR40	shell midden		Malabar 2		1953

Sebastian Inlet State Park Archaeological Site Data

County	Location	Site #	Site Type 1	Site Type 2	Culture	Culture	Date Recorded
Indian River	in park	8IR25	shell midden				1967
Indian River	in park	8IR26	shipwreck survivors camp	shell midden	1715	unspecified prehistoric	1971
Brevard	to north of park	8BR559	shell midden				1989
Indian River	to south of park	8IR42	shell midden		Malabar 2		1951
Indian River	to south of park	8IR11	shell midden				1953
Indian River	to south of park	8IR24	shipwreck survivors camp	shell midden			1951
Indian River	to south of park	8IR41	shell midden		Orange	Malabar 1	
Indian River	offshore	8IR23	shipwreck		1715 Spanish Fleet		1965
Indian River	offshore	8IR30	shipwreck		1715 Spanish Fleet		1969
Brevard	offshore	8BR168	shipwreck	early 19th century			1965

Addendum 7 – Priority Schedule and Cost Estimates

Sebastian Inlet State Park Priority Schedule And Cost Estimates

Estimates are developed for the funding and staff resources needed to implement the management plan based on goals, objectives and priority management activities. Funding priorities for all state park management and development activities are reviewed each year as part of the Division's legislative budget process. The Division prepares an annual legislative budget request based on the priorities established for the entire state park system. The Division also aggressively pursues a wide range of other funds and staffing resources, such as grants, volunteers and partnerships with agencies, local governments and the private sector for supplementing normal legislative appropriations to address unmet needs. The ability of the Division to implement the specific goals, objectives and priority actions identified in this plan will be determined by the availability of funding resources for these purposes.

Resource Management

1. Revise the exotic plant removal plan to include recently acquired parcels. Zero-10 years. Estimated Cost: \$1,000/year reoccurring **\$10,000.00**
2. Survey for exotic species and implement an exotic species removal program. Zero-10 years. Estimated Cost: \$20,000/year recurring **\$200,000.00**
3. Continue and expand the prescribed fire program by obtaining the needed equipment and by training staff. Add overgrown coastal strand on the north side of inlet to the plan. Zero-10 years. Estimated Cost: \$8,000/year reoccurring **\$80,000.00**
4. Mechanically treat overgrown pyrogenic natural communities. Zero-10 years. Estimated Cost: \$50,000 **\$50,000.00**
5. Monitor the site-bearing duneline, Atlantic beach on the east, and coastline on the Indian River Lagoon to the west for erosion damage. Zero-10 years. Estimated Cost: \$2000/year reoccurring **\$20,000.00**
6. Monitor the changes in the quality and quantity of suitable habitat for southeastern beach mice and the mouse population. Zero-10 years. Estimated Cost: \$5,000, plus \$5,000/year reoccurring..... **\$55,000.00**
7. Survey for and monitor wintering and nesting shorebirds. Zero-10 years. Estimated Cost: \$5000/year reoccurring **\$50,000.00**
8. Restoration of Coconut point protection zone for beach-nesting birds and public education according to the restoration plan. Zero-10 years. Estimated Cost: \$40,000 **\$40,000.00**
9. Monitoring all known archaeological sites for possible threats. Zero-10 years. Estimated Cost: \$1000/yearreoccurring **\$10,000.00**
10. Conduct both a Level I and Level II archaeological survey of the park, both on land and underwater, utilizing GPS technology. Zero-10 years. Estimated Cost: \$75,000 **\$75,000.00**

Sebastian Inlet State Park Priority Schedule And Cost Estimates

- 11. Implement cultural resource monitoring protocols, utilizing photopoints. Zero-10 years. Estimated Cost: \$1,000, plus \$1,000/year reoccurring **\$11,000.00**
- 12. Consider opportunities to reintroduce beach mice to appropriate habitat north of the inlet. Zero-10 years. Estimated Cost: \$5,000..... **\$5,000.00**
- 13. Catalog all collections objects in the fisheries museum. Zero-10 years. Estimated Cost: \$2,000 **\$2,000.00**
- 14. Reach a planning decision on future of McLarty Museum. Zero-10 years. Estimated Cost: \$1,000 **\$1,000.00**
- 15. Seek grant funding for a research project to document history of park and surrounding area. Zero-10 years. Estimated Cost: \$1,000 **\$1,000.00**

Administration

- 1. Add staff positions. Zero-10 years. Estimated Cost (includes benefits): 1 Park Attendant, 2 Toll Collectors, 2 Park Rangers, 1 Environmental Specialist I. Zero-10 years. Estimated Cost: \$136,000/year reoccurring **\$1,360,000.00**

Total Estimated Cost..... \$ 1,970,000.00

Development Area or Facilities

Administrative Office/"Spanish House" Area	468,700.00
Sebastian Inlet Marina.....	1,500,000.00
North Jetty/Beach Use Area.....	1,500,000.00
Swimming Cove/Overflow Area	1,026,000.00
South Inlet Shoreline	750,000.00
Camping Area	710,500.00
Cabin Area	1,976,000.00
South Beach Use Areas.....	267,000.00
Miscellaneous	67,600.00
Support Facilities.....	1,370,000.00

Total w/contingency\$11,562,960.00

Appendix B
**Sebastian Inlet District DMMA
ERP Permit (FDEP)**





Florida Department of Environmental Protection Permit

Permit Issued to:
Sebastian Inlet District

Attention: Martin Smithson, Administrator
(msmithson@sitd.us)

114 Sixth Avenue
Indialantic, Florida 32903

Environmental Resource Permit – Standard General
Permit No.: ERP05-0264486-004-ES

Permit Issued: February 24, 2010
Permit Expires: February 24, 2015

Permitting Authority

Florida Department of Environmental Protection
Central District Office
3319 Maguire Boulevard, Suite 232
Orlando, Florida 32803-3767
Telephone No. 407-893-7874
Fax No. 407-893-3075



Florida Department of Environmental Protection

Central District
3319 Maguire Boulevard, Suite 232
Orlando, Florida 32803-3767

Charlie Crist
Governor

Jeff Kottkamp
Lt. Governor

Michael W. Sole
Secretary

NOTICE OF PERMIT

In the Matter of an
Application for Permit by:
Sebastian Inlet District
114 Sixth Avenue
Indialantic, Florida 32903

Attention: Martin Smithson,
Administrator

Brevard County - ERP
Sebastian Inlet Dredged Material Management Area
File No.05-0264486-004

Dear Mr. Smithson:

Enclosed is Permit Number ERP05-0264486-004-ES to construct a stormwater management system and a dredged material management area (DMMA). The project will be located in the Sebastian Inlet State Park (north side), in Section 20, Township 30 South, and Range 39 East, Brevard County. This permit is issued pursuant to Section 373.118, 373.413, 373.416, and 373.426, *Florida Statutes* (F.S.) and Rules 40C-4, 40C-40, 40C-41, 40C-42, 62-312, and 62-343, *Florida Administrative Code* (F.A.C.)

Pursuant to Operating Agreements executed between the Department and the water management districts, as referenced in Chapter 62-113, F.A.C., the Department is responsible for reviewing this application.

Any party to this Order (permit) has the right to seek judicial review of the permit pursuant to Section 120.68, Florida Statutes, by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Office of General Counsel, 3900 Commonwealth Boulevard, Tallahassee, Florida 32399-3000; and by filing a copy of the notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 days from the date this notice is filed with the Clerk of the Department.

Mediation under section 120.573 of the Florida Statutes is not available for this proceeding.

If there are any questions, please contact Debra Laisure, P.E., of the Submerged Lands and Environmental Resource Program by telephone (407-893-7874), fax (407-893-3075), or email (Debra.Laisure@dep.state.fl.us).

RIGHTS OF AFFECTED PARTIES

"More Protection, Less Process"
www.dep.state.fl.us

This Permit is hereby granted unless a sufficient petition for an administrative hearing is timely filed under sections 120.569 and 120.57 of the Florida Statutes as provided below. The procedures for petitioning for a hearing are set forth below.

Mediation is not available.

A person whose substantial interests are affected by the Department's action may petition for an administrative proceeding (hearing) under sections 120.569 and 120.57 of the Florida Statutes. The petition must contain the information set forth below and must be filed (received by the clerk) in the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000.

Because the administrative hearing process is designed to redetermine final agency action on the application, the filing of a petition for an administrative hearing may result in a modification of the standard general permit or even a denial of the application. If a sufficient petition for an administrative hearing or request for an extension of time to file a petition is timely filed, this standard general permit automatically becomes only proposed agency action on the application, subject to the result of the administrative review process. Accordingly, the applicant is advised not to commence construction or other activities under this standard general permit until the deadlines noted below for filing a petition for an administrative hearing, or request for an extension of time has expired.

Under rule 62-110.106(4) of the Florida Administrative Code, a person whose substantial interests are affected by the Department's action may also request an extension of time to file a petition for an administrative hearing. The Department may, for good cause shown, grant the request for an extension of time. Requests for extension of time must be filed with the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000, before the applicable deadline. A timely request for extension of time shall toll the running of the time period for filing a petition until the request is acted upon. If a request is filed late, the Department may still grant it upon a motion by the requesting party showing that the failure to file a request for an extension of time before the deadline was the result of excusable neglect.

In the event that a timely and sufficient petition for an administrative hearing is filed, other persons whose substantial interests will be affected by the outcome of the administrative process have the right to petition to intervene in the proceeding. Any intervention will be only at the discretion of the presiding officer upon the filing of a motion in compliance with rule 28-106.205 of the Florida Administrative Code.

In accordance with rule 62-110.106(3) FAC, petitions for an administrative hearing by the applicant must be filed within 21 days of receipt of this written notice. Petitions filed by any persons other than the applicant, and other than those entitled to written notice under section 120.60(3) of the Florida Statutes must be filed within 21 days of publication of the notice or within 21 days of receipt of the written notice, whichever occurs first.

Under section 120.60(3) of the Florida Statutes, however, any person who has asked the Department for notice of agency action may file a petition within 21 days of receipt of such notice, regardless of the date of publication.

The petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. The failure of any person to file a petition for an administrative hearing within

the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under sections 120.569 and 120.57 of the Florida Statutes.

A petition that disputes the material facts on which the Department's action is based must contain the following information:

- (a) The name and address of each agency affected and each agency's file or identification number, if known;
- (b) The name, address, and telephone number of the petitioner; the name, address, and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding; and an explanation of how the petitioner's substantial interests are or will be affected by the agency determination;
- (c) A statement of when and how the petitioner received notice of the agency decision;
- (d) A statement of all disputed issues of material fact. If there are none, the petition must so indicate;
- (e) A concise statement of the ultimate facts alleged, including the specific facts that the petitioner contends warrant reversal or modification of the agency's proposed action; and
- (f) A statement of the specific rules or statutes that the petitioner contends requires reversal or modification of the agency's proposed action;
- (g) A statement of the relief sought by the petitioner, stating precisely the action that the petitioner wishes the agency to take with respect to the agency's proposed action.

A petition that does not dispute the material facts on which the Department's action is based shall state that no such facts are in dispute and otherwise shall contain the same information as set forth above, as required by rule 28-106.301. Under sections 120.569(2)(c) and (d) of the Florida Statutes, a petition for administrative hearing must be dismissed by the agency if the petition does not substantially comply with the above requirements or is untimely filed. This action is final and effective on the date filed with the Clerk of the Department unless a petition is filed in accordance with the above. Upon the timely filing of a petition this order will not be effective until further order of the Department.

This standard general permit constitutes an order of the Department. The applicant has the right to seek judicial review of the order under section 120.68 of the Florida Statutes, by the filing of a notice of appeal under rule 9.110 of the Florida Rules of Appellate Procedure with the Clerk of the Department in the Office of General Counsel, 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida, 32399-3000; and by filing a copy of the notice of appeal accompanied by the applicable filing fees with the appropriate district court of appeal. The notice of appeal must be filed within 30 days from the date when the final order is filed with the Clerk of the Department. The applicant, or any party within the meaning of section 373.114(1)(a) of the Florida Statutes, may also seek appellate review of this order before the Land and Water Adjudicatory Commission under section 373.114(1) of the Florida Statutes. Requests for review before the Land and Water Adjudicatory Commission must be filed with the Secretary of the Commission and served on the Department within 20 days from the date when the final order is filed with the Clerk of the Department.



Florida Department of Environmental Protection

Central District
3319 Maguire Boulevard, Suite 232
Orlando, Florida 32803-3767

Charlie Crist
Governor

Jeff Kottkamp
Lt. Governor

Michael W. Sole
Secretary

PROJECT INFORMATION:

Permit Number: ERP05-0264486-004-ES
Expiration Date: February 24, 2015
County: Brevard
Latitude: 27° 51' 39.39"
Longitude: 80° 27' 8.60"
Section 20/Township 51 South/Range 39 East
Project: Sebastian Inlet DMMA

PERMITTEE:

Sebastian Inlet District
114 Sixth Avenue
Indialantic, Florida 32903

Attention: Martin Smithson,
Administrator

Brevard County - ERP
File No. 05-0264486-004

Dear Mr. Smithson:

This permit modification is issued under the provisions of Part IV of Chapter 373, *Florida Statutes* (F.S.) and Chapters 62.4, 62-302, 62-330, 62-343, 62-101.040, 40C-4, 40C-40, 40C-41, and 40C-42, *Florida Administrative Code* (F.A.C.). The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawing(s), plans, and other documents attached hereto or on file with the Department and made a part hereof and specifically described as follows:

Construct and Operate: a DMMA on approximately 5.2 acres of the Sebastian Inlet State Park. The park is located along SR A1A on both the north and south side of the inlet between the Atlantic Ocean and the Intercoastal Waterway. The DMMA will be located on the northern side of the park in Section 20, Township 30 South and Range 39 East, Brevard County. In addition to construction of the DMMA, this permit authorizes improvements to access roads adjacent to SR A1A and in the area where the DMMA will be constructed. Stormwater runoff from the access roads will be treated and attenuated in dry retention areas. All work will be contained in uplands. No impacts to wetlands, either primary or secondary, are authorized by this permit. No dredging activities are authorized by this permit.

The 16 accompanying drawings are attached to and become a part of this permit, ERP05-0264486-004-ES.

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations and restrictions set forth in this permit, are "permit conditions" and are binding and enforceable pursuant to Sections 403.141, 403.727, or 403.859 through 403.861, F.S. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violations of these conditions.
2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.
3. As provided in subsections 403.087(6) and 403.722(5), F.S., the issuance of this permit does not convey any vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state, or local laws or regulations. This permit is not a waiver of or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in this permit.
4. This permit conveys no title to land or water, does not constitute State recognition or acknowledgment of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the State. Only the Trustees of the Internal Improvement Trust Fund may express State opinion as to title.
5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefore; nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department.
6. The permittee shall properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed and used by the permittee to achieve compliance with the conditions of this permit, as required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.
7. The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law and at reasonable times, access to the premises where the permitted activity is located or conducted to:
 - a. Have access to and copy any records that must be kept under conditions of the permit;
 - b. Inspect the facility, equipment, practices, or operations regulated or required under this permit; and
 - c. Sample or monitor any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.Reasonable time may depend on the nature of the concern being investigated.
8. If, for any reason, the permittee does not comply with or will be unable to comply with any conditions or limitation specified in this permit, the permittee shall immediately provide the Department with the following information:
 - a. A description of and cause of noncompliance; and
 - b. The period of noncompliance, including dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the noncompliance. The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the Department for penalties or for revocation of this permit.

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source which are submitted to the Department may be used by the Department as evidence in any enforcement case involving the permitted source arising under the Florida Statutes or Department rules, except where such use is prescribed by Section 403.111 and 403.73, F.S. Such evidence shall only be used to the extent it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules.
10. The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance; provided, however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.
11. This permit is transferable only upon Department approval in accordance with Rule 62-4.120 and 62-30.300, F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.
12. This permit or a copy thereof shall be kept at the work site of the permitted activity.
13. This permit also constitutes:
 - () Determination of Best Available Control Technology (BACT)
 - () Determination of Prevention of Significant Deterioration (PSD)
 - () Certification of compliance with State Water Quality Standards (Section 401, PL 92-500)
 - () Compliance with New Source Performance Standards.
14. The permittee shall comply with the following:
 - (a) Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.
 - (b) The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application for this permit. These materials shall be retained at least three years from the date the sample, measurement, report, or application unless otherwise specified by Department rule.
 - (c) Records of monitoring information shall include:
 1. the date, exact place, and time of sampling or measurements;
 2. the person responsible for performing the sampling or measurements;
 3. the dates analyses were performed;
 4. the person responsible for performing the analyses;
 5. the analytical techniques or methods used;
 6. the results of such analyses.
15. When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware the relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be corrected promptly.

SPECIFIC CONDITIONS:

PERMIT ALTERATIONS

1. All construction, operation, and maintenance shall be as set forth in the plans, specifications and performance criteria contained in the Department's files and approved by this permit. Any alteration or modification to the stormwater system as permitted requires prior approval from the Department.
2. At least 48 hours prior to the commencement of construction activities authorized by this permit, the permittee shall submit to the Department a notice of commencement indicating the start time.
3. If any other regulatory agency should require revisions or modifications to the permitted project, the Department is to be notified of the revisions so that a determination can be made whether a permit modification is required.
4. Permittee must obtain a permit from the Department prior to beginning construction of subsequent phases or any other work associated with this project not specifically authorized by this permit.

SITE INSPECTION BY DEP STAFF

5. Department-authorized staff, upon proper identification, will have permission to enter, inspect, and observe the system to insure conformity with the plans and specifications approved by the permit. The plans are on file in the Central District Office of the Department of Environmental Protection.

WATER QUALITY

6. Turbidity must be controlled to prevent violations of water quality pursuant to Rule 62-302.530(69), Florida Administrative Code. Turbidity shall not exceed 29 Nephelometric Turbidity Units above natural background conditions. Turbidity barriers shall be correctly installed at all locations where the possibility of transferring suspended solids into the receiving waterbody exists due to the proposed work. It is understood that "receiving waterbody" shall not be construed to mean the permittee's settling pond, dredge lake, or other parts of the permittee's closed water system. Turbidity barriers shall remain in place at all locations until construction is completed, soils are stabilized, and vegetation has been established.

Upon final completion of the project and upon reasonable assurance that the project is no longer a potential turbidity source, the permittee will be responsible for the removal of the barriers.

7. The project shall comply with applicable state water quality standards, including:
 - A. 62-302.500 - minimum criteria for all surface waters at all places and at all times;
 - B. 62-302.500 - Surface waters: general criteria;
 - C. 62-302.400 - Class III Waters - Recreation - Propagation and maintenance of a healthy, well-balanced population of Fish and Wildlife; and

SPECIFIC CONDITIONS:

- D. 62-302.700(1) Special Protection, Outstanding Florida Waters, Outstanding National Resource Waters. It shall be the Department policy to afford the highest protection to Outstanding Florida Waters and Outstanding Natural Resource Waters. No degradation of water quality, other than that allowed in Rule 62-4.242(2)(3), F.A.C. is permitted in Outstanding Florida Waters and Outstanding Natural Resource Waters, respectively.

INSPECTION REPORTS

8. Inspection reports for retention, underdrain, wet detention, swales, and wetland stormwater management systems shall be submitted to the Department two years after completion of construction and every two years thereafter on the enclosed form.
9. Copies of all turbidity monitoring reports shall be provided to the Department on a monthly basis. Reports shall be submitted to the letterhead address.

CONSTRUCTION DETAILS

10. The permittee shall require the contractor to review and to maintain in good condition at the construction site a copy of this permit complete with all conditions, attachments, exhibits, and permit modifications issued for this permit. The complete permit copy must be available for review upon request by Department representatives.
11. Before any offsite discharge from the stormwater management system occurs, the retention and detention storage must be excavated to rough grade prior to building construction or placement of impervious surface within the area served by those systems.
12. Adequate measures must be taken to prevent siltation of these treatment systems and control structures during construction or siltation must be removed prior to final grading and stabilization.
13. There shall be no storage or stockpiling of equipment, tools, or materials within the wetlands or Waters of the State.

EROSION CONTROL MEASURES

14. Prior to and during construction, the permittee shall correctly implement and maintain all erosion and sediment control measures (best management practices) required to retain sediment on-site and to prevent violations of state water quality standards. All practices must be in accordance with the guidelines and specifications in chapter 6 of the Florida Land Development Manual: A Guide to Sound Land and Water Management (FDEP 1988), which are hereby incorporated by reference, unless a project specific erosion and sediment control plan is approved as part of the permit, in which case the practices must be in accordance with the plan.

SPECIFIC CONDITIONS:

If site specific conditions require additional measures during any phase of construction or operation to prevent erosion or control sediment, beyond those specified in the erosion and sediment control plan, the permittee shall implement additional best management practices as necessary, in accordance with the specification in chapter 6 of the Florida Land Development Manual: A Guide to Sound Land and Water Management (FDEP 1988). The permittee shall correct any erosion or shoaling that causes adverse impacts to the water courses.

15. The following measures shall be taken to minimize erosion:
 - A. Swales and dry ponds: sodding of all side slopes; seeding and mulching of flat-lying bottom areas;
 - B. Berms and other disturbed flat-lying areas: seed and mulch.

Stabilization measures shall be initiated for erosion and sediment control on disturbed areas as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than seven (7) days after the construction activity in that portion of the site has temporarily or permanently ceased.

16. Turbidity controls shall be utilized around the entire work area. The turbidity controls shall be maintained throughout the duration of the project, and shall be effective in preventing all construction activity and associated earth work from extending into the adjacent wetlands and the Intercoastal Waterway directly west and south of the project site. The turbidity screens shall be installed at a height sufficient to contain any loose fill. At a minimum, the turbidity screens shall be inspected on a daily basis to ensure that they are functioning properly. The turbidity screens shall not be removed until all the side slopes on the DMMA and other disturbed areas have been completely stabilized.
17. All wetland areas or water bodies, which are outside of the specific limits of construction authorized by this permit, must be protected from erosion, siltation, scouring or excess turbidity and dewatering.

SUBMITTAL OF AS-BUILT PLANS

18. Within 30 days after completion of construction of the surface water management system, the permittee shall submit the enclosed form and two sets of record drawings of the project, as actually constructed, thereby notifying the Department that the facilities are ready for final inspection and approval. The permit will be converted from a construction permit to an operation permit once the project is determined to be in compliance with the permitted plans and with conditions provided in Rule 40E-4.381(g), F.A.C.
19. The location of at least one bench mark (and its corresponding elevation) per stormwater pond should be placed in the vicinity of each outfall structure and will be clearly shown on the as-built plans provided to the Department.

SPECIFIC CONDITIONS:

20. The operation phase of this permit shall not become effective until the permittee has complied with the requirements of condition 18, above; has submitted DEP Form 62-343.900(7), F.A.C., "Request for Transfer of Environmental Resource Permit Construction Phase to Operation Phase"; the Department determines the system to be in compliance with the permitted plans and specifications; and the entity approved by the Department in accordance with Section 7.0 of the St. Johns River Water Management District's "Management and Storage of Surface Waters Handbook" (1995) accepts responsibility for operation and maintenance of the system. The permit shall not be transferred to such approved operation and maintenance entity until the operation phase of the permit becomes effective. Following inspection and approval of the permitted system by the Department, the permittee shall initiate transfer of the permit to the approved responsible operating entity if different from the permittee. Until the permit is transferred pursuant to Section 62-343.110(1)(d), F.A.C., the permittee shall be liable for compliance with the terms of the permit.

MAINTENANCE ACTIVITIES

21. The following maintenance activities are the responsibility of the permittee and shall be performed as needed on
- A. All permitted systems:
 - 1. Removal of trash and debris;
 - 2. Inspection of inlets and outlets;
 - 3. Removal of sediments when the storage volume or conveyance capacity of the stormwater management system is below design levels; and
 - 4. Stabilization and restoration of eroded areas.
 - B. Retention, swale, and underdrain systems:
 - 1. Mowing and removal of grass clippings;
 - 2. Aeration, tilling, or replacement of topsoil; and
 - 3. Re-establishment of vegetation on disturbed surfaces.
 - C. Wet detention systems:
 - 1. Replanting of natural vegetation within the littoral zone; and
 - 2. Control of nuisance and exotic vegetation.
22. If the system is not functioning as designed and permitted, it is the permittee's responsibility to perform operational maintenance to restore the system. If operational maintenance measures are insufficient to enable the system to meet the design and performance standards of this chapter, the permittee must either replace the system or construct an alternative design. A permit modification must be obtained from the Department prior to constructing such an alternate design pursuant to section 40E-4.301, F.A.C.

SPECIFIC CONDITIONS:

DEWATERING

23. If dewatering is to occur during any phase of construction or thereafter and discharge is to on-site or off-site surface waters of the State, either directly or via a stormwater management system, a generic permit in accordance with Rule 62-621.300, F.A.C., will be required prior to any dewatering.
24. If dewatering is to occur during any phase of construction or thereafter and the surface water pump(s), wells or facilities are capable of withdrawing 5 million gallons of water per day (MGD) or more, a consumptive use permit in accordance with Rule 40E-20, F.A.C., may be required from the South Florida Water Management District (SFWMD) prior to beginning any dewatering.
25. A plan for routing of discharge water must be submitted to the DEP Central district Office for approval prior to commencement of dewatering.

EARTH WORK

26. If prehistoric or historic artifacts, such as pottery or ceramics, stone tools or metal implements, or any other physical remains that could be associated with Native American cultures, or early colonial or American settlements are encountered at any time within the project site area, the permitted project should cease all activities involving subsurface disturbance in the immediate vicinity of such discoveries. The permittee, or other designee, should contact the Florida Department of State, Division of Historical Resources, Review and Compliance Section at 850/245-6333, or (800) 847-7278, as well as the appropriate permitting agency office. Project activities should not resume without verbal and/or written authorization from the Division of Historical Resources.
27. In the event that any unmarked human remains are encountered anywhere on the subject property, all work shall stop immediately and the proper authorities notified in accordance with Section 872.05, Florida Statutes. The permittee, or other designee, should contact the authority cited in this Section. Thereafter, project activities should not resume without verbal and/or written authorization from the designated official.

MISCELLANEOUS

28. No impacts to wetlands, either primary or secondary, are authorized by this permit.
29. No dredging activities are authorized by this permit.

Executed in Orlando, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION



David Herbster
Submerged Lands and Environmental Resources
Date of Issue: February 24, 2010

Appendix C
**Florida Exotic Pest Plant
Council's (FEPPC) 2019 List of
Invasive Plant Species**





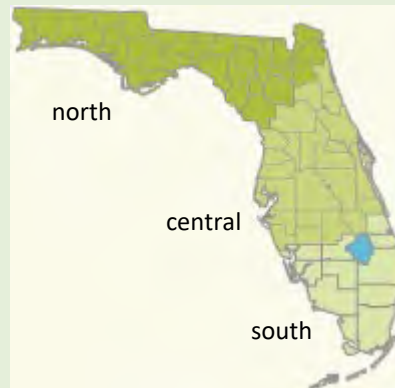
For more information on
invasive exotic plants
including links to related
web pages, visit:
www.fleppc.org

FLEPPC List Definitions:

Exotic—a species introduced to Florida, purposefully or accidentally, from a natural range outside of Florida. **Native**—a species whose natural range includes Florida. **Naturalized exotic**—an exotic that sustains itself outside cultivation (it is still exotic; it has not “become” native).

Invasive exotic— an exotic that has not only naturalized, but is expanding on its own in Florida native plant communities.

Zone: N = north, **C** = central, **S** = south, Referring to each species’ general distribution in regions of Florida (not its potential range in the state). Please refer to the map below.



Citation example:

FLEPPC. 2019 List of Invasive Plant Species.
Florida Exotic Pest Plant Council. Internet: www.fleppc.org

The 2019 list was prepared by the FLEPPC Plant List Committee

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Florida Exotic Pest Plant Council’s 2019 List of Invasive Plant Species

The mission of the Florida Exotic Pest Plant Council is to reduce the impacts of invasive plants in Florida through the exchange of scientific, educational, and technical information.

Note: The FLEPPC List of Invasive Plant Species is not a regulatory list. Only those plants listed as Federal Noxious Weeds, Florida Noxious Weeds, Florida Prohibited Aquatic Plants, or in local ordinances are regulated by law.

Purpose of the List

To provide a list of plants determined by the Florida Exotic Pest Plant Council to be invasive in natural areas of Florida and routinely update the list based upon information of newly identified occurrences and changes in distribution over time. Also, to focus attention on:

- The adverse effects exotic pest plants have on Florida’s biodiversity and native plant communities,
- The habitat losses in natural areas from exotic pest plant infestations,
- The impacts on endangered species via habitat loss and alteration,
- The need for pest plant management,
- The socio-economic impacts of these plants (e.g., increased wildfires or flooding in certain areas),
- Changes in the severity of different pest plant infestations over time,
- Providing information to help managers set priorities for research and control programs.

www.fleppc.org

CATEGORY I

Invasive exotics that are altering native plant communities by displacing native species, changing community structures or ecological functions, or hybridizing with natives. This definition does not rely on the economic severity or geographic range of the problem, but on the documented ecological damage caused.

Scientific Name	Common Name	Zone	Scientific Name	Common Name	Zone
<i>Abrus precatorius</i>	rosary pea	C, S	<i>Melinis repens</i>	Natalgrass	C, S
<i>Acacia auriculiformis</i>	earleaf acacia	C, S	<i>Microsorium grossum</i> ⁴	serpent fern, wart fern	S
<i>Albizia julibrissin</i>	mimosa, silk tree	N, C	<i>Microstegium vimineum</i>	Japanese stiltgrass	N
<i>Albizia lebbbeck</i>	woman's tongue	C, S	<i>Mimosa pigra</i>	catclaw mimosa	C, S
<i>Ardisia crenata</i>	coral ardisia	N, C, S	<i>Nandina domestica</i>	heavenly bamboo, nandina	N, C
<i>Ardisia elliptica</i>	shoebutton ardisia	C, S	<i>Nephrolepis brownii</i>	Asian sword fern	C, S
<i>Asparagus aethiopicus</i>	asparagus fern	N, C, S	<i>Nephrolepis cordifolia</i>	sword fern	N, C, S
<i>Bauhinia variegata</i>	orchid tree	C, S	<i>Neyraudia reynaudiana</i>	Burma reed	S
<i>Bischofia javanica</i>	bishopwood	C, S	<i>Nymphaoides cristata</i>	crested floatingheart	C, S
<i>Calophyllum antillanum</i>	Santa Maria	S	<i>Paederia cruddasiana</i>	sewer vine	S
<i>Casuarina equisetifolia</i>	Australian-pine	N, C, S	<i>Paederia foetida</i>	skunk vine	N, C, S
<i>Casuarina glauca</i>	suckering Australian-pine	C, S	<i>Panicum repens</i>	torpedograss	N, C, S
<i>Cenchrus purpureus</i> (<i>Pennisetum purpureum</i>)	elephantgrass, Napier grass	N, C, S	<i>Pistia stratiotes</i>	water-lettuce	N, C, S
<i>Cinnamomum camphora</i>	camphor-tree	N, C, S	<i>Psidium cattleianum</i>	stawberry guava	C, S
<i>Colocasia esculenta</i>	wild taro	N, C, S	<i>Psidium guajava</i>	guava	C, S
<i>Colubrina asiatica</i>	latherleaf	S	<i>Pueraria montana</i> var. <i>lobata</i>	kudzu	N, C, S
<i>Cupaniopsis anacardioides</i>	carrotwood	C, S	<i>Rhodomyrtus tomentosa</i>	downy rose-myrtle	C, S
<i>Deparia petersenii</i>	Japanese false spleenwort	N, C	<i>Ruellia simplex</i>	Mexican petunia	N, C, S
<i>Dioscorea alata</i>	winged yam	N, C, S	<i>Salvinia minima</i>	water spangles	N, C, S
<i>Dioscorea bulbifera</i>	air potato	N, C, S	<i>Scaevola taccada</i>	beach naupaka, half-flower	N, C, S
<i>Dolichandra unguis-cati</i> (<i>Macfadyena unguis-cati</i>)	cat's-claw vine	N, C, S	<i>Schefflera actinophylla</i>	schefflera, umbrella tree	C, S
<i>Eichhornia crassipes</i>	water-hyacinth	N, C, S	<i>Schinus terebinthifolia</i>	Brazilian pepper	N, C, S
<i>Eugenia uniflora</i>	Surinam cherry	C, S	<i>Scleria lacustris</i>	Wright's nutrush	C, S
<i>Ficus microcarpa</i> ¹	laurel fig	C, S	<i>Scleria microcarpa</i> [*]	tropical nutrush	C, S
<i>Hydrilla verticillata</i>	hydrilla	N, C, S	<i>Senna pendula</i> var. <i>glabrata</i>	Christmas senna, climbing cassia	C, S
<i>Hygrophila polysperma</i>	green hygro	N, C, S	<i>Solanum tampicense</i>	wetland night shade	C, S
<i>Hymenachne amplexicaulis</i>	West Indian marsh grass	N, C, S	<i>Solanum viarum</i>	tropical soda apple	N, C, S
<i>Imperata cylindrica</i>	cogongrass	N, C, S	<i>Sporobolus jacquemontii</i>	West Indian dropseed	C, S
<i>Ipomoea aquatica</i>	water-spinach	C	<i>Syngonium podophyllum</i>	arrowhead vine	N, C, S
<i>Jasminum dichotomum</i>	Gold Coast jasmine	C, S	<i>Syzygium cumini</i>	Java plum	C, S
<i>Jasminum fluminense</i>	Brazilian Jasmine	C, S	<i>Tectaria incisa</i>	incised halberd fern	S
<i>Lantana strigocamara</i> ²	lantana, shrub verbena	N, C, S	<i>Thelypteris opulenta</i>	jeweled maidenhair fern	S
<i>Ligustrum lucidum</i>	glossy privet	N, C	<i>Thespesia populnea</i>	seaside mahoe	C, S
<i>Ligustrum sinense</i>	Chinese privet	N, C, S	<i>Tradescantia fluminensis</i>	small-leaf spiderwort	N, C
<i>Lonicera japonica</i>	Japanese honeysuckle	N, C, S	<i>Tradescantia spathacea</i>	oyster plant	C, S
<i>Ludwigia peruviana</i>	Peruvian primrosewillow	N, C, S	<i>Triadica sebifera</i>	Chinese tallow-tree	N, C, S
<i>Lumnitzera racemosa</i>	black mangrove	S	<i>(Sapium sebiferum)</i>		
<i>Luziola subintegra</i>	Tropical American watergrass	S	<i>Urena lobata</i>	Caesar's weed	N, C, S
<i>Lygodium japonicum</i>	Japanese climbing fern	N, C, S	<i>Urochloa mutica</i>	paragrass	N, C, S
<i>Lygodium microphyllum</i>	Old World climbing fern	N, C, S	<i>Vitex rotundifolia</i>	beach vitex	N
<i>Manilkara zapota</i>	sapodilla	S			
<i>Melaleuca quinquenervia</i>	melaleuca, paper bark	C, S			

¹ Does not include *Ficus microcarpa* var. *fuyuenensis*, which is sold as "green island ficus".

² Historically this non-native has been referred to as *Lantana camara*, a species not known to occur in Florida.

³ Does not include the native endemic *Spermacoce neoterminalis*.

⁴ *Microsorium grossum* has been previously misidentified as *Microsorium scolopendria*.

^{*} Added to the FLEPPC List of Invasive Species in 2019.

Plant names are those published in the Atlas of Florida Plants (<http://www.florida.plantatlas.usf.edu>). For historical species nomenclature see "Guide to Vascular Plants of Florida Third Edition." Wunderlin and Hansen, University of Florida Press. 2011.

CATEGORY II

Invasive exotics that have increased in abundance or frequency but have not yet altered Florida plant communities to the extent shown by Category 1 species. These species may become Category 1 if ecological damage is demonstrated.

Scientific Name	Common Name	Zone	Scientific Name	Common Name	Zone
<i>Adenanthera pavonina</i>	red sandalwood	S	<i>Koeleruteria elegans</i> subsp. <i>formosana</i>	flamegold tree	C, S
<i>Agave sisalana</i>	sisal hemp	C, S	<i>Landoltia punctata</i>	spotted duckweed	N, C, S
<i>Alstonia macrophylla</i>	devil tree	S	<i>Leucaena leucocephala</i>	leadtree	N, C, S
<i>Alternanthera philoxeroides</i>	alligatorweed	N, C, S	<i>Limnophila sessiliflora</i>	Asian marshweed	N, C, S
<i>Antigonon leptopus</i>	coral vine	N, C, S	<i>Livistona chinensis</i>	Chinese fan palm	C, S
<i>Ardisia japonica</i>	Japanese ardisia	N	<i>Macroptilium lathyroides</i>	wild bushbean	N, C, S
<i>Aristolochia elegans</i> (<i>Aristolochia littoralis</i>)	calico flower	N, C, S	<i>Melaleuca viminalis</i> (<i>Callistemon viminalis</i>)	bottlebrush	C, S
<i>Asystasia gangetica</i>	Ganges primrose	C, S	<i>Melia azedarach</i>	Chinaberry	N, C, S
<i>Begonia cucullata</i>	wax begonia	N, C, S	<i>Melinis minutiflora</i>	molasses grass	C, S
<i>Broussonetia papyrifera</i>	paper mulberry	N, C, S	<i>Mikania micrantha</i>	mile-a-minute vine	S
<i>Bruguiera gymnorhiza</i>	large-leafed mangrove	S	<i>Momordica charantia</i>	balsam-apple	N, C, S
<i>Callisia fragrans</i>	Inch plant	C, S	<i>Murraya paniculata</i>	orange-jessamine	S
<i>Casuarina cunninghamiana</i>	river sheoak	C, S	<i>Myriophyllum spicatum</i>	Eurasian water-milfoil	N, C, S
<i>Cecropia palmata</i>	trumpet tree	S	<i>Passiflora biflora</i>	twin-flowered passion vine	S
<i>Cenchrus polystachios</i> (<i>Pennisetum polystachios</i>)	mission grass	S	<i>Phoenix reclinata</i>	Senegal date palm	C, S
<i>Cenchrus setaceus</i> (<i>Pennisetum setaceum</i>)	fountain grass	S	<i>Phyllostachys aurea</i>	golden bamboo	N, C
<i>Cestrum diurnum</i>	day jessamine	C, S	<i>Pittosporum pentandrum</i>	Taiwanese cheesewood	S
<i>Chamaedorea seifrizii</i>	bamboo palm	S	<i>Platycterium bifurcatum</i>	staghorn fern	S
<i>Clematis terniflora</i>	Japanese clematis	N, C	<i>Praxelis clematidea</i>	praxelis	C
<i>Cocos nucifera</i>	coconut palm	S	<i>Pteris vittata</i>	Chinese brake, ladder brake	N, C, S
<i>Crassocephalum crepidioides</i>	redflower ragleaf	C, S	<i>Ptychosperma elegans</i>	solitary palm	S
<i>Cryptostegia madagascariensis</i>	Madagascar rubbervine	C, S	<i>Richardia grandiflora</i>	largeflower Mexican clover	N, C, S
<i>Cyperus involucratus</i>	umbrella plant	C, S	<i>Ricinus communis</i>	castorbean	N, C, S
<i>Cyperus proflifer</i>	dwarf papyrus	C, S	<i>Rotala rotundifolia</i>	dwarf rotala, roundleaf toothcup	S
<i>Dactyloctenium aegyptium</i>	Durban crow's-foot grass	C, S	<i>Ruellia blechum</i>	green shrimp plant	N, C, S
<i>Dalbergia sissoo</i>	Indian rosewood, sissoo	C, S	<i>Sesbania punicea</i>	rattlebox	N, C, S
<i>Dalechampia scandens</i> [*]	spurge-creeper	S	<i>Sida planicaulis</i>	mata-pasto	C, S
<i>Distimake tuberosus</i> (<i>Merremia tuberosa</i>)	Spanish arbor vine, wood-rose	C, S	<i>Solanum diphyllum</i>	twingleaf nightshade	N, C, S
<i>Dracaena hyacinthoides</i> (<i>Sansevieria hyacinthoides</i>)	bowstring hemp	C, S	<i>Solanum torvum</i>	turkey berry	N, C, S
<i>Elaeagnus pungens</i>	silverthorn, thorny olive	N, C	<i>Spermacoce verticillata</i> ³	shrubby false buttonweed	C, S
<i>Elaeagnus umbellata</i>	autumn olive, silverberry	N	<i>Sphagnetocola trilobata</i>	wedelia	N, C, S
<i>Epipremnum pinnatum</i> cv. 'Aureum'	pothos	C, S	<i>Stachytarpheta cayennensis</i>	nettle-leaf porterweed	S
<i>Eulophia graminea</i>	Chinese crown orchid	C, S	<i>Syagrus romanzoffiana</i>	queen palm	C, S
<i>Ficus altissima</i>	council tree, false banyan	S	<i>Syzygium jambos</i>	Malabar plum, rose-apple	N, C, S
<i>Flacourtia indica</i>	governor's plum	S	<i>Talipariti tiliaceum</i>	mahoe, sea hibiscus	C, S
<i>Hemarthria altissima</i>	limpograss	C, S	<i>Terminalia catappa</i>	tropical-almond	C, S
<i>Heteropteryx brachiata</i>	redwing	S	<i>Terminalia muelleri</i>	Australian-almond	C, S
<i>Hyparrhenia rufa</i>	jaragua	N, C, S	<i>Tribulus cistoides</i>	puncture vine, burr-nut	N, C, S
<i>Ipomoea carnea</i> subsp. <i>fistulosa</i>	shrub morning-glory	C, S	<i>Urochloa maxima</i> (<i>Panicum maximum</i>)	Guineagrass	N, C, S
<i>Kalanchoe x houghtonii</i>	mother of millions	N, C, S	<i>Vernicia fordii</i>	tung-oil tree	N, C, S
<i>Kalanchoe pinnata</i>	life plant	C, S	<i>Vitex trifolia</i>	simple-leaf chastetree	C, S
			<i>Washingtonia robusta</i>	Washington fan palm	C, S
			<i>Wisteria sinensis</i>	Chinese wisteria	N, C
			<i>Xanthosoma sagittifolium</i>	malanga, elephant ear	N, C, S

Appendix D
**DMMA Plant Photos, by
Species**

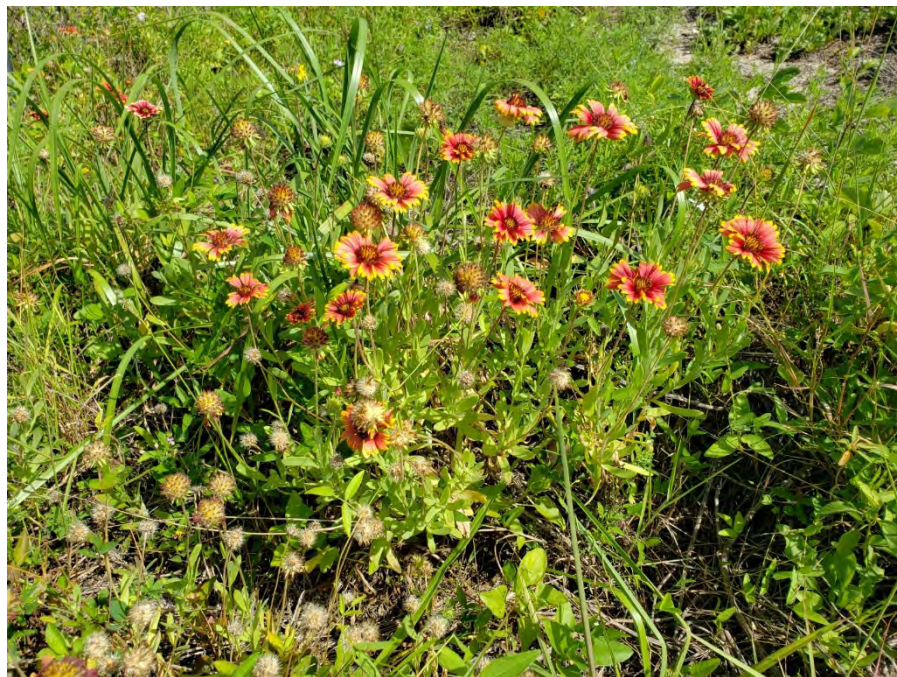
Bahiagrass
(*Paspalum notatum*)



Bermudagrass
(*Cynodon dactylon*)



Blanket Flower
(*Gaillardia pulchella*)



Camphorweed
(*Heterotheca subaxillaris*)



Coastal Sandbur
(*Cenchrus spinifex*)



Coffee Senna
(*Senna occidentalis*)



Coin Vine
(*Dalbergia ecastophllyum*)



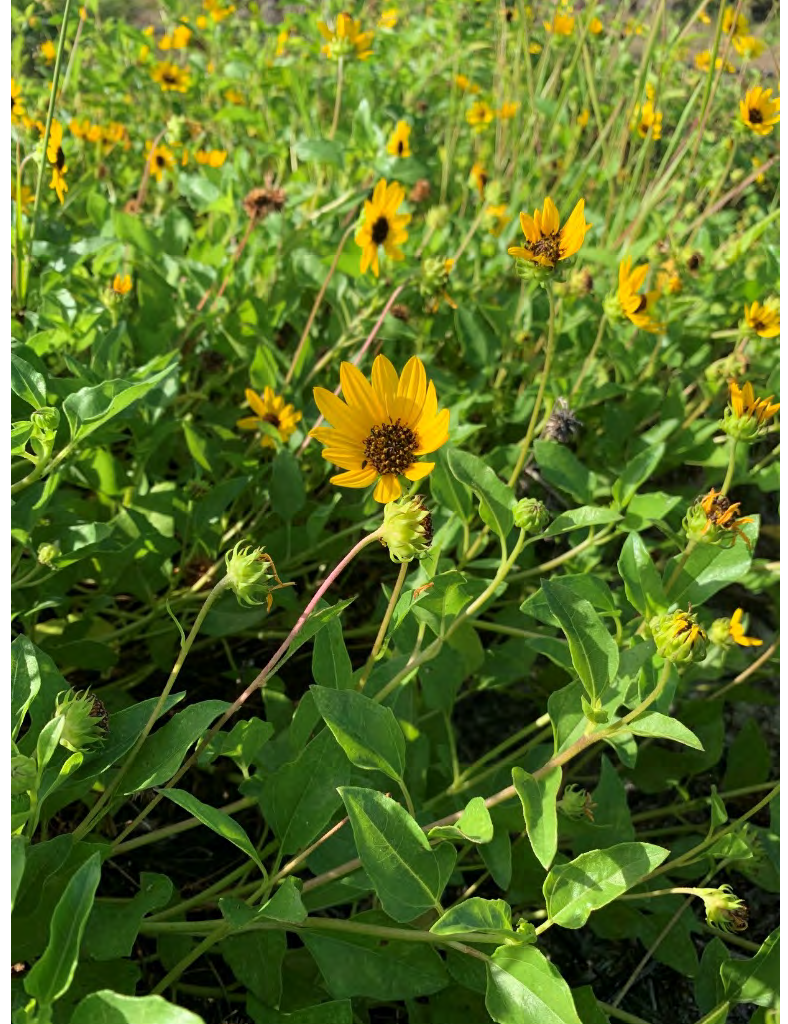
Common Wireweed
(*Sida ulmifolia*)



Dixie Ticktrefoil
(*Desmodium tortuosum*)



Dune Sunflower
(*Helianthus debilis*)



Durban Crowfootgrass
(*Dactyloctenium aegyptium*)
Nuisance/Exotic



Frog Fruit
(*Phyla nodiflora*)



Guineagrass
(*Urochloa maxima*)
Nuisance/Exotic



Gumbo Limbo
(*Bursera simaruba*)



Hairy Cowpea
(*Vigna luteola*)



Large-flower Mexican Clover
(*Richardia grandiflora*)

Nuisance/Exotic



Madagascar Periwinkle
(*Catharanthus roseus*)



Moonflower
(*Ipomoea alba*)



Nickerbean
(*Guilandina bonduc*)



Painted-leaf
(*Euphorbia cyathophora*)



Partridge-pea
(*Chamaecrista fasciculata*)



Pinewoods Fingergrass
(*Eustachys petraea*)



Poorman's Patch
(*Mentzelia floridana*)



Puncture Vine
(*Tribulus terrestris*)



Ragweed
(*Ambrosia artemisiifolia*)



Railroad Vine
(*Ipomoea pes-caprae*)



Rose Natalgrass
(*Melinis repens*)
Nuisance/Exotic



Sea Grape
(*Coccoloba uvifera*)



Shake-Shake
(*Crotalaria incana*)



Showy Milkwort
(*Asemeia violacea*)



Shrubby False Buttonweed
(*Spermacoce verticillata*)
Nuisance/Exotic



Southern Crabgrass
(*Digitaria ciliaris*)



Spurred Butterfly Pea
(*Centrosema virginianum*)



Tickseed
(*Bidens alba*)



Torpedo Grass (*Panicum repens*)
Nuisance/Exotic



Trailing Indigo
(*Indigofera spicata*)



Tread-softly
(*Cnidoscolus stimulosus*)



Vente Conmingo
(*Croton glandulosus*)



Virginia Creeper
(*Parthenocissus quinquefolia*)



White Sweetclover
(*Melilotus albus*)



Appendix E

DMMA Daily Herbicide Log



Appendix F

DMMA Herbicide Labels



71368-1

8/6/2002

1/12

ACCEPTED

AUG - 6 2002

Under the Federal Insecticide,
Fungicide, and Rodenticide Act,
as amended, for the pesticide
registered under
EPA Reg. No. 71368-1



Weedar® 64

Broadleaf Herbicide

The 2,4-D Amine Weed Killer

To Control Susceptible Broadleaf Weeds In Cereal Grains, Corn, Sorghum, Rice, Sugarcane,
Soybeans (Preplant only), Turf, Non-Crop Areas, and Certain Aquatic Applications.

ACTIVE INGREDIENT:

2,4-Dichlorophenoxyacetic acid, dimethylamine salt 46.8%*

INERT INGREDIENTS: 53.2%

100.0%

*2,4-Dichlorophenoxyacetic acid equivalent 38.9% by weight or 3.8 pounds per gallon. Isomer specific by AOAC method No. 978.05

EPA Reg. No. 71368-1

EPA Est. No. 228-IL-1

**KEEP OUT OF REACH OF CHILDREN
DANGER - PELIGRO**

PRECAUCION AL USUARIO: Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle.
(If you do not understand the label, find someone to explain it to you in detail.)

See Inside for Additional Precautionary Statements.

For Chemical Spill, Leak, Fire, or Exposure, Call CHEMTREC (800) 424-9300.
For Medical Emergencies Only, Call 877-325-1840.

NET CONTENTS 2.5 GALLONS (9.46 L)

Manufactured By:
Nufarm, Inc.
St. Joseph, MO



FIRST AID

IF IN EYES: Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing. Call a poison control center or doctor for treatment advice.

IF ON SKIN OR CLOTHING: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or a doctor for treatment advice.

IF INHALED: Remove victim to fresh air. If person is not breathing, call 911 or an ambulance, and then give artificial respiration, preferably mouth-to-mouth if possible. Call a poison control center or doctor for further treatment advice.

NOTE TO PHYSICIANS: This product contains a phenoxy herbicidal chemical. There is no specific antidote. All treatments should be based on observed signs and symptoms of distress in the patient. Overexposure to materials other than this product may have occurred.

PRECAUTIONARY STATEMENTS HAZARDS TO HUMANS AND DOMESTIC ANIMALS DANGER

Corrosive. Causes irreversible eye damage. Harmful if swallowed. May be fatal if absorbed through the skin. Avoid breathing vapors or spray mist. Do not get in eyes, on skin or on clothing.

PERSONAL PROTECTIVE EQUIPMENT (PPE):

Applicators and other handlers must wear: coveralls over short-sleeved shirt and short pants, waterproof gloves, chemical-resistant footwear plus socks, chemical-resistant headgear for overhead exposure and protective eye wear. A chemical-resistant apron should also be worn when cleaning equipment, mixing or loading.

Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them. Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry. After each day of use, clothing or PPE must not be reused until it has been cleaned.

ENGINEERING CONTROL STATEMENTS:

When handlers use closed systems, enclosed cabs, or aircraft in a manner that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides [40 CFR 170.240(d) (4-6)], the handler PPE (personal protective equipment) may be reduced or modified as specified in the WPS.

For containers over 1 gallon but less than 5 gallons, mixers and loaders who do not use a mechanical system (probe and pump) to transfer the contents of this container must wear coveralls or a chemical-resistant apron in addition to the other required PPE.

For containers of 5 gallons or more, a mechanical transfer system (probe and pump) must be used for transferring the contents of the container. If the contents of a non-refillable pesticide containers are emptied, the probe must be rinsed before removal. If the mechanical system is used in a manner that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides [40 CFR 170.240(d)(4)] the handler PPE requirements may be reduced or modified as specified in the WPS.

USER SAFETY RECOMMENDATIONS

Users should:

- Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.
- Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

ENVIRONMENTAL HAZARDS

This product is toxic to aquatic invertebrates. Drift or runoff may adversely affect aquatic invertebrates and non-target plants. For terrestrial uses, do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment washwaters. Do not apply when weather conditions favor drift from treated areas. Do not use the same spray equipment for other purposes unless thoroughly cleaned.

Do not contaminate water used for irrigation or domestic purposes (except as specifically recommended on this label) especially in areas where grapes, cotton, tomatoes or other susceptible plants are grown.

Do not treat irrigation ditches in areas where water will be used to overhead (sprinkler) irrigate susceptible crops especially grapes, tomatoes, tobacco, and cotton.

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Do not apply WEEDAR® 64 Broadleaf Herbicide directly to, or permit to drift onto cotton, okra, grapes, tomatoes, fruit trees, vegetables, flowers or other desirable crop or ornamental plants which are susceptible to 2,4-D herbicide. Do not apply near susceptible plants since very small quantities of the 2,4-D will cause severe injury during the growing or dormant periods. Crops contacted by WEEDAR® 64 Broadleaf Herbicide sprays or spray drift may be killed or suffer significant stand loss with extensive quality and yield reduction.

Do not apply when a temperature air inversion exists. Such a condition is characterized by little or no air movement and an increase in air temperature with an increase in height. In humid regions, a fog or mist may form. An inversion may be detected by producing a smoke column and checking for a layering effect. If questions exist pertaining to the existence of an inversion, consult with local weather services before making an application.

Use coarse sprays to minimize drift. Do not apply with hollow cone-type insecticide or other nozzles that produce fine spray droplets. Drift from aerial or ground application may be reduced by: (1) applying as near to the target as possible in order to obtain coverage; (2) by increasing the volume of spray mix per acre; (3) by decreasing the pounds of pressure at the nozzle tips; and (4) by using nozzles which produce a coarse spray pattern; (5) by not applying when wind is blowing toward susceptible crops or valuable plants.

MIXING AND LOADING: Most cases of ground water contamination involving phenoxy herbicides such as 2,4-D have been associated with mixing/loading and disposal sites. Caution should be exercised when handling 2,4-D pesticides at such sites to prevent contamination of ground water supplies. Use of closed systems for mixing or transferring this pesticide will reduce the probability of spills. Placement of the mixing/loading equipment on an impervious pad to contain spills will help prevent ground water contamination.

DIRECTIONS FOR USE

It Is A Violation Of Federal Law To Use This Product In A Manner Inconsistent With Its Labeling.

Read entire label before using this product.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.

AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR Part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE) and restricted entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not enter or allow entry into treated areas during the restricted entry interval (REI) of 48 hours.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated such as plants, soil or water is: coveralls over short-sleeved shirt and short pants, waterproof gloves, chemical-resistant footwear plus socks, chemical-resistant headgear for overhead exposure and protective eyewear.

NON-AGRICULTURAL USE REQUIREMENTS

The requirements in this box apply to uses of this product that are NOT within the scope of the Worker Protection Standard (WPS) for agricultural pesticides (40 CFR Part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries or greenhouses.

For ornamental turf uses (golf courses, cemeteries, parks and other turf grass areas), do not enter treatment areas until sprays have dried. Do not allow people (other than applicator) or pets on treatment area during application.

STORAGE AND DISPOSAL

STORAGE: Do not contaminate water, food or feed by storage or disposal. Store in original container in a dry, secured storage area. Keep container tightly closed when not in use.

PESTICIDE DISPOSAL: Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal law and may contaminate ground water. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

CONTAINER DISPOSAL - NONRETURNABLE PLASTIC: Triple rinse or (equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

RETURNABLE -- REFILLABLE CONTAINERS: After use, return the container to the point of purchase or designated locations. This container must only be refilled with WEEDAR® 64 Herbicide. DO NOT REUSE THE CONTAINER FOR ANY OTHER PURPOSE. Prior to refilling, inspect thoroughly for damage such as cracks, punctures, abrasions and damaged or worn out threads on closure devices. Do not refill or transport damaged or leaking containers. Check for leaks after refilling and before transportation. If the container is not being refilled, return it to the point of purchase.

GENERAL PRECAUTIONS AND RESTRICTIONS

Do not apply WEEDAR® 64 Broadleaf Herbicide through any type of irrigation system. Do not use in or near a greenhouse.

MIXING INSTRUCTIONS

Add about one-half the water to the mixing tank, then add WEEDAR® 64 with agitation and finally the rest of water with continuing agitation.

NOTE: Adding oil, wetting agent, or other surfactants to the spray may increase effectiveness on weeds but also may reduce selectivity to crops, resulting in crop damage.

COMPATIBILITY

If WEEDAR® 64 Broadleaf Herbicide is to be tank mixed with fertilizers or with other pesticides, compatibility should be tested prior to mixing. To test for compatibility, use a small container and mix a small amount (0.5 to 1 qt) of spray, combining all ingredients in the same ratio as the anticipated use. If any indications of physical incompatibility develop, do not use this mixture for spraying. Indications of incompatibility usually will appear within 5 to 15 minutes after mixing.

Read and follow all directions and precautions on this label and on the labels of any products for which a tank mixture is being considered.

APPLICATION PROCEDURES

Apply by air or ground equipment in sufficient gallowage to obtain adequate coverage, except as otherwise directed on this label. Use 2 or more gallons of water per acre for aerial application and 10 or more gallons of water per acre for ground application.

GENERAL INFORMATION

INJURY TO CROPS FROM THIS HERBICIDE MAY OCCUR. IF YOU ARE NOT PREPARED TO ACCEPT SOME DEGREE OF CROP INJURY DO NOT USE THIS PRODUCT.

Crop varieties vary in response to 2,4-D and some are easily injured. Apply WEEDAR® 64 Broadleaf Herbicide only to varieties known to be tolerant to 2,4-D. If you are uncertain concerning tolerant varieties or local use situations that may affect crop tolerance to 2,4-D, consult your seed company, State Agricultural Extension Service or qualified crop consultant for advice.

Be sure that use of this product conforms to all applicable laws, rules and regulations. Certain states have restrictions pertaining to application distances from susceptible crops. The applicator should become familiar with these laws, rules or regulations and follow them exactly.

GENERAL WEED LIST

Annual and Biennial Weeds

*beggarticks	jimsonweed	**pigweeds (<i>Amaranthus</i> spp.)	sunflower
bullthistle	*knotweed	prickly lettuce	*vervans
coffeeweed	*mallow (venice or little)	ragweed (common or giant)	vetches
common cocklebur	marshelder	rough fleabane	wild carrot
common burdock	morningglory (common, ivy, woolly)	*Russian thistle	wild lettuce
common evening primrose	*musk thistle (***)	Salsify (western or common)	wild parsnips
common lambsquarters	mustards (except blue mustard)	*smartweeds (annual species)	
hairy galinsoga	pepper weeds (except perennial)	sowthistles (annual or spiny)	

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Perennial Weeds

*bindweed (hedge, field, European)	dandelion	*hoary cress	plantains
blue lettuce	*docks	*ironweed	sowthistle (perennial)
*Canada thistle	*dogbanes	Jerusalem artichoke	*vervains
catnip	*goldenrod	many flowered aster	*wild garlic
chicory	*ground ivy	*nettles (including stinging)	*wild onion
	healall	*orange hawkweed	

*These species may require repeated applications and/or use of the higher rate recommended on this product label even under ideal conditions for application.

**Control of pigweeds in the High Plains area of Texas and Oklahoma may not be satisfactory with this product.

***Not registered for control of musk thistle in California.

SPECIFIC USE DIRECTIONS

CEREAL GRAINS

CROP	AMOUNT OF WEEDAR® 64 PER ACRE	DIRECTIONS
Wheat, Barley, Oats Rye, Triticale (not underseeded with legumes) Postemergence Annual and biennial broadleaf weeds Perennial broadleaf weeds	1/2 to 2 pints* 1 to 2 pints*	Apply after grain is fully tillered (usually about 4 to 8 inches high) but not forming joints in the stem. Do not spray grain in the boot to dough stage.
Wheat, Barley, Oats, Rye, Triticale (underseeded with legumes)	1/4 to 1/2 pint*	Apply after grain is 8 inches tall. Do not spray grain in boot to dough stage. Do not spray alfalfa or sweet clover unless the infestation is severe and injury to these legumes can be tolerated.
Emergency weed control Wheat, Triti- cale Perennial broadleaf weeds	3 pints	Apply when weeds are approaching bud stage, after the grain dough stage. Do not spray during the boot to dough stage. The 3 pints per acre application can produce injury to wheat. Balance the severity of your weed problem against the possibility of crop damage. Where perennial weeds are scattered, spot treatment is suggested to minimize the extent of crop injury.

*Use the lower rate if small annual and biennial weeds are the major problem. Use the higher rate if perennial weeds or annual and biennial weeds are present which are in the hard-to-kill categories as determined by local experience. The higher rates increase the risk of grain injury and should be used only where the weed control problem justifies the grain damage risk. Do not apply WEEDAR® 64 to grain in the seedling stage.

RESTRICTIONS AND LIMITATIONS FOR USE ON CEREAL GRAINS

For aerial application on grain, apply WEEDAR® 64 Broadleaf Herbicide in 3 to 10 gallons of water per acre.

For ground application a minimum of 10 to 15 gallons of water per acre is recommended for proper spray coverage.

Do not permit dairy animals or meat animals being finished for slaughter to forage treated grain fields within 2 weeks after treatment. Do not feed treated straw to livestock if an emergency treatment as described above is applied.

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CORN AND SORGHUM

CROP	AMOUNT OF WEEDAR® 64 PER ACRE	DIRECTIONS
CORN (Field and Sweet) Preplant	1 to 2 pints	To control emerged broadleaf weed seedlings or existing cover crops prior to planting corn, apply 7 to 14 days before planting. Do not use on light, sandy soil, or where soil moisture is inadequate for normal weed growth. Use high rate for less susceptible weeds or cover crops such as alfalfa.
Preemergence	2 to 3 pints	Apply 3 to 5 days after planting but before corn emerges. Do not use on light, sandy soils or where soil moisture is low.
Postemergence Annual broadleaf weeds Perennial broadleaf weeds	1/2 to 1 pint	Apply when weeds are small and corn is less than 8 inches tall (to top of canopy). When corn is over 8 inches tall, use drop nozzles and keep spray off foliage. Treat perennial weeds when they are in the bud to bloom stage. Do not spray corn in the tassel to dough stage. Corn treated with 2,4-D may become temporarily brittle. Winds or cultivation may cause stalk breakage during the period of time when the corn is brittle.
	1 to 1-1/2 pints	
Grain Sorghum (Milo) Postemergence	1 pint	Apply when sorghum is 6 to 15 inches tall. If sorghum is taller than 8 inches to top of the canopy, use drop nozzles and keep spray off the foliage. Do not treat during the boot, flowering or dough stage.

RESTRICTIONS AND LIMITATIONS FOR USE ON CORN AND SORGHUM

Do not forage or feed fodder for 7 days following application.

SOYBEANS* (Preplant Only)

WEEDS	AMOUNT OF WEEDAR® 64 PER ACRE	DIRECTIONS
Postemergence	3/4 to 1 pint	Apply not less than 15 days prior to planting soybeans, when weeds are small and actively growing. Use the higher rate on larger weeds and when perennials are present.
	> 1 to 2 pints	Apply not less than 30 days prior to planting soybeans, when weeds are actively growing.
		In addition to those weeds found on the GENERAL WEED LIST, WEEDAR® 64 will suppress or control the following broadleaf weeds frequently encountered in reduced tillage soybean production systems: alfalfa*, bullnettle, smallflowered bittercress, Carolina geranium, smallflowered buttercup, common and rough cinquefoil, red clover*, horseweed or marestail, mousetail, wild mustard, field pennycress, cutleaf evening primrose, common purslane, speedwell, velvetleaf, and Virginia copperleaf. * These weeds are only partially controlled. Apply no more than 2.0 pints of WEEDAR® 64 in one season prior to planting soybeans. After applying, plant soybean seed as deep as practical or at least 1-1/2 to 2 inches deep. Adjust the planter press wheel, if necessary, to ensure that planted seed is completely covered. If desired, WEEDAR® 64 may be applied pre-plant to soybeans in tank mixtures with other herbicides such as Poast®, Poast Plus®, Roundup®, Roundup D-Pak®, Honcho®, Gramoxone Extra®, Prowl®, Pursuit Plus®, Scepter®, Scepter 70 DG, Squadron® and others that are registered for pre-plant soybean use. NOTE: Unacceptable injury to soybeans planted in fields previously treated with WEEDAR® 64 may occur and the extent of injury will depend on weather and agronomic factors such as the amount of weed vegetation and previous crop residue present that may be in effect between the time of application and the emergence of the soybean plant.

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RESTRICTIONS AND LIMITATIONS FOR USE IN SOYBEANS (PRE-PLANT)

Do not apply WEEDAR® 64 when weather conditions such as temperature, air inversions, or wind favor drift from treated areas to susceptible plants.

Apply no more than 2.0 pints of WEEDAR® 64 per acre in one season prior to planting soybeans.

Only one application per growing season, regardless of the application rate used, is allowed.

Do not apply WEEDAR® 64 prior to planting soybeans if you are not prepared to accept the results of soybean injury including possible loss of stand and yield.

Do not replant fields treated with WEEDAR® 64 in the same growing season with crops other than those labeled for 2,4-D pre-plant use.

Do not mow or cultivate weeds prior to treating with WEEDAR® 64 as poor control may result.

Do not cut for feed treated hay, forage, or fodder or graze treated soybeans to livestock.

Do not apply WEEDAR® 64 pre-plant to soybeans in fields having a coarse-textured soil where the percent organic matter is <1.0%.

Only one application of WEEDAR® 64 may be made prior to planting soybeans per growing season.

Do not feed treated hay, forage, or fodder. Livestock should be restricted from feeding/grazing of treated cover crops.

***Not currently registered for use in California.**

RICE, SUGARCANE, FALLOWLAND AND CROP STUBBLE

CROP	AMOUNT OF WEEDAR® 64 PER ACRE	DIRECTIONS
Rice (Pre-plant use)	1 to 2 pints	Apply four or more weeks prior to planting rice. DO NOT USE IN CALIFORNIA.
Rice (Postemergence use)	1 to 2-1/2 pints	Apply when rice is in the late tillering stage of development at the time of first joint development. Do not apply after panicle initiation, after rice internodes exceed one-half inch, at early seedling, early panicle, boot or heading stages. Consult local university or Agricultural Extension Service specialists for more specific information on rates and timing of application. DO NOT USE IN CALIFORNIA.
Sugarcane Preemergence	4 pints	Apply before canes appear for control of emerged broadleaf weeds. DO NOT USE IN CALIFORNIA.
Postemergence	1-1/2 to 4 pints	Apply after cane emerges and through lay-by. DO NOT USE IN CALIFORNIA.
Fallowland and Crop Stubble Annual broadleaf weeds	1 to 2 pints	Use the lower rate when weeds are small (2 to 3 inches tall) and actively growing. Use the higher rate on older and drought-stressed plants.
Biennial broadleaf weeds	2 to 4 pints	Spray while musk thistles or other biennial species are in the seedling to rosette stage and before flower stalks become apparent. The lower rate can be used in the spring during rosette stage. Use the highest rate in the fall or after flower stalks have developed.
Perennial broadleaf weeds	2 to 6 pints	Spray weed in the bud to bloom stage or while in good vegetative growth. Do not disturb treated areas for at least 2 weeks after treatment, or until tops are dead.
Wild garlic and onion in crop stubble	4 to 6 pints	Apply to new regrowth of wild garlic or onion which occurs in the fall following harvest of small grains, corn or grain sorghum.

RESTRICTIONS AND LIMITATIONS FOR USE IN FALLOWLAND AND CROP STUBBLE

Do not plant any crop for 3 months after treatment or until chemical has disappeared from the soil.

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RESTRICTIONS AND LIMITATIONS FOR USE IN RICE

Do not apply more than a total of 2-1/2 pints of WEEDAR® 64 to rice per growing season.
Do not use on rice in California without an approved Supplemental Label allowing the use.

RESTRICTIONS AND LIMITATIONS FOR USE IN SUGARCANE

Do not apply more than a total of 8 pints of WEEDAR® 64 to sugarcane per acre per growing season.

ESTABLISHED GRASS PASTURES, RANGELAND, AND CONSERVATION RESERVE PROGRAM AREAS

WEEDS	AMOUNT OF WEEDAR® 64 PER ACRE	DIRECTIONS
Annual broadleaf weeds	2 pints	Apply when weeds are small and actively growing and prior to bud stage. Spray while musk thistles or other biennial species are in the seedling to rosette stage and before flower stalks become apparent. The lower rate can be used in the spring during rosette stage. Use the highest rate in the fall or after flower stalks have developed. Do not apply to newly seeded areas until grass is well established. Do not apply to grass in the early boot through milk stage if grass seed production is desired. Bentgrass and legumes may be injured by this treatment.
Biennial and perennial broadleaf weeds	2 to 4 pints	

RESTRICTIONS AND LIMITATIONS FOR USE IN PASTURES AND RANGELANDS

Do not graze (dairy) cattle in treated areas for 7 days after application.
Do not cut forage for hay within 30 days of application.
Do not permit dairy animals or meat animals being finished for slaughter to forage treated fields within 3 days of slaughter.

CONSERVATION RESERVE PROGRAM AREAS

WEEDS	AMOUNT OF WEEDAR® 64 PER ACRE	DIRECTIONS
Annual broadleaf weeds In young grasses	1/2 to 1 pint	Apply to actively growing annual broadleaf weeds. Use 1/2 to 1 pint when weeds are small; use higher rates on older weeds. Do not apply to young grasses with fewer than 6 leaves or prior to tillering, as excessive injury may result. Do not apply more than 1 pint until grasses are well established as excessive injury may result.
In established grasses	1/2 to 2 pints	
Biennial and perennial broadleaf weeds In established grasses	2 to 4 pints	Treat when biennial weeds are in the seedling to rosette stage and before flower stalks become apparent. Treat perennial weeds in the bud to bloom stage. Apply to actively growing weeds.

RESTRICTIONS AND LIMITATIONS FOR USE ON CONSERVATION RESERVE PROGRAM AREAS

Use at least 2 gallons of water per acre by air and 5 gallons of water per acre by ground.
Do not harvest or graze treated Conservation Reserve Program areas.
Do not apply to grasses in the boot to dough stage if grass seed production is desired.

GRASSES FOR SEED PRODUCTION

WEEDS	AMOUNT OF WEEDAR® 64 PER ACRE	DIRECTIONS
Annual and perennial broadleaf weeds	2 to 4 pints	Apply to established stands in spring from tiller to early boot stage. Do not spray in boot stage. New spring seedlings may be treated with the lower rate after grass seedlings have at least 5 leaves. Perennial weed regrowth may be treated in the fall. DO NOT USE IN CALIFORNIA.

RESTRICTIONS AND LIMITATIONS FOR USE ON GRASSES FOR SEED PRODUCTION

Do not graze dairy animals or cut forage for hay within 7 days of application.

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NON-CROPLAND

Such as fencerows, hedgerows, roadsides, drainage ditches, rights-of-way, utility power lines, railroads and other non-crop areas

WEEDS	AMOUNT OF WEEDAR® 64 PER ACRE	DIRECTIONS
Annual broadleaf weeds	2 to 4 pints	Treat when weeds are young and actively growing. Perennial weeds should be near the bud stage, but not flowering at application. Do not use on susceptible southern grasses such as St. Augustine. Do not apply to newly seeded areas until grass is well established. Bentgrass, clover, legumes and dichondria may be injured by this treatment.
Biennial and perennial broadleaf weeds	4 to 8 pints	

RESTRICTIONS AND LIMITATIONS FOR USE ON NON-CROPLAND

Do not graze dairy animals for 7 days following application.
Use sufficient gallonage for thorough and uniform coverage.

WEEDS IN ORNAMENTAL TURF AREAS

Golf courses, cemeteries, parks, turfgrass, and other grass areas

WEEDS	AMOUNT OF WEEDAR® 64 PER ACRE	DIRECTIONS
Annual broadleaf weeds	2 to 4 pints	Treat when weeds are young and actively growing. Perennial weeds should be near the bud stage, but not flowering at application. Do not use on susceptible southern grasses such as St. Augustine. Do not apply to newly seeded areas until grass is well established. Bentgrass, clover, legumes and dichondria may be injured by this treatment.
Biennial and perennial broadleaf weeds	4 pints	

RESTRICTIONS AND LIMITATIONS FOR USE ON ORNAMENTAL TURF AREAS

Use sufficient gallonage for thorough and uniform coverage.
Do not apply more than 2 broadcast applications per year per treatment site. This does not exclude spot treatments.
Do not allow people (other than applicator) or pets on treatment area during application.
Do not enter treatment areas until sprays have dried.

SPOT TREATMENT IN NON-CROP AREAS

Mix 2 to 3 fluid ounces of WEEDAR® 64 Broadleaf Herbicide in 3 gallons of water. Wet all weeds and stems thoroughly. For best results, treat when weeds are actively growing.

FORESTRY - TREE INJECTION

For controlling species such as alder, aspen, birch, blackgum, cherry, oak, sweetgum, and tulip poplar

Make injections as near to the root collar as possible, using one injection per inch of trunk dbh (4-1/2 feet). For resistant species such as hickory, injections should overlap. For best results, injections should be made during the growing season, May 15th through October 15th.

For Dilute Injection: Mix 1 gallon of WEEDAR® 64 Broadleaf Herbicide in 19 gallons of water for dilute injections.

For Concentrate Injections: Use 1 to 2 ml of concentrate WEEDAR® 64 Broadleaf Herbicide per injection. The injection bit must penetrate the inner bark.

APPLES, PEARS, STONE FRUIT AND NUT ORCHARDS

WEEDS IN CROP	AMOUNT OF WEEDAR® 64 PER ACRE	DIRECTIONS
Annual broadleaf weeds	3 pints	For control of weeds on the orchard floor, apply using coarse sprays and low pressure in sufficient volume of water to obtain thorough wetting of weeds. Treat when weeds are small and actively growing. Do not use on light, sandy soil.

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RESTRICTIONS AND LIMITATIONS FOR USE IN APPLES, PEARS, STONE FRUIT AND NUT ORCHARDS

Do not apply to bare ground as injury may result.
Do not apply immediately before irrigation and withhold irrigation for 2 days before and for 3 days after treatment.
Do not allow spray to drift onto or contact foliage, fruit, stems, trunks of trees or exposed roots as injury may result.
Do not apply to newly established or young orchards. Trees must be at least 1 year old and in vigorous condition.
Do not apply during bloom.
Do not graze or feed cover crops from treated orchards.
Do not make more than 2 applications per year.
Do not harvest stone fruit within 40 days of application.
Do not harvest nuts within 60 days of application.
Do not harvest apples or pears within 14 days of application.
For apples and pears, allow at least 75 days between applications.

WEEDS AND BRUSH IRRIGATION CANAL DITCHBANKS

(Seventeen Western States: Arizona, California, Colorado, Idaho, Kansas, Montana, Nebraska, New Mexico, Nevada, North Dakota, Oklahoma, Oregon, South Dakota, Texas, Utah, Washington, and Wyoming)

For control of annual and perennial broadleaf weeds, apply 1 to 2 quarts of WEEDAR® 64 Broadleaf Herbicide per acre in approximately 20 to 100 gallons per acre. Treat when weeds are young and actively growing before the bud or early bloom stage. For harder-to-control weeds, a repeat spray after 3 to 4 weeks using the same rates may be needed for maximum results. Apply no more than two treatments per season.

For woody brush and patches of perennial broadleaf weeds, mix 1 gallon of WEEDAR® 64 in 150 gallons of water. Wet foliage thoroughly using about 1 gallon of solution per square rod.

SPRAYING INSTRUCTIONS: Apply with low pressure (10 to 40 psi) power spray equipment mounted on a truck, tractor, or boat. Apply while traveling upstream to avoid accidental concentration of chemical into water. Spray when the air is fairly calm, 5 mph or less. Do not use on small canals (less than 10 cfs) where water will be used for drinking purposes.

Boom spraying onto water surface must be held to a minimum and no cross-stream spraying to opposite banks should be permitted. When spraying shoreline weeds, allow no more than 2 foot overspray onto water with an average of less than 1 foot overspray to prevent introduction of greater than negligible amounts of chemical into the water.

Do not allow dairy animals to graze on treated areas for at least 7 days after spraying. Water within treated banks should not be fished.

AQUATIC WEED CONTROL

For use in ponds, lakes, reservoirs, marshes, bayous, drainage ditches, canals, rivers and streams that are quiescent or slow moving.

NOTICE TO APPLICATORS

State and Local Coordination: Before application, coordination and approval of local and state authorities may be required, either by letter of agreement or issuance of special permits for such use.

Fish Toxicity - Oxygen Ratio: Fish breathe oxygen in the water and a water - oxygen ratio must be maintained. Decaying weeds use up oxygen. To avoid fish kill from decaying plant material do not treat more than one half the lake or pond at one time. For large bodies of weed infested waters leave buffer strips of at least 100 feet wide and delay treatment of these strips for 4 to 5 weeks or until the dead vegetation has decomposed.

Wind Velocity - Ground or Surface Application: Do not apply when wind speeds are at or above 10 mph. **Air Application:** Do not apply when wind speeds are at or above 5 mph. The restrictions do not apply to subsurface applications used in weed control programs.

Irrigation: Delay the use of treated waters for irrigation for three weeks after treatment unless an approved assay shows that the water does not contain more than 0.1 ppm 2,4-D acid. Do not treat irrigation ditches in areas where water will be used to overhead sprinkler irrigate susceptible crops especially grapes, tomatoes and cotton.

Potable Water: Delay the use of treated water for domestic purposes for a period of three weeks or until such time as an approved assay shows that the water contains no more than 0.1 ppm 2,4-D acid.

Water Hyacinth (*Eichornia crasipe*) - Directions For Use

WEEDAR® 64 will control water hyacinth with surface and air applications.

Amounts to Use: 2 to 4 quarts (4 lb. acid equivalent per gallon) per acre. **Spray the weed mass only.** Use 4 quarts when plants are matured or when the weed mass is dense.

When To Apply: Spray when water hyacinth plants are actively growing. Repeat as necessary to kill regrowth and hyacinth plants missed in the previous operation.

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How To Use - Surface Application: Use power sprayers operated with a boom or spray gun mounted on a boat, tractor or truck. Thorough wetting of foliage is essential for maximum control. Use 100 to 400 gal. per acre of spray mixture. Special precautions such as the use of low pressure, large nozzles and thickening agents should be taken to avoid spray drift in areas of sensitive crops. For DIRECTA-SPRA™ operation use WEEDAR® 64 with 1 pint of drift control agent in 50 to 100 gallons of water. For other applications, follow the drift control agent label for mixing directions. **Air Application:** Use drift control spray equipment or thickening agents mixed into the spray solution. Apply 1.0 gallon per acre of WEEDAR® 64 through standard boom systems with a minimum of 5 gallons of spray mix per acre. For MICROFOIL® drift control spray systems, apply WEEDAR® 64 in 12 to 15 gallons spray mix per acre.

2,4-D Acid Equivalent	1/2 lb.	1 lb.	2 lbs.	3 lbs.	4 lbs.
WEEDAR® 64	1 pt.	2 pts.	2 qts.	3 qts.	4 qts.

Water Milfoil (*Myriophyllum spicatum*) - Directions For Use

For Eurasian Water Milfoil in programs conducted by the Tennessee Valley Authority in dams and reservoirs of the TVA system. WEEDAR® 64 will control water milfoil with surface, subsurface and air applications.

How To Use: To control water milfoil when less than 5 gallons of concentrate per acre is recommended, dilute the concentrate with water to apply a minimum of 5 gallons of spray mix per acre. Do not treat within 1/2 mile of potable water intakes. Shoreline areas should be treated by sub-surface injection applied by boat to avoid aerial drift. Do not apply when weather conditions favor drift from target area. Do not contaminate water by cleaning of equipment washwaters.

Open Water Areas: To reduce contamination and prevent undue exposure to fish and other aquatic organisms, do not treat water areas that are not infested with aquatic weeds.

Amounts To Use: Apply 2.5 to 10 gallons of WEEDAR® 64 per acre. The higher rate is used in areas of greater water exchange. These areas may require a repeat application.

When To Apply: For best results, apply in spring or early summer when milfoil starts to grow. This timing can be checked by sampling the lake bottom in areas heavily infested with weeds the year before.

Subsurface Application: Apply 2.5 to 10 gallons of WEEDAR® 64 per acre as a concentrate directly into the water through boat mounted distribution systems.

Surface Application: Apply 2.5 to 10 gallons of WEEDAR® 64 per acre in a minimum spray volume of 5 gallons mix per acre.

Air Application: Use drift control spray equipment or thickening agents mixed into the spray solution. Apply 2.5 to 10 gallons per acre of WEEDAR® 64 through standard boom systems with a minimum of 5 gallons of spray mix per acre. For MICROFOIL® drift control spray systems apply WEEDAR® 64 in 12 to 15 gallons spray mix per acre.

LIMITED WARRANTY AND DISCLAIMER

The manufacturer warrants that this product conforms to the chemical description on the label; that this product is reasonably fit for the purposes set forth in the directions for use when it is used in accordance with such directions; and that the directions, warnings and other statements on this label are based upon responsible experts' evaluation of reasonable tests of effectiveness, of toxicity to laboratory animals and to plants, and of residues on food crops, and upon reports of field experience. Tests have not been made on all varieties or in all states or under all conditions. THE MANUFACTURER NEITHER MAKES NOR INTENDS, NOR DOES IT AUTHORIZE ANY AGENT OR REPRESENTATIVE TO MAKE, ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, AND IT EXPRESSLY EXCLUDES AND DISCLAIMS ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

THIS WARRANTY DOES NOT EXTEND TO, AND THE BUYER SHALL BE SOLELY RESPONSIBLE FOR, ANY AND ALL LOSS OR DAMAGE WHICH RESULTS FROM THE USE OF THIS PRODUCT IN ANY MANNER WHICH IS INCONSISTENT WITH THE LABEL DIRECTIONS, WARNINGS OR CAUTIONS.

BUYER'S EXCLUSIVE REMEDY AND MANUFACTURER'S OR SELLER'S EXCLUSIVE LIABILITY FOR ANY AND ALL CLAIMS, LOSSES, DAMAGES, OR INJURIES RESULTING FROM THE USE OR HANDLING OF THIS PRODUCT, WHETHER OR NOT BASED IN CONTRACT, NEGLIGENCE, STRICT LIABILITY IN TORT OR OTHERWISE SHALL BE LIMITED, AT THE MANUFACTURER'S OPTION, TO REPLACEMENT OF, OR THE REPAYMENT OF THE PURCHASE PRICE FOR, THE QUANTITY OF PRODUCT WITH RESPECT TO WHICH DAMAGES ARE CLAIMED. IN NO EVENT SHALL MANUFACTURER OR SELLER BE LIABLE FOR SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES RESULTING FROM THE USE OR HANDLING OF THIS PRODUCT.

NOTICE TO BUYER

Purchase of this material does not confer any rights under patents governing this product or the use thereof in countries outside of the United States.

Garlon® is a Registered Trademark of Dow AgroSciences.

Gramoxone Extra® is a Registered Trademark of a Zeneca Group Company.

Poast® and Poast Plus® are Registered Trademarks of BASF Corp.

Prowl®, Pursuit Plus®, Scepter® and Squadron® are Registered Trademarks of American Cyanamid Co.

Roundup®, Roundup D-Pak® and Honcho® are Registered Trademarks of Monsanto Co.

Weedar® is a Registered Trademark of Nufarm, Inc.

Microfoil® and Directa-Spray® are Registered Trademarks of Rhone-Poulenc.

This sample label is current as of 11/20/2002. The product descriptions and recommendations provided in this sample label are for background information only. Always refer to the label on the product before using Monsanto or any other agrichemical product.

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Complete Directions for Use

EPA Reg. No. 524-445

AVOID CONTACT OF HERBICIDE WITH FOLIAGE, GREEN STEMS, EXPOSED NON-WOODY ROOTS OR FRUIT OF CROPS (EXCEPT AS SPECIFIED FOR INDIVIDUAL ROUNDUP READY® CROPS), DESIRABLE PLANTS AND TREES, BECAUSE SEVERE INJURY OR DESTRUCTION MAY RESULT.

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Not all products recommended on this label are registered for use in California. Check the registration status of each product in California before using.

Read the entire label before using this product.

Use only according to label instructions.

It is a violation of Federal law to use this product in any manner inconsistent with its labeling

Read the "LIMIT OF WARRANTY AND LIABILITY" statement at the end of the label before buying or using. If terms are not acceptable, return at once unopened.

THIS IS AN END-USE PRODUCT. THIS COMPANY DOES NOT INTEND AND HAS NOT REGISTERED IT FOR REFORMULATION. SEE INDIVIDUAL CONTAINER LABEL FOR REPACKAGING LIMITATIONS.

1.0 INGREDIENTS

ACTIVE INGREDIENT:

*Glyphosate, N-(phosphonomethyl)glycine, in the form of its isopropylamine salt	41.0%
OTHER INGREDIENTS:	59.0%
	100.0%

*Contains 480 grams per litre or 4 pounds per U.S. gallon of the active ingredient glyphosate, in the form of its isopropylamine salt. Equivalent to 356 grams per litre or 3 pounds per U.S. gallon of the acid, glyphosate.

No license granted under any non-U.S. patent(s).

2.0 IMPORTANT PHONE NUMBERS

1. FOR PRODUCT INFORMATION OR ASSISTANCE IN USING THIS PRODUCT, CALL TOLL-FREE,

1-800-332-3111.

2. IN CASE OF AN EMERGENCY INVOLVING THIS HERBICIDE PRODUCT, OR FOR MEDICAL ASSISTANCE, CALL COLLECT, DAY OR NIGHT,

(314)-694-4000.

3.0 PRECAUTIONARY STATEMENTS

3.1 Hazards to Humans and Domestic Animals

Keep out of reach of children.

WARNING! AVISO!

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en

detalle. (If you do not understand the label, find someone to explain it to you in detail.)

CAUSES SUBSTANTIAL BUT TEMPORARY EYE INJURY.

HARMFUL IF SWALLOWED OR INHALED.

Do not get in eyes or on clothing.

Avoid breathing vapor or spray mist.

FIRST AID:	Call a poison control center or doctor for treatment advice.
IF IN EYES	<ul style="list-style-type: none"> • Hold eye open and rinse slowly and gently with water for 15 - 20 minutes. • Remove contact lenses if present after the first 5 minutes then continue rinsing eye.
IF INHALED	<ul style="list-style-type: none"> • Remove individual to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. Get medical attention.
IF SWALLOWED	<ul style="list-style-type: none"> • This product will cause gastrointestinal tract irritation. Immediately dilute by swallowing water or milk. Get medical attention. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.
<ul style="list-style-type: none"> • Have the product container or label with you when calling a poison control center or doctor, or going for treatment. • This product is identified as Roundup Original herbicide, EPA Registration No. 524-445. • You may also contact (314) 694-4000, collect day or night, for emergency medical treatment information. 	

DOMESTIC ANIMALS: This product is considered to be relatively nontoxic to dogs and other domestic animals; however, ingestion of this product or large amounts of freshly sprayed vegetation may result in temporary gastrointestinal irritation (vomiting, diarrhea, colic, etc.). If such symptoms are observed, provide the animal with plenty of fluids to prevent dehydration. Call a veterinarian if symptoms persist for more than 24 hours.

Personal Protective Equipment (PPE)

Applicators and other handlers must wear: long-sleeved shirt and long pants, shoes plus socks, and protective eyewear.

Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them. Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

When handlers use closed systems, enclosed cabs, or aircraft in a manner that meets the requirements listed in Worker Protection Standard (WPS) for agricultural pesticides (40 CFR 170.240 (d) (4-6)), the handler PPE requirements may be reduced or modified as specified in the WPS.

User Safety Recommendations

Users should:

- Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.

3.2 Environmental Hazards

Do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment washwaters.

3.3 Physical or Chemical Hazards

Spray solutions of this product should be mixed, stored and applied using only stainless steel, aluminum, fiberglass, plastic or plastic-lined steel containers.

DO NOT MIX, STORE OR APPLY THIS PRODUCT OR SPRAY SOLUTIONS OF THIS PRODUCT IN GALVANIZED STEEL OR UNLINED STEEL (EXCEPT STAINLESS STEEL) CONTAINERS OR SPRAY TANKS. This product or spray solutions of this product react with such containers and tanks to produce hydrogen gas which may form a highly combustible gas mixture. This gas mixture could flash or explode, causing serious personal injury, if ignited by open flame, spark, welder's torch, lighted cigarette or other ignition source.

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in any manner inconsistent with its labeling. This product can only be used in accordance with the Directions for Use on this label or in separately published Supplemental Labeling.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulations.

Agricultural Use Requirements

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE) and restricted entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not enter or allow worker entry into treated areas during the restricted entry interval (REI) of 12 hours.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is: coveralls, chemical resistant gloves (EPA Chemical Resistance Category A) 8 mils in thickness or greater composed of materials such as butyl rubber, natural rubber, neoprene rubber, or nitrile rubber, shoes plus socks and protective eyewear.

Non-Agricultural Use Requirements

The requirements in this box apply to uses of this product that are NOT within the scope of the Worker Protection Standard for agricultural pesticides (40 CFR Part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries or greenhouses.

Keep people and pets off treated areas until spray solution has dried to prevent transfer of this product onto desirable vegetation.

4.0 STORAGE AND DISPOSAL

Do not contaminate water, foodstuffs, feed or seed by storage or disposal.

Keep container closed to prevent spills and contamination.

Wastes resulting from the use of this product that cannot be used or chemically reprocessed should be disposed of in a landfill approved for pesticide disposal or in accordance with applicable Federal, state, or local procedures.

Emptied container retains vapor and product residue. Observe all labeled safeguards until container is cleaned, reconditioned, or destroyed.

See container label for STORAGE AND DISPOSAL instructions.

5.0 GENERAL INFORMATION (How this product works)

Product Description: This product is a postemergent, systemic herbicide with no soil residual activity. It is generally non-selective and gives broad-spectrum control of many annual weeds, perennial weeds, woody brush and trees. It is formulated as a water-soluble liquid. It may be applied through most standard industrial or field-type sprayers after dilution and thorough mixing with water or other carriers according to label instructions.

Time to Symptoms: This product moves through the plant from the point of foliage contact to and into the root system. Visible effects on most annual weeds occur within 2 to 4 days, but on most perennial weeds may not occur for 7 days or more. Extremely cool or cloudy weather following treatment may slow activity of this product and delay development of visual symptoms. Visible effects are a gradual wilting and yellowing of the plant which advances to complete browning of above-ground growth and deterioration of underground plant parts.

Stage of Weeds: Annual weeds are easiest to control when they are small. Best control of most perennial weeds is obtained when treatment is made at late growth stages approaching maturity. Refer to the "ANNUAL WEEDS", "PERENNIAL WEEDS" and "WOODY BRUSH AND TREES RATE TABLES" for recommendations for specific weeds.

Always use the higher rate of this product per acre within the recommended range when weed growth is heavy or dense or weeds are growing in an undisturbed (noncultivated) area.

Do not treat weeds under poor growing conditions such as drought stress, disease or insect damage, as reduced weed control may result. Reduced results may also occur when treating weeds heavily covered with dust.

Cultural Considerations: Reduced control may result when applications are made to annual or perennial weeds that have been mowed, grazed, or cut, and have not been allowed to regrow to the recommended stage for treatment.

Rainfastness: Heavy rainfall soon after application may wash this product off of the foliage and a repeat application may be required for adequate control.

Spray Coverage: For best results, spray coverage should be uniform and complete. Do not spray weed foliage to the point of runoff.

Mode of Action: The active ingredient in this product inhibits an enzyme found only in plants and microorganisms that is essential to formation of specific amino acids.

No Soil Activity: Weeds must be emerged at the time of application to be controlled by this product. Weeds germinating from seed after application will not be controlled. Unemerged plants arising from unattached underground rhizomes or root stocks of perennials will not be affected by the herbicide and will continue to grow.

Biological Degradation: Degradation of this product is primarily a biological process carried out by soil microbes.

Tank Mixing: This product does not provide residual weed control. For subsequent residual weed control, follow a label-approved herbicide program. Read and carefully observe the cautionary statements and all other information appearing on the labels of all herbicides used. Use according to the most restrictive label directions for each product in the mixture.

Buyer and all users are responsible for all loss or damage in connection with the use or handling of mixtures of this product with herbicides or other materials that are not expressly recommended in this labeling. Mixing this product with herbicides or other materials not recommended on this label may result in reduced performance.

When this label recommends a tank mixture with a generic active ingredient such as diuron, atrazine, 2,4-D, or dicamba, the user is responsible for ensuring that the mixture product's label allows the specific application.

Annual Maximum Use Rate: Except as otherwise specified in a crop section of this label, the combined total of all treatments must not exceed 8 quarts of this product per acre per year. For applications in non-crop sites or in tree, vine, or shrub crops, the combined total of all treatments must not exceed 10.6 quarts of this product per acre per year. The maximum use rates stated throughout this product's labeling apply to this product combined with the use of all other herbicides containing glyphosate or sulfosate as the active ingredient, whether applied as mixtures or separately. Calculate the application rates and ensure that the total use of this and other glyphosate or sulfosate containing products does not exceed stated maximum use rate.

NOTE: Use of this product in any manner not consistent with this label may result in injury to persons, animals or crops, or other unintended consequences.

6.0 MIXING

Clean sprayer parts immediately after using this product by thoroughly flushing with water.

NOTE: REDUCED RESULTS MAY OCCUR IF WATER CONTAINING SOIL IS USED, SUCH AS VISIBLY MUDDY WATER OR WATER FROM PONDS AND DITCHES THAT IS NOT CLEAR.

6.1 Mixing with Water

This product mixes readily with water. Mix spray solutions of this product as follows: Fill the mixing or spray tank with the required amount of water. Add the recommended amount of this product near the end of the filling process and mix well. Use caution to avoid siphoning back into the carrier source. Use approved anti-back-siphoning devices where required by state or local regulations. During mixing and application, foaming of the spray solution may occur. To prevent or minimize foam, avoid the use of mechanical agitators, terminate by-pass and return lines at the bottom of the tank and, if needed, use an approved anti-foam or defoaming agent.

6.2 Tank Mixing Procedure

Mix labeled tank mixtures of this product with water as follows:

1. Place a 20- to 35-mesh screen or wetting basket over filling port.
2. Through the screen, fill the spray tank one-half full with water and start agitation.
3. If ammonium sulfate is used add it slowly through the screen into the tank. Continue agitation. Ensure that dry ammonium sulfate is completely dissolved in the spray tank before adding other products.
4. If a wettable powder is used, make a slurry with the water carrier, and add it SLOWLY through the screen into the tank. Continue agitation.
5. If a flowable formulation is used, premix one part flowable with one part water. Add diluted mixture SLOWLY through the screen into the tank. Continue agitation.
6. If an emulsifiable concentrate formulation is used, premix one part emulsifiable concentrate with two parts water. Add diluted mixture slowly through the screen into the tank. Continue agitation.
7. Continue filling the spray tank with water and add the required amount of this product near the end of the filling process.
8. If a nonionic surfactant is used, add it to the spray tank before completing the filling process.
9. Add individual formulations to the spray tank as follows: wettable powder, flowable, emulsifiable concentrate, drift reduction additive, water-soluble liquid followed by surfactant.

Maintain good agitation at all times until the contents of the tank are sprayed. If the spray mixture is allowed to settle, thorough agitation is required to resuspend the mixture before spraying is resumed.

Keep by-pass line on or near the bottom of the tank to minimize foaming. Screen size in nozzle or line strainers should be no finer than 50 mesh.

Always predetermine the compatibility of labeled tank mixtures of this product with water carrier by mixing small proportional quantities in advance. Ensure that the specific tank mixture product is registered for application at the desired site.

Refer to the "Tank Mixing" section of "GENERAL INFORMATION" for additional precautions.

6.3 Mixing for Hand-Held Sprayers

Prepare the desired volume of spray solution by mixing the amount of this product in water as shown in the following table:

Spray Solution

Desired Volume	Amount of Roundup Original					
	0.5%	1%	1.5%	2%	5%	10%
1 gal	0.7 oz	1.3 oz	2 oz	2.7 oz	6.5 oz	13 oz
25 gal	1 pt	1 qt	1.5 qt	2 qt	5 qt	10 qt
100 gal	2 qt	1 gal	1.5 gal	2 gal	5 gal	10 gal

2 tablespoons = 1 fluid ounce

For use in knapsack sprayers, it is suggested that the recommended amount of this product be mixed with water in a larger container. Fill sprayer with the mixed solution.

6.4 Surfactants

Nonionic surfactants (NIS) or wetting agents that are labeled for use with herbicides may be added to the spray solution. Do not reduce rates of this herbicide when adding surfactants. Read and carefully observe cautionary statements and other information appearing on the additives label.

When adding additional surfactant, use 0.5 percent surfactant concentration (2 quarts per 100 gallons of spray solution) when using surfactants that contain at least 70 percent active surfactant, or a 1 percent surfactant concentration (4 quarts per 100 gallons of spray solution) for those surfactants containing less than 70 percent active surfactant.

6.5 Ammonium Sulfate

The addition of 1 to 2 percent dry ammonium sulfate by weight or 8.5 to 17 pounds per 100 gallons of water may increase the performance of this product, particularly under hard water conditions, drought conditions or when tank mixed with certain residual herbicides, on annual and perennial weeds. The equivalent rate of ammonium sulfate in a liquid formulation may also be used. Ensure that dry ammonium sulfate is completely dissolved in the spray tank before adding herbicides or surfactants. Thoroughly rinse the spray system with clean water after use to reduce corrosion.

NOTE: When using ammonium sulfate, apply this product at rates recommended in this label. Lower rates will result in reduced performance. The use of ammonium sulfate as an additive does not preclude the need for additional surfactant.

6.6 Colorants or Dyes

Agriculturally approved colorants or marking dyes may be added to this product. Colorants or dyes used in spray solutions of this product may reduce performance, especially at lower rates or dilutions. Use colorants or dyes according to the manufacturer's recommendations.

6.7 Drift Reduction Additives

Drift reduction additives may be used with all equipment types, except wiper applicators, sponge bars and Controlled Droplet Applicator (CDA) equipment. When a drift reduction additive is used, read and carefully observe the cautionary statements and all other information appearing on the additive label. The use of drift reduction additives can affect spray coverage which may result in reduced performance.

7.0 APPLICATION EQUIPMENT AND TECHNIQUES

Do not apply this product through any type of irrigation system.

This product may be applied with the following application equipment:

Aerial—Fixed Wing and Helicopter

Ground Broadcast Spray—Boom or boomless systems, pull-type sprayer, floaters, pick-up sprayers, spray coupes and other ground broadcast equipment.

Hand-Held or High-Volume Spray Equipment—Knapsack and backpack sprayers, pump-up pressure sprayers, handguns, handwands, mistblowers*, lances and other hand-held and motorized spray equipment used to direct the spray onto weed foliage.

*This product is not registered in California or Arizona for use in mistblowers.

Selective Equipment—Recirculating sprayers, shielded and hooded sprayers, wiper applicators and sponge bars.

Injection Systems—Aerial or ground injection sprayers.

Controlled Droplet Applicator (CDA)—Hand-held or boom-mounted applicators which produce a spray consisting of a narrow range of droplet sizes.

APPLY THESE SPRAY SOLUTIONS IN PROPERLY MAINTAINED AND CALIBRATED EQUIPMENT CAPABLE OF DELIVERING DESIRED VOLUMES.

SPRAY DRIFT MANAGEMENT

AVOID DRIFT. EXTREME CARE MUST BE USED WHEN APPLYING THIS PRODUCT TO PREVENT INJURY TO DESIRABLE PLANTS AND CROPS.

Do not allow the herbicide solution to mist, drip, drift or splash onto desirable vegetation since minute quantities of this product can cause severe damage or destruction to the crop, plants or other areas on which treatment was not intended.

Avoiding spray drift at the application site is the responsibility of the applicator. The interaction

of many equipment and weather-related factors determine the potential for spray drift. The applicator and the grower is responsible for considering all these factors when making decisions.

7.1 Aerial Equipment

DO NOT APPLY THIS PRODUCT USING AERIAL SPRAY EQUIPMENT EXCEPT UNDER CONDITIONS AS SPECIFIED WITHIN THIS LABEL.

Use the recommended rates of this herbicide in 3 to 15 gallons of water per acre unless otherwise specified on this label. Unless otherwise specified, do not exceed 1 quart per acre. Refer to the individual use area sections of this label for recommended volumes, application rates, and further instructions.

FOR AERIAL APPLICATION IN CALIFORNIA OR SPECIFIC COUNTIES THEREIN, OR ARKANSAS, REFER TO THE FEDERAL SUPPLEMENTAL LABEL FOR AERIAL APPLICATIONS IN THAT STATE OR COUNTY FOR SPECIFIC INSTRUCTIONS, RESTRICTIONS AND REQUIREMENTS

This product plus dicamba tank mixtures may not be applied by air in California.

Ensure uniform application—To avoid streaked, uneven or overlapped application, use appropriate marking devices.

AERIAL SPRAY DRIFT MANAGEMENT

The following drift management requirements must be followed to avoid off-target drift movement from aerial applications to agricultural field crops.

1. The distance of the outermost nozzles on the boom must not exceed 3/4 the length of the wingspan or rotor.
2. Nozzles must always point backward, parallel with the air stream and never be pointed downwards more than 45 degrees. Where states have more stringent regulations, they should be observed.

Importance of Droplet Size

The most effective way to reduce drift potential is to apply large droplets. The best drift management strategy is to apply the largest droplets that provide sufficient coverage and control. Applying larger droplets reduces drift potential, but will not prevent drift if applications are made improperly, or under unfavorable environmental conditions (see the "Wind", "Temperature and Humidity", and "Temperature Inversions" sections of this label).

Controlling Droplet Size

- **Volume:** Use high-flow-rate nozzles to apply the highest practical spray volume. Nozzles with the higher rated flows produce larger droplets.
- **Pressure:** Use the lower spray pressures recommended for the nozzle. Higher pressure reduces droplet size and does not improve canopy penetration. When higher flow rates are needed, use higher-flow-rate nozzles instead of increasing pressure.
- **Number of nozzles:** Use the minimum number of nozzles that provide uniform coverage.
- **Nozzle orientation:** Orienting nozzles so that the spray is released backwards, parallel to the airstream, will produce larger droplets than other orientations. Significant deflection from the horizontal will reduce droplet size and increase drift potential.
- **Nozzle type:** Use a nozzle type that is designed for the intended application. With most nozzle types, narrower spray angles produce larger droplets. Consider using low-drift nozzles. Solid stream nozzles oriented straight back produce larger droplets than other nozzle types.
- **Boom length:** For some use patterns, reducing the effective boom length to less than 3/4 of the wingspan or rotor length may further reduce drift without reducing swath width.
- **Application height:** Applications should not be made at a height greater than 10 feet above the top of the largest plants unless a greater height is required for aircraft safety. Making applications at the lowest height that is safe reduces the exposure of the droplets to evaporation and wind.

Swath Adjustment

When applications are made with a crosswind, the swath will be displaced downwind. Therefore, on the up and downwind edges of the field, the applicator must compensate for this displacement by adjusting the path of the aircraft upwind. Swath adjustment distance should increase, with increasing drift potential (higher wind, smaller droplets, etc.).

Wind

Drift potential is lowest between wind speeds of 2 to 10 miles per hour. However, many factors, including droplet size and equipment type determine drift potential at any given speed. Application should be avoided below 2 miles per hour due to variable wind direction and high inversion potential. **NOTE:** Local terrain can influence wind patterns. Every applicator should be familiar with local wind patterns and how they affect drift.

Temperature and Humidity

When making applications in low relative humidity, set up equipment to produce larger droplets to compensate for evaporation. Droplet evaporation is most severe when conditions are both hot and dry.

Temperature Inversions

Applications should not occur during a temperature inversion because drift potential is high. Temperature inversions restrict vertical air mixing, which causes small suspended droplets to remain in a concentrated cloud. This cloud can move in unpredictable directions due to the light variable winds common during inversions. Temperature inversions

are characterized by increasing temperatures with altitude and are common on nights with limited cloud cover and light to no wind. They begin to form as the sun sets and often continue into the morning. Their presence can be indicated by ground fog; however, if fog is not present, inversions can also be identified by the movement of smoke from a ground source or an aircraft smoke generator. Smoke that layers and moves laterally in a concentrated cloud (under low wind conditions) indicates an inversion, while smoke that moves upward and rapidly dissipates indicates good vertical air mixing.

Sensitive Areas

The product should only be applied when the potential for drift to adjacent sensitive areas (e.g., residential areas, bodies of water, known habitat for threatened or endangered species, non-target crops) is minimal (e.g., when wind is blowing away from the sensitive areas).

Avoid direct application to any body of water.

Aircraft Maintenance

Thoroughly wash aircraft, especially landing gear, after each day of spraying to remove residues of this product accumulated during spraying or from spills. **PROLONGED EXPOSURE OF THIS PRODUCT TO UNCOATED STEEL SURFACES MAY RESULT IN CORROSION AND POSSIBLE FAILURE OF THE PART. LANDING GEAR IS MOST SUSCEPTIBLE.** The maintenance of an organic coating (paint), which meets aerospace specification MIL-C-38413, may prevent corrosion.

7.2 Ground Broadcast Equipment

Use the recommended rates of this product in 3 to 40 gallons of water per acre as a broadcast spray unless otherwise specified. As density of weeds increases, spray volume should be increased within the recommended range to ensure complete coverage. Carefully select proper nozzles to avoid spraying a fine mist. For best results with ground application equipment, use flat spray nozzles. Check for even distribution of spray droplets.

7.3 Hand-Held or High-Volume Equipment

Apply to foliage of vegetation to be controlled. For applications made on a spray-to-wet basis, spray coverage should be uniform and complete. Do not spray to the point of runoff. Use coarse sprays only. For recommended rates and timing, refer to the "ANNUAL WEEDS—Hand-Held or High-Volume Equipment" section of this product label.

7.4 Selective Equipment

This product may be applied through recirculating spray systems, shielded applicators, hooded sprayers, wiper applicators or sponge bars, after dilution and thorough mixing with water, to listed weeds growing in any non-crop site specified on this label.

In cropping systems, hooded sprayers, shielded sprayers, and wipers may be used in row middles (in between rows of crop plants) where any dripping or leaking will not contact crop foliage, when listed under "TYPES OF APPLICATION" in the crop sections of this product's labeling. Such equipment must be capable of preventing all crop contact with herbicide solutions and operated without leakage of spray mists or dripping onto crop. Wipers over-the-top of crops may be used only when specifically recommended in this product's labeling.

AVOID CONTACT OF HERBICIDE WITH DESIRABLE VEGETATION.

Contact of the herbicide solution with desirable vegetation may result in damage or destruction. Applicators used above desirable vegetation should be adjusted so that the lowest spray stream or wiper contact point is at least 2 inches above the desirable vegetation. Droplets, mist, foam or splatter of the herbicide solution settling on desirable vegetation may result in discoloration, stunting or destruction.

Applications made above the crops should be made when the weeds are a minimum of 6 inches above the desirable vegetation. Better results may be obtained when more of the weed is exposed to the herbicide solution. Weeds not contacted by the herbicide solution will not be affected. This may occur in dense clumps, severe infestations or when the height of the weeds varies so that not all weeds are contacted. In these instances, repeat treatment may be necessary.

Recirculating Spray System

A recirculating spray system directs the spray solution onto weeds growing above desirable vegetation, while spray solution not intercepted by weeds is collected and returned to the spray tank for reuse.

Shielded and Hooded Applicators

When applied under the conditions described in the following paragraphs for shielded and hooded applications, this product at recommended rates will control those weeds listed in the "ANNUAL WEEDS RATE TABLE" and "PERENNIAL WEEDS RATE TABLE" sections of this label. A hooded sprayer is a type of shielded applicator where the spray pattern is fully enclosed including top, sides, front and back, thereby shielding the crop from the spray solution. Keep shields on these sprayers adjusted to protect desirable vegetation. When applying to crops grown on raised beds, ensure that the hood is designed to completely enclose the spray solution. If necessary, extend the front and rear flaps of the hoods to reach the ground in deep furrows. **EXTREME CARE MUST BE EXERCISED TO AVOID CONTACT OF HERBICIDE WITH DESIRABLE VEGETATION.**

This equipment must be set up and operated in a manner that avoids bouncing or raising the hoods off the ground in any way. If the hoods are raised, spray particles may escape

and come into contact with the crop, causing damage or destruction of the crop. Avoid operation on rough or sloping ground where the spray hoods might be raised off the ground. Use hoods designed to minimize excessive dripping or run-off down the insides of the hoods. A single, low pressure/ low drift flat-fan nozzle with an 80 to 95 degree spray angle positioned at the top center of the hood is recommended. Spray volume should be 20 to 30 gallons per acre.

These procedures will reduce the potential for crop injury:

- The spray hoods must be operated on the ground or skimming across the ground.
- Leave at least an 8-inch untreated strip over the drill row. For example, if the crop row width is 38 inches, the maximum width of the spray hood should be 30 inches.
- Maximum tractor speed: 5 miles per hour to avoid bouncing of the spray hoods.
- Maximum wind speed: 10 miles per hour.
- Use low-drift nozzles that provide uniform coverage within the treated area.

Crop injury may occur when the foliage of treated weeds comes into direct contact with leaves of the crop. Do not apply this product when the leaves of the crop are growing in direct contact with weeds to be treated. Droplets, mist, foam or splatter of the herbicide solution may contact the crop and cause discoloration, stunting or destruction.

Wiper Applicators

When applied under the conditions described in the following paragraphs, this product **CONTROLS** many weeds, including volunteer corn, Texas panicum, common rye, shattercane, sicklepod, spanishneedles and bristly starbur; and **SUPPRESSES** many weeds including Florida beggarweed, Bermudagrass, hemp dogbane, dogfennel, guineagrass, johnsongrass, milkweed, silverleaf nightshade, redroot pigweed, giant ragweed, smutgrass, sunflower, Canada thistle, musk thistle, vaseygrass, velvetleaf.

Wiper applicators are devices that physically wipe appropriate amounts of this product directly onto the weed.

Equipment must be designed, maintained and operated to prevent the herbicide solution from contacting desirable vegetation. Operate this equipment at ground speeds no greater than 5 miles per hour. Performance may be improved by reducing speed in areas of heavy weed infestations to ensure adequate wiper saturation. Better results may be obtained if two applications are made in opposite directions.

Avoid leakage or dripping onto desirable vegetation. Adjust height of applicator to ensure adequate contact with weeds. Keep wiping surfaces clean. Be aware that, on sloping ground, the herbicide solution may migrate, causing dripping on the lower end and drying of the wicks on the upper end of a wiper applicator.

Do not use wiper equipment when weeds are wet.

Mix only the amount of solution to be used during a 1-day period, as reduced activity may result from use of leftover solutions. Clean wiper parts immediately after using this product by thoroughly flushing with water.

Do not add surfactant to the herbicide solution.

For Rope or Sponge Wick Applicators—Solutions ranging from 33 to 75 percent of this product in water may be used. Apply this solution to weeds listed in this section.

For Panel Applicators—Solutions ranging from 33 to 100 percent of this product in water may be used in panel wiper applicators.

7.5 Injection Systems

This product may be used in aerial or ground injection spray systems. It may be used as a liquid concentrate or diluted prior to injecting into the spray stream. Do not mix this product with the concentrate of other products when using injection systems.

7.6 CDA Equipment

The rate of this product applied per acre by vehicle-mounted CDA equipment must not be less than the amount recommended in this label when applied by conventional broadcast equipment. For vehicle-mounted CDA equipment, apply 2 to 15 gallons of water per acre.

For the control of annual weeds with hand-held CDA units, apply a 20 percent solution of this product at a flow rate of 2 fluid ounces per minute and a walking speed of 1.5 miles per hour (1 quart per acre). For the control of perennial weeds, apply a 20 to 40 percent solution of this product at a flow rate of 2 fluid ounces per minute and a walking speed of 0.75 miles per hour (2 to 4 quarts per acre).

Controlled droplet application equipment produces a spray pattern that is not easily visible. Extreme care must be exercised to avoid spray or drift contacting the foliage or any other green tissue of desirable vegetation, as damage or destruction may result.

8.0 ANNUAL AND PERENNIAL CROPS (Alphabetical)

NOTE: THIS SECTION GIVES GENERAL DIRECTIONS THAT APPLY TO ALL LISTED CROPS WITHIN SECTION 8 GROUPED ALPHABETICALLY BELOW. SEE THE INDIVIDUAL CROP CATEGORIES FOR SPECIFIC INSTRUCTIONS, PREHARVEST INTERVALS, AND ADDITIONAL PRECAUTIONS AND RESTRICTIONS.

See the "ROUNDUP READY CROPS" section of this label or separately published Supplemental Labeling for instructions for treating Roundup Ready crops.

TYPES OF APPLICATIONS: Chemical Fallow, Preplant Fallow Beds, Preplant, Preemergence, At-Planting, Hooded Sprayers in Row-Middles, Shielded Sprayers in Row-

Middles, Wiper Applications in Row-Middles, and Post-Harvest Treatments.

GENERAL USE INSTRUCTIONS:

Apply this product during fallow intervals preceding planting, prior to planting or transplanting, at-planting, or preemergent to annual and perennial crops listed in this label, except where specifically limited. For any crop **not** listed in this label, applications must be made at least 30 days prior to planting. Unless otherwise specified, weed control applications may be made according to the rates listed in the "ANNUAL WEEDS", "PERENNIAL WEEDS", and "WOODY BRUSH AND TREES RATE TABLES" in this label. Repeat applications may be made up to a maximum of 8 quarts per acre per year.

Post-directed hooded sprayers and wiper equipment capable of preventing all crop contact with herbicide solutions may be used in mulched or unmulched row middles after crop establishment. Where specifically noted below, wipers may also be used above certain crops to control tall weeds. Refer to the "Selective Equipment" section of this label for essential precautions when using hooded sprayers or wipers to avoid crop injury caused by leakage of spray mists or dripping onto crops. Crop injury is possible with these applications and shall be the sole responsibility of the applicator.

The maximum use rates stated throughout this product's labeling apply to this product combined with the use of all other herbicides containing glyphosate or sulfosate as the active ingredient, whether applied as mixtures or separately. Calculate the application rates and ensure that the total use of this and other glyphosate or sulfosate containing products does not exceed stated maximum use rate.

GENERAL PRECAUTIONS, RESTRICTIONS: Avoid contact of herbicide with foliage, green shoots or stems, bark, exposed roots (including those emerging from plastic mulch), or fruit of crops because severe injury or destruction may result. When making preemergence and at-planting applications, applications must be made before crop emergence to avoid severe crop injury. Broadcast applications made at emergence will result in injury or death to emerged seedlings. Apply before seed germination in coarse sandy soils to further minimize the risk of injury. Unless otherwise specified in this product's labeling, treatments with selective equipment including wipers and hooded sprayers must be made at least 14 days prior to harvest. Post-harvest or fallow applications must be made at least 30 days prior to planting any non-labeled crop. See "APPLICATION EQUIPMENT AND TECHNIQUES" section of this label for additional information.

In crops where spot treatments are allowed, do not treat more than 10 percent of the total field to be harvested. The crop receiving spray in treated area will be killed. Take care to avoid drift or spray outside the target area for the same reason.

For broadcast postemergent treatments, do not harvest or feed treated vegetation for 8 weeks following application, unless otherwise specified.

8.1 Cereal and Grain Crops

LABELLED CROPS: Barley, Buckwheat, Millet (pearl, proso), Oats, Rice, Rye, Quinoa, Teff, Teosinte, Triticale, Wheat (all types), Wild Rice.

PRECAUTIONS, RESTRICTIONS: Do not treat rice fields or levees when field contains water.

TYPES OF APPLICATIONS: Those listed in Section 8.0 plus the following: Red Rice Control Prior to Planting Rice, Spot Treatment (except Rice), Over-the-Top Wiper Applicators (Feed Barley and Wheat only), Preharvest (Feed Barley and Wheat only).

Preplant, Preemergence, At-Planting

USE INSTRUCTIONS: This product may be applied before, during or after planting of cereal crops. Applications must be made prior to emergence of the crop.

Red Rice Control Prior to Planting Rice

USE INSTRUCTIONS: Apply 1.5 quarts of this product in 5 to 10 gallons of water per acre. Flush fields prior to application to obtain uniform germination and stand of red rice. Make application when the majority of the red rice plants are in the 2-leaf stage and no more than 4 inches tall. Red rice plants with less than 2 true leaves may be only partially controlled.

PRECAUTIONS, RESTRICTIONS: Avoid spraying during low humidity conditions, as reduced control may result. Do not treat rice fields or levees when the fields contain floodwater. Do not re-flood treated fields for 8 days following application.

Spot Treatment (except Rice)

USE INSTRUCTIONS: This product may be applied as a spot treatment in cereal crops. Apply this product before heading in small grains.

PRECAUTIONS, RESTRICTIONS: Do not treat more than 10 percent of the total field area to be harvested. The crop receiving spray in the treated area will be killed. Take care to avoid drift or spray outside target area for the same reason.

Over-the-Top Wiper Applicators (Feed Barley and Wheat only)

USE INSTRUCTIONS: Wiper applications may be used in feed barley and wheat. To control common rye or cereal rye, apply after the weeds have headed and achieved maximum growth, and when the rye is at least 6 inches above the wheat crop.

PRECAUTIONS, RESTRICTIONS: Allow at least 35 days between application and harvest. Do not use roller applicators.

Preharvest (Feed Barley and Wheat only)

USE INSTRUCTIONS: This product provides weed control when applied prior to harvest of wheat or feed barley. For wheat, apply after the hard-dough stage of grain (30 percent or less grain moisture). For feed barley, apply after the hard-dough stage and when the grain contains 20 percent moisture or less. Stubble may be grazed immediately after harvest.

This product may be applied using either aerial or ground spray equipment. For ground

applications, apply this product in 10 to 20 gallons of water per acre. For aerial applications, apply this product in 3 to 10 gallons of water per acre.

PRECAUTIONS, RESTRICTIONS: Do not apply more than 1 quart of this product per acre. Allow 7 days between application and harvest, feeding or grazing. Preharvest application is not recommended for wheat or barley grown for seed, as a reduction in germination or vigor may occur.

Post-Harvest

USE INSTRUCTIONS: This product may be applied after harvest of cereal crops. Higher rates may be required for control of large weeds which were growing in the crop at the time of harvest. Tank mixtures with 2,4-D or dicamba may be used.

PRECAUTIONS, RESTRICTIONS: For any crop not listed on this label, applications must be made at least 30 days prior to planting the next crop. Allow a minimum of 7 days between treatment and harvest or feeding of treated vegetation.

8.2 Corn

TYPES OF CORN: Field Corn, Seed Corn, Silage Corn, Sweet Corn and Popcorn.

TYPES OF APPLICATIONS: Those listed in Section 8.0 plus the following: Preharvest.

For Roundup Ready corn, see the "ROUNDUP READY CROPS" section of this label.

Preplant, Preemergence, At-Planting

USE INSTRUCTIONS: This product may be applied alone or in a tank-mixture before, during or after planting corn. Applications must be made prior to emergence of the crop.

TANK MIXTURES: This product may be tank mixed with the following products provided that the specific product is registered for application prior to planting corn. Apply these tank mixtures in 10 to 20 gallons of water or 10 to 60 gallons of nitrogen solution per acre.

2,4-D	Fultime®
Atrazine	Guardsman®/Leadoff®
Axiom®	Harness®
Balance®	Harness Xtra
Banvel®/Clarity®	Harness Xtra 5.6L
Bicep Magnum®	Lariat®
Bicep II MAGNUM®	Lasso®/Alachlor
Bullet®	Linex®/Lorox®
Degree®	Marksman®
Degree Xtra®	Micro-Tech®
Distinct®	Prowl®
Dual MAGNUM®	Python®
Dual II MAGNUM®	Simazine
Epic®	Topnotch®
Frontier®/Outlook®	

For difficult-to-control annual weeds such as fall panicum, barnyardgrass, crabgrass, shattercane and broadleaf signalgrass up to 2 inches tall, and Pennsylvania smartweed up to 6 inches tall, apply this product at 2 pints per acre in these tank mixtures. For other labeled annual weeds, apply 1.5 to 2 pints of this product per acre when weeds are less than 6 inches tall, and 2 to 3 pints when weeds are over 6 inches tall. When using nitrogen solutions as the carrier, use rate may need to be increased for acceptable weed control.

PRECAUTIONS, RESTRICTIONS: Applications of 2,4-D or dicamba must be made at least 7 days prior to planting corn.

For Southern states, do not apply in nitrogen solutions to tough-to-control grasses such as barnyardgrass, fall panicum, broadleaf signalgrass, annual ryegrass and any perennial weeds. The area covered by this recommendation includes from Route 50 South in Illinois and Indiana and the following states: Alabama, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, New Jersey, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia and West Virginia.

Hooded Sprayers

USE INSTRUCTIONS: This product may be used through hooded sprayers for weed control between the rows of corn. Only hooded sprayers that completely enclose the spray pattern may be used. See additional instruction for the use of hooded sprayers in the "APPLICATION EQUIPMENT AND TECHNIQUES" section of this label.

PRECAUTIONS, RESTRICTIONS: Corn must be at least 12 inches tall, measured without extending leaves. Contact of this product in any manner to any vegetation to which treatment is not intended may cause damage. Such damage shall be the sole responsibility of the applicator. Do not apply more than 1 quart of this product per acre for each application and no more than 3 quarts per acre per year for hooded sprayer applications.

Spot Treatment

USE INSTRUCTIONS: For spot treatments, apply this product prior to silking of corn.

PRECAUTIONS, RESTRICTIONS: Do not treat more than 10 percent of the total field area to be harvested. The crop receiving spray in the treated area will be killed. Take care to avoid drift or spray outside target area for the same reason.

Preharvest

USE INSTRUCTIONS: Make applications at 35 percent grain moisture or less. Ensure that maximum kernel fill is complete and the corn is physiologically mature (black layer formed). For ground applications, apply up to 3 quarts of this product per acre. For aerial applications, apply up to 2 quarts of this product per acre.

PRECAUTIONS, RESTRICTIONS: Allow a minimum of 7 days between application and harvest, feeding or grazing. Preharvest application is not recommended for corn grown for seed, as a reduction in germination or vigor may occur.

Post-Harvest

USE INSTRUCTIONS: This product may be applied after harvest of corn. Higher rates may be required for control of large weeds which were growing in the crop at the time of harvest. Tank mixtures with 2,4-D or dicamba may be used.

PRECAUTIONS, RESTRICTIONS: Allow a minimum of 7 days between treatment and harvest or feeding of treated vegetation.

8.3 Cotton

TYPES OF APPLICATIONS: Those listed in Section 8.0 plus the following: Selective Equipment, Spot Treatment, Preharvest.

For Roundup Ready cotton, see the "ROUNDUP READY CROPS" section of this label.

Preplant, Preemergence, At-Planting

USE INSTRUCTIONS: This product may be applied alone or in tank-mixture, before, during or after planting cotton. Applications must be made prior to emergence of the crop.

TANK MIXTURES: This product may be tank mixed with the following products provided that the specific product is registered for application prior to planting cotton. Apply these tank mixtures in 10 to 20 gallons of water per acre.

Caparo®	Dual II MAGNUM
Clarity	Karmex®
Command	Meturon®
Cotoran®	Prowl
Cotton-Pro®	Staple®
Direx®	Zorial®
Dual Magnum	2, 4-D

PRECAUTIONS/RESTRICTIONS: Refer to individual product labels for rates, restrictions, precautionary statements and preplant intervals.

Hooded Sprayer, Selective Equipment

USE INSTRUCTIONS: This product may be applied through hooded sprayers, recirculating sprayers, shielded applicators or wiper applicators in cotton. Allow at least 7 days between application and harvest.

PRECAUTIONS, RESTRICTIONS: See the "Selective Equipment" part of the "APPLICATION EQUIPMENT AND TECHNIQUES" section of this label for information on proper use and calibration of this equipment.

Spot Treatment

USE INSTRUCTIONS: For spot treatments, apply this product prior to boll opening of cotton.

PRECAUTIONS, RESTRICTIONS: Do not treat more than 10 percent of the total field area to be harvested. The crop receiving spray in treated area will be killed. Take care to avoid drift or spray outside target area for the same reason.

Preharvest

USE INSTRUCTIONS: This product provides weed control and cotton regrowth inhibition when applied prior to harvest of cotton. For weed control, apply at rates given in the "ANNUAL WEEDS", "PERENNIAL WEEDS" and "WOODY BRUSH AND TREES RATE TABLES" sections of this label. For cotton regrowth inhibition, apply 1 pint to 2 quarts of this product per acre.

Up to 2 quarts of this product may be applied using either aerial or ground spray equipment. Apply after sufficient bolls have developed to produce the desired yield of cotton. Applications made prior to this time could affect maximum yield potential.

TANK MIXTURES: This product may be tank mixed with DEF® 6, Folex®, Ginstar®, or Prep® to provide additional enhancement of cotton leaf drop.

PRECAUTIONS, RESTRICTIONS: Allow a minimum of 7 days between application and harvest of cotton. Preharvest application is not recommended for cotton grown for seed, as a reduction in germination or vigor may occur. THE USE OF ADDITIVES FOR PREHARVEST APPLICATION OF THIS PRODUCT TO COTTON IS PROHIBITED.

8.4 Fallow Systems

LABELLED CROPS: This product may be applied during the fallow period prior to planting or emergence of any crop on this label.

TYPES OF APPLICATIONS: Chemical Fallow, Preplant Fallow Beds, Aid-to-Tillage.

Chemical Fallow

USE INSTRUCTIONS: This product may be applied during the fallow period prior to planting or emergence of any crop listed on this label. This product may be used as a substitute for tillage to control annual weeds in fallow fields. Also, broadcast or spot treatments will control or suppress many perennial weeds in fallow fields. Ground or aerial application equipment may be used. Tank mixtures with 2,4-D and dicamba may be used. Applications up to 2 quarts per acre may be made by aerial application in fallow sites where there is sufficient buffer to prevent injury due to drift onto adjacent crops.

PRECAUTIONS, RESTRICTIONS: For any crop not listed on this label, applications must be made at least 30 days prior to planting. Do not apply dicamba tank mixtures by air in California.

Refer to the specific product labels for crop rotation restrictions and cautionary state-

ments of all products used in tank mixtures. Some crop injury may occur if dicamba is applied within 45 days of planting.

Preplant Fallow Beds

USE INSTRUCTIONS: This product may be applied to fallow beds prior to planting or emergence of any crop listed on this label. For any crop not listed on this label, applications must be made at least 30 days prior to planting. This product will control weeds listed in the "ANNUAL WEEDS", "PERENNIAL WEEDS", and "WOODY BRUSH AND TREES RATE TABLES" sections of this label.

TANK MIXTURES: In addition, 12 fluid ounces of this product plus 2 to 3 fluid ounces of Goal® 2XL per acre will control the following weeds with the maximum height or length indicated: 3 inches—common cheeseweed, chickweed, groundsel; 6 inches—London rocket, shepherd's-purse.

16 fluid ounces of this product plus 2 to 3 fluid ounces of Goal 2XL per acre will control the following weeds with the maximum height or length indicated: 6 inches—common cheeseweed, groundsel, mareestail (*Conyza canadensis*), 12 inches—chickweed, London rocket, shepherd's-purse.

Aid-to-Tillage

USE INSTRUCTIONS: This product may be used in conjunction with tillage practices in fallow systems or preplant to labeled crops to control downy brome, cheat, volunteer wheat, tansy mustard and foxtail. Apply 12 fluid ounces of this product in 3 to 10 gallons of water per acre. Make applications before weeds are 6 inches in height. Application must be followed by conventional tillage practices no later than 15 days after treatment and before regrowth occurs. Allow at least 1 day after application before tillage.

PRECAUTIONS, RESTRICTIONS: Tank mixtures with residual herbicides may result in reduced performance.

8.5 Grain Sorghum (Milo)

TYPES OF APPLICATIONS: Those listed in Section 8.0 plus the following: Spot Treatment, Over-the-Top Wiper Applications, Preharvest.

Preplant, Preemergence, At-Planting

USE INSTRUCTIONS: This product may be applied alone or in tank-mixture before, during or after planting grain sorghum. Applications must be made prior to emergence of the crop.

TANK MIXTURES: This product may be tank mixed with the following products provided that the specific product is registered for application prior to planting grain sorghum. Apply these tank mixtures in 10 to 20 gallons of water or 10 to 60 gallons of nitrogen solution per acre.

Atrazine	Lariat
Bicep II MAGNUM	Lasso
Bullet	Micro-Tech
Dual II MAGNUM	

For difficult-to-control annual weeds such as fall panicum, barnyardgrass, crabgrass, shattercane and broadleaf signalgrass up to 2 inches tall, and Pennsylvania smartweed up to 6 inches tall, apply this product at 2 pints per acre in these tank mixtures. For other labeled annual weeds, apply 1.5 to 2 pints of this product per acre when weeds are less than 6 inches tall, and 2 to 3 pints when weeds are over 6 inches tall. When using nitrogen solutions as the carrier, the use rate may need to be increased for acceptable weed control.

Spot Treatment, Over-the-Top Wiper Applications

USE INSTRUCTIONS: This product may be applied as a spot treatment in grain sorghum. Make spot treatments before heading of milo. This product may be applied with wiper applicators to control or suppress the weeds listed under "Wiper Applicators" in the "Selective Equipment" section of this label.

PRECAUTIONS, RESTRICTIONS: For spot treatment, do not treat more than 10 percent of the total field area to be harvested. The crop receiving spray in treated area will be killed. Take care to avoid drift or spray outside target area for the same reason.

For wiper applicators, allow at least 40 days between application and harvest. Do not use roller applicators. Do not feed or graze treated milo fodder. Do not ensile treated vegetation.

Hooded Sprayers

USE INSTRUCTIONS: This product may be used through hooded sprayers for weed control between the rows of milo. Only hooded sprayers that completely enclose the spray pattern may be used. See additional instruction for the use of hooded sprayers in the "APPLICATION EQUIPMENT AND TECHNIQUES" section of this label.

Crop injury may occur when the foliage of treated weeds comes into direct contact with leaves of the crop. Do not apply this product when the leaves of the crop are growing in direct contact with weeds to be treated. Droplets, mist, foam or splatter of the herbicide solution may contact the crop and cause discoloration, stunting or destruction.

PRECAUTIONS, RESTRICTIONS: Milo must be at least 12 inches tall, measured without extending leaves. Treat before milo sends tillers between the drill rows. If such tillers are contacted with the spray solution, the main plant may be killed. Contact of this product in any manner to any vegetation to which treatment is not intended may cause damage. Such damage shall be the sole responsibility of the applicator. Do not graze or feed milo forage or fodder following applications of this product through hooded sprayers. Do not apply more than 1 quart of this product per acre per application and no more than 3 quarts per acre per year for hooded sprayer applications.

Preharvest

USE INSTRUCTIONS: Make applications at 30 percent grain moisture or less.

PRECAUTIONS, RESTRICTIONS: Do not apply more than 2 quarts of this product per acre. As with other herbicides that cause sudden plant death, avoid preharvest applications of this product to milo infected with charcoal rot as lodging can occur. Allow a minimum of 7 days between application and harvest, feeding, or grazing of sorghum. Preharvest application is not recommended for sorghum grown for seed, as a reduction in germination or vigor may occur. The use of this product for preharvest grain sorghum (milo) is not registered in California

Post-Harvest

USE INSTRUCTIONS: This product may be applied after harvest of grain sorghum. Higher rates may be required for control of large weeds which were growing in the crop at the time of harvest. Tank mixtures with 2,4-D or dicamba may be used.

This product may be applied to grain sorghum (milo) stubble following harvest to suppress or control regrowth. Apply 1 quart of this product per acre for control, or 1.5 pints of this product per acre for suppression.

PRECAUTIONS, RESTRICTIONS: Allow a minimum of 7 days between treatment and harvest or feeding of treated vegetation.

8.6 Herbs and Spices

LABELED CROPS: Allspice, Angelica, Star anise, Annatto (seed), Balm, Basil, Borage, Burnet, Camomile, Caper buds, Caraway, Black caraway, Cardamom, Cassia bark, Cassia buds, Catnip, Celery seed, Chervil (dried), Chive, Chinese chive, Cinnamon, Clary, Clove buds, Coriander leaf (cilantro or chinese parsley), Coriander seed (cilantro), Costmary, Culantro (leaf), Culantro (seed), Cumin, Curry (leaf), Dill (dillweed), Dill (seed), Epazote, Fennel seed (common and Florence), Fenugreek, White ginger flower, Grains of paradise, Horehound, Hyssop, Juniper berry, Lavender, Lemongrass, Lovage (leaf and seed), Mace, Marigold, Marjoram (including oregano), Mexican oregano, Mioga flower, Mustard (seed), Nasturtium, Nutmeg, Parsley (dried), Pennyroyal, Pepper (black and white), Pepper leaves, Peppermint, Perilla, Poppy (seed), Rosemary, Rue, Saffron, Sage, Savory (summer and winter), Spearmint, Stevia leaves, Sweet bay, Tansy, Tarragon, Thyme, Vanilla, Wintergreen, Woodruff, Wormwood.

TYPES OF APPLICATIONS: Those listed in Section 8.0 plus the following: Over-the-Top Wiper Applications (Peppermint and Spearmint only), Spot Treatments (Peppermint and Spearmint only).

PRECAUTIONS, RESTRICTIONS: When applying this product prior to transplanting or direct-seeding crops into plastic mulch, care must be taken to remove residues of this product, which could cause crop injury, from the plastic prior to planting. Residues can be removed by a single 0.5-inch application of water, either by natural rainfall or via a sprinkler system. Care should be taken to ensure that the water flushes off the plastic mulch and does not enter the transplant holes. For some crops below, it is recommended to make applications 3 days before transplanting or planting.

Over-the-Top Wiper Applications or Spot Treatments (Peppermint and Spearmint only)

USE INSTRUCTIONS: This product may be used as a spot treatment or wiper application in spearmint and peppermint. Apply spot treatments on a spray-to-wet basis with hand-held equipment, such as backpack and knapsack sprayers, pump-up pressure sprayers, hand-guns, hand-wands or any other hand-held or motorized spray equipment used to direct the spray solution to a limited area. In wiper applications, the applicator should be adjusted so that the wiper contact point is at least 2 inches above the crop. Weeds should be a minimum of 6 inches taller than the crop.

PRECAUTIONS, RESTRICTIONS: Allow at least 7 days between application and harvest. Further applications may be made in the same area at 30-day intervals. In spot treatment applications, no more than 10 percent of the total field area to be harvested should be treated at one time. The crop receiving spray in the treated area will be killed. Take care to avoid drift or spray outside the target area for this reason. In wiper applications, contact of the herbicide solution with the crop may result in damage or destruction.

8.7 Oil Seed Crops

LABELED CROPS: Borage, Buffalo gourd (seed), Canola, Crambe, Flax, Jojoba, Lesquerella, Meadowfoam, Mustard (seed), Rape, Safflower, Sesame, Sunflower.

For Roundup Ready canola, see the "ROUNDUP READY CROPS" section of this label.

TYPES OF APPLICATIONS: Those listed in Section 8.0.

USE INSTRUCTIONS: This product may be applied before, during or after planting oil seed crops. Broadcast applications must be made prior to emergence of the listed oil seed crops. Wiper applicators or hooded sprayers may be used between the rows once the crop is established.

TANK MIXTURES: For sunflowers, a tank mixture with Prowl may be applied before, during or after planting in conventional tillage systems, into a cover crop, established sod or in previous crop residue.

PRECAUTIONS, RESTRICTIONS: Do not apply more than 2 quarts of this product per acre on canola. Do not apply more than 1 quart of this product per acre for sunflowers as a single preplant or preemergent application per year. Do not feed or graze sunflower forage following application of this product.

8.8 Soybeans

TYPES OF APPLICATIONS: Those listed in Section 8.0 plus the following: Spot Treatment, Preharvest, Selective Equipment.

For Roundup Ready soybeans, see the "ROUNDUP READY CROPS" section of this label.

Preplant, Preemergence, At-Planting

USE INSTRUCTIONS: This product may be applied alone or in a tank-mixture before, during or after planting soybeans. Applications must be made prior to emergence of the crop.

TANK MIXTURES: Apply these tank mixtures in 10 to 20 gallons of water per acre.

Aim®	Gauntlet®
Amplify®	Lasso
Assure® II	Linex
Authority®	Lorox/Linuron
Boundary®	Lorox Plus®
Canopy®	Micro-Tech
Canopy XL®	Prowl
Command®	Pursuit®
Command Xtra®	Pursuit Plus®
Domain®	Reflex®
Dual MAGNUM	Scepter®
Dual II MAGNUM	Sencor®/Lexone®
Firstrate®	Squadron®
Flexstar™	Steel®
Frontier/Outlook	Valor®
Fusion®	

This product may be tank mixed with 2,4-D or 2,4-DB provided that the specific product is registered for application prior to planting soybeans. See the 2,4-D label for intervals between application and planting.

For difficult-to-control annual weeds such as fall panicum, barnyardgrass, crabgrass, shattercane and broadleaf signalgrass up to 2 inches tall, and Pennsylvania smartweed up to 6 inches tall, apply this product at 2 pints per acre in these tank mixtures. For other labeled annual weeds, apply 1.5 to 2 pints of this product per acre when weeds are less than 6 inches tall, and 2 to 3 pints when weeds are over 6 inches tall.

PRECAUTIONS, RESTRICTIONS: Tank mixtures with some of the above listed herbicides may result in reduced weed control due to antagonism. Read and carefully observe the cautionary statements and all other information appearing on the product labels, supplemental labeling or fact sheets published separately for all herbicides used. Use according to the most restrictive directions for each product in the mixture.

Spot Treatment

USE INSTRUCTIONS: For spot treatments, apply this product prior to initial pod set in soybeans.

PRECAUTIONS, RESTRICTIONS: Do not treat more than 10 percent of the total field area to be harvested. The crop receiving spray in treated area will be killed. Take care to avoid drift or spray outside target area for the same reason.

Preharvest

USE INSTRUCTIONS: This product provides weed control when applied prior to harvest of soybeans.

Apply at rates given in the "ANNUAL WEEDS", "PERENNIAL WEEDS" and "WOODY BRUSH AND TREES RATE TABLES". This product may be applied using either aerial or ground spray equipment. Apply after pods have set and lost all green color. Care should be taken to avoid excessive seed shatter loss due to ground application equipment.

PRECAUTIONS, RESTRICTIONS: Do not apply more than 5 quarts per acre of this product for preharvest applications. Do not apply more than 2 quarts per acre of this product by air. Allow a minimum of 7 days between application and harvest of soybeans. Do not graze or harvest treated hay or fodder for livestock feed within 25 days of last preharvest application. (If the application rate is 1 quart per acre or lower, the grazing restriction is reduced to 14 days after last preharvest application.) Preharvest application is not recommended for soybeans grown for seed, as a reduction in germination or vigor may occur.

Selective Equipment

USE INSTRUCTIONS: This product may be applied through recirculating sprayers, shielded applicators, hooded sprayers, over-the-top wiper applicators or sponge bars in soybeans. Allow at least 7 days between application and harvest.

PRECAUTIONS, RESTRICTIONS: See the "Selective Equipment" part of the "APPLICATION EQUIPMENT AND TECHNIQUES" section of this label for information on proper use and calibration of this equipment.

8.9 Sugarcane

TYPES OF APPLICATIONS: Those listed in Section 8.0

Preplant, Preemergence, At-Planting

USE INSTRUCTIONS: This product may be applied in or around sugarcane fields or in fields prior to the emergence of plant cane.

PRECAUTIONS, RESTRICTIONS: Do not apply to vegetation in or around ditches, canals or ponds containing water to be used for irrigation.

Spot Treatment

USE INSTRUCTIONS: This product may be applied as a spot treatment in sugarcane. For control of volunteer or diseased sugarcane, make a 1 percent solution of this product in water and spray-to-wet the foliage of vegetation to be controlled. Volunteer or diseased sugarcane should have at least 7 new leaves.

PRECAUTIONS, RESTRICTIONS: Avoid spray contact with healthy cane plants since severe damage or destruction may result. Do not feed or graze treated sugarcane foliage following application.

Fallow Treatments

USE INSTRUCTIONS: This product may be used as a replacement for tillage in fields that are lying fallow between sugarcane crops. This product may also be used to remove the last stubble of ratoon cane. For removal of last stubble of ratoon cane, apply 4 to 5 quarts of this product in 10 to 40 gallons of water per acre to new growth having at least 7 new leaves. Allow 7 or more days after application before tillage. Ground or aerial application equipment may be used. Applications up to 3 quarts per acre may be made by aerial application in fallow sites where there is sufficient buffer to prevent injury due to drift onto adjacent crops. Tank mixtures with 2,4-D and dicamba may be used.

Hooded Sprayers

USE INSTRUCTIONS: This product may be used through hooded sprayers for weed control between the rows of sugarcane. See the "APPLICATION EQUIPMENT AND TECHNIQUES" section of this label for additional use instructions.

PRECAUTIONS, RESTRICTIONS: Do not allow treated weeds to come into contact with the crop. Droplets, mist, foam or splatter of the herbicide solution settling on the crop may result in discoloration, stunting or destruction. Such damage shall be the sole responsibility of the applicator.

8.10 Vegetable Crops

NOTE: THIS "VEGETABLE CROPS" SECTION GIVES GENERAL DIRECTIONS THAT APPLY TO ALL LISTED VEGETABLE CROPS WITHIN SECTION 8.10 GROUPED ALPHABETICALLY BELOW. SEE THE INDIVIDUAL CROP CATEGORIES FOR SPECIFIC INSTRUCTIONS, PREHARVEST INTERVALS, PRECAUTIONS AND RESTRICTIONS.

TYPES OF APPLICATIONS: Chemical Fallow, Preplant Fallow Beds, Preplant, Preemergence, Prior to Transplanting Vegetables, At-Planting, Hooded Sprayers in Row-Middles, Shielded Sprayers in Row-Middles, Wiper Applications in Row-Middles, and Post-Harvest, Directed Applications (Nonbearing Ginseng), Over-the-Top Wiper Applications (Rutabagas only).

PRECAUTIONS, RESTRICTIONS: When applying this product prior to transplanting or direct-seeding crops into plastic mulch, care must be taken to remove residues of this product, which could cause crop injury, from the plastic prior to planting. Residues can be removed by a single 0.5-inch application of water, either by natural rainfall or via a sprinkler system. Care should be taken to ensure that the water flushes off the plastic mulch and does not enter the transplant holes. Applications made at emergence will result in injury or death to emerged seedlings.

Avoid contact of herbicide with foliage, green shoots or stems, bark, exposed roots (including those emerging from plastic mulch), or fruit of crops because severe injury or destruction may result. When making preemergence and at planting applications, applications must be made before crop emergence to avoid severe crop injury. Broadcast applications made at emergence will result in injury or death to emerged seedlings. In crops with vines, hooded sprayer, shielded sprayer, and wiper application to row middles should be made prior to vine development otherwise severe injury or destruction may result. Unless otherwise specified in this product's labeling, treatments with selective equipment including wipers and hooded sprayers must be made at least 14 days prior to harvest. Post-harvest or fallow applications must be made at least 30 days prior to planting any non-labeled crop. See "APPLICATION EQUIPMENT AND TECHNIQUES" section of this label for additional information.

8.10.1 Brassica Vegetables

LABELED CROPS: Broccoli, Chinese broccoli (gai lon), Broccoli raab (rapini), Brussels sprouts, Cabbage, Chinese cabbage (bok choy), Chinese cabbage (napa), Chinese mustard cabbage (gai choy), Cauliflower, Cavalo broccolo, Collards, Kale, Kohlrabi, Mizuna, Mustard greens, Mustard spinach, Rape greens.

8.10.2 Bulb Vegetables

LABELED CROPS: Garlic, Great-headed garlic, Leek, Onion (dry bulb and green), Welsh Onion, Shallot.

8.10.3 Cucurbit Vegetables and Fruits

LABELED CROPS: Chayote (fruit), Chinese waxgourd (Chinese preserving melon), Citron melon, Cucumber, Gherkin, Edible gourd (includes hyotan, cucuzza, hechima, Chinese okra), Melons (all), *Momordica spp* (includes balsam apple, balsam pear, bittermelon, Chinese cucumber), Muskmelon (includes cantaloupe, casaba, crenshaw melon, golden pershaw melon, honeydew melon, honey ball melon, mango melon, Persian melon, pineapple melon, Santa Claus melon, snake melon), Pumpkin, Summer squash (includes crookneck squash, scallop squash, straightneck squash, vegetable marrow, zucchini), Winter squash (includes butternut squash, calabaza, hubbard squash, acorn squash, spaghetti squash), Watermelon.

PRECAUTIONS, RESTRICTIONS: For Cantaloupe, Casaba melon, Crenshaw melon,

Cucumber, Gherkin, Gourds, Honeydew melon, Honey ball melon, Mango melon, Melons (all), Muskmelon, Persian melon, Pumpkin, Squash (summer, winter), and Watermelon, allow at least 3 days between application and planting.

8.10.4 Leafy Vegetables

LABELED CROPS: Amaranth (Chinese spinach), Arugula (rocket), Beet greens, Cardoon, Celery, Chinese celery, Celtuce, Chaya, Chervil, Edible-leaved chrysanthemum, Garland chrysanthemum, Corn salad, Cress (garden and upland), Dandelion, Dock (sorrel), Dokudami, Endive (escarole), Florence fennel, Gow kee, Lettuce (head and leaf), Orach, Parsley, Purslane (garden and winter), Radicchio (red chicory), Rhubarb, Spinach, New Zealand spinach, Vine spinach, Swiss chard, Watercress (upland), Water spinach.

PRECAUTIONS, RESTRICTIONS: For Watercress, avoid applications within 3 days prior to seeding and during the period between seeding and emergence to minimize the risk of injury.

8.10.5 Fruiting Vegetables

LABELED CROPS: Eggplant, Groundcherry (*Physalis spp*), Pepino, Pepper (includes bell pepper, chili pepper, cooking pepper, pimento, sweet pepper), Tomatillo, Tomato.

PRECAUTIONS, RESTRICTIONS: For Eggplant, Ground cherry, Pepper (all), and Tomatillo, allow at least 3 days between application and planting. For Tomato, hooded or shielded sprayer applications in row middles are not recommended.

8.10.6 Legume Vegetables (Succulent or Dried)

LABELED CROPS: Bean (*Lupinus*: includes grain lupin, sweet lupin, white lupin, and white sweet lupin), Bean (*Phaseolus*: includes field bean, kidney bean, lima bean, navy bean, pinto bean, runner bean, snap bean, tepary bean, wax bean), Bean (*Vigna*: includes adzuki bean, asparagus bean, blackeye pea, catjang, Chinese longbean, cowpea, crowder pea, moth bean, mung bean, rice bean, southern pea, urd bean, yardlong bean), Broad bean (fava), Chickpea (garbanzo), Guar, Jackbean, Lablab bean, Lentil, Pea (*Pisum*: includes dwarf pea, edible-podded pea, English pea, field pea, garden pea, green pea, snowpea, sugar snap pea), Pigeon pea, Soybean (immature seed), Sword bean.

8.10.7 Root and Tuber Vegetables

LABELED CROPS: Arracacha, Arrowroot, Chinese artichoke, Jerusalem artichoke, Beet (garden), Burdock, Canna, Carrot, Cassava (bitter and sweet), Celeriac, Chayote (root), Chervil (turnip-rooted), Chicory, Chufa, Dasheen (taro), Galangal, Ginger, Ginseng, Horseradish, Leren, Kava (turnip-rooted), Parsley (turnip-rooted), Parsnip, Potato, Radish, Oriental radish, Rutabaga, Salsify, Black salsify, Spanish salsify, Skirret, Sweet potato, Tanier, Turmeric, Turnip, Wasabi, Yacon, Yam bean, True yam.

Directed Applications (Non-bearing Ginseng only)

USE INSTRUCTIONS: This product may be used for general weed control in established non-bearing ginseng. Applications may be made with boom equipment, CDA, shielded sprayers, hand-held and high volume wands, lances, and orchard guns or with wiper application equipment.

PRECAUTIONS, RESTRICTIONS: Direct applications so that there is no contact of this product with the ginseng plant. Applications must be made at least one year prior to harvest.

Over-the-Top Wiper Applications (Rutabagas only)

USE INSTRUCTIONS: Wiper applicators may be used over-the-top of rutabagas.

PRECAUTIONS, RESTRICTIONS: Allow at least 14 days between application and harvest of rutabagas.

8.11 Miscellaneous Crops

LABELED CROPS: Aloe vera, Asparagus, Bamboo shoots, Globe artichoke, Okra, Peanut (ground nut), Pineapple, Strawberry, Sugar beet.

TYPES OF APPLICATIONS: Those listed in Section 8.0 plus the following: General Weed Control, Site Preparation, Spot Treatment (Asparagus).

PRECAUTIONS, RESTRICTIONS: Avoid contact of herbicide with foliage, green shoots or stems, bark, exposed roots (including those emerging from plastic mulch), or fruit of crops because severe injury or destruction may result. When making preemergence and at planting applications, applications must be made before crop emergence to avoid severe crop injury. Broadcast applications made at emergence will result in injury or death to emerged seedlings. In crops with vines, hooded sprayer, shielded sprayer, and wiper application to row middles should be made prior to vine development otherwise severe injury or destruction may result. Unless otherwise specified in this product's labeling, treatments with selective equipment including wipers and hooded sprayers must be made at least 14 days prior to harvest. Post-harvest or fallow applications must be made at least 30 days prior to planting any non-labeled crop. See "APPLICATION EQUIPMENT AND TECHNIQUES" section of this label for additional information.

General Weed Control, Site Preparation

USE INSTRUCTIONS: This product may be applied for general weed control or for site preparation prior to planting or transplanting crops listed in this section.

PRECAUTIONS, RESTRICTIONS: When applying this product prior to transplanting or direct-seeding crops into plastic mulch, care must be taken to remove residues of this product, which could cause crop injury, from the plastic prior to planting. Residues can be removed by a single 0.5-inch application of water, either by natural rainfall or via a sprinkler system. Care should be taken to ensure that the water flushes off the plastic mulch and does not enter the transplant holes. Applications made at emergence will result in injury or death to emerged seedlings.

Do not apply within a week before the first asparagus spears emerge. Do not feed or graze treated pineapple forage following application.

Spot Treatment (Asparagus)

USE INSTRUCTIONS: This product may be applied immediately after cutting, but prior to the emergence of new spears.

PRECAUTIONS, RESTRICTIONS: Do not treat more than 10 percent of the total field area to be harvested. Do not harvest within 5 days of treatment.

Post-Harvest (Asparagus)

USE INSTRUCTIONS: This product may be applied after the last harvest and all spears have been removed. If spears are allowed to regrow, delay application until ferns have developed. Delayed treatments should be applied as a directed or shielded spray in order to avoid contact of the spray with ferns, stems or spears.

PRECAUTIONS, RESTRICTIONS: Direct contact of the spray with the asparagus may result in serious crop injury. Select and use recommended types of spray equipment for postemergence post-harvest applications. A directed spray is any application where the spray pattern is aligned in such a way as to avoid direct contact of the spray with the crop. A shielded spray is any application where a physical barrier is positioned and maintained between the spray and the crop to prevent contact of spray with the crop.

9.0 TREE, VINE, AND SHRUB CROPS (Alphabetical)

NOTE: THIS SECTION GIVES GENERAL DIRECTIONS THAT APPLY TO ALL LISTED TREE, VINE, AND SHRUB CROPS WITHIN SECTION 9 GROUPED ALPHABETICALLY BELOW. SEE THE INDIVIDUAL CROP CATEGORIES FOR SPECIFIC INSTRUCTIONS, PREHARVEST INTERVALS, PRECAUTIONS AND RESTRICTIONS.

TYPES OF APPLICATIONS: Preplant (Site Preparation) Broadcast Sprays, General Weed Control, Middles (between rows of trees, vines or bushes), Strips (within rows of trees, vines or bushes), Selective Equipment (Shielded Sprayers, Wiper Applications), Directed Sprays, Spot Treatments, Perennial Grass Suppression, Cut Stump.

Applications may be made with boom equipment, CDA equipment, shielded sprayers, hand-held and high-volume wands, lances, orchard guns or with wiper applicator equipment, except as directed.

GENERAL USE INSTRUCTIONS: This product may be applied in middles (between rows of trees or vines), strips (within rows of trees or vines), and for general weed control or perennial grass suppression in established tree fruit and nut groves, orchards, berries, and vineyards. It may also be used for site preparation prior to planting or transplanting these crops. Apply 1 pint to 5 quarts per acre according to the "ANNUAL WEEDS RATE TABLE" and "PERENNIAL WEEDS RATE TABLE" sections of this label. Utilize rates at the higher end of the recommended rate range when weeds are stressed, growing in dense populations or are greater than 12 inches tall. Repeat applications may be made up to a maximum of 10.6 quarts per acre per year.

The maximum use rates stated throughout this product's labeling apply to this product combined with the use of all other herbicides containing glyphosate or sulfosate as the active ingredient, whether applied as mixtures or separately. Calculate the application rates and ensure that the total use of this and other glyphosate or sulfosate containing products does not exceed stated maximum use rate.

GENERAL PRECAUTIONS, RESTRICTIONS: Extreme care must be exercised to avoid contact of herbicide solution, spray, drift or mist with foliage or green bark of trunk, branches, suckers, fruit or other parts of trees, canes and vines. Avoid applications when recent pruning wounds or other mechanical injury has occurred. Contact of this product with other than matured brown bark can result in serious crop damage or destruction. Only shielded or directed sprayers may be used in crops with potential for crop contact, and then only where there is sufficient clearance. For applications in strips (within rows of trees), only selective equipment (directed sprays, hooded sprayers, shielded applicators, or wipers) should be used to minimize the potential for leakage or drift of herbicide sprays onto crop. For berry crops, hooded or shielded sprayers must be fully enclosed including top, sides, front and back. Only wipers or shielded applicators capable of preventing all contact with crop may be used. See "APPLICATION EQUIPMENT AND TECHNIQUES" section of this label for additional directions and precautions.

Allow a minimum of 3 days between application and transplanting.

Middles (Between Rows)

USE INSTRUCTIONS: This product will control or suppress annual and perennial weeds and ground covers growing between the rows of labeled tree and vine crops. If weeds are under drought stress, irrigate prior to application. Reduced control may result if weeds have been mowed prior to application.

TANK MIXTURES: A tank mixture of this product plus Goal 2XL may be used for annual weeds in middles between rows of citrus crops, tree fruits, tree nuts and vine crops. This mixture is recommended when weeds are stressed or growing in dense populations. 16 to 32 fluid ounces per acre of this product plus 3 to 12 fluid ounces per acre of Goal 2XL will control common cheeseweed (*malva*) or hairy fleabane (*Conyza bonar-*

iensis) with a maximum height or diameter of 3 inches, and annual weeds with a maximum height or diameter of 6 inches, including crabgrass, common groundsel, junglerice, common lambsquarters, redroot pigweed, London rocket, common ryegrass, shepherd's-purse, annual sowthistle, filaree (suppression), horseweed/marestail (*Conyza canadensis*), stinging nettle and common purslane (suppression).

Strips (In Rows)

TANK MIXTURES: This product may be applied in rows of tree or vine crops in tank mixtures with the following products:

Devrinol® 50 DF	Simazine 4L
Direx 4L	Simazine 80W
Goal 2XL	Sim-Trol® 4L
Karmex DF	Solicam® DF
Krovar® I	Surflan® AS
Princep Caliber® 90	Surflan 75W
Prowl	

Do not apply these tank mixtures in Puerto Rico.

Refer to the individual product labels for specific crops, rates, geographic restrictions and precautionary statements.

Perennial Grass Suppression

This product will suppress perennial grasses such as bahiagrass, Bermudagrass, tall fescue, orchardgrass, Kentucky bluegrass, and quackgrass that are grown as ground covers in tree and vine crops.

For suppression of tall fescue, fine fescue, orchardgrass and quackgrass, apply 8 fluid ounces of this product in 10 to 20 gallons of water per acre.

For suppression of Kentucky bluegrass covers, apply 6 fluid ounces of this product per acre. Do not add ammonium sulfate.

For best results, mow cool season grass covers in the spring to even their height and apply this product 3 to 4 days after mowing.

For suppression of vegetative growth and seedhead inhibition of bahiagrass for approximately 45 days, apply 6 fluid ounces of this product in 10 to 25 gallons of water per acre. Apply 1 to 2 weeks after full green-up or after mowing to a uniform height of 3 to 4 inches. This application must be made prior to seedhead emergence.

For suppression up to 120 days, apply 4 fluid ounces of this product per acre, followed by an application of 2 to 4 fluid ounces per acre about 45 days later. Make no more than 2 applications per year.

For burndown of Bermudagrass, apply 1 to 2 quarts of this product in 3 to 20 gallons of water per acre. Use this treatment only if reduction of the Bermudagrass stand can be tolerated. When burndown is required prior to harvest, allow at least 21 days to ensure sufficient time for burndown to occur.

For suppression of Bermudagrass, apply 6 to 16 fluid ounces of this product per acre east of the Rocky Mountains and 16 fluid ounces of this product per acre west of the Rocky Mountains. Apply in a total spray volume of 3 to 20 gallons per acre, no sooner than 1 to 2 weeks after full green-up. If the Bermudagrass is mowed prior to application, maintain a minimum of 3 inches in height. Sequential applications may be made when regrowth occurs and Bermudagrass injury and stand reduction can be tolerated. East of the Rocky Mountains, rates of 6 to 10 fluid ounces of this product per acre should be used in shaded conditions or where a lesser degree of suppression is desired.

Cut Stump (Tree Crops)

USE INSTRUCTIONS: Cut stump applications of this product may be made during site preparation or site renovation, prior to transplanting tree crops. This product will control regrowth of cut stumps and resprouts of many types of tree species, some of which are listed below.

Citrus Trees: Calamondin, Chironja, Citron, Citrus hybrids, Grapefruit, Kumquat, Lemon, Lime, Mandarin (Tangerine), Orange (all), Pummelo, Tangelo, Tangor.

Fruit Trees: Apple, Apricot, Cherry (sweet, sour), Crabapple, Loquat, Mayhaw, Nectarine, Olive, Peach, Pear, Plum/Prune (all), Quince.

Nut Trees: Almond, Beechnut, Brazil Nut, Butternut, Cashew, Chestnut, Chinquapin, Filbert (hazelnut), Hickory Nut, Macadamia, Pecan, Pistachio, Walnut (black, English).

Apply this product using suitable equipment to ensure coverage of the entire cambium. Cut trees or resprouts close to the soil surface. Apply a 50 to 100 percent solution of this product to the freshly cut surface immediately after cutting. Delays in application may result in reduced performance. For best results, applications should be made during periods of active growth and full leaf expansion.

PRECAUTIONS, RESTRICTIONS: DO NOT MAKE CUT STUMP APPLICATIONS WHEN THE ROOTS OF ADJACENT DESIRABLE TREES MAY BE GRAFTED TO THE ROOTS OF THE CUT STUMP. INJURY RESULTING FROM ROOT GRAFTING MAY OCCUR IN ADJACENT TREES. Some sprouts, stems, or trees may share the same root system. Adjacent trees having a similar age, height and spacing may signal shared roots. Whether grafted or shared, injury is likely to occur to non-treated stems/trees when one or more trees sharing common roots are treated.

9.1 Berry Crops

LABELLED CROPS: Blackberry (including bingleberry, black satin berry, boysenberry, Cherokee blackberry, chesterberry, Cheyenne blackberry, coryberry, darrowberry, dewberry, Dirksen thornless berry, Himalayaberry, hullberry, juneberry, lavacaberry, lowberry, lucretiaberry, marionberry, nectarberry, olallieberry, Oregon evergreen berry, phenom-

enalberry, rangeberry, ravenberry, rossberry, Shawnee blackberry, and youngberry), Blueberry, Cranberry, Currant, Elderberry, Gooseberry, Huckleberry, Loganberry, Salal.

TYPES OF APPLICATIONS: Those listed in Section 9.0 plus Spot Treatment in Cranberry Production and Post-Harvest Treatments in Cranberry Production.

PRECAUTIONS, RESTRICTIONS: To avoid damage, herbicide sprays must not be allowed to contact desirable vegetation, including green shoots, canes, or foliage. Allow a minimum of 30 days between last application and harvest in cranberries. Allow a minimum of 14 days between last application and harvest in other berry crops. Do not make directed sprays within the cranberry bush areas prior to berry harvest.

Spot Treatment in Cranberry Production

USE INSTRUCTIONS: Spot treatments may be used to control weeds growing in dry ditches (interior and perimeter) of cranberry production areas. Hand-held sprayers or other appropriate application equipment listed under "APPLICATION EQUIPMENT AND TECHNIQUES" in this label may be used. Drop water level to remove standing water in ditches prior to application. In hand-held sprayers, use 1 to 2 percent solution of this product. Spray to wet vegetation, not to run-off.

PRECAUTIONS, RESTRICTIONS: For treatments after draw-down of water in dry ditches, allow 2 or more days after treatment before reintroduction of water to achieve maximum weed control. Apply this product within 1 day after draw-down to ensure application to actively growing weeds. Allow a minimum of 30 days between last application and harvest of cranberries. Do not apply this material through the irrigation system. Do not make applications by air. Do not apply directly to water. Use nozzles that emit medium- to large-sized droplets to minimize drift in order to avoid crop injury.

Post-Harvest Treatments in Cranberry Production

USE INSTRUCTIONS: Application of this product may be made after the harvest of cranberries to control weeds growing within the field. Best results will be obtained if applications are made to vines that appear dormant (after they have turned red). Hand-held sprayers, wipers, or other appropriate application equipment listed under "APPLICATION EQUIPMENT AND TECHNIQUES" in this label may be used. If using hand-held sprayers, use a 0.5 to 1 percent solution of this product. Spray to wet vegetation, not to run-off. If using hand-held boom sprayers, apply 2 to 4 quarts of this product per acre.

PRECAUTIONS, RESTRICTIONS: Make applications only after cranberries have been harvested. Do not treat more than 10 percent of the total bog. Allow a minimum of 6 months after last application and next harvest of cranberries. Do not apply this product through the irrigation system. Do not make applications by air. Do not apply directly to water. Even though vines appear dormant, contact of the herbicide solution with desirable vegetation may result in damage or severe plant injury. Cranberry plants that are directly sprayed may be killed.

9.2 Citrus

LABELED CROPS: Calamondin, Chironja, Citron, Citrus Hybrids, Grapefruit, Kumquat, Lemon, Lime, Mandarin (tangerine), Orange (all), Pummelo, Satsuma Mandarin, Tangelo (ugli), Tangor.

TYPES OF APPLICATIONS: Those listed in Section 9.0.

USE INSTRUCTIONS (The recommendations below pertain to applications in Florida and Texas): For burndown or control of the weeds listed below, apply the recommended rates of this product in 3 to 30 gallons of water per acre. Where weed foliage is dense, use 10 to 30 gallons of water per acre.

For goatweed, apply 2 to 3 quarts of this product per acre. Apply in 20 to 30 gallons of water per acre when plants are actively growing. Use 2 quarts per acre when plants are less than 8 inches tall and 3 quarts per acre when plants are greater than 8 inches tall. If goatweed is greater than 8 inches tall, the addition of Krovar I or Karmex may improve control. Refer to the individual product labels for specific crops, rates, geographic restrictions and precautionary statements.

Perennial weeds:

S = Suppression B = Burndown
PC = Partial control C = Control

WEED SPECIES	ROUNDUP ORIGINAL RATE PER ACRE			
	1 QT	2 QT	3 QT	5 QT
Bermudagrass	B	—	PC	C
Guineagrass				
Texas and Florida Ridge	B	C	C	C
Florida Flatwoods	—	B	C	C
Paragrass	B	C	C	C
Torpedograss	S	—	PC	C

PRECAUTIONS, RESTRICTIONS: Allow a minimum of 1 day between last application and harvest in citrus crops. For citron groves, apply as directed sprays only.

9.3 Miscellaneous Tree Food Crops

LABELED CROPS: Cactus (fruit and pads), Palm (heart, leaves), Palm (oil).

TYPES OF APPLICATIONS: Those listed in Section 9.0.

9.4 Non-Food Tree Crops

LABELED CROPS: Pine, Poplar, Eucalyptus, Christmas trees, Other Non-Food Tree Crops.

TYPES OF APPLICATIONS: Those listed in Section 9.0.

Directed Sprays, Spot Treatment, Wiper Applications

USE INSTRUCTIONS: This product may be used as a post-directed spray and spot treatment around established poplar, eucalyptus, Christmas trees and other non-food tree crops.

PRECAUTIONS, RESTRICTIONS: Care must be exercised to avoid contact of spray, drift or mist with foliage or green bark of established Christmas trees and other pine trees. Desirable plants may be protected from the spray solution by using shields or coverings made of cardboard or other impermeable material. UNLESS OTHERWISE DIRECTED, THIS PRODUCT IS NOT RECOMMENDED FOR USE AS AN OVER-THE-TOP BROADCAST SPRAY IN CHRISTMAS TREES AND OTHER PINE TREES.

Site Preparation

USE INSTRUCTIONS: This product may be used prior to planting Christmas trees.

PRECAUTIONS, RESTRICTIONS: Precautions should be taken to protect nontarget plants during site preparation applications.

9.5 Pome Fruit

LABELED CROPS: Apple, Crabapple, Loquat, Mayhaw, Pear (including oriental pear), Quince.

TYPES OF APPLICATIONS: Those listed in Section 9.0.

PRECAUTIONS, RESTRICTIONS: Allow a minimum of 1 day between last application and harvest in pome crops.

9.6 Stone Fruit

LABELED CROPS: Apricot, Cherry (sweet, tart), Nectarine, Olive, Peach, Plum/Prune (all types), Plumcot.

TYPES OF APPLICATIONS: Those listed in Section 9.0.

PRECAUTIONS, RESTRICTIONS: Allow a minimum of 17 days between last application and harvest in stone fruit crops. For olive groves, apply as directed sprays only.

Restrictions on Application Equipment

For cherries, any application equipment listed in this section may be used in all states.

Any application equipment listed in this section may be used in apricots, nectarines, peaches and plums/prunes growing in Arizona, California, Colorado, Idaho, Kansas, Kentucky, New Jersey, North Dakota, Oklahoma, Oregon, Texas, Utah and Washington, except for peaches grown in the states specified in the following paragraph. In all other states, use wiper equipment only.

For PEACHES grown in Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina and Tennessee only, apply with a shielded boom sprayer or shielded wiper applicator, which prevents any contact of this product with the foliage or bark of trees. Apply no later than 90 days after first bloom. Applications made after this time may result in severe damage. Remove suckers and low-hanging limbs at least 10 days prior to application. Avoid applications near trees with recent pruning wounds or other mechanical injury. Apply only near trees that have been planted in the orchard for 2 or more years. EXTREME CARE MUST BE TAKEN TO ENSURE NO PART OF THE PEACH TREE IS CONTACTED.

9.7 Tree Nuts

LABELED CROPS: Almond, Beechnut, Betelnut, Brazil nut, Butternut, Cashew, Chestnut, Chinquapin, Coconut, Filbert (hazelnut), Hickory nut, Macadamia, Pecan, Pine nut, Pistachio, Walnut (black, English).

TYPES OF APPLICATIONS: Those listed in Section 9.0.

PRECAUTIONS, RESTRICTIONS: Allow a minimum of 3 days between last application and harvest of tree nuts, except coconut. Allow 14 days between application and harvest in coconut.

9.8 Tropical and Subtropical Trees and Fruits

LABELED CROPS: Ambarella, Atemoya, Avocado, Banana, Barbados cherry (acerola), Biriba, Blimbe, Breadfruit, Cacao (cocoa) bean, Canistel, Carambola (starfruit), Cherimoya, Coffee, Custard apple, Dates, Durian, Feijoa, Figs, Governor's plum, Guava, Ilaia, Imbe, Imbu, Jaboticaba, Jackfruit, Longan, Lychee, Mamey apple, Mango, Mangosteen, Marmaladebox (genip), Mountain papaya, Papaya, Pawpaw, Plantain, Persimmon, Pomegranate, Pulasan, Rambutan, Rose apple, Sapodilla, Sapote (black, mamey, white), Spanish lime, Soursop, Star apple, Sugar apple, Surinam cherry, Tamarind, Tea, Ti (roots and leaves), Wax jambu.

TYPES OF APPLICATIONS: Those listed in Section 9.0.

PRECAUTIONS, RESTRICTIONS: Allow a minimum of 1 day between last application and harvest in banana, guava, papaya, and plantain crops. Allow a minimum of 14 days between last application and harvest for any other tropical or subtropical tree fruit. Allow a minimum of 28 days between last application and harvest in coffee crops. In coffee and banana, delay applications 3 months after transplanting to allow the new coffee or banana plant to become established.

9.9 Vine Crops

LABELED CROPS: Grapes (juice, raisin, table, wine), Hops, Kiwi, Passion fruit.

TYPES OF APPLICATIONS: Those listed in Section 9.0.

Applications should not be made when green shoots, canes or foliage are in the spray zone.

In the northeast and Great Lakes regions, applications must be made prior to the end of bloom stage of grapes to avoid injury, or make applications with shielded sprayers or wiper equipment.

PRECAUTIONS, RESTRICTIONS: Allow a minimum of 14 days between last application and harvest in vine crops. Do not use selective equipment in kiwi.

10.0 PASTURE GRASSES, FORAGE LEGUMES AND RANGELANDS

GENERAL USE INSTRUCTIONS: This product may be applied to turf or pasture grasses, forage legumes, and rangelands for weed control as directed below. Apply 12 fluid ounces to 5 quarts per acre according to the "ANNUAL WEEDS", "PERENNIAL WEEDS", and "WOODY BRUSH AND TREES RATE TABLES" in this product label booklet.

GENERAL PRECAUTIONS, RESTRICTIONS: Follow the specific limitations below with regard to application methods, timing, treatment rates, and post-application intervals. All applications must be made at least 30 days before planting any crop that is not specified for treatment in this label booklet or supplemental labeling.

10.1 Alfalfa, Clover, and Other Forage Legumes

LABELED CROPS: Alfalfa, Clover, Kenaf, Kudzu, Lespedeza, Leucaena, Lupin, Sainfoin, Trefoil, Velvet bean, Vetch (all types).

TYPES OF APPLICATIONS: Preplant, Preemergence, At-Planting, Spot Treatment, Over-the-Top Wiper Applications, Renovation, Preharvest (except Kenaf and Leucaena).

Preplant, Preemergence, At-Planting

USE INSTRUCTIONS: This product may be applied before, during or after planting crops listed in this section. Applications must be made prior to emergence of the crop.

PRECAUTIONS, RESTRICTIONS: Remove domestic livestock before application. The crop may be fed or grazed as soon as it reaches sufficient maturity.

Preharvest (except Kenaf and Leucaena)

USE INSTRUCTIONS: This product may be used in declining stands or any stand where severe crop injury or destruction is acceptable. This product will control annual and perennial weeds, including quackgrass, when applied prior to crop harvest. Applications may be made at any time of the year. For control of quackgrass, apply in the spring, late summer or fall when quackgrass is actively growing. Treatments for quackgrass must be followed by deep tillage for complete control.

PRECAUTIONS, RESTRICTIONS: Make only one application to an existing crop stand per year. The treated crop and weeds can be harvested and fed to livestock according to the intervals below.

	Maximum Single Application Rate	Minimum Interval between application and harvest/grazing
Alfalfa	2 quarts per acre	36 hours
All other labeled legumes above	3 pints per acre	3 days

This application may destroy an alfalfa stand and may severely injure or destroy other labeled crops such as clover. Preharvest application is not recommended for alfalfa grown for seed, as a reduction in germination or vigor may occur.

Spot Treatment, Over-the-Top Wiper Applications

USE INSTRUCTIONS: This product may be applied as a spot treatment or with wiper applicators. For wipers, see the "Wiper Applicators" in the "Selective Equipment" section of the product label booklet. Applications may be made in the same area at 30-day intervals.

PRECAUTIONS, RESTRICTIONS: For spot treatment and wiper applications, apply in areas where the movement of domestic livestock can be controlled. No more than 10 percent of the total field area should be treated at one time. Remove domestic livestock before application and wait 3 days after application before grazing livestock or harvesting.

Renovation

USE INSTRUCTIONS: This product may be applied as a broadcast spray to renovate existing stands of alfalfa, clover, and other labeled forage legumes. If the crop is to be grazed or harvested for feed, use up to 2 quarts per acre in alfalfa and up to 3 pints per acre in other labeled legumes. For complete removal of established stands of clover, it may be necessary to use the higher treatment rates listed in the "PERENNIAL WEEDS RATE TABLE" in this label booklet.

PRECAUTIONS, RESTRICTIONS: When treatment rates of 2 quarts per acre for alfalfa or 3 pints per acre for other forage legumes are used, remove domestic livestock before application and wait 3 days after application before reintroduction. If treatment rates above these levels are necessary, do not graze or harvest treated foliage for livestock feed. Crops listed for treatment in this label booklet may be planted into the treated area at any time; for other crops, wait 30 days between application and planting.

10.2 Conservation Reserve Program (CRP)

TYPES OF APPLICATIONS: Renovation (Rotating out of CRP), Site Preparation, Postemergence Weed Control in Dormant CRP Grasses, Wiper Applications Over-the-Top.

Renovation (Rotating out of CRP), Site Preparation

USE INSTRUCTIONS: This product may be used to prepare CRP land for crop production. Refer to Federal, state or local use guides for CRP renovation recommendations. For any crop not listed for treatment in this product's label booklet, applications must be made at least 30 days prior to planting.

Postemergence Weed Control in Dormant CRP Grasses, Wiper Applications Over-the-Top

USE INSTRUCTIONS: This product may be used to suppress competitive growth and

seed production of undesirable vegetation in CRP acres. Such applications may be made with wiper application equipment or as a broadcast or spot treatment to dormant CRP grasses. For selective applications with broadcast spray equipment, apply 12 to 16 fluid ounces of this product per acre in early spring before desirable CRP grasses, such as crested and tall wheatgrass, break dormancy and initiate green growth. Late fall applications can be made after desirable perennial grasses have reached dormancy.

PRECAUTIONS, RESTRICTIONS: Some stunting of CRP perennial grasses will occur if broadcast applications are made when plants are not dormant. No waiting period is required between application and grazing or harvesting for feed. Do not apply more than 3 quarts per acre per year onto CRP grasses.

10.3 Grass Seed or Sod Production

LABELED CROPS: Any grass (*Gramineae* family) except Corn, Sorghum, Sugarcane and those listed in this product's label booklet under "Cereal and Grain Crops".

TYPES OF APPLICATIONS: Preplant, Preemergence, At-Planting, Renovation, Site Preparation, Shielded Sprayers, Wiper Applications Over-the-Top, Spot Treatments, Creating Rows in Annual Ryegrass.

Preplant, Preemergence, At-Planting, Renovation, Site Preparation

USE INSTRUCTIONS: This product controls most existing vegetation prior to renovating turf or forage grass seed areas or establishing turf grass grown for sod. Make applications before, during or after planting or for renovation. For maximum control of existing vegetation, delay planting to determine if any regrowth from escaped underground plant parts occurs. Where existing vegetation is growing under mowed turfgrass management, apply this product after omitting at least one regular mowing to allow sufficient growth for good interception of the spray. Where repeat treatments are necessary, sufficient regrowth must be attained prior to application. For warm-season grasses, such as Bermudagrass, summer or fall applications provide best control. Broadcast equipment may be used to control sod remnants or other unwanted vegetation after sod is harvested.

PRECAUTIONS, RESTRICTIONS: Do not disturb soil or underground plant parts before treatment. Tillage or renovation techniques such as vertical mowing, coring or slicing should be delayed for 7 days after application to allow proper translocation into underground plant parts. If application rates total 3 quarts per acre or less, no waiting period between treatment and feeding or livestock grazing is required. If the rate is greater than 3 quarts per acre, remove domestic livestock before application and wait 8 weeks after application before grazing or harvesting. For any crop not listed for treatment in this product's label booklet, applications must be made at least 30 days prior to planting. Applications must be made prior to the emergence of the crop to avoid crop injury.

Shielded Sprayers

USE INSTRUCTIONS: Apply 1 to 3 quarts of this product in 10 to 20 gallons of water per acre to control weeds between grass seed rows. Uniform planting in straight rows aid in shielded sprayer applications. Best results are obtained when the grass seed crop is small enough to easily pass by the protective shields. For additional instructions, see "Shielded Applicators" in the "APPLICATION EQUIPMENT AND TECHNIQUES" section of this product's label booklet.

PRECAUTIONS, RESTRICTIONS: Contact of this product in any manner to any vegetation to which treatment is not intended may cause damage. Such damage shall be the sole responsibility of the applicator.

Wiper Applications Over-the-Top

USE INSTRUCTIONS: Applicators should be adjusted so that the wiper contact point is at least 2 inches above the desirable vegetation. Weeds should be a minimum of 6 inches above the desirable vegetation. Better results may be obtained when more of the weed is exposed to the herbicide solution. Weeds not contacted by the herbicide solution will not be affected. This may occur in dense clumps, severe infestations, or when height of weeds varies so that not all weeds are contacted. In these instances, repeat treatments may be necessary. For additional instructions, see "Wiper Applicators" in the "APPLICATION EQUIPMENT AND TECHNIQUES" section of this product's label booklet.

PRECAUTIONS, RESTRICTIONS: Contact of the herbicide solution with desirable vegetation may result in damage or destruction.

Spot Treatments

USE INSTRUCTIONS: Use a 1.0- to 2.0-percent solution.

PRECAUTIONS, RESTRICTIONS: Apply this product prior to heading of grasses grown for seed. The crop receiving the spray in the treated area will be killed. Take care to avoid drift or spray outside the target area for the same reason. Hand-held equipment may be used to control sod remnants or other unwanted vegetation after sod is harvested.

Creating Rows in Annual Ryegrass

USE INSTRUCTIONS: Use 1 to 2 pints of this product per acre. Use the higher rate when the ryegrass is greater than 6 inches tall. Best results are obtained when applications are made before the ryegrass reaches 6 inches in height.

PRECAUTIONS, RESTRICTIONS: Set nozzle heights to allow the establishment of the desired row spacing while preventing spray droplets, spray fines, or drift to contact the ryegrass plants not treated. Use of low-pressure nozzles, or drop nozzles designed to target the application over a narrow band are recommended.

Grower assumes all responsibility for crop losses from misapplication.

10.4 Pastures

LABELED CROPS: Any grass (*Gramineae* family) except Corn, Sorghum, Sugarcane and those listed in this product's label booklet under "Cereal and Grain Crops". Grasses that may be treated include Bahiagrass, Bermudagrass, Bluegrass, Brome, Fescue, Guineagrass, Kikuyugrass, Orchardgrass, Pangola grass, Ryegrass, Timothy, Wheatgrass.

TYPES OF APPLICATIONS: Preplant, Preemergence, Spot Treatment, Over-the-Top Wiper Applications, Pasture Renovation, Postemergent Weed Control (Broadcast Treatments).

Preplant, Preemergence, Pasture Renovation

USE INSTRUCTIONS: This product may be applied prior to planting or emergence of forage grasses. In addition, this product may be used to control perennial pasture species listed on this label prior to replanting.

PRECAUTIONS, RESTRICTIONS: If application rates total 3 quarts per acre or less, no waiting period between treatment and feeding or livestock grazing is required. If the rate is greater than 3 quarts per acre, remove domestic livestock before application and wait 8 weeks after application before grazing or harvesting. Crops listed for treatment in this label booklet may be planted into the treated area at any time; for other crops, wait 30 days between application and planting.

Spot Treatment, Over-the-Top Wiper Applications

USE INSTRUCTIONS: This product may be applied as a spot treatment or with wiper applicators in pastures. Applications may be made in the same area at 30-day intervals.

PRECAUTIONS, RESTRICTIONS: For spot treatments or wiper application methods using rates of 3 quarts per acre or less, the entire field or any portion of it may be treated. When spot treatments or wiper application are made using rates above 3 quarts per acre, no more than 10 percent of the total pasture may be treated at any one time. To achieve maximum performance, remove domestic livestock before application and wait 7 days after application before grazing livestock or harvesting.

Postemergent Weed Control (Broadcast Treatments)

USE INSTRUCTIONS: This product may be used to suppress competitive growth and seed production of annual weeds and undesirable vegetation in pastures. For selective applications with broadcast spray equipment, apply 12 to 16 fluid ounces of this product per acre in early spring before desirable perennial grasses break dormancy and initiate green growth. Late fall applications can be made after desirable perennial grasses have reached dormancy.

PRECAUTIONS, RESTRICTIONS: Some stunting of perennial grasses will occur if broadcast applications are made when plants are not dormant. No waiting period is required between application and grazing or harvesting for feed. Use of higher application rates will cause stand reductions. Do not apply more than 3 quarts per acre per year onto pasture grasses except for renovation uses (see instructions above). If replanting is needed due to severe stand reduction, applications must be made at least 30 days prior to planting any crop not listed for treatment in this product's label booklet.

10.5 Rangelands

TYPES OF APPLICATIONS: Postemergence.

This product will control or suppress many annual weeds growing in perennial cool and warm-season grass rangelands.

Preventing viable seed production is key to the successful control and invasion of annual grassy weeds in rangelands. Follow-up applications in sequential years should eliminate most of the viable seeds.

Grazing of treated areas should be delayed to encourage growth of desirable perennials. Allowing desirable perennials to flower and reseed in the treated area will encourage successful transition.

USE INSTRUCTIONS: Apply 12 to 16 fluid ounces of this product per acre to control or suppress many weeds, including downy brome, cheatgrass, cereal rye and jointed goatgrass in rangelands. Apply when most brome plants are in early flower and before the plants, including seedheads, turn color. Allowing for secondary weed flushes to occur in the spring following rain events further depletes the seed reserve and encourages perennial grass conversion on weedy sites. Fall applications are possible, and recommended, where spring moisture is usually limited and fall germination allows for good weed growth.

For medusahead, apply 16 fluid ounces of this product per acre at the 3-leaf stage. Delaying applications beyond this stage will result in reduced or unacceptable control. Controlled burning may be useful in eliminating the thatch layer produced by slow decaying culms prior to application. Allow new growth to occur before spraying after a burn. Repeat applications in subsequent years may be necessary to eliminate the seedbank before reestablishing desirable perennial grasses in medusahead-dominated rangelands.

PRECAUTIONS, RESTRICTIONS: Slight discoloration of the desirable grasses may occur, but they will regreen and regrow under moist soil conditions as effects of this product wear off. Do not use ammonium sulfate when spraying rangeland grasses with this product. No waiting period between treatment and feeding of livestock grazing is required. Do not apply more than 3 quarts per acre per year.

11.0 ROUNDUP READY CROPS

The following instructions or those separately published on Supplemental labeling

include all applications which can be made onto the specified Roundup Ready crops during the complete cropping season. Do NOT combine these instructions with other recommendations made for crop varieties that do not contain the Roundup Ready gene, in the "ANNUAL AND PERENNIAL CROPS (Alphabetical)" section of this label.

THIS COMPANY RECOMMENDS USE OF THIS PRODUCT FOR POSTEMERGENCE APPLICATION ONLY ON CROP VARIETIES DESIGNATED AS CONTAINING THE ROUNDUP READY GENE.

Applying this product to crop varieties that are not designated as Roundup Ready will result in severe crop injury and yield loss. Avoid contact with foliage, green stems, or fruit of crops, or any desirable plants that do not contain the Roundup Ready gene, since severe injury or destruction will result.

The Roundup Ready designation indicates that the crop variety contains a patented gene that provides tolerance to this product. Information on Roundup Ready crop varieties may be obtained from your seed supplier. Roundup Ready crop varieties must be purchased from an authorized licensed seed supplier.

NOTE: Roundup Ready seed, and the method of selectively controlling weeds using glyphosate on a Roundup Ready crop, are protected under several U.S. Patents, including 5,352,605 and 5,633,435. A license to use Roundup Ready seed must be obtained prior to use. Monsanto retains ownership of the gene and process technologies, and the Purchaser of the seed receives the right to use the licensed genes and technologies subject to the limited use license conditions. Seed containing the Roundup Ready trait cannot be used for research and demonstration, reverse engineering or in connection with herbicide registration. Progeny seed containing the Roundup Ready trait cannot be saved for replanting or transferred to others for replanting. Contact your Authorized Retailer for information on obtaining a limited use license.

For ground applications with broadcast equipment, apply this product in 5 to 20 gallons of spray solution per acre. Carefully select proper nozzle and spray pressure to avoid spraying a fine mist. For best results with ground application equipment use flat spray nozzles. Check for even distribution of spray droplets.

For aerial applications apply this product in 3 to 15 gallons of water per acre. See the "APPLICATION EQUIPMENT AND TECHNIQUES" section of this label for procedures to avoid spray drift that may cause injury to any vegetation not intended for treatment. Use of appropriate buffer zones will help prevent injury to adjacent vegetation.

ATTENTION: AVOID DRIFT. EXTREME CARE MUST BE USED WHEN APPLYING THIS PRODUCT TO PREVENT INJURY TO DESIRABLE PLANTS AND CROPS WHICH DO NOT CONTAIN THE ROUNDUP READY GENE.

See the "MIXING" and "APPLICATION EQUIPMENT AND TECHNIQUES" sections of this label for additional directions and restrictions on the application of this product.

Tank mixtures with other herbicides, insecticides, fungicides, micronutrients or foliar fertilizers may result in reduced weed control or crop injury and are NOT recommended for over-the-top applications of this product unless otherwise noted in this product label, supplemental labeling or fact sheets published separately.

Unless otherwise directed, nonionic surfactant may be added to the spray solution for applications to Roundup Ready crops. The addition of certain surfactants to this product may result in some crop response including leaf necrosis, leaf chlorosis or leaf speckling due to the surfactant added to the spray mixture. Read and carefully observe cautionary statements and other information appearing on the surfactant label.

Ammonium sulfate may be mixed with this product for applications to Roundup Ready crops. Refer to the "MIXING" section for use instructions for ammonium sulfate.

Sprayer Preparation: It is important that sprayer and mixing equipment be clean and free of pesticide residue before making applications of this product. Follow the cleaning procedures specified on the label of the product(s) previously used. THOROUGHLY CLEAN THE SPRAY TANK AND ALL LINES AND FILTERS TO ELIMINATE POTENTIAL CONTAMINATION FROM OTHER HERBICIDES PRIOR TO MIXING AND APPLYING THIS PRODUCT.

NOTE: The following recommendations are based on a clean start at planting by using a burndown application or tillage to control existing weeds before crop emergence. In no-till and stale seedbed systems, a preplant burn-down treatment of this product is recommended to control existing weeds prior to crop emergence. Some weeds, such as black nightshade, broadleaf signalgrass, sicklepod, Texas panicum, sandbur, annual morningglory, woolly cupgrass, shattercane, wild proso millet, burcucumber, and giant ragweed with multiple germination times or suppressed (stunted) weeds may require a second application of this product for complete control. The second application should be made after some regrowth has occurred and at least 10 days after a previous application of this product.

11.1 Canola with the Roundup Ready Gene

TYPES OF APPLICATIONS: Preplant, At-Planting, Preemergence, Postemergence
DO NOT USE THIS PRODUCT ON CANOLA WITH THE ROUNDUP READY GENE PLANTED IN THE FOLLOWING STATES: ALABAMA, DELAWARE, FLORIDA, GEORGIA, KENTUCKY, MARYLAND, NEW JERSEY, NORTH CAROLINA, SOUTH CAROLINA, TENNESSEE, VIRGINIA AND WEST VIRGINIA.

Maximum Allowable Combined Application Quantities Per Season	
Preplant, At-Planting, Preemergence applications	2 quarts per acre
Total in-crop applications from emergence to 6-leaf stage	1 quart per acre

Preplant, Preemergence, At-Planting

USE INSTRUCTIONS: This product may be applied before, during or after planting canola.

Postemergence

USE INSTRUCTIONS: This product may be applied postemergence to Roundup Ready canola from emergence through the 6-leaf stage of development. Applications made during bolting or flowering may result in crop injury and yield loss. To maximize yield potential, make applications early to eliminate competing weeds.

Weeds Controlled: For specific rates of application and instructions, refer to the "ANNUAL WEEDS RATE TABLE" and "PERENNIAL WEEDS RATE TABLE" in this booklet.

Single Application - Apply 16 to 24 fluid ounces per acre no later than the 6-leaf stage for the control of annual weeds. Avoid overlapping applications that may result in temporary yellowing, delayed flowering, and/or growth reduction. Similar injury may result when applications of more than 16 fluid ounces per acre are applied after the 4-leaf stage.

Sequential Application - Apply 16 fluid ounces per acre to 1- to 3-leaf canola followed by a sequential application at a minimum interval of 10 days, but no later than the 6-leaf stage. Sequential applications are recommended for early emerging annual weeds and perennial weeds such as Canada thistle and quackgrass or when controlling weeds with multiple application times.

PRECAUTIONS, RESTRICTIONS: See the "ROUNDUP READY CROPS" section of this label for general precautionary instructions for use in Roundup Ready crops. No more than two over-the-top broadcast applications may be made from crop emergence through the 6-leaf stage of development and the total in-crop application should not exceed 32 fluid ounces per acre. Allow a minimum of 60 days between last application and canola harvest.

11.2 Corn with the Roundup Ready Gene

TYPES OF APPLICATIONS: Preplant, At-Planting, Preemergence, Postemergence (In-Crop), Spot Treatment, Preharvest, Post-Harvest.

Maximum Allowable Combined Application Quantities Per Season	
Combined total per year for all applications	8 quarts per acre
Preplant, At-Planting, Preemergence applications	5 quarts per acre
Total in-crop applications from emergence through the V8 stage or 30 inches	2 quarts per acre
Maximum preharvest application rate after maximum kernel fill is complete and the crop is physiologically mature (black layer formation) until 7 days before harvest	1 quart per acre

Preplant, Preemergence, At-Planting

USE INSTRUCTIONS: This product may be applied alone or in a tank-mixture before, during or after planting corn.

TANK MIXTURES: This product may be tank mixed with Bullet, Degree, Degree Xtra, Harness, Harness Xtra, Harness Xtra 5.6L, Lariat, Lasso or Micro-Tech at 50 to 100 percent of labeled rate. Refer to the specific product label and observe all precautions and limitations on the label for any preemergence herbicide application, including application timing restrictions, soil restrictions, minimum recropping interval and rotational guidelines—the more restrictive requirements apply.

NOTE: For maximum weed control, a postemergence (in-crop) application of this product should be applied following the use of less than labeled rates of the preemergence residual products listed above.

Postemergence (In-crop)

USE INSTRUCTIONS: This product may be applied postemergence to Roundup Ready corn from emergence through the V8 stage (8 leaves with collars) or until corn height reaches 30 inches, whichever comes first.

When applied as directed, this product controls labeled annual grass and broadleaf weeds in Roundup Ready corn. Many perennial grasses and broadleaf weeds will be controlled or suppressed with one or more application of this product. The postemergent application of 24 to 32 fluid ounces per acre of this product should be made before the weeds reach a height and/or density that the weeds become competitive with the crop, generally 4 inch tall weeds or less.

This product may be applied alone as a postemergence in-crop application to provide control of emerged weeds listed on this label. If new flushes of weeds occur, a sequential application of this product at 24 to 32 fluid ounces per acre will control the labeled grasses and broadleaf weeds.

TANK MIXTURES: This product may be applied in tank mixture with Bullet, Degree, Degree Xtra, Harness, Harness Xtra, Harness Xtra 5.6L, and Micro-Tech at 50 to 100 percent of labeled rate. This product may be applied in tank mixture with Permit[®] and atrazine at labeled rates. Refer to the specific product label and observe all precautions and limitations on the label for all products used in tank mixtures, including application timing restrictions, soil restrictions, minimum recropping interval and rotational guide-

lines; the more restrictive requirements apply.

Tank-Mix Partner	Maximum Height of Corn For Application
Degree, Degree Xtra Harness, Harness Xtra Harness Xtra 5.6L	11 inches
Bullet* Micro-Tech*	5 inches
Permit	30 inches
atrazine	12 inches

*Bullet and Micro-Tech are not registered for use as a postemergence application in Texas.

PRECAUTIONS, RESTRICTIONS: See the "ROUNDUP READY CROPS" section of this label for general precautionary instructions for use in Roundup Ready crops. Single in-crop applications of this product are not to exceed 1 quart per acre. Sequential in-crop applications of this product from emergence through the V8 stage or 30 inches must not exceed 2 quarts per acre per growing season. Allow a minimum of 10 days between in-crop applications of this product. Allow a minimum of 50 days between application of this product and harvest of corn forage.

Preharvest

USE INSTRUCTIONS: In Roundup Ready corn, up to 1 quart per acre of this product can be applied preharvest. Make applications at 35 percent grain moisture or less. Ensure that maximum kernel fill is complete and the corn is physiologically mature (black layer formed).

PRECAUTIONS, RESTRICTIONS: Allow a minimum of 7 days between application and harvest, feeding or grazing.

Post-Harvest

USE INSTRUCTIONS: This product may be applied after harvest of corn. Higher rates may be required for control of large weeds that were growing in the crop at the time of harvest. Tank mixtures with 2,4-D or dicamba may be used.

PRECAUTIONS, RESTRICTIONS: Allow a minimum of 7 days between treatment and harvest or feeding of treated vegetation.

11.3 Cotton with the Roundup Ready Gene

TYPES OF APPLICATIONS: Preplant, At-Planting, Preemergence, Selective Equipment, Preharvest.

PRECAUTIONS, RESTRICTIONS: See the "ROUNDUP READY CROPS" section of this label for general precautionary instructions for use in Roundup Ready crops. ALLOW A MINIMUM OF 7 DAYS BETWEEN APPLICATION AND HARVEST.

Preplant, Preemergence, At-Planting

USE INSTRUCTIONS: This product may be applied before, during or after planting cotton.

Selective Equipment

USE INSTRUCTIONS: This product may be applied using precision hooded sprayers at rates up to 1 quart per acre per application to Roundup Ready cotton through layby. For best results, make applications while weeds are small (less than 3 inches).

PRECAUTIONS, RESTRICTIONS: See the "Selective Equipment" part of the "APPLICATION EQUIPMENT AND TECHNIQUES" section of this label for information on proper use and calibration of this equipment.

Preharvest

USE INSTRUCTIONS: This product may be applied for preharvest annual and perennial weed control as a broadcast treatment to Roundup Ready cotton after 20 percent boll crack. Up to 2 quarts of this product may be applied using either aerial or ground spray equipment. **NOTE:** This product will not enhance the performance of harvest aids when applied to Roundup Ready cotton.

PRECAUTIONS, RESTRICTIONS: Allow a minimum of 7 days between application and harvest of cotton. Do not apply this product to cotton grown for seed, as a reduction in germination or vigor may occur. THE USE OF ADDITIVES FOR PREHARVEST APPLICATION OF THIS PRODUCT TO ROUNDUP READY COTTON IS PROHIBITED.

ATTENTION: USE OF THIS PRODUCT IN ACCORDANCE WITH LABEL DIRECTIONS IS EXPECTED TO RESULT IN NORMAL GROWTH OF ROUNDUP READY COTTON, HOWEVER, VARIOUS ENVIRONMENTAL CONDITIONS, AGRONOMIC PRACTICES AND OTHER FACTORS MAKE IT IMPOSSIBLE TO ELIMINATE ALL RISKS ASSOCIATED WITH THIS PRODUCT, EVEN WHEN APPLICATIONS ARE MADE IN CONFORMANCE WITH THE LABEL SPECIFICATIONS. IN SOME CASES, THESE FACTORS CAN RESULT IN BOLL LOSS, DELAYED MATURITY AND/OR YIELD LOSS.

11.4 Soybeans with the Roundup Ready Gene

TYPES OF APPLICATIONS: Preplant, At-Planting, Preemergence, Postemergence (In-Crop), Preharvest, Post-Harvest.

Maximum Allowable Combined Application Quantities Per Season	
Combined total per year for all applications	8 quarts per acre
Preplant, At-Planting, Preemergence applications	5 quarts per acre
Total in-crop applications from cracking throughout flowering	3 quarts per acre
Maximum preharvest application rate	1 quart per acre

PRECAUTIONS/RESTRICTIONS: See the "ROUNDUP READY CROPS" section of this label for general precautionary instructions for use in Roundup Ready crops.

Preplant, Preemergence, At-Planting

USE INSTRUCTIONS: This product may be applied before, during or after planting soybeans.

Postemergence (In-Crop)

USE INSTRUCTIONS: When applied as directed, this product will control labeled annual grasses and broadleaf weeds in Roundup Ready soybeans. Applications of this product can be made in Roundup Ready soybeans from emergence (cracking) throughout flowering. Refer to the "ANNUAL WEEDS RATE TABLE" in this label for rate recommendations for specific annual weeds. In general, an initial application of 1 quart per acre on 2- to 8-inch tall weeds is recommended. Weeds will generally be 2 to 8 inches tall, 2 to 5 weeks after planting. If the initial application is delayed and weeds are larger, apply a higher rate of this product. This product may be used up to 2 quarts per acre in any single in-crop application for control of annual weeds and where heavy weed densities exist.

A 1- to 2-quarts per acre rate (single or multiple applications) of this product will control or suppress perennial weeds such as: Bermudagrass, Canada thistle, common milkweed, field bindweed, hemp dogbane, horsenettle, mare's tail (horseweed), nutsedge, quackgrass, rhizome johnsongrass, redvine, trumpet creeper, swamp smartweed and wirestem muhly. For best results, allow perennial weed species to achieve at least 6 inches of growth before spraying with this product.

Under adverse growing conditions such as drought, hail, wind damage or a poor soybean stand that slows or delays canopy closure, a sequential application of this may be necessary to control late flushes of weeds. IN THE SOUTHERN STATES, A SEQUENTIAL APPLICATION OF THIS PRODUCT WILL BE REQUIRED TO CONTROL NEW FLUSHES OF WEEDS IN THE ROUNDUP READY SOYBEAN CROP. To control giant ragweed, it is recommended that 1 quart per acre of this product be applied when the weed is 8 to 12 inches tall to increase control and possibly avoid the need for a sequential application.

NOTE: The use of this product for in-crop applications over Roundup Ready soybeans may not be practiced in California unless the applicator has at the time of application a California-approved Supplemental Label specifying the accepted Directions for Use.

PRECAUTIONS, RESTRICTIONS: The combined total application from crop emergence through harvest must not exceed 3 quarts per acre. The maximum rate for any single in-crop application is 2 quarts per acre. The maximum combined total of this product that can be applied during flowering is 2 quarts per acre.

Preharvest

USE INSTRUCTIONS: This product provides weed control when applied prior to harvest of soybeans. Up to 1 quart per acre of this product can be applied by aerial or ground application.

PRECAUTIONS, RESTRICTIONS: Care should be taken to avoid excessive seed shatter loss due to ground application equipment. Allow a minimum of 14 days between final application and harvest of soybean grain or feeding of soybean grain, forage or hay.

Post-Harvest

USE INSTRUCTIONS: This product may be applied after harvest of Roundup Ready soybeans. Higher rates may be required for control of large weeds that were growing in the crop at the time of harvest. Tank mixtures with 2,4-D or dicamba may be used.

12.0 NON-CROP USES: FARMSTEAD, INDUSTRIAL, TURF AND ORNAMENTAL SITES

TYPES OF APPLICATIONS: General Non-Crop Weed Control, Trim-and-Edge, Bare Ground, Ornamentals, Plant Nurseries, Christmas Trees, Chemical Mowing, Turfgrass Renovation, Seed or Sod Production, Cut Stumps, Habitat Management, Injection and Frill, Parks, Recreational and Residential Areas, Railroads, Roadsides.

Unless otherwise specified, applications may be made to control any weeds listed in the "ANNUAL WEEDS", "PERENNIAL WEEDS", and "WOODY BRUSH AND TREES RATE TABLE" sections. Refer also to the "Selective Equipment" section.

12.1 General Non-Crop Weed Control, Trim-and-Edge, Bare Ground

USE INSTRUCTIONS: Use in areas such as airports, apartment complexes, Christmas tree farms, ditch banks, dry ditches, dry canals, fencerows, golf courses, industrial sites, lumber yards, manufacturing sites, office complexes, ornamental nurseries,

parks, parking areas, petroleum tank farms and pumping installations, railroads, recreational areas, residential areas, roadsides, sod or turf seed farms, schools, storage areas, substations, warehouse areas, other public areas, and similar industrial and non-crop sites.

This product may be used in general non-crop areas. It may be applied with any application equipment described in this label. This product may be used to trim-and-edge around objects in non-crop sites, for spot treatment of unwanted vegetation and to eliminate unwanted weeds growing in established shrub beds or ornamental plantings. This product may be used prior to planting an area to ornamentals, flowers, turfgrass (sod or seed), or prior to laying asphalt or beginning construction projects.

Repeated applications of this product may be used, as weeds emerge, to maintain bare ground.

TANK MIXTURES: This product may be tank mixed with the following products provided that the specific product is registered for use on such non-crop sites. Refer to these products' labels for approved non-crop sites and application rates.

Arsenal	Pendulum 3.3 EC
Barricade 65WG	Pendulum WDG
Clarity	Plateau
Diuron	Princep DF
Endurance	Princep Liquid
Escort®	Ronstar® 50WP
Garlon® 3A	Sahara®
Garlon 4	Simazine
Hyvar X	Spike® 80DF
Karmex DF	Surflan
Krovax I DF	Telar
Manage®	Vanquish
Oust	2,4-D

This product plus dicamba tank mixtures may not be applied by air in California.

Brush Control Tank Mixtures

Tank mixtures of this product may be used to increase the spectrum of control for herbaceous weeds, woody brush and trees. When tank mixing, read and carefully observe the label claims, cautionary statements and all information on the labels of all products used. Use according to the most restrictive precautionary statements for each product in the mixture. Any recommended rate of this product may be used in a tank mix.

For control of herbaceous weeds, use the lower recommended tank mixture rates. For control of dense stands or tough-to-control woody brush and trees, use the higher recommended rates.

NOTE: For side trimming treatments, it is recommended that this product be used alone or in tank mixture with Garlon 4.

PRODUCT	BROADCAST RATE
Arsenal 2WSL	6 to 32 fluid ounces per acre
Escort	1 to 2 ounces per acre
Garlon 3A*, Garlon 4	1 to 4 quarts per acre
PRODUCT	SPRAY-TO-WET RATES
Arsenal 2WSL	0.06 to 0.12% by volume
Escort	1 to 2 ounces per acre
PRODUCT	LOW VOLUME DIRECTED SPRAY RATES
Arsenal 2 WSL	0.1 to 0.5% by volume
Escort	1 to 2 ounces per acre

* Ensure that Garlon 3A is thoroughly mixed with water according to label directions before adding this product. Have spray mixture agitating at the time this product is added to avoid spray compatibility problems.

12.2 Ornamentals, Plant Nurseries, Christmas Trees

USE INSTRUCTIONS: This product may be used to maintain weed control in tree or ornamental sites.

Post-Directed, Trim-and-Edge

This product may be used as a post-directed spray around established woody ornamental species such as arbovitae, azalea, boxwood, crabapple, eucalyptus, euonymus, fir, Douglas fir, jojoba, hollies, lilac, magnolia, maple, oak, poplar, privet, pine, spruce and yew. This product may also be used to trim and edge around trees, buildings, sidewalks and roads, potted plants and other objects in a nursery setting.

Desirable plants may be protected from the spray solution by using shields or coverings made of cardboard or other impermeable material. UNLESS OTHERWISE DIRECTED, THIS PRODUCT IS NOT RECOMMENDED FOR USE AS AN OVER-THE-TOP BROADCAST SPRAY IN ORNAMENTALS AND CHRISTMAS TREES. Care must be exercised to avoid contact of spray, drift or mist with foliage or green bark of established ornamental species.

Site Preparation

This product may be used prior to planting any ornamental, nursery or Christmas tree species.

Wiper Applications

This product may be used through wick or other suitable wiper applicators to control or partially control undesirable vegetation around established eucalyptus or poplar trees. See the "Selective Equipment" section of this label for further information about the proper use of wiper applicators.

Greenhouse/Shadehouse

This product may be used to control weeds growing in and around greenhouses and shadehouses. Desirable vegetation must not be present during application and air circulation fans must be turned off.

12.3 Chemical Mowing

USE INSTRUCTIONS: This product will suppress some annual and perennial grasses listed in this section to serve as a substitute for mowing.

Chemical Mowing - Perennials

Use 6 fluid ounces of this product per acre when treating Kentucky bluegrass. Use 8 fluid ounces of this product per acre when treating tall fescue, fine fescue, orchardgrass, bahiagrass or quackgrass covers. Use 16 fluid ounces of this product per acre when treating Bermudagrass. Use 64 fluid ounces of this product per acre when treating torpedograss or paragrass. Apply treatments in 10 to 20 gallons of spray solution per acre. Use only in areas where some temporary injury or discoloration of perennial grasses can be tolerated.

Chemical Mowing - Annuals

For growth suppression of some annual grasses, such as annual ryegrass, wild barley and wild oats growing in coarse turf on roadsides or other industrial areas, apply 4 to 5 fluid ounces of this product in 10 to 40 gallons of spray solution per acre. Applications should be made when annual grasses are actively growing and before the seedheads are in the boot stage of development. Treatments may cause injury to the desired grasses.

Bromus Species and Medusahead in Pastures and Rangelands

Bromus species. This product may be used to treat downy brome (*Bromus tectorum*), Japanese brome (*Bromus japonicus*), soft chess (*Bromus mollis*) and cheatgrass (*Bromus secalinus*) found in industrial, rangeland and pasture sites. Apply 8 to 16 fluid ounces of this product per acre on a broadcast basis.

For best results, treatment should coincide with early seedhead emergence of the most mature plants. Delaying the application until this growth stage will maximize the emergence of other weedy grass flushes. Applications should be made to the same site each year until seed banks are depleted and the desirable perennial grasses can become reestablished on the site.

Medusahead. To treat medusahead, apply 16 fluid ounces of this product per acre as soon as plants are actively growing, and prior to the 4-leaf stage. Applications may be made in the fall or spring.

Applications to brome and medusahead may be made using ground or aerial equipment. Aerial applications for these uses may be made using fixed wing or helicopter equipment. For aerial applications, apply in 2 to 10 gallons of water per acre. For applications using ground equipment, apply in 10 to 20 gallons of water per acre. When applied as directed in this label section, there are no grazing restrictions.

Dormant Turfgrass

This product may be used to control or suppress many winter annual weeds and tall fescue for effective release of dormant Bermudagrass and bahiagrass turf. Treat only when turf is dormant and prior to spring greenup.

Apply 8 to 64 fluid ounces of this product per acre. Apply the recommended rates in 10 to 40 gallons of water per acre. Use only in areas where Bermudagrass or bahiagrass are desirable ground covers and where some temporary injury or discoloration can be tolerated.

Treatments in excess of 16 fluid ounces per acre may result in injury or delayed greenup in highly maintained areas, such as golf courses and lawns. DO NOT apply tank mixtures of this product plus Oust or Outrider® herbicide in highly maintained turfgrass areas. For further uses, refer to the "Roadsides" section of this label, which gives rates for dormant Bermudagrass and bahiagrass treatments.

Actively Growing Bermudagrass

This product may be used to control or partially control many annual and perennial weeds for effective release of actively growing Bermudagrass. DO NOT apply more than 16 fluid ounces of this product per acre in highly maintained turfgrass areas. DO NOT apply tank mixtures of this product plus Oust in highly maintained turfgrass areas. For further uses, refer to the "Roadsides" section of this label, which gives rates for actively growing Bermudagrass treatments. Use only in areas where some temporary injury or discoloration can be tolerated.

12.4 Turfgrass Renovation, Seed or Sod Production

USE INSTRUCTIONS: This product controls most existing vegetation prior to renovating turfgrass areas or establishing turfgrass grown for seed or sod. For maximum control of existing vegetation, delay planting or sodding to determine if any regrowth from escaped underground plant parts occurs. Where repeat treatments are necessary, sufficient regrowth must be attained prior to application. For warm-season grasses such as Bermudagrass, summer or fall applications provide the best control. Where existing vegetation is growing under mowed turfgrass management, apply this product after omitting at least one regular mowing to allow sufficient growth for good interception of the spray.

Desirable turfgrasses may be planted following the above procedures.

Hand-held equipment may be used for spot treatment of unwanted vegetation growing in existing turfgrass. Broadcast or hand-held equipment may be used to control sod remnants or other unwanted vegetation after sod is harvested.

PRECAUTIONS, RESTRICTIONS: Do not disturb soil or underground plant parts before treatment. Tillage or renovation techniques such as vertical mowing, coring or slicing should be delayed for 7 days after application to allow translocation into underground plant parts. Do not feed or graze turfgrass grown for seed or sod production for 8 weeks following application.

12.5 Cut Stumps

TYPES OF APPLICATION: Treating cut stumps in any non-crop site listed on this label.

USE INSTRUCTIONS: This product will control regrowth of cut stumps and resprouts of many types of woody brush and tree species, some of which are listed below. Apply this product using suitable equipment to ensure coverage of the entire cambium. Cut trees or resprouts close to the soil surface. Apply a 50 to 100 percent solution of this product to the freshly cut surface immediately after cutting. Delays in application may result in reduced performance. For best results, applications should be made during periods of active growth and full leaf expansion.

Alder	Reed, giant
Eucalyptus	Saltcedar
Madrone	Sweetgum
Oak	Tan oak
Pepper, Brazilian	Willow
Pine, Austrian	

PRECAUTIONS, RESTRICTIONS: Do not make cut stump applications when the roots of desirable woody brush or trees may be grafted to the roots of the cut stump. Some sprouts, stems, or trees may share the same root system. Adjacent trees having a similar age, height and spacing may signal shared roots. Whether grafted or shared, injury is likely to occur to non-treated stems/trees when one or more trees sharing common roots are treated.

12.6 Habitat Management

TYPES OF USES: Habitat Restoration and Maintenance, Wildlife Food Plots.

Habitat Restoration and Maintenance

USE INSTRUCTIONS: This product may be used to control exotic and other undesirable vegetation in habitat management areas. Applications can be made to allow recovery of native plant species, prior to planting desirable native species, and for similar broad-spectrum vegetation control requirements in habitat management areas. Spot treatments can be made to selectively remove unwanted plants for habitat maintenance and enhancement.

Wildlife Food Plots

USE INSTRUCTIONS: This product may be used as a site preparation treatment to control annual and perennial weeds prior to planting wildlife food plots. Any wildlife food species may be planted after applying this product, or native species may be allowed to repopulate the area. If tillage is needed to prepare a seedbed, wait 7 days after application before tillage.

12.7 Injection and Frill (Woody Brush and Trees)

USE INSTRUCTIONS: This product may be used to control woody brush and trees by injection or frill applications. Apply this product using suitable equipment that must penetrate into the living tissue. Apply the equivalent of 0.04 fluid ounce (1 mL) of this product per each 2 to 3 inches of trunk diameter at breast height (DBH). This is best achieved by applying a 50 to 100 percent concentration of this product either to a continuous frill around the tree or as cuts evenly spaced around the tree below all branches. As tree diameter increases in size, better results are achieved by applying diluted material to a continuous frill or more closely spaced cuttings. Avoid application techniques that allow runoff to occur from frilled or cut areas in species that exude sap freely. In species such as this, make the frill or cuts at an oblique angle to produce a cupping effect and use a 100 percent concentration of this product. For best results, application should be made during periods of active growth and after full leaf expansion.

12.8 Parks, Recreational, and Residential Areas

USE INSTRUCTIONS: All of the instructions in the "General Non-Crop Weed Control, Trim-and-Edge, Bare Ground" section apply to park and recreational areas.

This product may be used in parks, recreational and residential areas. It may be applied with any application equipment described in this label. This product may be used to trim-and-edge around trees, fences, and paths, around buildings, sidewalks, and other objects in these areas. This product may be used for spot treatment of unwanted vegetation. This product may be used to eliminate unwanted weeds growing in established shrub beds or ornamental plantings. This product may be used prior to planting an area to ornamentals, flowers, turfgrass (sod or seed), or prior to laying asphalt or beginning construction projects.

12.9 Railroads

USE INSTRUCTIONS: All of the instructions in the "General Non-Crop Weed Control, Trim-and-Edge, Bare Ground" section apply to railroads.

Bare Ground, Ballast and Shoulders, Crossings, Spot Treatments

This product may be used to maintain bare ground on railroad ballast and shoulders. Repeat applications of this product may be used, as weeds emerge, to maintain bare ground. This product may be used to control tall-growing weeds to improve line-of-sight at railroad crossings and reduce the need for mowing along rights-of-way. For crossing applications, up to 80 gallons of spray solution per acre may be used.

TANK MIXTURES: This product may be tank mixed with the following products provided that the specific product is registered for ballast, shoulder, spot, bare ground and crossing treatments:

Arsenal	Krovar I DF
Clarity	Oust
Diuron	Sahara
Escort	Spike
Garlon 3A	Telar
Garlon 4	Vanquish
Hyvar X	2,4-D

Brush Control

This product may be used to control woody brush and trees on railroad rights-of-way. Apply 4 to 10 quarts of this product per acre as a broadcast spray, using boom-type or boomless nozzles. Up to 80 gallons of spray solution per acre may be used. Apply a 0.75 to 2 percent solution of this product when using high-volume spray-to-wet applications. Apply a 5 to 10 percent solution of this product when using low volume directed sprays for spot treatment.

TANK MIXTURES: This product may be mixed with the following products for enhanced control of woody brush and trees:

Arsenal	Garlon 4
Escort	Tordon®K
Garlon 3A	

Bermudagrass Release

This product may be used to control or partially control many annual and perennial weeds for effective release of actively growing Bermudagrass. Apply 1 to 3 pints of this product in up to 80 gallons of spray solution per acre. Use the lower rate when treating annual weeds below 6 inches in height (or runner length). Use the higher rate as weeds increase in size or as they approach flower or seedhead formation. These rates will also provide partial control of the following perennial species:

Bahiagrass	Johnsongrass
Bluestem, silver	Trumpetcreeper
Fescue, tall	Vaseygrass

TANK MIXTURES: This product may be tank-mixed with Oust. If tank-mixed, use no more than 1 to 3 pints of this product with 1 to 2 ounces of Oust per acre. Use the lower rates of each product to control annual weeds less than 6 inches in height (or runner length) that are listed in this label and the Oust label. Use the higher rates as annual weeds increase in size and approach the flower or seedhead stages. These rates will also provide partial control of the following perennial weeds:

Bahiagrass	Fescue, tall
Blackberry	Johnsongrass
Bluestem, silver	Poorjoe
Broomsedge	Raspberry
Dallisgrass	Trumpetcreeper
Dewberry	Vaseygrass
Dock, curly	Vervain, blue
Dogfennel	

PRECAUTIONS, RESTRICTIONS: Use only on well-established Bermudagrass. Bermudagrass injury may result from the treatment, but regrowth will occur under moist conditions. Repeat applications in the same season are not recommended, since severe injury may occur.

12.10 Roadsides

USE INSTRUCTIONS: All of the instructions in the "General Non-Crop Weed Control, Trim-and-Edge, Bare Ground" section apply to roadsides.

TANK MIXTURES: This product may be tank-mixed with the following products provided that the specific product is registered for shoulder, guardrail, spot and bare ground treatments:

Clarity	Princep DF
Diuron	Princep Liquid
Endurance	Ronstar 50WP
Escort	Sahara
Krovar I DF	Simazine
Oust	Surflan
Outrider	Telar
Pendulum 3.3 EC	Vanquish
Pendulum WDG	2,4-D

See the "General Non-Crop Weed Control, Trim-and-Edge, Bare Ground" section of this

label for general instructions for tank mixing.

Shoulder Treatments

This product may be used on road shoulders. It may be applied with boom sprayers, shielded boom sprayers, high-volume off-center nozzles, hand-held equipment, and similar equipment.

Guardrails and Other Obstacles to Mowing

This product may be used to control weeds growing under guardrails and around signposts and other objects along the roadside.

Spot Treatment

This product may be used as a spot treatment to control unwanted vegetation growing along roadsides.

Release of Bermudagrass or Bahiagrass

Dormant Applications

This product may be used to control or partially control many winter annual weeds and tall fescue for effective release of dormant Bermudagrass or bahiagrass. Treat only when turf is dormant and prior to spring greenup. This product may also be tank-mixed with Outrider herbicide or Oust for residual control. Tank mixtures of this product with Oust may delay greenup.

For best results on winter annuals, treat when plants are in an early growth stage (below 6 inches in height) after most have germinated. For best results on tall fescue, treat when fescue is at or beyond the 4- to 6-leaf stage.

Apply 8 to 64 fluid ounces of this product in a tank mixture with 0.75 to 1.3 ounces Outrider herbicide per acre. Read and follow all label directions for Outrider herbicide.

Apply 8 to 64 fluid ounces of this product per acre alone or in a tank mixture with 0.25 to 1 ounce per acre of Oust. Apply the recommended rates in 10 to 40 gallons of water per acre. Use only in areas where Bermudagrass or bahiagrass are desirable ground covers and where some temporary injury or discoloration can be tolerated. To avoid delays in greenup and minimize injury, add no more than 1 ounce of Oust per acre on Bermudagrass and no more than 0.5 ounce of Oust per acre on bahiagrass and avoid treatments when these grasses are in a semi-dormant condition.

Actively Growing Bermudagrass

This product may be used to control or partially control many annual and perennial weeds for effective release of actively growing Bermudagrass. Apply 1 to 3 pints of this product in 10 to 40 gallons of spray solution per acre. Use the lower rate when treating annual weeds below 6 inches in height (or runner length). Use the higher rate as weeds increase in size or as they approach flower or seedhead formation. These rates will also provide partial control of the following perennial species:

Bahiagrass	Johnsongrass
Bluestem, silver	Trumpetcreeper
Fescue, tall	Vaseygrass

TANK MIXTURES: This product may be tank mixed with Outrider herbicide for control or partial control of Johnsongrass and other weeds listed in the Outrider herbicide label. Use 8 to 32 fluid ounces of this product with 0.75 to 1.3 ounces of Outrider herbicide. Use the higher rates of both products for control of perennial weeds or annual weeds greater than 6 inches in height.

This product may be tank-mixed with Oust. If tank-mixed, use no more than 1 to 2 pints of this product with 1 to 2 ounces of Oust per acre. Use the lower rates of each product to control annual weeds less than 6 inches in height (or runner length) that are listed in this label and the Oust label. Use the higher rates as annual weeds increase in size and approach the flower or seedhead stages. These rates will also provide partial control of the following perennial weeds:

Bahiagrass	Fescue, tall
Bluestem, silver	Johnsongrass
Broomsedge	Poorjoe
Dallisgrass	Trumpetcreeper
Dock, curly	Vaseygrass
Dogfennel	Vervain, blue

PRECAUTIONS, RESTRICTIONS: Use only on well-established Bermudagrass. Bermudagrass injury may result from the treatment, but regrowth will occur under moist conditions. Repeat applications of the tank mix in the same season are not recommended, since severe injury may occur.

Actively Growing Bahiagrass

For suppression of vegetative growth and seedhead inhibition of bahiagrass for approximately 45 days, apply 6 fluid ounces of this product in 10 to 40 gallons of water per acre. Apply 1 to 2 weeks after full greenup or after mowing to a uniform height of 3 to 4 inches. This application must be made prior to seedhead emergence.

For suppression up to 120 days, apply 4 fluid ounces of this product per acre, followed by an application of 2 to 4 fluid ounces per acre about 45 days later. Make no more than two applications per year.

TANK MIXTURES: This product may be used for control or partial control of Johnsongrass and other weeds listed on the Outrider herbicide label in actively growing bahiagrass. Apply 1.5 to 5 fluid ounces of this product with 0.75 to 1.3 ounces of Outrider herbicide per acre. Use the higher rates for control of perennial weeds or annual weeds greater than 6 inches in height. Use only on well established bahiagrass.

A tank mixture of this product plus Oust may be used. Apply 6 fluid ounces of this product plus 0.25 ounce of Oust per acre 1 to 2 weeks following an initial spring mowing.

Make only one application per year.

13.0 ANNUAL WEEDS RATE TABLE (Alphabetically by Species)

WATER CARRIER VOLUMES OF 3 TO 10 GALLONS PER ACRE FOR GROUND APPLICATIONS AND 3 TO 5 GALLONS PER ACRE FOR AERIAL APPLICATIONS ARE RECOMMENDED.

Apply to actively growing annual weeds. Annual weeds are generally easiest to control when they are small.

Older, mature (hardened) annual weed species may require higher rates even if they meet the size requirements.

Do not tank mix with soil residual herbicides when using these rates unless otherwise specified.

For weeds that have been mowed, grazed or cut, allow regrowth to occur prior to treatment.

This product may be used up to 48 fluid ounces per acre where heavy weed densities exist.

WEED SPECIES	RATE (fluid ounces per acre)				
	16	24	32	40	48
	Maximum height/length (in inches)				
Ammannia, purple	3	6	12	-	18
Anoda, spurred	-	2	3	5	8
Barley	18	18+	-	-	-
Barnyardgrass	-	3	6	7	9
Bassia, fivehook	-	-	6	-	-
Beggarweed, Florida	-	5	8	-	-
Bittercress	12	20	-	-	-
Bluegrass, annual	10	-	-	-	-
Bluegrass, bulbous	6	-	-	-	-
Brome, downy ^{1,2}	6	12	-	-	-
Brome, Japanese	6	12	24	-	-
Browntop panicum	6	8	12	-	24
Buckwheat, wild ³	-	1	2	-	-
Burcucumber	-	6	12	-	18
Buttercup	12	20	-	-	-
Carolina geranium	-	-	4	-	9
Carpetweed	-	6	12	-	-
Cheat ²	6	20	-	-	-
Chervil	20	-	-	-	-
Chickweed	-	12	18	-	-
Cocklebur	12	18	24	-	36
Copperleaf, hophornbeam	-	2	4	-	6
Copperleaf, Virginia	-	2	4	-	6
Coreopsis, plains	-	6	12	-	18
Corn, volunteer	6	12	20	-	-
Corn speedwell	12	-	-	-	-
Crabgrass	3	6	12	-	-
Crowfootgrass	-	-	6	-	12
Cutleaf evening primrose	-	-	3	-	6
Devilsclaw (unicorn plant)	-	3	6	-	-
Dwarfandelion	12	-	-	-	-
Eastern mangrass	8	12	-	-	-
Eclipta	-	4	8	12	-
Fall panicum	4	-	6	-	12
Falsedandelion	-	20	-	-	-
Falseflax, smallseed	12	-	-	-	-
Fiddleneck	-	6	12	-	-
Field pennycress	6	12	-	-	-
Filaree	-	-	6	-	12
Fleabane, annual	6	20	-	-	-
Fleabane, hairy (<i>Conyza bonariensis</i>)	-	-	6	-	10
Fleabane, rough	3	6	12	-	-
Florida pusley	-	-	4	-	6
Foxtail, giant, bristly, yellow	6	12	20	-	-
Foxtail, Carolina	10	-	-	-	-
Foxtail, green	12	-	-	-	-
Goatgrass, jointed	6	12	-	-	-
Goosegrass	-	3	6	-	12
Grain sorghum (milo)	6	12	20	-	-
Groundcherry	-	3	6	-	9
Groundsel, common	-	6	10	-	-
Hemp sesbania	-	2	4	6	8
Henbit	-	-	6	-	12
Horseweed/ Marestalk (<i>Conyza canadensis</i>)	-	6	12	-	18
Itchgrass	6	8	12	-	18
Jimsonweed	-	-	12	-	18

ANNUAL WEEDS RATE TABLE (Cont'd)

WEED SPECIES	RATE (fluid ounces per acre)				
	16	24	32	40	48
	Maximum height/length (in inches)				
Johnsongrass, seedling	6	12	18	-	24
Junglerice	-	3	6	7	9
Knotweed	-	-	6	-	12
Kochia ⁴	-	3 to 6	12	-	-
Lambsquarters	-	6	12	-	20
Little barley	6	12	-	-	-
London rocket	6	-	24	-	-
Mayweed	-	2	6	12	18
Morningglory, annual (<i>Ipomoea spp</i>)	-	-	3	-	6
Mustard, blue	6	12	18	-	-
Mustard, tansy	6	12	18	-	-
Mustard, tumble	6	12	18	-	-
Mustard, wild	6	12	18	-	-
Nightshade, black	-	4	6	-	12
Nightshade, hairy	-	4	6	-	12
Oats	3	6	18	-	-
Pigweed species	-	12	18	24	-
Prickly lettuce	-	6	12	-	-
Purslane	-	-	3	-	6
Ragweed, common	-	6	12	-	18
Ragweed, giant	-	6	12	-	18
Red rice	-	-	4	-	-
Rye, volunteer/cereal ²	6	18	18+	-	-
Ryegrass	-	-	6	-	12
Sandbur, field	6	12	-	-	-
Sandbur, longspine	6	12	-	-	-
Shattercane	6	12	20	-	-
Shepherd's-purse	6	12	-	-	-
Sicklepod	-	2	4	-	8
Signalgrass, broadleaf	-	3	6	7	9
Smartweed, ladysthumb	-	-	6	-	9
Smartweed, Pennsylvania	-	-	6	-	9
Sowthistle, annual	-	-	6	-	12
Spanishneedles	-	-	6	-	12
Speedwell, purslane	12	-	-	-	-
Sprangletop	6	12	20	-	-
Spurge, prostrate	-	6	12	-	-
Spurge, spotted	-	6	12	-	-
Spurry, umbrella	6	-	-	-	-
Stinkgrass	-	12	-	-	-
Sunflower	12	18	-	-	-
Swinecress	-	5	12	-	-
Teaweed/Prickly sida	-	2	4	-	6
Texas panicum	6	8	12	-	24
Thistle, Russian ⁵	-	6	12	-	-
Velvetleaf	-	-	6	-	12
Virginia pepperweed	-	18	-	-	-
Waterhemp	-	-	6	-	12
Wheat ²	6	12	18	-	-
Wheat (overwintered)	-	6	12	-	18
Wild oats	3	6	18	-	-
Wild proso millet	-	6	12	-	18
Witchgrass	-	12	-	-	-
Woolly cupgrass	-	6	12	-	-
Yellow rocket	-	12	20	-	-

¹ For control of downy brome in no-till systems, use 24 fluid ounces per acre.

² Performance is better if application is made before this weed reaches the boot stage of growth.

³ Use 24 fluid ounces per acre of this product to control wild buckwheat in the cotyledon to 2-leaf stage. Use 32 fluid ounces per acre to control 2- to 4-leaf wild buckwheat. For improved control of wild buckwheat over 2 inches in size, use sequential treatments of 32 fluid ounces followed by 32 fluid ounces of this product per acre.

⁴ Do not treat kochia in the button stage.

⁵ Control of Russian Thistle may vary based on environmental conditions and spray coverage. Whenever possible, a tank mixture with 2,4-D as described below may improve control.

13.1 Annual Weeds—Rates for 10 to 40 Gallons per Acre

Apply 1 to 2 quarts of this product per acre. Use 1 quart per acre if weeds are less than 6 inches tall, 1.5 quarts per acre if weeds are 6 to 12 inches tall and 2 quarts per acre if weeds are greater than 12 inches tall. These rates will provide control of weeds listed in the "ANNUAL WEEDS RATE TABLE" when water carrier volumes are 10 to 40 gallons

per acre for ground applications. Older, mature (hardened) annual weed species may require higher rates even if they meet the size requirements.

13.2 Annual Weeds—Tank Mixtures with 2,4-D, Dicamba, or Tordon 22K

12 to 16 fluid ounces of this product plus 0.25 pound of dicamba or 0.5 pound of 2,4-D or 1 to 2 fluid ounces of Tordon 22K per acre will control the following weeds with the maximum height or length indicated: 6 inches—prickly lettuce, marestalk/horseweed, morningglory, kochia (dicamba only) wild buckwheat (Tordon 22K only); 12 inches—cocklebur, lambsquarters, pigweed, Russian thistle (2,4-D only).

16 fluid ounces of this product plus 0.5 pound of 2,4-D per acre will control the following weeds when they are a maximum height or length of 6 inches: common ragweed, giant ragweed, Pennsylvania smartweed, and velvetleaf.

Refer to the specific product labels for crop rotation restrictions and cautionary statements of all products used in tank mixtures. Ensure that the specific product is registered for application at the desired site. Some crop injury may occur if dicamba or Tordon 22K is applied within 45 days of planting.

DO NOT APPLY DICAMBA TANK MIXTURES BY AIR IN CALIFORNIA.

13.3 Annual Weeds—Hand-Held or High-Volume Equipment

For control of weeds listed in the “ANNUAL WEEDS RATE TABLE”, apply a 0.5 percent solution of this product to weeds less than 6 inches in height or runner length. Apply prior to seedhead formation in grass or bud formation in broadleaf weeds. For annual weeds over 6 inches tall, or unless otherwise specified, use a 1 percent solution.

For best results, use a 2 percent solution on harder-to-control perennials, such as Bermudagrass, dock, field bindweed, hemp dogbane, milkweed and Canada thistle.

When using application methods that result in less than complete coverage, use a 5 percent solution for annual and perennial weeds and a 5 to 10 percent solution for woody brush and trees.

13.4 Annual Weeds—Tank Mixtures with Atrazine for Fallow and Reduced Tillage Systems

For use only in Colorado, Kansas, Nebraska, Oklahoma, Oregon, South Dakota, and Washington. In Oregon and Washington, do not exceed 1 pound of atrazine per acre.

24 to 28 fluid ounces of this product plus 1 to 2 pounds of atrazine per acre will control the following weeds: Barnyardgrass (requires 28 ounces for control), Downy brome, Green foxtail, Lambsquarters, Prickly lettuce, Tansy mustard, Pigweed, Field sandbur, Stinkgrass, Russian thistle, Volunteer wheat, Witchgrass and Kochia (add 0.125 pound of dicamba for control). Ensure that the specific atrazine product is registered for application at the desired site.

14.0 PERENNIAL WEEDS RATE TABLE (Alphabetically by Species)

Apply to actively growing perennial weeds.

NOTE: If weeds have been mowed or tilled, do not treat until plants have resumed active growth and have reached the recommended stages.

Repeat treatments may be necessary to control weeds regenerating from underground parts or seed. Repeat treatments must be made prior to crop emergence.

Unless otherwise stated, allow 7 or more days after application before tillage.

Best results are obtained when soil moisture is adequate for active weed growth.

Weed Species	Rate (QT/A)	Water Volume (GPA)	Hand-Held % Solution
Alfalfa	1-2	3-10	2%
Alligatorweed	4	3-20	1.5%
Anise (fennel)	—	—	1-2%
Bahiagrass	3-5	3-20	2%
Bentgrass	1.5	10-20	2%

Make applications after the last hay cutting in the fall. Allow alfalfa to regrow to a height of 6 to 8 inches or more prior to treatment. Applications should be followed with deep tillage at least 7 days after treatment, but before soil freeze-up.

Partial control. Apply when most of the plants are in bloom. Repeat applications will be required to maintain control.

For hand-held, apply as a spray-to-wet treatment. Optimum results are obtained when plants are treated at the bud to full-bloom stage of growth.

Apply when most plants have reached the early head stage.

For suppression in grass seed production areas. For ground applications only. Ensure entire crown area has resumed growth prior to a fall application. Bentgrass should have at least 3 inches of growth. Tillage prior to treatment should be avoided. Tillage 7 to 10 days after application is recommended for best results.

Weed Species	Rate (QT/A)	Water Volume (GPA)	Hand-Held % Solution
Bermudagrass	3-5	3-20	2%
Bermudagrass, water (knotgrass)	1-1.5	5-10	2%
Bindweed, field	0.5-5	3-20	2%
Bluegrass, Kentucky	1-2	3-40	2%
Blueweed, Texas	3-5	3-40	2%
Brackenfern	3-4	3-40	1-1.5%
Bromegrass, smooth	1-2	3-40	2%
Bursage, woolly-leaf	—	3-20	2%
Canarygrass, reed	2-3	3-40	2%
Cattail	3-5	3-40	2%
Clover; red, white	3-5	3-20	2%
Cogongrass	3-5	10-40	2%
Dallisgrass	3-5	3-20	2%
Dandelion	3-5	3-40	2%
Dock, curly	3-5	3-40	2%

For control, apply 5 quarts of this product per acre. For partial control, apply 3 quarts per acre. Treat when Bermudagrass is actively growing and seedheads are present. Retreatment may be necessary to maintain control.

Apply 1.5 quarts of this product in 5 to 10 gallons of water per acre. Apply when water Bermudagrass is 12 to 18 inches in length. Allow 7 or more days before tilling, flushing or flooding the field.

Fall applications only: Apply 1 quart of this product in 5 to 10 gallons of water per acre. Fallow fields should be tilled prior to application. Apply prior to frost on water Bermudagrass that is 12 to 18 inches in length.

This product is not registered in California for use on water Bermudagrass.

Do not treat when weeds are under drought stress as good soil moisture is necessary for active growth.

For control, apply 4 to 5 quarts of this product per acre west of the Mississippi River and 3 to 4 quarts east of the Mississippi River. Apply when the weeds are at or beyond full bloom. For best results, apply in late summer or fall. Fall treatments must be applied before a killing frost.

Also for control, apply 2 quarts of this product plus 0.5 pound of dicamba in 10 to 20 gallons of water per acre. Do not apply by air.

For suppression on irrigated agricultural land, apply 1 to 2 quarts of this product plus 1 pound of 2,4-D in 10 to 20 gallons of water per acre with ground equipment only. Applications should be made following harvest or in fall fallow ground when the bindweed is actively growing and the majority of runners are 12 inches or more in length. The use of at least one irrigation will promote active bindweed growth.

For suppression, apply 16 fluid ounces of this product plus 0.5 pound of 2,4-D in 3 to 10 gallons of water per acre for ground applications and 3 to 5 gallons of water per acre for aerial applications. Apply by air in fallow and reduced tillage systems only. Applications should be delayed until maximum emergence has occurred and when vines are between 6 to 18 inches in length.

In California only, apply 1 to 5 quarts of this product per acre. Actual rate needed for suppression or control will vary within this range depending on local conditions. For suppression on irrigated land where annual tillage is performed, apply 1 quart of this product in 3 to 10 gallons of water per acre. Apply to bindweed that has reached a length of 12 inches or greater. Allow maximum weed emergence and runner growth. Allow 3 or more days after application before tillage.

Apply 2 quarts of this product in 10 to 40 gallons of water per acre when most plants have reached boot-to-early seedhead stage of development. For partial control in pasture or hay crop renovation, apply 1 to 1.5 quarts of this product in 3 to 10 gallons of water per acre. Apply to actively growing plants when most have reached 4 to 12 inches in height.

Apply 4 to 5 quarts of this product per acre west of the Mississippi River and 3 to 4 quarts per acre east of the Mississippi River. Apply when plants are at or beyond full bloom. New leaf development indicates active growth. For best results, apply in late summer or fall. Fall treatments must be applied before a killing frost.

Apply to fully expanded fronds that are at least 18 inches long.

Apply 2 quarts of this product in 10 to 40 gallons of water per acre when most plants have reached boot-to-early seedhead stage of development. For partial control in pasture or hay crop renovation, apply 1 to 1.5 quarts of this product in 3 to 10 gallons of water per acre. Apply to actively growing plants when most have reached 4 to 12 inches in height.

For control, apply 2 quarts of this product plus 0.5 pound of dicamba per acre. For partial control, apply 1 quart of this product plus 0.5 pound of dicamba per acre. Apply when plants are producing new active growth which has been initiated by moisture for at least 2 weeks and when plants are at or beyond flowering.

For best results, apply when most plants have reached the boot-to-head stage of growth.

Apply when most plants have reached the early head stage.

Apply when most plants have reached the early bud stage.

Also for control, apply 16 to 32 fluid ounces of this product plus 0.5 to 1 pound of 2,4-D in 3 to 10 gallons of water per acre.

Apply when cogongrass is at least 18 inches tall in late summer or fall. Due to uneven stages of growth and the dense nature of vegetation preventing good spray coverage, repeat treatments may be necessary to maintain control.

Apply when most plants have reached the early head stage.

Apply when most plants have reached the early bud stage of growth.

Also for control, apply 16 fluid ounces of this product plus 0.5 pound of 2,4-D in 3 to 10 gallons of water per acre.

Apply when most plants have reached the early bud stage of growth.

Also for control, apply 16 to 32 fluid ounces of this product plus 0.5 to 1 pound of 2,4-D in 3 to 10 gallons of water per acre.

Weed Species	Rate (QT/A)	Water Volume (GPA)	Hand-Held % Solution
Dogbane, hemp	4	3-40	2%
Apply when most plants have reached the late bud to flower stage of growth. Following crop harvest or mowing, allow weeds to regrow to a mature stage prior to treatment. For best results, apply in late summer or fall.			
For suppression, apply 16 fluid ounces of this product plus 0.5 pound of 2,4-D in 3 to 10 gallons of water per acre for ground applications and 3 to 5 gallons of water per acre for aerial applications. Delay applications until maximum emergence of dogbane has occurred.			
Fescue (except tall)	3-5	3-20	2%
Apply when most plants have reached the early head stage.			
Fescue, tall	1-3	3-40	2%
Apply 3 quarts of this product per acre when most plants have reached boot-to-early seedhead stage of development.			
Fall applications only: Apply 1 quart of this product in 3 to 10 gallons of water per acre. Apply to fescue in the fall when plants have 6 to 12 inches of new growth. A sequential application of 1 pint per acre of this product will improve long-term control and control seedlings germinating after fall treatments or the following spring.			
Guineagrass	2-3	3-40	1%
Apply when most plants have reached at least the 7-leaf stage of growth. Ensure thorough coverage when using hand-held equipment.			
In Texas and ridge of Florida, use 2 quarts for control. In the flatwoods region of Florida, 3 quarts is required for control.			
Horsenettle	3-5	3-20	2%
Apply when most plants have reached the early bud stage.			
Horseradish	4	3-40	2%
Apply when most plants have reached the late bud to flower stage of growth. For best results, apply in late summer or fall.			
Icelandic plant	—	—	1.5-2%
Icelandic plant should be at or beyond the early bud stage of growth. Thorough coverage is necessary for best control.			
Jerusalem artichoke	3-5	3-20	2%
Apply when most plants are in the early bud stage.			
Johnsongrass	0.5-3	3-40	1%
In annual cropping systems apply 1 to 2 quarts of this product per acre. Apply 1 quart of this product in 3 to 10 gallons of water per acre. Use 2 quarts of this product when applying 10 to 40 gallons of water per acre. In non-crop, or areas where annual tillage is not practiced (no-till), apply 2 to 3 quarts of this product in 10 to 40 gallons of water per acre.			
For best results, apply when most plants have reached the boot-to-head stage of growth or in the fall prior to frost. Allow 7 or more days after application before tillage. Do not tank mix with residual herbicides when using 1 quart of this product per acre.			
For burndown of Johnsongrass, apply 1 pint of this product in 3 to 10 gallons of water per acre before the plants reach a height of 12 inches. For this use, allow at least 3 days after treatment before tillage.			
Spot treatment (partial control or suppression)—Apply a 1 percent solution of this product when Johnsongrass is 12 to 18 inches in height. Coverage should be uniform and complete.			
Kikuyugrass	2-3	3-40	2%
Spray when most kikuyugrass is at least 8 inches in height (3- or 4-leaf stage of growth). Allow 3 or more days after application before tillage.			
Knapweed	4	3-40	2%
Apply when most plants have reached the late bud to flower stage of growth. For best results, apply in late summer or fall.			
Lantana	—	—	1-1.25%
Apply at or beyond the bloom stage of growth. Use the higher application rate for plants that have reached the woody stage of growth.			
Lespedeza	3-5	3-20	2%
Apply when most plants have reached the early bud stage.			
Milkweed, common	3	3-40	2%
Apply when most plants have reached the late bud to flower stage of growth.			
Muhly, wirestem	1-2	3-40	2%
Use 1 quart of this product in 3 to 10 gallons of water per acre. Use 2 quarts of this product when applying 10 to 40 gallons of water per acre or in pasture, sod, or non-crop areas. Spray when the wirestem muhly is 8 inches or more in height. Do not till between harvest and fall applications or in the fall or spring prior to spring applications. Allow 3 or more days after application before tillage.			
Mullein, common	3-5	3-20	2%
Apply when most plants are in the early bud stage.			
Napiergrass	3-5	3-20	2%
Apply when most plants are in the early head stage.			
Nightshade, silverleaf	2	3-10	2%
Applications should be made when at least 60 percent of the plants have berries. Fall treatments must be applied before a killing frost.			
Nutsedge, purple or yellow	0.5-3	3-40	1-2%
Apply 3 quarts of this product per acre or apply a 1 to 2 percent solution for control of nutsedge plants and immature nutlets attached to treated plants. Treat when plants are in flower or when new nutlets can be found at rhizome tips. Nutlets that have not germinated will not be controlled and may germinate following treatment. Repeat treatments will be required for long-term control of ungerminated tubers.			
Sequential applications: 1 to 2 quarts of this product in 3 to 10 gallons of water per acre will also			

provide control. Make applications when a majority of the plants are in the 3- to 5-leaf stage (less than 6 inches tall). Repeat this application, as necessary, when newly emerging plants reach the 3- to 5-leaf stage. Subsequent applications will be necessary for long-term control.

For partial control of existing plants, apply 1 pint to 2 quarts of this product in 3 to 40 gallons of water per acre. Treat when plants have 3 to 5 leaves and most are less than 6 inches tall. Repeat treatments will be required to control subsequent emerging plants or regrowth of existing plants.

Orchardgrass	1-2	3-40	2%
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Apply 2 quarts of this product in 10 to 40 gallons of water per acre when most plants have reached boot-to-early seedhead stage of development. For partial control in pasture or hay crop renovation, apply 1 to 1.5 quarts of this product in 3 to 10 gallons of water per acre. Apply to actively growing plants when most have reached 4 to 12 inches in height.

Orchardgrass sods going to no-till corn: Apply 1 to 1.5 quarts of this product in 3 to 10 gallons of water per acre. Apply to orchardgrass that is a minimum of 12 inches tall for spring applications and 6 inches tall for fall applications. Allow at least 3 days following application before planting. A sequential application of atrazine will be necessary for optimum results.

Pampasgrass	—	—	1.5-2%
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Pampasgrass should be at or beyond the boot stage of growth. Thorough coverage is necessary for best control.

Paragrass	3-5	3-20	2%
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Apply when most plants are in the early head stage.

Phragmites	3-5	10-40	1-2%
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For partial control and for best results, treat during late summer or fall when plants are actively growing and in full bloom. Treatment before or after this stage may lead to reduced control. Due to the dense nature of the vegetation, which may prevent good spray coverage or uneven stages of growth, repeat treatments may be necessary to maintain control. Visual control symptoms will be slow to develop.

Poison hemlock	—	—	1-2%
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For hand-held, apply as a spray-to-wet treatment. Optimum results are obtained when plants are treated at the bud to full-bloom stage of growth. Thorough coverage is necessary for best control.

Pokeweed, common	1.0	3-40	2%
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Apply to actively growing plants up to 24 inches tall.

Quackgrass	1-3	3-40	2%
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In annual cropping systems, or in pastures and sods followed by deep tillage:

Apply 1 quart of this product in 3 to 10 gallons of water per acre. For 10 to 40 gallons of water per acre, apply 2 quarts of this product. Do not tank mix with residual herbicides when using the 1-quart rate. Spray when quackgrass is 6 to 8 inches in height. Do not till between harvest and fall applications or in fall or spring prior to spring application. Allow 3 or more days after application before tillage. In pastures or sods, use a moldboard plow for best results.

In pastures, sods or non-crop areas where deep tillage does not follow application: Apply 2 to 3 quarts of this product in 10 to 40 gallons of water per acre when the quackgrass is greater than 8 inches tall.

Redvine	0.75-2	5-10	2%
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For suppression, apply 24 fluid ounces of this product per acre at each of two applications 7 to 14 days apart or a single application of 2 quarts per acre. Apply recommended rates in 5 to 10 gallons of water per acre. Apply in late September or early October to plants that are at least 18 inches tall and have been growing 45 to 60 days since the last tillage operation. Make applications at least 1 week before a killing frost.

Reed, giant	—	—	2%
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Best results are obtained when applications are made in late summer to fall.

Ryegrass, perennial	1-3	3-40	1%
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In annual cropping systems apply 1 to 2 quarts of this product per acre. Apply 1 quart of this product in 3 to 10 gallons of water per acre. Use 2 quarts of this product when applying 10 to 40 gallons of water per acre. In non-crop, or areas where annual tillage is not practiced (no-till), apply 2 to 3 quarts of this product in 10 to 40 gallons of water per acre.

For best results, apply when most plants have reached the boot-to-head stage of growth or in the fall prior to frost. Do not tank-mix with residual herbicides when using 1 quart of this product per acre.

Smartweed, swamp	3-5	3-40	2%
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Apply when most plants have reached the early bud stage of growth. Also for control, apply 16 fluid ounces of this product plus 0.5 pound of 2,4-D in 3 to 10 gallons of water per acre in the late summer or fall.

Sowthistle, perennial	2-3	3-40	2%
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Apply when most plants are at or beyond the bud stage of growth. After harvest, mowing or tillage in the late summer or fall, allow at least 4 weeks for initiation of active growth and rosette development prior to the application of this product. Fall treatments must be applied before a killing frost. Allow 3 or more days after application before tillage.

Spurge, leafy	—	3-10	2%
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For suppression, apply 16 fluid ounces of this product plus 0.5 pound of 2,4-D in 3 to 10 gallons of water per acre in the late summer or fall. If mowing has occurred prior to treatment, apply when most of the plants are 12 inches tall.

Starthistle, yellow	2	10-40	2%
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Best results are obtained when applications are made during the rosette, bolting and early flower stages.

Sweet potato, wild	—	—	2%
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For partial control, apply to plants that are at or beyond the bloom stage of growth. Repeat applications may be required.

Thistle, artichoke	—	—	2%
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For partial control, apply to plants that are at or beyond the bloom stage of growth. Repeat applications may be required.

Weed Species	Rate (QT/A)	Water Volume (GPA)	Hand-Held % Solution
Thistle, Canada	2-3	3-40	2%
Apply when most plants are at or beyond the bud stage of growth. After harvest, mowing or tillage in the late summer or fall, allow at least 4 weeks for initiation of active growth and rosette development prior to the application of this product. Fall treatments must be applied before a killing frost. Allow 3 or more days after application before tillage.			
For suppression in the spring, apply 1 quart of this product, or 1 pint of this product plus 0.5 pound of 2,4-D, in 3 to 10 gallons of water per acre. Allow rosette regrowth to a minimum of 6 inches in diameter before treating. Applications can be made as long as leaves are still green and plants are actively growing at the time of application. Allow 3 or more days after application before tillage.			
Timothy	2-3	3-40	2%
For best results, apply when most plants have reached the boot-to-head stage of growth.			
Torpedograss	4-5	3-40	2%
For partial control, apply when most plants are at or beyond the seedhead stage of growth. Repeat applications will be required to maintain control. Fall treatments must be applied before frost.			
Trumpet creeper	2	5-10	2%
For partial control, apply in late September or October, to plants that are at least 18 inches tall and have been growing 45 to 60 days since the last tillage operation. Make applications at least 1 week before a killing frost.			
Vaseygrass	3-5	3-20	2%
Apply when most plants are in the early head stage.			
Velvetgrass	3-5	3-20	2%
Apply when most plants are in the early head stage.			
Wheatgrass, western	2-3	3-40	2%
For best results, apply when most plants have reached the boot-to-head stage of growth.			

15.0 WOODY BRUSH AND TREES RATE TABLE (Alphabetically by Species)

Apply this product after full leaf expansion, unless otherwise directed. Use the higher rate for larger plants and/or dense areas of growth. On vines, use the higher rate for plants that have reached the woody stage of growth. Best results are obtained when application is made in late summer or fall after fruit formation.

In arid areas, best results are obtained when applications are made in the spring to early summer when brush species are at high moisture content and are flowering.

Unless otherwise directed, apply broadcast treatments in 3 to 40 gallons of water per acre. Ensure thorough coverage when using hand-held equipment. Symptoms may not appear prior to frost or senescence with fall treatments.

Allow 7 or more days after application before tillage, mowing or removal. Repeat treatments may be necessary to control plants regenerating from underground parts or seed. Some autumn colors on undesirable deciduous species are acceptable provided no major leaf drop has occurred. Reduced performance may result if fall treatments are made following a frost.

Weed Species	Rate (QT/A)	Hand-Held % Solution
* = Partial Control		
Alder	3-4	1-1.5%
Ash*	2-5	1-2%
Aspen, quaking	2-3	1-1.5%
Bearmat (Bearclover)*	2-5	1-2%
Beech	2-5	1-2%
Birch	2-5	1-1.5%
Blackberry	3-4	1-1.5%
Make applications after plants have reached full leaf maturity. Best results are obtained when applications are made in late summer or fall. Applications may also be made after leaf drop and until a killing frost or as long as stems are green. After berries have set or dropped in late fall, blackberry can be controlled by applying a 0.75 percent solution of this product. For control of blackberries after leaf drop and until killing frost or as long as stems are green, apply 3 to 4 quarts of this product in 10 to 40 gallons of water per acre.		
Blackgum	2-5	1-2%
Bracken	2-5	1-2%
Broom; French, Scotch	2-5	1.5-2%
Buckwheat, California*	2-4	1-2%
Thorough coverage of foliage is necessary for best results.		
Cascara*	2-5	1-2%
Catsclaw*	—	1-1.5%
Ceanothus*	2-5	1-2%
Chamise	—	1%
Thorough coverage of foliage is necessary for best results.		
Cherry; bitter, black, pin	2-3	1-1.5%

Weed Species	Rate (QT/A)	Hand-Held % Solution
* = Partial Control		
Coyote brush	3-5	1.5-2%
Apply when at least 50 percent of the new leaves are fully developed.		
Dogwood*	2-5	1-2%
Elderberry	2-3	1-1.5%
Elm*	2-5	1-2%
Eucalyptus	—	2%
For control of eucalyptus resprouts, apply when resprouts are 6 to 12 feet tall. Ensure complete coverage. Avoid application to drought-stressed plants.		
Florida holly (Brazilian Peppertree)*	2-5	1-2%
Gorse*	2-5	1-2%
Hasardia*	2-4	1-2%
Thorough coverage of foliage is necessary for best results.		
Hawthorn	2-3	1-1.5%
Hazel	2-3	1-1.5%
Hickory*	2-5	1-2%
Honeysuckle	3-4	1-1.5%
Hornbeam, American*	2-5	1-2%
Kudzu	4-5	2%
Repeat applications may be required to maintain control.		
Locust, black*	2-4	1-2%
Madrone resprouts*	—	2%
Apply to resprouts that are 3 to 6 feet tall. Best results are obtained with spring/early summer treatments.		
Manzanita*	2-5	1-2%
Maple, red	2-4	1-1.5%
Apply a 1 to 1.5 percent solution when at least 50 percent of the new leaves are fully developed. For partial control, apply 2 to 4 quarts of this product per acre.		
Maple, sugar	—	1-1.5%
Apply when at least 50 percent of the new leaves are fully developed.		
Monkey flower*	2-4	1-2%
Thorough coverage of foliage is necessary for best results.		
Oak; black, white*	2-4	1-2%
Oak, post	3-4	1-1.5%
Oak; northern	—	1-1.5%
Apply when at least 50 percent of the new pin leaves are fully developed.		
Oak; southern red	2-3	1-1.5%
Persimmon*	2-5	1-2%
Pine	2-5	1-2%
Poison ivy/ Poison oak	4-5	2%
Repeat applications may be required to maintain control. Fall treatments must be applied before leaves lose green color.		
Poplar, yellow*	2-5	1-2%
Redbud, eastern	2-5	1-2%
Rose, multiflora	2	1%
Treatments should be made prior to leaf deterioration by leaf-eating insects.		
Russian olive*	2-5	1-2%
Sage, black	2-4	1%
Thorough coverage of foliage is necessary for best results.		
Sage, white*	2-5	1-2%
Sage brush, California	2-4	1%
Thorough coverage of foliage is necessary for best results.		
Salmonberry	2-3	1-1.5%
Saltcedar	2-5	1-2%
Sassafras*	2-5	1-2%
Sourwood*	2-5	1-2%
Sumac; poison, smooth, winged*	2-4	1-2%
Sweetgum	2-3	1-1.5%
Swordfern*	2-5	1-2%
Tallowtree, Chinese	—	1%
Thorough coverage of foliage is necessary for best results.		
Tan oak resprouts*	—	2%
Apply to resprouts that are less than 3 to 6 feet tall. Best results are obtained with fall applications.		
Thimbleberry	2-3	1-1.5%
Tobacco, tree*	2-4	1-2%

Weed Species	Rate (QT/A)	Hand-Held % Solution
*=Partial Control		
Trumpet creeper	2-3	1-1.5%
Vine maple*	2-5	1-2%
Virginia creeper	2-5	1-2%
Waxmyrtle, southern*	2-5	1-2%
Willow	3-4	1-1.5%

No license granted under any non-U.S. patent(s).

EPA Reg. No. 524-445

In case of an emergency involving this product,
Call Collect, day or night, (314) 694-4000.

16.0 LIMIT OF WARRANTY AND LIABILITY

This Company warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes set forth in the Complete Directions for Use label booklet ("Directions") when used in accordance with those Directions under the conditions described therein. NO OTHER EXPRESS WARRANTY OR IMPLIED WARRANTY OF FITNESS FOR PARTICULAR PURPOSE OR MERCHANTABILITY IS MADE. This warranty is also subject to the conditions and limitations stated herein.

Buyer and all users shall promptly notify this Company of any claims whether based in contract, negligence, strict liability, other tort or otherwise.

Buyer and all users are responsible for all loss or damage from use or handling which results from conditions beyond the control of this Company, including, but not limited to, incompatibility with products other than those set forth in the Directions, application to or contact with desirable vegetation, unusual weather, weather conditions which are outside the range considered normal at the application site and for the time period when the product is applied, as well as weather conditions which are outside the application ranges set forth in the Directions, application in any manner not explicitly set forth in the Directions, moisture conditions outside the moisture range specified in the Directions, or the presence of products other than those set forth in the Directions in or on the soil, crop or treated vegetation.

This Company does not warrant any product reformulated or repackaged from this product except in accordance with this Company's stewardship requirements and with express written permission from this Company.

For over-the-top uses on Roundup Ready crop varieties crop safety and weed control performance are not warranted by this Company when this product is used in conjunction with "brown bag" or "bin run" seed saved from previous year's production and replanted.

THE EXCLUSIVE REMEDY OF THE USER OR BUYER, AND THE LIMIT OF THE LIABILITY OF THIS COMPANY OR ANY OTHER SELLER FOR ANY AND ALL LOSSES, INJURIES OR DAMAGES RESULTING FROM THE USE OR HANDLING OF THIS PRODUCT (INCLUDING CLAIMS BASED IN CONTRACT, NEGLIGENCE, STRICT LIABILITY, OTHER TORT OR OTHERWISE) SHALL BE THE PURCHASE PRICE PAID BY THE USER OR BUYER FOR THE QUANTITY OF THIS PRODUCT INVOLVED, OR, AT THE ELECTION OF THIS COMPANY OR ANY OTHER SELLER, THE REPLACEMENT OF SUCH QUANTITY OR, IF NOT ACQUIRED BY PURCHASE, REPLACEMENT OF SUCH QUANTITY. IN NO EVENT SHALL THIS COMPANY OR ANY OTHER SELLER BE LIABLE FOR ANY INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES.

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MONSANTO



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ST. LOUIS, MISSOURI 63167 USA

Specimen Label

GLYPHOSATE	GROUP	9	HERBICIDE
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HERBICIDE

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For control of annual and perennial weeds and woody plants in natural and production (plantations), forests for site preparation, mid-rotation release treatments, timber stand improvement activities, noncrop sites including industrial sites, rights-of-way (including roadsides, electric utility and communication transmission lines, pipelines, railroads, airports), irrigation and drainage ditches, canals, reservoirs, natural areas (including wildlife management areas, wildlife openings, wildlife habitats and refuges, parks and recreational areas, campgrounds, trailheads and trails), rangeland, and in and around aquatic sites and wetlands; also for perennial grass release, and grass growth suppression and grazed areas on these sites.

Avoid contact of herbicide with foliage, green stems, exposed non-woody roots or fruit of crops, desirable plants and trees, because severe injury or destruction may result.

Active Ingredient:

glyphosate † N-(phosphonomethyl)glycine, isopropylamine salt	53.8%
Other Ingredients.....	46.2%
Total	100.0%

† Contains 5.4 lb per gallon glyphosate, isopropylamine salt (4 lb per gallon glyphosate acid).

Precautionary Statements

Hazards to Humans and Domestic Animals

EPA Reg. No. 62719-324

Keep Out of Reach of Children

CAUTION

Harmful If Inhaled • Avoid breathing spray mist. Remove contaminated clothing and wash before reuse. Wash thoroughly with soap and water after handling.

Personal Protective Equipment (PPE)

Applicators and other handlers must wear:

- Long-sleeved shirt and long pants
- Shoes plus socks.

Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

Engineering Controls

When handlers use closed systems, enclosed cabs, or aircraft in a manner that meets the requirements listed in Worker Protection

Standard (WPS) for agricultural pesticides [40 CFR 170.240 (d)(4-6)], the handler PPE requirements may be reduced or modified as specified in the WPS.

User Safety Recommendations

Users should:

- Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.

First Aid

If inhaled: Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible. Call a poison control center or doctor for further treatment advice.

Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact 1-800-992-5994 for emergency medical treatment information.

Environmental Hazards

Do not contaminate water when cleaning equipment or disposing of equipment washwaters. Treatment of aquatic weeds can result in oxygen depletion or loss due to decomposition of dead plants. This oxygen loss can cause fish suffocation.

In case of leak or spill, soak up and remove to a landfill.

Physical or Chemical Hazards

Spray solutions of this product should be mixed, stored and applied using only stainless steel, aluminum, fiberglass, plastic or plastic-lined steel containers.

Do not mix, store or apply this product or spray solutions of this product in galvanized steel or unlined steel (except stainless steel) containers or spray tanks. This product or spray solutions of this product react with such containers and tanks to produce hydrogen gas, which may form a highly combustible gas mixture. This gas mixture could flash or explode, causing serious personal injury, if ignited by open flame, spark, welder's torch, lighted cigarette or other ignition source.

Directions for Use

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

Read all Directions for Use carefully before applying.

This is an end-use product. Dow AgroSciences does not intend and has not registered it for reformulation.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your state or tribe, consult the agency responsible for pesticide regulation.

Agricultural Use Requirements

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR Part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE), and restricted entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not enter or allow worker entry into treated areas during the restricted entry interval (REI) of 4 hours.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is:

- Coveralls
- Chemical-resistant gloves made of any waterproof material
- Shoes plus socks

Non-Agricultural Use Requirements

The requirements in this box apply to uses of this product that are NOT within the scope of the Worker Protection Standard for agricultural pesticides (40 CFR Part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries or greenhouses.

Keep people and pets off treated areas until spray solution has dried.

Storage and Disposal

Do not contaminate water, food, feed or seed by storage or disposal.

Pesticide Storage: Store above 10°F (-12°C) to keep product from crystallizing. Crystals will settle to the bottom. If allowed to crystallize, place in a warm room 68°F (20°C) for several days to redissolve and roll or shake container or recirculate in mini-bulk containers to mix well before using.

Pesticide Disposal: Wastes resulting from use of this product that cannot be used or chemically reprocessed should be disposed of in a landfill approved for pesticide disposal or in accordance with applicable Federal, state or local procedures.

Nonrefillable containers 5 gallons or less:

Container Handling: Nonrefillable container. Do not reuse or refill this container.

Triple rinse or pressure rinse container (or equivalent) promptly after emptying. **Triple rinse** as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. **Pressure rinse** as follows: Empty the remaining contents into application equipment or a mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container, and rinse at about 40 psi for at least 30 seconds. Drain for 10 seconds after the flow begins to drip. Then offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration, or by other procedures allowed by state and local authorities.

Refillable containers larger than 5 gallons:

Container Handling: Refillable container. Refill this container with pesticide only. Do not reuse this container for any other purpose. Cleaning the container before final disposal is the responsibility of the person disposing of the container. Cleaning before refilling is the responsibility of the refiller. To clean the container before final disposal, empty the remaining contents from this container into application equipment or a mix tank. Fill the container about 10% full with water and, if possible, spray all sides while adding water. If practical, agitate vigorously or recirculate water with the pump for two minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times. Then offer for recycling if available, or puncture and dispose of in a sanitary landfill, or by incineration, or by other procedures allowed by state and local authorities.

Nonrefillable containers 5 gallons or larger:

Container Handling: Nonrefillable container. Do not reuse or refill this container.

Triple rinse or pressure rinse container (or equivalent) promptly after emptying. **Triple rinse** as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container 1/4 full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times. **Pressure rinse** as follows: Empty the remaining contents into application equipment or a mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container, and rinse at about 40 psi for at least 30 seconds. Drain for 10 seconds after the flow begins to drip. Then offer for recycling if available, or puncture and dispose of in a sanitary landfill, or by incineration, or by other procedures allowed by state and local authorities.

Product Information

This product is a broad spectrum, systemic, postemergent herbicide with no soil residual activity. It is intended for control of annual and perennial weeds and woody plants and brush. It is formulated as a water soluble liquid.

Time to Symptoms: The active ingredient in this product moves through the plant from the point of foliage contact to and into the root system. Visible effects are a gradual wilting and yellowing of the plant that advances to complete browning of above ground growth and deterioration of underground plant parts. Visible effects on most annual weeds occur within two to four days, but on most perennial weeds visible effects may not occur for seven days or more. Extremely cool or cloudy weather

following treatment may slow the activity of this product and delay development of visual symptoms.

Stage of Weeds: Annual weeds are easiest to control when they are small. Best control of most perennial weeds is obtained when treatment is made at late growth stages approaching maturity. Refer to the annual, perennial and woody brush and trees rate tables for specific weeds. Always use the higher rate within the rate range for heavy or dense weed growth or when weeds are growing in an undisturbed (noncultivated) area. When treating weeds with disease or insect damage, weeds heavily covered with dust, or weeds under poor growing conditions, reduced weed control may result.

Cultural Considerations: Reduced control may result when applications are made to annual or perennial weeds that have been mowed, grazed, or cut, and have not been allowed to regrow to the specified stage for treatment.

Rainfastness: Heavy rainfall soon after application may wash off this product from the foliage and a repeat application up to the labeled rate may be required for adequate control.

Spray Coverage: For best results, spray coverage should be uniform and complete.

Mode of Action: The active ingredient in this product inhibits an enzyme. This enzyme is found only in plants and microorganisms that are essential to forming specific amino acids.

No Soil Activity: Weeds must be emerged at the time of application to be controlled by this product. Weeds germinating from seed after application will not be controlled. Unemerged plants arising from unattached underground rhizomes or rootstocks of perennials will not be affected by the herbicide and will continue to grow.

Biological Degradation: Degradation of this product is primarily a biological process carried out by soil microbes.

Maximum Application Rates: The maximum application rates specified in this label are given in units of volume, either fluid ounces, pints or quarts, of this product per acre. The maximum allowed application rates apply to this product combined with the use of any and all other glyphosate- or sulfosate-containing herbicides, either applied separately or in a tank mix, on the basis of total pounds of glyphosate (acid equivalents) per acre. If more than one glyphosate- or sulfosate-containing product is applied to the same site within the same year, ensure that the total of pounds acid equivalent glyphosate does not exceed the maximum allowed.

Do not apply more than 8 quarts of this product (8 lb glyphosate acid) per acre per year for all use sites listed on this label.

IMPORTANT: When using this product, unless otherwise specified, mix with a surfactant, such as a nonionic surfactant containing 80% or greater active ingredient. For conifer release (pine release) use only surfactants that are approved for conifer release and specified on the surfactant label as safe for use in conifer release (pine release). Use of this product without surfactant will result in reduced herbicide performance. Ammonium sulfate, drift control additives, or dyes and colorants may be used. See Mixing Directions and the surfactant manufacturer's label for more information.

Grazing Restrictions: This product may be used to treat undesirable vegetation in utility rights-of-way that pass through pastures, rangeland, and forestry sites that are being grazed. For tank mix applications, comply with all restrictions appearing on the tank mix product label.

Except for lactating dairy animals there are no grazing restrictions following the labeled applications of this product.

For lactating dairy animals there are no grazing restrictions for the following labeled applications of this product:

- Where the spray can be directed onto undesirable woody brush and trees, including in handgun spray to wet or low volume directed spray treatments.
- For tree injection of frill applications and for cut stump treatments.

For broadcast applications, observe the following restrictions for lactating dairy animals:

- For application rates between 4.5 and 7.5 quarts per acre, no more than 15 percent of the available grazing area may be treated.
- For application rates less than 4.5 quarts per acre, no more than 25 percent of the available grazing area may be treated.

These restrictions do not apply to pastures, rangeland or forestry sites outside of utility rights-of-way.

Herbicide Resistance Management

Glyphosate, the active ingredient in this product, is a group 9 herbicide (inhibitor of EPSP synthase). Some naturally occurring weed biotypes that are tolerant (resistant) to glyphosate may exist due to genetic variability in a weed population. Where resistant biotypes exist, the repeated use

of herbicides with the same mode of action can lead to the selection for resistant weeds. Certain agronomic practices reduce the likelihood that resistant weed populations will develop, and can be utilized to manage weed resistance once it occurs.

To delay the selection for glyphosate resistant weeds, use the following practices:

- Scout fields before and after application to detect weed escapes or shifts in weed species.
- Start with a clean field by applying a burndown herbicide or by tillage.
- Control weeds early when they are small.
- Add other herbicides, including a selective and/or a residual herbicide, and cultural practices, including tillage or crop rotation, where appropriate.
- Use the application rate for the most difficult to control weed in the field. Do not tank mix with other herbicides that reduce this product's efficacy through antagonism or with ones that encourage application rates of this product below those specified on this label.
- Control weed escapes and prevent weeds from setting seeds.
- In situations where resistant weeds are a problem, before moving from one site to another, clean equipment to minimize the spread of weed seeds or plant parts.
- Use new commercial seed that is as free of weed seed as possible.
- Report any incidence of repeated non-performance of this product against a particular weed species to the local retailer, county extension agent, or Dow AgroSciences representative.

The following good agronomic practices are recommended to reduce the spread of confirmed glyphosate-resistant biotypes:

- Tank mix this product or apply it sequentially with an appropriately labeled herbicide with a different mode of action to achieve control if a naturally occurring resistant biotype is present in the site.
- Cultural and mechanical control practices, including crop rotation or tillage, may also be used.
- To control weed escapes, including resistant biotypes, before they set seed, scout treated sites after applying this product.
- Thoroughly clean equipment before leaving any site known to contain resistant biotypes.

Because the presence of glyphosate resistance in weed populations is difficult to detect prior to use, Dow AgroSciences accepts no liability for any losses that may result from the failure of this product to control glyphosate-resistant weeds.

Attention

Avoid contact of herbicide with foliage, green stems, exposed non-woody roots or fruit of crops, desirable plants and trees, because severe injury or destruction may result.

AVOID DRIFT. Use extreme care when applying this product to prevent injury to desirable plants and crops.

Do not allow the herbicide solution to mist, drip, drift or splash onto desirable vegetation since minute quantities of this product can cause severe damage or destruction to the crop, plants or other areas on which treatment was not intended. The likelihood of injury occurring from the use of this product increases when winds are gusty, as wind velocity increases, when wind direction is constantly changing, or when there are other meteorological conditions that favor spray drift. When spraying, avoid combinations of pressure and nozzle type that will result in splatter or fine particles (mist) which are likely to drift. **Avoid applying at excessive speed or pressure.**

NOTE: Use of this product in any manner not consistent with this label may result in injury to persons, animals or crops, or other unintended consequences. Keep container closed to prevent spills and contamination.

Spray Drift Management

Avoiding spray drift at the application site is the responsibility of the applicator. The interaction of many equipment- and weather-related factors determine the potential for spray drift. The applicator and the grower are responsible for considering all these factors when making decisions. The following drift management requirements must be followed to avoid off-target drift movement from aerial applications to agricultural field crops. These requirements do not apply to forestry applications, public health uses or to applications using dry formulations.

- The distance of the outermost nozzles on the boom must not exceed 3/4 the length of the wingspan or rotor.
- Nozzles must always point backward parallel with the air stream and never be pointed downwards more than 45 degrees.

Where states have more stringent regulations, they must be observed.

The applicator must be familiar with and take into account the information covered in the Aerial Drift Reduction Advisory.

Aerial Drift Reduction Advisory

This section is advisory in nature and does not supersede the mandatory label requirements.

Importance of Droplet Size: The most effective way to reduce drift potential is to apply large droplets. The best drift management strategy is to apply the largest droplets that provide sufficient coverage and control. Applying larger droplets reduces drift potential, but will not prevent adverse effects from drift if applications are made improperly, or under unfavorable environmental conditions (see Wind, Temperature and Humidity, and Temperature Inversions).

Controlling Droplet Size:

- **Volume** - Use high flow rate nozzles to apply the highest practical spray volume. Nozzles with higher rated flows produce larger droplets.
- **Pressure** - Do not exceed the nozzle manufacturer's recommended pressures. Use the lower spray pressures for the nozzle. Higher pressure reduces droplet size and does not improve canopy penetration. When higher flow rates are needed, use higher flow rate nozzles instead of increasing pressure.
- **Number of Nozzles** - Use the minimum number of nozzles that provide uniform coverage.
- **Nozzle Orientation** - Orienting nozzles so that the spray is parallel to the airstream produces larger droplets than other orientations and is the recommended practice. Significant deflection from horizontal will reduce droplet size and increase drift potential.
- **Nozzle Type** - Use a nozzle type that is designed for the intended application. With most nozzle types, narrower spray angles produce larger droplets. Consider using low-drift nozzles. Solid stream nozzles oriented straight back produce the largest droplets and the lowest drift.

Boom Length: For some use patterns, reducing the effective boom length to less than 3/4 of the wingspan or rotor length may further reduce drift without reducing swath width.

Application Height: Applications must not be made at a height greater than 10 feet above the top of the largest plants unless a greater height is required for aircraft safety. Making applications at the lowest height that is safe reduces exposure of droplets to evaporation and wind.

Swath Adjustment: When applications are made with a crosswind, the swath will be displaced downwind. Therefore, on the up and downwind edges of the field, the applicator must compensate for this displacement by adjusting the path of the aircraft upwind. Swath adjustment distance must increase with increasing drift potential (higher wind, smaller drops, etc.).

Wind: Drift potential is lowest between wind speeds of 2 to 10 mph. However, many factors, including droplet size and equipment type, determine drift potential at any given speed. Do not apply this product when wind speed is below 2 mph due to variable wind direction and high inversion potential. **Note:** Local terrain can influence wind patterns. Every applicator should be familiar with local wind patterns and how they affect spray drift.

Temperature and Humidity: When making applications in low relative humidity, set up equipment to produce larger droplets to compensate for evaporation. Droplet evaporation is most severe when conditions are both hot and dry.

Temperature Inversions: Do not apply this product during a temperature inversion because drift potential is high. Temperature inversions restrict vertical air mixing, which causes small suspended droplets to remain in a concentrated cloud. This cloud can move in unpredictable directions due to the light variable winds common during inversions. Temperature inversions are characterized by increasing temperatures with altitude and are common on nights with limited cloud cover and light to no wind. They begin to form as the sun sets and often continue into the morning. Their presence can be indicated by ground fog; however, if fog is not present, inversions can also be identified by the movement of smoke from a ground source or an aircraft smoke generator. Smoke that layers and moves laterally in a connected cloud (under low wind conditions) indicates an inversion, while smoke that moves upwards and rapidly dissipates indicates good vertical air mixing.

Sensitive Areas: Apply this pesticide only when the potential for drift to adjacent sensitive areas (e.g., residential areas, bodies of water, known habitat for threatened or endangered species, non-target crops) is minimal (e.g., when wind is blowing away from the sensitive areas).

Mixing Directions

Use only clean, stainless steel, fiberglass, plastic or plastic-lined steel containers to mix, store and apply spray solutions of this product. Do not mix, store or apply this product or spray solutions of this product in galvanized steel or unlined steel, except stainless steel, containers or spray tanks.

Eliminate any risk of siphoning the contents of the tank mix back into the carrier source while mixing. Use approved anti-back-siphoning devices where required by state or local regulations.

Note: Reduced results may occur if water containing soil is used, including visibly muddy water or water from ponds and ditches that is not clear.

Rodeo – Alone

This product mixes readily with water. Mix spray solutions of this product as follows:

1. Fill the mixing or spray tank with the required amount of clean water.
2. Add the specified amount of this product and nonionic surfactant near the end of the filling process and mix well.
3. During mixing and application, foaming of the spray solution may occur. To prevent or minimize foaming, avoid the use of mechanical agitators, terminate by-pass and return lines at the bottom of the tank and, if needed, use an approved anti-foam or defoaming agent.

Rodeo – Tank Mix

This product does not provide residual weed control. For residual weed control or an alternate mode of action, tank mix this product with other herbicides. It is the pesticide user’s responsibility to ensure that all products in the listed mixtures are registered for the intended use. Users must follow the most restrictive directions for use and precautionary statements of each product in the tank mixture..

Under certain conditions, at certain growth stages, and/or under other circumstances, some tank mix products have the potential to cause injury. Read all labels for products used in the tank mix prior to using them to determine the potential for crop injury.

Tank mixing with other herbicides, insecticides, fungicides, micronutrients or foliar fertilizers may result in reduced weed control or injury. Do not use these products in applications with this product unless otherwise noted in this label. To the extent consistent with applicable law, buyer and all users are responsible for all loss or damage in connection with the use or handling of mixtures of this product with herbicides or other materials that are not expressly specified in this labeling. Mixing this product with herbicides or other materials not specified on this label may result in reduced performance.

The user is responsible for ensuring that the specific application being made is included on the label of the product used in the tank mix when a tank mixture with a generic active ingredient, including 2,4-D, atrazine, dicamba, diuron, or pendimethalin, is used.

Read all individual product labels for all products in the tank mix and observe all precautions and restrictions on the label. Use according to the most restrictive directions for each product in the tank mix. Always predetermine the compatibility of all tank mix products, together in the carrier, by mixing small proportional quantities in advance of mixing and applying them to the use site. Add the tank mix product to the tank as directed by the label. Maintain agitation and add the required amount of this product.

Maintain good agitation at all times until the contents in the tank are sprayed. If the mixture is allowed to settle, thorough agitation is required to resuspend the mixture before spraying resumes. Keep the bypass line on or near the bottom of the tank to minimize foaming. The screen size in the nozzle or line strainers must be no finer than 50 mesh.

Note: If tank mixing with Garlon® 3A herbicide, ensure that Garlon 3A is well mixed with at least 75 percent of the total spray volume before adding this product to the spray tank to avoid incompatibility.

Hand-Held Sprayers

Prepare the desired volume of spray solution by mixing the amount of this product in water as shown in the following table:

Spray Concentration (percent)	Amount of this Product for Desired Volume:		
	1 gal	25 gal	100 gal
0.5	2/3 fl oz	1 pt	2 qt
0.75	1 fl oz	1 1/2 pt	3 qt
1	1 1/3 fl oz	1 qt	1 gal
1.5	2 fl oz	1 1/2 qt	1 1/2 gal
2	2 2/3 fl oz	2 qt	2 gal
3.75	5 fl oz	3 3/4 qt	3 3/4 gal
5	6 1/2 fl oz	1 1/4 gal	5 gal
10	13 fl oz	2 1/2 gal	10 gal

Nonionic Surfactant

When using this product, unless otherwise specified, mix with a surfactant, including a nonionic surfactant containing 80% or more active ingredient. For conifer release (pine release), use only surfactants that are approved for conifer release and specified on the surfactant label as safe for use in conifer release. Using this product without surfactant will result in reduced herbicide performance.

Colorants or Dyes

Agriculturally-approved colorants or marking dyes may be added to this product. Colorants or dyes used in spray solutions of this product may reduce performance, especially at lower rates or dilutions. Use colorants or dyes according to the manufacturer's directions.

Drift Control Additives

Drift control additives may be used with all equipment types except wiper applicators, sponge bars and CDA equipment. When a drift control additive is used, it is the pesticide user’s responsibility to ensure that all products in the listed mixtures are registered for the intended use. Users must follow the most restrictive directions for use and precautionary statements of each product in the tank mixture..

Application Equipment and Application Methods

Chemigation: Do not apply this product through any type of irrigation system.

Apply spray solutions in properly maintained and calibrated equipment capable of delivering desired volumes.

This product may be applied with the following application equipment and application methods.

Aerial Application

Equipment: Fixed wing and helicopter

Do not apply this product using aerial spray equipment except under conditions as specified within this label.

Avoid drift. Do not apply when winds are gusty or under any other condition which favors drift. Drift may cause damage to any vegetation contacted to which treatment is not intended. To prevent injury to adjacent desirable vegetation, maintain appropriate buffer zones.

Do not directly apply to any body of water.

Use the specified rates of this herbicide in 3 to 25 gallons of water per acre unless otherwise specified on this label. Refer to the specific use directions of this label for volumes and application rates.

Coarse sprays are less likely to drift; therefore, do not use nozzles or nozzle configurations that dispense spray as fine spray droplets. Do not angle nozzles forward into the airstream and do not increase spray volume by increasing nozzle pressure. A drift control additive may be used. When a drift control additive is used, carefully read and observe the precautionary statements and all other information specified on the additive label.

Ensure uniform application. To avoid streaked, uneven or overlapped application, use appropriate marking devices.

Aerial Application Restrictions in California Only

AVOID DRIFT: Do not apply when winds are gusty or under any other condition which favors drift. Drift may cause damage to any vegetation contacted to which treatment is not intended. To prevent injury to adjacent desirable vegetation, appropriate buffer zones must be maintained.

Do not aerially apply this product in a tank mix with dicamba in California.

Make aerial applications with helicopter only. To ensure uniform application, avoid streaking, uneven, or overlapped application, and use appropriate marking devices.

Use the following guidelines when aerial applications are made near crops or desirable perennial vegetation after budbreak and before total leaf drop, and/or near other desirable vegetation or annual crops:

- Do not apply this product using aerial equipment in residential areas.
- Do not apply within 100 feet of all desirable vegetation or crop(s).
- If wind up to 5 miles per hour is blowing toward desirable vegetation or crop(s), do not apply within 500 feet of the desirable vegetation or crop(s).
- Winds blowing from 5 to 10 miles per hour toward desirable vegetation or crop(s) may require buffer zones in excess of the 500-foot minimum buffer.
- Do not apply when winds are in excess of 10 miles per hour or when inversion conditions exist.

Use only coarse sprays to minimize drift. Do not use nozzles or nozzle configurations that dispense spray as fine spray droplets. Do not angle nozzles forward into the airstream and do not increase spray volume by increasing nozzle pressure above the manufacturer's directions.

Thoroughly wash aircraft, especially landing gear, after each day of spraying to remove residues of this product accumulated during spraying or from spills. Prolonged exposure of this product to uncoated steel surfaces may result in corrosion and possible failure of the part. Landing gear is most susceptible. The maintenance of an organic coating (paint) which meets aerospace specification MIL-C-38413 may prevent corrosion.

**ADDITIONAL LIMITATIONS FOR AERIAL APPLICATION
IN FRESNO COUNTY, CALIFORNIA ONLY**

Always read and follow the label directions and precautionary statements for all products used in the aerial application.

The following information applies only from February 15 through March 31 within the following boundaries of Fresno County, California:
North: Fresno County line
South: Fresno County line
East: State Highway 99 West

Observe the following directions to minimize off-site movement during aerial application of this product. Minimization of off-site movement is the responsibility of the grower, Pest Control Advisor and aerial applicator.

Written Directions

Written directions MUST be submitted by or on behalf of the applicator to the Fresno County Agricultural Commissioner 24 hours prior to the application. These written directions MUST state the proximity of surrounding crops and that conditions of each manufacturer's product label and this label have been satisfied.

Aerial Applicator Training and Equipment

Aerial application of this product is limited to pilots who have successfully completed a Fresno County Agricultural Commissioner and California Department of Pesticide Regulation approved training program for aerial application of herbicides. All aircraft must be inspected, critiqued in flight and certified at a Fresno County Agricultural Commissioner approved fly-in. Test and calibrate spray equipment at intervals sufficient to insure that proper rates of herbicides and adjuvants are being applied during commercial use. Applicator must document such calibrations and testing. Demonstration of performance at Fresno County Agricultural Commissioner approved fly-ins constitutes such documentation, or other written records showing calculations and measurements of flight and spray parameters acceptable to the Fresno County Agricultural Commissioner.

Applications at Night – Do not apply this product by air earlier than 30 minutes prior to sunrise and/or later than 30 minutes after sunset without prior permission from the Fresno County Agricultural Commissioner.

To report known or suspected misuse of this product, call 1-800-332-3111.

For additional information on the proper aerial application of this product in Fresno County, call 916-784-1718.

Aquatic and Noncrop Sites

When this product is applied under the conditions described, it controls or partially controls the labeled weeds growing in the following industrial, recreational, and public areas or other similar sites.

Aquatic sites includes all bodies of fresh and brackish water that may be flowing, nonflowing, or transient-including lakes, rivers, streams, ponds, seeps, irrigation and drainage ditches, canals, reservoirs, estuaries and similar sites.

If aquatic sites are present in the noncrop area and are part of the intended treatment, read and observe the following directions:

- This product does not control plants that are completely submerged or have a majority of their foliage under water.
- There is no restriction on the use of treated water for irrigation, recreation, or domestic purposes.

Spray Solution:

Desired Volume	Amount of This Product								
	0.5	0.75	1	1.25	1.5	2	5	8	10
1 gal	2/3 fl oz	1 fl oz	1 1/3 fl oz	1 2/3 fl oz	2 fl oz	2 2/3 fl oz	6 1/2 fl oz	10 1/4 fl oz	13 fl oz
25 gal	1 pt	1 1/2 pt	1 qt	1 1/4 qt	1 1/2 qt	2 qt	1 1/4 gal	2 gal	2 1/2 gal
100 gal	2 qt	3 qt	1 gal	1 1/4 gal	1 1/2 gal	2 gal	5 gal	8 gal	10 gal

2 Tablespoons = 1 fl oz

For best results when using knapsack sprayers, mix the specified amount of product with water in a larger container. Fill the knapsack sprayer with the solution and add the correct amount of surfactant.

Selective Equipment

Equipment: Recirculating sprayers, shielded and hooded sprayers, wiper applicators and sponge bars.

Do not contact desirable vegetation with herbicide. Droplets, mist, foam, or splatter of the herbicide settling on desirable vegetation is likely to result in discoloration, stunting or destruction.

Better results are obtained when more of the weed is exposed to the herbicide solution. Weeds not contacted by the herbicide solution will not be affected. This may occur in dense clumps, severe infestations, or

- Consult local and state fish and game agency and water control authorities before applying this product to public water. Permits may be required to treat such water.
- To make aquatic applications around and within 1/2 mile of active potable water intakes, the water intake must be turned off for a minimum period of 48 hours after the application. The water intake may be turned on prior to 48 hours if the glyphosate level in the intake water is below 0.7 parts per million as determined by laboratory analysis. These aquatic applications may be made only in those cases where there are alternative water sources or holding ponds that would permit the turning off of an active potable water intake for a minimum period of 48 hours after the application.

Restrictions:

- Do not apply this product within 1/2 mile upstream of an active potable water intake in flowing water (i.e., river stream, etc.), or within 1/2 mile of an active potable water intake in a standing body of water, such as a lake, pond, or reservoir.

Ground Application

Equipment: Boom or boomless systems, pull-type sprayer, floaters, pick-up sprayers, spray coupes and other ground broadcast equipment.

Use the specified rates of this product in 3 to 40 gallons of water per acre as a broadcast spray unless otherwise specified on this label. As density of weeds increases, increase the spray volume within the rate range to ensure complete coverage. Carefully select proper nozzles to avoid spraying a fine mist. For best results with ground application equipment, use flat fan nozzles. Check for even distribution of spray droplets.

Hand-Held and High-Volume Including Backpack Application

Equipment: Knapsack and backpack sprayers, pump up pressure sprayers, handguns, hand wands, mistblowers, lances, and other hand-held and motorized spray equipment used to direct the spray onto weed foliage. **Note:** This product is not registered in Arizona or California for use in mistblowers.

Apply to foliage of vegetation to be controlled. Do not spray to the point of runoff for applications made on a spray to wet basis. Use coarse sprays only. For best results, cover the top half of the plant and at least half of the total foliage. To ensure adequate spray coverage, spray both sides of large or tall woody brush and trees, when foliage is thick and dense, or where there are multiple sprouts.

High Volume Sprays: Prepare a 3/4 to 2 percent solution of this product in water, add a nonionic surfactant and apply to foliage of vegetation to be controlled. For specific rates of application and instructions for control of various annual and perennial weeds, see the Weeds Controlled section.

Make applications on a spray to wet basis with uniform and complete spray coverage. Do not spray to point of runoff.

Low Volume Directed Sprays: This product may be used as a 5 to 10 percent solution in low volume directed sprays for spot treatment of trees and brush. This treatment method is most effective in areas where there is a low density of undesirable trees or brush. If a straight stream nozzle is used, start the application at the top of the targeted vegetation and spray from top to bottom in a lateral zigzag motion. Ensure that at least 50 percent of the leaves are contacted by the spray solution. For flat fan and cone nozzles and with hand-directed mist blowers, mist the application over the foliage of the targeted vegetation. Treat small, open-branched trees only from one side. If the foliage is thick or there are multiple root sprouts, apply from several sides to ensure adequate spray coverage. Prepare the desired volume of spray solution by mixing the amount of this product in water as shown in the following table.

when the height of weeds varies so that not all weeds are contacted. If this occurs, repeat treatment up to the labeled rate may be necessary.

Shielded and Hooded Applicators: A shielded or hooded applicator directs the herbicide solution onto weeds while shielding desirable vegetation from the herbicide. Use nozzles that provide uniform coverage within the treated area. Keep shields on these sprayers adjusted to protect desirable vegetation. **Exercise extreme care to avoid contact of the herbicide with desirable vegetation.**

Wiper Applicators: Wiper applicators are devices that physically wipe appropriate amounts of this product directly onto the weed. Equipment must be designed, maintained and operated to prevent the herbicide solution from contacting desirable vegetation.

Adjust wiper applicators used over the top of desirable vegetation so that the wiper contact point is at least 2 inches above the desirable vegetation. Better results are obtained when more of the weed is exposed to the herbicide solution. Weeds should be a minimum of 6 inches above the desirable vegetation. Adjust the applicator height to ensure adequate contact with weeds as weeds not contacted by the herbicide solution will not be affected. Poor contact may occur when weeds are growing in dense clumps, in severe weed infestations, or when weed height varies dramatically. If this occurs, repeat treatment up to the labeled rate may be necessary.

Operate this equipment at ground speeds no more than 5 mph. Performance may be improved by reducing speed in areas of heavy weed infestations to ensure adequate wiper saturation. Better results may be obtained if two applications are made in opposite directions.

Droplets, mist, foam, or splatter of the herbicide settling onto desirable vegetation may result in discoloration, stunting or destruction. Avoid leakage or dripping onto desirable vegetation. Adjust height of applicator to ensure adequate contact with weeds. Keep wiping surfaces clean. Be aware that on sloping ground the herbicide solution may migrate, causing dripping on the lower end and drying of the wicks on the upper end of a wiper applicator.

Do not use wiper equipment when weeds are wet.

Mix only the amount of solution to be used during a one-day period as reduced activity may result from use of leftover solutions. Clean wiper parts by thoroughly flushing with water immediately after using this product.

For best results, use a nonionic surfactant at a rate of 10 percent by volume of total herbicide solution for all wiper applications.

Rope or Sponge Wick Applicators: Use solutions of 33 to 75 percent of this product in water.

Panel Applicator: Use solutions of 33 to 100 percent of this product in water.

Injection Systems

Equipment: Aerial or ground injection sprayers.

This product may be used in aerial or ground injection spray systems. It may be used as a liquid concentrate or diluted prior to injecting into the spray stream. Do not mix this product with the concentrate of other products when using injection systems.

Controlled Droplet Applicator (CDA)

Equipment: Hand-held or boom-mounted applicators that produce a spray consisting of a narrow range of droplet sizes.

The rate of this product applied per acre by vehicle-mounted CDA equipment must not be less than the amount specified on this label when applied by conventional broadcast equipment. For vehicle-mounted CDA equipment, apply 3 to 15 gallons of water per acre.

For the control of annual weeds with hand-held CDA units, apply a 20 percent solution of this product at a flow rate of 2 fl oz per minute and a walking speed of 1.5 mph (1 1/2 pints of product per acre). For control of perennial weeds, apply a 20 to 40 percent solution of this product at a flow rate of 2 fl oz per minute and a walking speed of 0.75 mph (3 to 6 pints of product per acre).

CDA equipment produces a spray pattern that is not easily visible. Exercise extreme care to avoid spray or drift contacting the foliage or any other green tissue of desirable vegetation as damage or destruction may result.

Use Sites

Use this product in noncrop areas, including airports, apartment complexes, aquatic sites, Christmas tree farms, commercial sites, Conservation Reserve Program (CRP) areas, ditch banks, driveways, dry ditches, dry canals, fencerows, golf courses, greenhouses, habitat management, industrial areas, lumber yards, manufacturing sites, municipal sites, natural areas, office complexes, ornamentals, parking areas, parks, pastures, petroleum tank farms and pumping installations, plant nurseries, public areas, railroads, rangeland, recreation areas, utility rights-of-way, roadsides, shadehouses, sod or turf seed farms, sports complexes, storage areas, substations, turfgrass areas, utility sites, warehouse areas, wildlife habitat management areas, and in grazed areas on these sites.

Aquatic Sites

This product may be applied to emerged weeds in all bodies of fresh and brackish water that may be flowing, nonflowing or transient including lakes, rivers, streams, ponds, estuaries, rice levees, seeps, irrigation and drainage ditches, canals, reservoirs, wastewater treatment facilities, wildlife habitat restoration and management areas and similar sites.

If aquatic sites are present in the noncrop area and are part of the intended treatment, read and observe the following directions:

- This product does not control plants that are completely submerged or have a majority of their foliage under water.
- There is no restriction on the use of treated water for irrigation, recreation or domestic purposes.
- Consult local and state fish and game agency and water control authorities before applying this product to public water. Permits may be required to treat such water.
- To make aquatic applications around and within 1/2 mile of active potable water intakes, the water intake must be turned off for a minimum period of 48 hours after the application. The water intake may be turned on prior to 48 hours if the glyphosate level in the intake water is below 0.7 parts per million as determined by laboratory analysis. These aquatic applications may be made **only** in those cases where there are alternative water sources or holding ponds which would permit the turning off of an active potable water intake for a minimum period of 48 hours after the application.
- For treatments after draw down of water or in dry ditches, allow 7 days or more after treatment before reintroduction of water to achieve maximum weed control. Apply this product within 1 day after draw down to ensure application to actively growing weeds.
- Floating mats of vegetation may require retreatment up to the labeled rate. Avoid wash off of sprayed foliage by spray boat or recreational boat backwash or by rainfall within 6 hours of application. Do not retreat within 24 hours following the initial treatment.
- Applications made to moving bodies of water must be made while traveling upstream to prevent concentration of this herbicide in water. When making any bankside applications, do not overlap more than 1 foot into open water. Do not spray in bodies of water where weeds do not exist. The maximum application rate of 7 1/2 pints per acre must not be exceeded in any single broadcast application that is being made over water.
- When emerged infestations require treatment of the total surface area of impounded water, treating the area in strips may avoid oxygen depletion due to decaying vegetation. Oxygen depletion may result in fish kill.

Restrictions:

- Do not apply this product directly to water within 1/2 mile upstream of an active potable water intake in flowing water (i.e., river, stream, etc.), or within 1/2 mile of an active potable water intake in a standing body of water, such as a lake, pond or reservoir. This restriction does not apply to intermittent inadvertent overspray of water in terrestrial use sites.

Wetland Sites

This product may be applied to undesirable vegetation in and around water (aquatic areas) and wetlands found in forestry, utility rights-of-way sites or other site listed on the label, including where these sites are adjacent to or surrounding domestic water supply reservoirs, supply streams, lakes and ponds.

If wetland sites are present, read and observe the following directions:

- There is no restriction on the use of treated water for irrigation, recreation or domestic purposes.
- Consult local public water control authorities before applying this product in and around public water. Permits may be required to treat in such areas.

Restrictions:

- Do not apply this product directly to water within 1/2 mile upstream of an active potable water intake in flowing water (i.e., river, stream, etc.), or within 1/2 mile of an active potable water intake in a standing body of water, such as a lake, pond or reservoir. This restriction does not apply to intermittent inadvertent overspray of water in terrestrial use sites.
- Do not spray open bodies of water where woody brush, trees and herbaceous weeds do not exist. Do not apply more than 3 3/4 quarts per acre in a single over water broadcast application except in stream crossings in utility right-of-way or where applications will result in less than 20 percent of the total water area being treated. In either of these locations, any specified rate may be applied:

Christmas Tree Plantations

Broadcast Application (Oregon and Washington Only)

Broadcast apply this product over the established Christmas tree species Douglas fir (*Pseudotsuga menziesii*), fir species (*Abies* spp.), and pine species (*Pinus* spp.) (except eastern white, loblolly, longleaf, shortleaf, slash), and spruce species (*Picea* spp.). Use 1 quart of this product per acre in 5 to 30 gallons of water per acre. For best results, add up to 10 fl oz of Entry II surfactant per acre. If using a different surfactant, follow the manufacturer's directions for use and ensure conifer safety has been adequately tested for that surfactant. Apply after trees have completed at least a full growing season since planting or transplanting.

Apply only in the fall after the formation of the final conifer resting buds or in the spring prior to initial bud swell. Final resting buds must be fully hardened and in the dormant stage. Applying this product at any other time may result in unacceptable injury to the Christmas trees. Avoid spray pattern overlap as injury may occur.

In some areas, 1 to 2 quarts of this product per acre may be used. Consult your local representative for specific use instructions if rates greater than 1 quart per acre are required.

For best results, do not use drift control additives as they may increase injury to Christmas trees.

Precautions:

- Ensure that adequate buffers are maintained to prevent drift onto nearby desirable crops or vegetation.

Restrictions:

- **Preharvest Interval:** Do not apply within 1 full year prior to tree harvest.

Cut Stump

Treat cut stumps in any noncrop site listed on this label. This product will control regrowth of freshly cut stumps and resprouts of many types of woody brush and tree species, some of which are listed below. Apply this product using suitable equipment to ensure coverage of the entire cambium. Cut trees or resprouts close to the soil surface. Apply a 50 to 100 percent solution of this product to freshly cut surface immediately after cutting. Delays in application may result in reduced performance. For best results, make applications during periods of active growth and full leaf expansion.

When used according to directions for cut stump application, this product will control, partially control or suppress most woody brush and tree species, some of which are listed below:

Common Name	Scientific Name
alder	<i>Alnus</i> spp.
coyotebrush ¹	<i>Baccharis pilularis</i>
dogwood ¹	<i>Cornus</i> spp.
eucalyptus	<i>Eucalyptus</i> spp.
hickory ¹	<i>Carya</i> spp.
madrone, Pacific	<i>Arbutus menziesii</i>
maple ¹	<i>Acer</i> spp.
oak	<i>Quercus</i> spp.
peppertree, Brazilian	<i>Schinus terebinthifolius</i>
Australian-pine,	<i>Casuarina equisetifolia</i>
poplar ¹	<i>Populus</i> spp.
reed, giant	<i>Arundo donax</i>
saltcedar	<i>Tamarix ramosissima</i>
sweetgum ¹	<i>Liquidambar styraciflua</i>
sycamore ¹	<i>Platanus occidentalis</i>
tan oak	<i>Lithocarpus densiflorus</i>
willow	<i>Salix</i> spp.

¹Do not use this product on these species in the state of California.

Precautions:

- Adjacent trees that are of a similar age, height and spacing may indicate shared roots.
- Injury is likely to occur to non-treated stems or trees when one tree or more that shares a common root is treated.

Restrictions:

- Do not make cut stump applications when the roots of desirable woody brush or trees may be grafted to the roots of the cut stump. Some sprouts, stems, or trees may share the same root system.

Injection and Frill (Woody Brush and Trees)

Woody vegetation may be controlled by injection or frill application of this product. Apply this product using suitable equipment that penetrates into the living tissue. Apply the equivalent of 1 mL of this product per each two to three inches of trunk diameter at breast height (DBH). This is best achieved by applying 50 to 100 percent concentration of this product either to a continuous frill around the tree or as cuts evenly spaced around the tree below all branches. As tree diameter increases in size, better results are achieved by applying diluted material to a continuous frill or more closely spaced cuttings. Do not make any applications that allow runoff to occur from frilled or cut areas in species that exude sap freely. In species such as this, make frill or cuts at an oblique angle to produce a cupping effect and use a 100 percent undiluted concentration of this product. For best results, apply during periods of active growth and full leaf expansion.

This product controls the following woody species:

Common Name	Scientific Name
oak	<i>Quercus</i> spp.
poplar	<i>Populus</i> spp.
sweetgum	<i>Liquidambar styraciflua</i>
sycamore	<i>Platanus occidentalis</i>

This product suppresses the following woody species:

Common Name	Scientific Name
blackgum ¹	<i>Nyssa sylvatica</i>
dogwood	<i>Cornus</i> spp.
hickory	<i>Carya</i> spp.
maple, red	<i>Acer rubrum</i>

¹Do not use this product on these species in the state of California.

Forestry Site Preparation

This product is for the control or partial control of woody brush, trees, and herbaceous weeds in forestry. This product is also for use in preparing or establishing wildlife openings within these sites and maintaining logging roads.

In forestry sites, use this product in site preparation prior to planting any tree species including Christmas trees, eucalyptus, hybrid tree cultivars and silvicultural nursery sites. Unless otherwise specified, make applications of this product for control or partial control of herbaceous weeds, woody brush and trees listed in the Weeds Controlled section.

Application Rates

Method of Application	Rate	Spray Volume (gal/acre)
Broadcast		
aerial	1.5 - 7.5 qt/acre	5 - 30
ground		10 - 60
Spray to Wet		
handgun, backpack	0.75 - 2%	spray to wet
mistblower	by volume	
Low Volume Directed Spray¹		
handgun, backpack	5 - 10%	partial coverage
mistblower	by volume	

¹ For low volume directed spray applications, coverage should be uniform with at least 50% of the foliage contacted. For best results, coverage of the top one-half of the plant, including the growing tip, is important (over the top and down coverage). To ensure adequate spray coverage, spray all sides of large or tall woody brush and trees, when foliage is thick and dense, or where there are multiple stems or tall sprouts.

Use a higher rate in the rate range for control or partial control of woody brush, trees and hard to control perennial herbaceous weeds. For best results, apply to actively growing woody brush and trees after full leaf expansion and before leaf drop. Use increased rates within the rate range to control perennial herbaceous weeds from emergence up to the appearance of seedheads, flowers or berries. Use a lower rate in the rate range to control annual herbaceous weeds and actively growing perennial herbaceous weeds after seedheads, flowers or berries appear. Apply to foliage of actively growing annual herbaceous weeds anytime after emergence.

This product has no herbicidal or residual activity in the soil. Where repeat applications up to the labeled rate are necessary, do not apply more than 8 quarts of product per acre per year.

Tank Mixes

This product may be used in tank mix combination with other herbicide products to broaden the spectrum of vegetation controlled. When tank mixing, read and observe applicable use directions, precautions and limitations on the respective product labels. Use according to the most restrictive precautionary statements for each product in the mixture. Any specified rate of this product may be used in a tank mix.

Note: For forestry site preparation, make sure the tank mix product is approved for use prior to planting the desired species. Observe planting interval restrictions.

Any specified rate of this product may be used in a tank mix with the following products for forestry site preparation:

Product
Milestone VM
Garlon 3A
Garlon 4
Arsenal Applicators Concentrate
Escort
Chopper
Oust XP
Arsenal Applicators Concentrate
Arsenal Applicators Concentrate

For control of herbaceous weeds, use the lower specified tank mixture rates. For control of dense stands or difficult to control woody brush and trees, use the higher specified rates.

Aerial Application

Aerially apply this product by helicopter only in forestry sites. See Aerial Application in Application Equipment and Application Methods for more details.

Ground Application

Apply this product using suitable ground equipment for broadcast applications in forestry sites. See Ground Application in Application Equipment and Application Methods for more details. Unless otherwise specified, apply the specified rates of this product as a broadcast spray in sufficient spray volume to provide complete and uniform coverage of plant foliage. Check for even distribution throughout the spray pattern.

Hand-Held and Backpack Application

Apply this product using handgun and backpack equipment in forestry sites. See Hand-Held and Backpack Application in Application Equipment and Application Methods for more details. For spray to wet applications, coverage should be uniform and complete, but not to the point of runoff.

This product may be used for low volume directed sprays for spot treatment of trees and brush. It is most effective in areas where there is a low density of undesirable trees or brush. For flat fan and cone nozzles, spray the foliage of the targeted vegetation. Small, open branched trees need only be treated from one side. If the foliage is thick or there are multiple root sprouts, apply from several sides to ensure adequate spray coverage.

Forestry Conifer and Hardwood Release

Directed Sprays and Selective Equipment

Apply this product as a directed spray or with selective equipment in forestry conifer and hardwood sites, including Christmas tree plantations and silvicultural nurseries. A surfactant must be used with this product. Use only surfactants approved for conifer release and specified on the surfactant label as safe for use in conifer release (pine release). Using this product without a surfactant will result in reduced herbicide performance. See Mixing Directions and Application Equipment and Application Methods sections.

Avoid contact of spray drift, mist or drips with foliage, green bark or non-woody surface roots of desirable plant species.

Tank Mixes: When tank mixing, read and observe applicable use directions, precautions and limitations on the respective product labels. Use according to the most restrictive precautionary statements for each product in the mixture.

Broadcast Application Outside Area of Southeastern United States

Apply this product as a broadcast application for release of Douglas fir (*Pseudotsuga menziesii*), fir (*Abies* species), hemlock (*Tsuga* species), pines (*Pinus* species) (includes all species except loblolly, longleaf, shortleaf, or slash), and California redwood (*Sequoia* species) outside the area of the southeastern United States. Apply this product as a broadcast application only after formation of final conifer resting buds in the fall or prior to initial bud swelling in the spring. Note: Except where specified, make broadcast applications of this product only where conifers have been established for more than one year.

Injury may occur to conifers treated for release, especially where spray patterns overlap or the higher labeled rate is applied. Damage can be accentuated if applications are made when conifers are actively growing, are under stress from drought, flood water, improper planting, insects, animal damage or diseases.

Apply 3/4 to 1 1/2 quarts per acre as a broadcast spray. Apply 3/4 to 1 1/8 quarts of this product per acre to release Douglas fir, pine and spruce species at the end of the first growing season (except California). Ensure all conifers are well hardened off.

A surfactant must be used with this product for optimum weed control. Use only surfactants approved for use in over the top release applications. Using this product without a surfactant will result in reduced herbicide performance. For best results, do not use a surfactant for release of hemlock species or California redwood. In mixed conifer stands, injury to these species may result if a surfactant is used. See Mixing Directions and Application Equipment and Application Methods sections.

For release of Douglas fir, a nonionic surfactant for over the top foliar spray may be used. To avoid possible conifer injury, use nonionic surfactants at 2 fl oz per acre at elevations above 1500 feet, or 1 fl oz per acre in the coastal range or at elevations below 1500 feet. Using a higher rate of surfactant may result in unacceptable conifer injury. Ensure the nonionic surfactant has been adequately tested for safety to Douglas fir before using.

Tank Mixes with Oust XP: Apply 3/4 to 1 1/2 quarts of this product with the labeled rate of Oust XP per acre to release jack pine and white. Use the labeled rate of Oust XP per acre with this product to release white pine. Make applications to actively growing weeds as a broadcast spray over the top of established conifers. Make applications after formation of conifer resting buds in the late summer or fall.

Tank Mixes with Arsenal Applicators Concentrate: Apply 3/4 to 1 1/8 quarts of this product with the labeled rate of Arsenal Applicators Concentrate per acre to release Douglas fir. Apply 1 1/2 quarts of this product with the labeled rate of Arsenal Applicators Concentrate per acre to release balsam fir and red spruce.

In **Maine** and **New Hampshire**, apply up to 2 1/4 quarts of this product per acre to control or suppress difficult to control hardwood species. For the release of red pine, balsam fir, red spruce, white spruce, Norway spruce, and black spruce with dense tough to control brush, and where maples make up a large component of the undesirable trees, this product may be tank mixed with the labeled rate of Arsenal Applicators Concentrate and the labeled rate of Oust XP per acre. Apply this mix as a broadcast spray.

Broadcast Application in Southeastern United States

Apply this product as a broadcast application for release of loblolly pine (*Pinus taeda*), eastern white pine (*Pinus strobus*), shortleaf pine (*Pinus echinata*), slash pine (*Pinus elliotii*), Virginia pine (*Pinus virginiana*), and longleaf pine (*Pinus palustris*) in the southeastern United States.

Apply 1 1/8 to 1 7/8 quarts of this product per acre as a broadcast spray during late summer or early fall after the conifers have hardened off. For applications at the end of the first growing season, use 3/4 quart of this product alone or in a tank mix.

Tank Mixes with Arsenal Applicators Concentrate: For conifer release, apply 3/4 to 1 1/2 quarts of this product with the labeled rate of Arsenal Applicators Concentrate per acre as a broadcast spray. Use only on conifer species that are labeled for over the top spray for both products. Use the higher specified rates for dense tough to control wood brush and trees.

Herbaceous Release

When applied as directed, this product plus listed residual herbicides provide postemergence control of the annual weeds and control or suppression of the perennial weeds listed in this label, and residual control of the weeds listed in the residual herbicide label. Make applications to actively growing weeds as a broadcast spray over the top of labeled conifers.

Use a surfactant labeled for use in over the top herbaceous release applications. Using this product without a surfactant will result in reduced herbicide performance. See Mixing Directions and Application Equipment and Application Methods sections on this label.

Weed control may be reduced if spray solution water volumes exceed 25 gallons per acre for these treatments.

Tank Mixes with Oust XP: Apply 12 to 18 fl oz of this product with the labeled rate of Oust XP per acre to release loblolly pines. Apply 9 to 12 fl oz of this product with the labeled rate of Oust XP per acre to release slash pines.

Tank Mix with Atrazine: Apply 3/4 quarts of this product with 4 lb ai of atrazine per acre to release Douglas fir. Apply only over Douglas fir that has been established for at least one full growing season. Apply in the early spring, usually mid-March through early April. Injury will occur if applications are made after bud swell in the spring. For this use, do not add surfactant to the tank mix.

In **Maine** and **New Hampshire**, for release of red pine, balsam fir, red spruce, white spruce, Norway spruce, and black spruce with heavy grass and herbaceous weeds infesting the site, up to 2 1/4 quarts of this product per acre may be tank mixed with the labeled rate of Oust XP to control grass, herbaceous weeds and woody brush. Apply this mix as a broadcast spray.

Mid-Rotation Conifer Release and Spot Treatments for Crop Tree Release and Timber Stand Improvement

This product is applied as a ground broadcast or directed spray application for mid-rotation release applications under the canopy of pines (and other conifers) and hardwoods. Make applications using application techniques that prevent or minimize direct contact to the foliage of crop trees (including in stands of pine, other conifers, or hardwood). This may be accomplished using directed sprays and ground equipment with nozzles oriented to target only undesirable understory vegetation below the crop tree canopy. This product is applied as a spot, individual plant treatment for woody and herbaceous weeds (see Hand-Held and Backpack Application in Application Equipment and Application Methods section). When making spot applications, do not allow spray to contact the foliage of desirable crop trees.

Broadcast Application for Control of Undesirable Competitive Vegetation in Larch (*Larix* spp.) Plantations in Maine

Apply this product to control or reduce competition from undesirable vegetation in Larch (*Larix* spp.) plantations in the state of Maine.

Application Timing

Apply only after lignification has occurred in 50% or more of the current year's terminal growth.

Application Directions

Broadcast Spray: Use 1 to 3 quarts of this product per acre. Apply in a total spray volume of 10 to 60 gallons per acre using ground equipment or 5 to 15 gallons per acre if applied aerially. Up to 30 fl oz of Entry II surfactant may be added.

Directed Sprays: This product may be applied as a directed spray for competitive release of larch. Avoid contact of spray drift, mist or drips with foliage, green bark or non-woody surface roots of desirable plants. See Application Equipment and Application Methods of the product label.

Injury to larch may occur, especially where spray patterns overlap or higher labeled rates of this product or surfactant were applied. Damage can be accentuated if application is made when larch is actively growing or is under stress. Make applications only if some level of injury to larch is acceptable.

Noncrop Areas and Industrial Sites

See the rate tables in the Annual Weeds, Perennial Weeds, and Woody Brush and Trees sections for specific application rates. This product has no herbicidal or residual activity in the soil. Where repeat applications up to the labeled rate are necessary, do not apply more than 8 quarts of this product per acre per year.

Use a higher rate in the rate range for control or partial control of woody brush, trees, and hard to control perennial herbaceous weeds. For best results, apply to actively growing woody brush and trees after full leaf expansion and before fall color and leaf drop. Use increased rates within the rate range for difficult to control species, where dense stands occur, or where conditions for control are not ideal and to control perennial herbaceous weeds from emergence up to the appearance of seedheads, flowers or berries. Use a lower rate in the rate range to control annual herbaceous weeds and actively growing perennial herbaceous weeds after seedheads, flowers or berries appear. Apply to foliage of actively growing annual herbaceous weeds anytime after emergence.

Tank Mixing for Noncrop Areas

This product may be used in tank mix combination with other herbicide products to broaden the spectrum of vegetation controlled. When tank mixing, read and observe applicable use directions, precautions and limitations on the respective product labels. Use according to the most restrictive precautionary statements for each product in the mixture. Any specified rate of this product may be used in a tank mix.

Maintain good agitation at all times during the mixing process and application. Ensure that the tank mix product(s) is well mixed with the spray solution before adding this product. Mix only the amount of spray solution that will be used during the same day. Reduced weed control may result if a tank mixture is allowed to stand overnight. If the spray mix is allowed to settle, thorough agitation is required to resuspend the mixture before spraying is resumed.

Weed Control, Trim and Edge, and Bare Ground

This product may be used in general noncrop and non-food areas. It may be applied with any application equipment described in this label. This product may be used to trim and edge around objects in noncrop sites, for spot treatment of unwanted vegetation, and to eliminate unwanted weeds growing in established shrub beds or ornamental plantings. This product may be used prior to planting an area to ornamentals, flowers, turfgrass (sod or seed), or prior to laying asphalt or beginning construction projects.

To maintain bare ground, repeated applications up to the labeled rate of this product may be used.

This product provides control of emerged annual weeds and control or partial control of emerged perennial weeds, woody brush and trees when applied in a tank mix to bare ground.

Turfgrass Renovation, Seed or Sod Production

This product controls most existing vegetation prior to renovating turfgrass areas or establishing turfgrass grown for seed or sod. For maximum control of existing vegetation, delay planting or sodding to determine if any regrowth from escaped underground plant parts occurs. When repeat treatments are necessary, sufficient regrowth must be attained prior to application. For warm season turfgrass, including bermudagrass, summer or fall applications provide the best control. Where existing vegetation is growing under mowed turfgrass

management, apply this product after omitting at last one regular mowing to allow sufficient grown for good interception of the spray.

Do not disturb soil or underground plant parts before treatment. Delay tillage or renovation techniques, including vertical mowing, coring, or slicing, for seven days after application to allow translocation into underground plant parts.

Desirable turfgrass may be planed following the above procedures.

Hand-held equipment may be used for spot treatment of unwanted vegetation growing in existing turfgrass. Broadcast or hand-held equipment may be used to control sod remnants or other unwanted vegetation after sod is harvested.

Do not feed or graze turfgrass grown for seed or sod production for eight weeks following application.

Ornamentals and Plant Nurseries

Post-Direct and Trim and Edge

This product may be used as a post-directed spray around established woody ornamental species, including arborvitae, azalea, boxwood, crabapple, euonymus, fir, Douglas fir, jojoba, hollies, lilac, magnolia, maple, oak, provet, pine, spruce and yew. This product may also be used to trim and edge around trees, buildings, sidewalks and roads, potted plants and other objects in a nursery setting.

Desirable plants may be protected from the spray solution by using shields or coverings made of cardboard or other impermeable material. Do not use this product for any over the top broadcast spray in ornamentals. Exercise care to avoid contact of spray, drift or mist with foliage or green bark of established ornamental species.

Site Preparation

This product may be used prior to planting any ornamental, nursery or Christmas tree species.

Greenhouse/Shadehouse

This product may be used to control weeds growing in and around greenhouses and shadehouses. Desirable vegetation must not be present during application and air circulation fans must be turned off.

Wildlife Habitat Management

This product may be used to control exotic and other undesirable vegetation in habitat management and natural areas, including rangeland and wildlife refuges. Apply to allow recovery of native plant species, prior to planting desirable native species, and for broad spectrum vegetation control. Apply spot treatments to selectively remove unwanted plants for habitat enhancement.

Wildlife Food Plots

This product may be used as a site preparation treatment to control annual and perennial weeds prior to planting wildlife food plots. Any wildlife food species may be planted after applying this product, or native species may be allowed to repopulate the area. If tillage is needed to prepare a seedbed, wait 7 days after application before tilling to allow translocation into underground plant parts.

Hollow Stem Injection

Apply this product to control giant knotweed (*Polygonum sachalinense*), Japanese knotweed (*Polygonum cuspidatum*), or other invasive knotweeds using individual stem treatment. Use a hand-held injection device that delivers the specified amount of this product into these hollow stem plants.

Make a hole through both sides of the stem about 6 inches above the ground, just below a node, using an awl or other pointed tool. Inject 5 mL of undiluted product directly into this hole in the hollow stem. Treat each stem of the knotweed plant.

Restrictions:

- Do not apply more than a total of 8 quarts of this product per acre for all treatments combined. At 5 mL per stem, 7.5 quarts will treat approximately 1420 stems per acre.

Parks, Recreational and Residential Areas

Use this product in parks, recreational and residential areas. Apply it with any application equipment described in this label. Use this product to trim and edge around trees, fences, paths, around buildings, sidewalks, and other objects in these areas. This product may be used for spot treatment of unwanted vegetation, eliminate unwanted weeds growing in established shrub beds or ornamental plantings, and prior to planting an area to ornamentals, flowers, turfgrass (sod or seed), or prior to laying asphalt or beginning construction projects.

All of the label instructions apply to park and recreational areas.

Railroads

All of the instructions in the Noncrop Areas and Industrial Sites and Roadside sections apply to railroads.

Bare Ground, Ballast and Shoulders, Crossings, and Spot Treatment

Use this product to maintain bare ground on railroad ballast and shoulders. Repeat applications up to the labeled rate of this product may be used as weeds emerge to maintain bare ground. Use this product to control tall growing weeds to improve line of sight at railroad crossings and reduce the need for mowing along rights-of-way.

Brush Control

Apply 3 to 8 quarts of this product per acre as a broadcast spray, using boom-type or boomless nozzles. Applications up to 80 gallons of spray solution per acre may be used. Apply a 3/4 to 1.5 percent solution of this product when using high volume spray to wet applications. Apply a 5 to 10 percent solution of this product when using low volume directed sprays for spot treatment.

Roadsides

All of the instructions in the Noncrop Areas and Industrial Sites and Railroads sections apply to roadsides.

Shoulder Treatments

Use this product on road shoulders. Apply it with boom sprayers, shielded boom sprayers, high volume off-center nozzles, OC nozzle clusters, manifold nozzle systems, hand-held equipment, and similar equipment, and under-deck mowing plus herbicide systems.

Guardrails and Other Obstacles to Mowing

Use this product to control weeds growing under guardrails and around signposts and other objects along the roadside.

Spot Treatment

Use this product as a spot treatment to control unwanted vegetation growing along roadsides.

Tank Mixes: This product may be used in tank mix combination with other herbicide products to broaden the spectrum of vegetation controlled and for residual weed control. Follow applicable use directions, precautions and limitations on the respective product labels. Use according to the most restrictive precautionary statements for each product in the mixture. Any specified rate of this product may be used in a tank mix.

Chemical Mowing

Perennials: This product suppresses perennial grasses listed in this section to serve as a substitute for mowing. Use 4.5 fl oz of this product per acre when treating Kentucky bluegrass, tall fescue, fine fescue, orchardgrass, or quackgrass. Apply 12 fl oz of this product per acre when treating bermudagrass. Apply 4.5 to 8 fl oz of this product per acre when treating bahiagrass. Use the higher labeled rates when grass is under heat stress. Apply 3 pints of this product per acre when treating torpedograss or paragrass. Apply treatments in 10 to 20 gallons of spray solution per acre.

Annuals: For growth suppression of some annual grasses, including annual ryegrass, wild barley and wild oats growing in coarse turfgrass on roadsides or other industrial areas, apply 3 to 3.75 fl oz of this product in 10 to 40 gallons of spray solution per acre. Apply when annual grasses are actively growing and before the seedheads are in the boot stage of development. Treatments may cause injury to the desired grasses.

Release of Dormant Bermudagrass or Bahiagrass

Apply 6 to 48 fl oz of this product per acre in 10 to 40 gallons of water per acre. Use only in areas where bermudagrass or bahiagrass are desirable groundcovers and where some temporary injury or discoloration can be tolerated. Treatments of more than 12 fl oz per acre may result in injury or delayed greenup in highly maintained areas, including golf courses and lawns.

For best results on winter annuals, treat when weeds are in an early growth stage (less than 6 inches in height) after most have germinated. For best results on tall fescue, treat when fescue is in or beyond the 4- to 6-leaf stage.

Tank Mixes: This product may be used in tank mix combination with other herbicide products to broaden the spectrum of vegetation controlled and for residual weed control. When tank mixing, read and follow all applicable use directions, precautions, and limitation on the respective product labels. Use according to the most restrictive precautionary statements for each product in the mixture. Any specified rate of this product may be used in a tank mix.

Actively Growing Bermudagrass

Use this product to control or partially control many annual and perennial weeds for effective release of actively growing bermudagrass. Use only in areas where some temporary injury or discoloration can be tolerated. Use only on well-established bermudagrass. Bermudagrass injury may result from the treatment, but regrowth will occur under moist conditions. Repeat applications of the tank mix in the same season are not recommended because severe injury may occur.

Apply up to 2.25 pints of this product in 10 to 40 gallons of spray solution per acre. Use the lower rate when treating annual weeds less than

6 inches in height (or runner length). Use the higher labeled rate as weeds increase in size or as they approach flower or seedhead formation.

Actively Growing Bahiagrass

For suppression of vegetable growth and seedhead inhibition of bahiagrass for approximately 45 days, apply 4.5 fl oz of this product in 10 to 40 gallons of water per acre. Apply one to two weeks after full greenup or after mowing to a uniform height of 3 to 4 inches. Make this application prior to seedhead emergence. For suppression up to 120 days, apply 3 fl oz of this product per acre, followed by an application of 1.5 to 3 fl oz per acre about 45 days later. Make no more than two applications per year.

Tank Mixes: This product may be used in tank mix combination with other herbicide products to broaden the spectrum of vegetation controlled and for residual weed control. When tank mixing, read and follow all applicable use directions, precautions, and limitation on the respective product labels. Use according to the most restrictive precautionary statements for each product in the mixture. Any specified rate of this product may be used in a tank mix.

Utility Sites

Use this product for control of brush, tree, and weed control and side trimming in areas including electrical power, pipeline and telephone rights-of-ways, and other sites associated with these rights-of-ways including substations, roadsides, and railroads. This product may be applied with any application equipment or method described on this label unless specifically prohibited.

Tank Mixes: This product may be used in tank mix combination with other herbicide products to broaden the spectrum of vegetation controlled and for residual weed control. When tank mixing, read and follow all applicable use directions, precautions, and limitation on the respective product labels. Use according to the most restrictive precautionary statements for each product in the mixture. Any specified rate of this product may be used in a tank mix.

Rangelands

Use this product to control or suppress many annual weeds growing in perennial cool and warm season grass rangelands. Preventing weed seed production is critical to the successful control of annual grassy weeds invading these perennial grass sites. Eliminate most of the viable seeds with follow up applications in sequential years. Delay grazing of treated areas to encourage growth of desirable perennials. Allowing desirable perennials to flower and reseed in the treated area will encourage successful transition.

Bromus: Use this product to control or suppress downy brome/cheatgrass (*Bromus tectorum*), Japanese brome (*Bromus japonicus*), soft chess (*Bromus mollis*), cheat (*Bromus secalinus*), cereal rye, and jointed goatgrass. Apply 6 to 12 fl oz of this product per acre as a broadcast treatment.

For best results, coincide treatments with early seedhead emergence of the most mature plants. Delaying the application until this growth stage maximizes the emergence of other weedy grass flushes. Make applications to the same site each year until seed banks are depleted and the desirable perennial grasses become established on the site.

Medusahead: Apply 12 fl oz of this product per acre to control or suppress medusahead at the 3-leaf stage when plants are actively growing. Delaying applications beyond this stage results in reduced or unacceptable control. Repeat applications in subsequent years to eliminate the seed bank before reestablishing desirable perennial grasses. Apply in the fall or spring.

Apply by ground or air. Make aerial applications for these uses with fixed wing or helicopter equipment. For aerial applications, apply in 2 to 10 gallons of water per acre. For ground applications, apply in at least 10 to 20 gallons of water per acre.

Spot Treatment and Wiper Application

Apply this product in rangeland, pastures, or industrial sites as a spot treatment or over the top of desirable grasses using wiper applicators to control tall weeds. See Wiper Application section for specific instructions. Make repeat applications up to the labeled rate in the same area at 30-day intervals.

The entire site or any portion of it may be treated when using 2.25 quarts or less of this product per acre for spot treatments or wiper applications. No more than 10 percent of the total site may be treated at any one time when using more than 2.25 quarts of this product per acre for spot treatments or wiper applications. To achieve maximum performance, remove domestic livestock before application and wait 7 days after application before grazing livestock or harvesting for feed.

Pastures

Type of Pastures: Bahiagrass, bermudagrass, bluegrass, brome, fescue, orchardgrass, ryegrass, timothy, wheatgrass, alfalfa, clover

Spot Treatment and Wiper Application

This product may be applied as a spot treatment or as a wiper application. Make applications in the same area at 30-day intervals. See Wiper Application section for specific instructions.

Precautions:

- For spot treatment and wiper applications, the entire field or any portion of it may be treated when using a rate of 2.25 quarts or less per acre.
- To achieve maximum performance, remove domestic livestock before application and wait 14 days after application before grazing livestock or harvesting.

Restrictions:

- Do not treat more than 10 percent of any acre at one time if applying more than 2.25 quarts per acre as a spot treatment or wiper application.

Preplant, Preemergence, and Pasture Renovation

Apply this product prior to planting or emergence of forage grasses and legumes. In addition, this product may be used to control perennial pasture species listed on this label prior to re-planting.

Precautions:

- If the application rates total 2.25 quarts or less per acre, there is no waiting period between treatment and feeding or livestock grazing is required.
- If the application rates total more than 2.25 quarts per acre, remove domestic livestock before application and wait eight weeks after application before grazing or harvesting.

Restrictions:

- Crops listed for treatment in this label may be planted into the treated area at any time. Wait 30 days between application and planting for all other crops.

Bamboo

Use this product on roadside rights-of way to control or suppress bamboo. Use the higher rate in the rate range for dense stands and larger plants. Mow or cut bamboo and allow it to resprout to have sufficient foliage in order for the spray solution to completely cover the foliage. Optimum control or suppression of bamboo is achieved when this product is applied between August and October (prior to frost). One application of this product plus a surfactant will not eradicate bamboo. Several mowings and applications are required to completely control bamboo.

Apply the specified rate plus a surfactant (1/4 to 1/2% v/v), such as a nonionic surfactant containing 80% active ingredient or more. Using this product without a surfactant results in reduced performance.

Application Method	Rate	Spray Volume (gal/acre)
ground broadcast	1.5 – 7.5 qt/acre	10 - 60
handgun spray to wet	0.75 – 2%	spray to wet
handgun or backpack low volume directed spray	4 – 10%	spray to cover

Restrictions:

- Do not apply more than a total of 8 quarts of this product per acre per year.

Annual Weeds, Perennial Weeds, and Woody Brush and Trees

Annual Weeds

Apply 24 fl oz of this product per acre if weeds are less than 6 inches in height or runner length. Use 1.25 to 3 quarts of this product per acre if weeds are more than 6 inches in height or runner length or when weeds are growing under stressed conditions. Use a higher rate in the rate range for tough to control species regardless of the size of the weed at the time of application. Treat tough to control weeds when they are relatively small. Tank mix this product with only those products that are labeled for application at the target site. Refer to the label of the tank mix partner for use sites and application rates.

Apply a 0.4 percent solution of this product as a spray to wet application to weeds less than 6 inches in height or runner length. Use a 0.7 to 1.5 percent solution for annual weeds more than 6 inches tall or for smaller weeds growing under stressed conditions. Use the higher concentration for tough to control species or for weeds more than 24 inches tall. Apply prior to seedhead formation in grass or bud formation in broadleaf weeds.

Use a 4 to 7 percent solution of this product for low volume directed spray applications. Spray coverage should be uniform with at least

50 percent of the foliage contacted. For best results, cover the top one-half of the plant. To ensure adequate spray coverage, spray both sides of large or tall weeds when foliage is thick and dense or where there are multiple sprouts.

Common Name

anoda, spurred balsamapple¹
barley
barnyardgrass
bassia, fivehook
bittercress
bluegrass, annual
bluegrass, bulbous
brome, downy/cheatgrass
brome, Japanese
buttercup
Carolina foxtail
Carolina geranium
castorbean
chamomile, mayweed
cheat
chervil
chickweed
cocklebur, common
coreopsis, plains
corn, volunteer
crabgrass
dwarf/dandelion, Virginia
eastern mangrass
eclipta
falsedandelion
falseflax, smallseed
fiddleneck
field pennycress
fleabane, annual
fleabane, hairy
fleabane, rough
Florida pusley
foxtail
goatgrass, jointed
goosegrass
groundsel, common
henbit
horseweed/marestail
itchgrass
johnsongrass
junglerice
knotweed
kochia²
lambquarters, common
mallow, little
medusahead
morningglory
mustard, blue
mustard, tumble
mustard, wild
oats, wild
panicum, fall
pigweed, redroot
pigweed, smooth
prickly lettuce
puncturevine
purslane, common
ragweed, common
ragweed, giant
rocket, London
Russian-thistle
rye, cereal
ryegrass, Italian³
sandbur, field
sesbania, hemp
shattercane
shepherd's-purse
sicklepod
signalgrass, broadleaf
smartweed, Pennsylvania
sowthistle, annual
Spanishneedles³
speedwell, corn
speedwell, purslane
sprangletop
spurge, annual
spurge, prostrate
spurge, spotted
spurry, umbrella
stinkgrass
sunflower, common
tansymustard, pinnate
teaweed/sida, prickly
Texas panicum

Scientific Name

Anoda cristata
Momordica charantia
Hordeum vulgare
Echinochloa crus-galli
Bassia hyssopifolia
Cardamine spp.
Poa annua
Poa bulbosa
Bromus tectorum
Bromus japonicus
Ranunculus spp.
Alopecurus carolinianus
Geranium carolinianum
Ricinus communis
Anthemis cotula
Bromus secalinus
Anthriscus cerefolium
Cerastium vulgatum
Xanthium strumarium
Coreopsis tinctoria
Zea mays
Digitaria spp.
Krigia virginica
Glyceria spp.
Eclipta prostrata
Pyrrhopappus carolinianus
Camelina microcarpa
Amsinckia spp.
Thlaspi arvense
Erigeron annuus
Conyza bonariensis
Erigeron strigosus
Richardia scabra
Setaria spp.
Aegilops cylindrica
Eleusine indica
Senecio vulgaris
Lamium amplexicaule
Conyza canadensis
Rottboellia cochinchinensis
Sorghum halepense
Echinochloa colona
Polygonum spp.
Kochia scoparia
Chenopodium album
Malva parviflora
Taeniatherum caput-medusae
Ipomoea spp.
Chorispora tenella
Sisymbrium altissimum
Sinapis arvensis
Avena fatua
Panicum dichotomiflorum
Amaranthus retroflexus
Amaranthus hybridus
Lactuca serriola
Tribulus terrestris
Portulaca oleracea
Ambrosia artemisiifolia
Ambrosia trifida
Sisymbrium irio
Salsola tragus
Secale cereale
Lolium perenne
Cenchrus spinifex
Sesbania herbacea
Sorghum bicolor
Capsella bursa-pastoris
Senna obtusifolia
Urochloa platyphylla
Polygonum pennsylvanicum
Sonchus oleraceus
Bidens bipinnata
Veronica arvensis
Veronica peregrina
Leptochloa spp.
Chamaesyce spp.
Chamaesyce humistrata
Chamaesyce maculata
Holosteum umbellatum
Eragrostis cilianensis
Hellianthus annuus
Descurainia pinnata
Sida spinosa
Panicum spp.

Common Name (Cont.)

velvetleaf
Virginia pepperweed
wheat
witchgrass
woolly cupgrass
yellow rocket

¹Apply with hand-held equipment only.

²Do not treat kochia in the button stage.

³Apply 3 pints of product per acre.

Perennial Weeds

Best results are obtained when perennial weeds are treated after they reach the reproductive stage of growth (seedhead initiation in grasses and bud formation in broadleaves). Best results are obtained when non-flowering plants are treated when they reach a mature stage of growth. In many situations, applications are required prior to these growth stages. Under these conditions, use a higher rate in the rate range.

When using spray to wet treatments with hand-held equipment, ensure thorough coverage of the plant. For best results, use a 1.5 percent solution on harder to control perennials including bermudagrass, dock, field bindweed, hemp dogbane, milkweed and Canada thistle.

Use a 4 to 7 percent solution of this product in low volume directed spray applications. Spray coverage should be uniform with at least 50 percent of the foliage contacted. For best results, cover the top one-half of the plant. To ensure adequate spray coverage, spray both sides of large or tall weeds when foliage is thick and dense or where there are multiple sprouts.

Allow 7 days or more after application before tillage.

Common Name

alfalfa
alligatorweed¹
anise/fennel
artichoke, Jerusalem
bahiagrass
beachgrass, European
bentgrass
bermudagrass
bindweed, field
bluegrass, Kentucky
blueweed, Texas
brackenfern
brome, smooth
bursage, woollyleaf
canarygrass, reed
cattail
clover, red
clover, white
cogongrass
cordgrass
cutgrass, giant¹
dallisgrass
dandelion
dock, curly
dogbane, hemp
fescue
fescue, tall
German ivy
guineagrass
horsenettle
horseradish
iceplant, crystalline
johnsongrass-
kikuyugrass
knapweed, Russian
lantana, largeleaf
lespedeza, common
lespedeza, sericea-
loosestrife, purple
lotus, American
maidencane
milkweed
muhly, wirestem
mullein, common
napiergrass
nightshade, silverleaf
nutsedge, purple
nutsedge, yellow
orchardgrass
pampasgrass
paragrass
phragmites²
poison-hemlock
quackgrass
redvine
reed, giant
ryegrass, perennial

Scientific Name

Abutilon theophrasti
Lepidium virginicum
Triticum aestivum
Panicum capillare
Eriochloa villosa
Barbarea vulgaris

Medicago sativa
Alternanthera philoxeroides
Foeniculum vulgare
Helianthus tuberosus
Paspalum notatum
Ammophila arenaria
Agrostis spp.
Cynodon dactylon
Convolvulus arvensis
Poa pratensis
Helianthus ciliaris
Pteridium aquilinum
Bromus inermis
Ambrosia grayi
Phalaris arundinacea
Typha spp.
Trifolium pratense
Trifolium repens
Imperata cylindrica
Spartina spp.
Zizaniopsis miliacea
Paspalum dilatatum
Taraxacum officinale
Rumex crispus
Apocynum cannabinum
Festuca spp.
Lolium arundinaceum
Senecio mikanioides
Urochloa maxima
Solanum carolinense
Armoracia rusticana
Mesembryanthemum crystallinum
Sorghum halepense
Pennisetum clandestinum
Acroptilon repens
Lantana camara
Kummerowia striata
Lespedeza cuneata
Lythrum salicaria
Nelumbo lutea
Panicum hemitomon
Asclepias spp.
Muhlenbergia frondosa
Verbascum thapsus
Pennisetum purpureum
Solanum elaeagnifolium
Cyperus rotundus
Cyperus esculentus
Dactylis glomerata
Cortaderia selloana
Urochloa mutica
Phragmites spp.
Conium maculatum
Elymus repens
Brunnichia ovata
Arundo donax
Lolium perenne

Common Name (Cont.)

smartweed, swamp
sowthistle, perennial
spatterdock
starthistle, yellow-
sweet potato, wild¹
thistle, artichoke
thistle, Canada
timothy
torpedograss¹
trumpetcreeper
tules, common
vaseygrass
velvetgrass
water fern³
waterhyacinth
waterlettuce
waterprimrose
wheatgrass, western

¹ Partial control.

² Partial control in southeastern states.

³ Not for use in California

Scientific Name

Polygonum amphibium
Sonchus arvensis
Nuphar lutea
Centaurea solstitialis
Ipomoea pandurata
Cynara cardunculus
Cirsium arvense
Phleum pratense
Panicum repens
Campsis radicans
Scirpus acutus
Paspalum urvillei
Holcus spp.
Salvinia spp.
Eichornia crassipes
Pistia stratiotes
Ludwigia spp.
Pascopyrum smithii

Woody Brush and Trees

Apply this product after full leaf expansion unless otherwise directed. Use the higher labeled rate for larger plants and/or dense areas of growth. On vines, use the higher labeled rate for plants that have reached the woody stage of growth. Best results are obtained when application is made in late summer or fall after fruit formation.

In arid areas, best results are obtained when applications are made in the spring or early summer when brush species are at high moisture content and are flowering.

Ensure thorough coverage when using hand-held equipment.

See Low Volume Directed Spray Application section of label. Spray coverage should be uniform with at least 50 percent of the foliage contacted. For best results, cover the top half to 2/3 of the plant foliage. Spray both sides of large or tall woody brush and trees to ensure adequate spray coverage when foliage is thick and dense or where there are multiple sprouts. Symptoms may not appear prior to frost or senescence with fall treatments.

Allow seven days or more after application before tillage, mowing or removal. Repeat treatments up to the labeled rate may be necessary to control plants regenerating from underground parts or seed. Some autumn colors on undesirable deciduous species are acceptable provided no major leaf drop has occurred. Reduced performance may result if fall treatments are made following a frost.

Note: If brush has been mowed or tilled, or trees have been cut, do not treat until regrowth has reached the specified stage of growth.

This product will control, partially control, or suppress the following woody brush and trees.

Common Name

alder
ash¹
aspen, quaking
bearclover, beararm
beach
birch
bittercherry
blackberry
blackgum
blue gum, Tasmanian
brackenfern
broom, French
broom, Scotch
buckwheat, California¹
cascara¹
catclaw-vine¹
ceanothus
chamise
cherry
cherry, black
cherry, pin
copperleaf, hophornbeam
coyotebrush
deer vetch
dewberry, southern
dogwood
elderberry
elm¹
gorse
hasardia¹
hawthorn
hazel
hickory
holly, Florida

Scientific Name

Alnus spp.
Fraxinus spp.
Populus tremuloides
Ceanothus prostratus
Fagus spp.
Betula spp.
Prunus emarginata
Rubus spp.
Nyssa sylvatica
Eucalyptus globulus
Pteridium aquilinum
Genista monspessulana
Cytisus scoparius
Eriogonum fasciculatum
Frangula purshiana
Macfadyena unguis-cati
Ceanothus spp.
Adenostoma fasciculatum
Prunus spp.
Prunus serotina
Prunus pensylvanica
Acalypha ostryifolia
Baccharis pilularis
Lotus unifoliolatus
Rubus trivialis
Cornus spp.
Sambucus nigra
Ulmus spp.
Ulex europaeus
Haplopappus squamosus
Crataegus spp.
Corylus spp.
Carya spp.
Schinus terebinthifolius

Common Name (Cont.)

honeysuckle
hornbeam, American
kudzu
locust, black¹
madrone, Pacific
manzanita
maple
maple, red¹
maple, sugar
maple, vine¹
monkeyflower¹
oak
oak, black¹
oak, pin
oak, post
oak, red
oak, southern red
oak, white¹
peppertree, Brazilian
persimmon¹
pine
poison-ivy, eastern
poison-oak
poison-sumac¹
prunus
raspberry
redbud, eastern-
rose, multiflora-
Russian-olive
sage, black, white
sagebrush, California
salmonberry
saltcedar¹
saltbush, sea myrtle
sassafras-
sourwood¹
sumac, smooth¹
sumac, dwarf¹
sweetgum-
swordfern¹
tallowtree, Chinese-
oak, tanbark resprouts
thimbleberry, western
tobacco, tree¹
trumpetcreeper-
Virginia-creeper¹
waxmyrtle, southern¹
willow-
yellow-poplar¹
yerba santa
¹Partial control

Scientific Name

Lonicera spp.
Carpinus caroliniana
Pueraria montana
Robinia pseudoacacia
Arbutus menziesii
Arctostaphylos spp.
Acer spp.
Acer rubrum
Acer saccharum
Acer circinatum
Mimulus guttatus
Quercus spp.
Quercus kelloggia
Quercus palustris
Quercus stellata
Quercus rubra
Quercus falcata
Quercus alba
Schinus terebinthifolius
Diospyros spp.
Pknus spp.
Toxicodendron radicans
Toxicodendron spp.
Toxicodendron vernix
Prunus spp.
Rubus spp.
Cercis canadensis
Rosa multiflora
Elaeagnus angustifolia
Salvia spp.
Artemisia californica
Rubus spectabilis
Tamarix ramosissima
Baccharis halimifolia
Sassafras albidum
Oxydendrum arboreum
Rhus glabra
Rhus copallinum
Liquidambar styraciflua
Polystichum munitum
Triadica sebifera
Lithocarpus densiflorus
Rubus parviflorus
Nicotiana glauca
Campsis radicans
Parthenocissus quinquefolia
Myrica cerifera
Salix spp.
Liriodendron tulipifera
Eriodictyon californicum

unfavorable temperatures, soil conditions, etc.), abnormal conditions (such as excessive rainfall, drought, tornadoes, hurricanes), presence of other materials, the manner of application, or other factors, all of which are beyond the control of Dow AgroSciences or the seller. To the extent permitted by law, all such risks shall be assumed by buyer.

Limitation of Remedies

The exclusive remedy for losses or damages resulting from this product (including claims based on contract, negligence, strict liability, or other legal theories), shall be limited to, at Dow AgroSciences' election, one of the following:

- (1) Refund of purchase price paid by buyer or user for product bought, or
- (2) Replacement of amount of product used.

To the extent permitted by law, Dow AgroSciences shall not be liable for losses or damages resulting from handling or use of this product unless Dow AgroSciences is promptly notified of such loss or damage in writing. To the extent permitted by law, in no case shall Dow AgroSciences be liable for consequential or incidental damages or losses.

The terms of the Warranty Disclaimer, Inherent Risks of Use, and Limitation of Remedies cannot be varied by any written or verbal statements or agreements. No employee or sales agent of Dow AgroSciences or the seller is authorized to vary or exceed the terms of the Warranty Disclaimer or Limitation of Remedies in any manner.

®™ Trademarks of Dow AgroSciences, DuPont or Pioneer and their affiliated companies or respective owners

Produced for
Dow AgroSciences LLC
9330 Zionsville Road
Indianapolis, IN 46268

Label code: CD02-148-020
Replaced label: D02-148-007
LOES number: 010-01471

EPA accepted 11/27/18

Revisions

1. Updated the trademark line to read, "®™ Trademarks of Dow AgroSciences, DuPont or Pioneer and their affiliated companies or respective owners"
2. Add "Caution" to the Precautionary Statements and combine the statements into one paragraph.
3. Under Rainfastness – revised sentence to read, "Heavy rainfall soon... repeat application up to the labeled rate may be required."
4. Revised 2nd paragraph of Directed Sprays to read, "Injury to larch may occur especially where spray patterns overlap or higher labeled rates of this..."
5. Removed rates and application method from table of Tank Mix Partners for Forestry Sites.
6. Broadcast Applications Outside Areas of Southeastern United States revised to read, "...overlap or the higher labeled rate is applied."
7. Chemical Mowing revised sentence to read, "Repeat applications of the tank mix in the same season are not recommended because severe injury may occur."
8. Add missing table for Hand Held Sprayers to sub-label B
9. Add following statements to Wiper Applications: "Rope or Sponge Wick applications: Use solutions of 33 to 75 percent of this product in water." "Panel Applications: Use solutions of 33 to 100 percent of this product in water."
10. Correct typo under "Hollow Stem Injection" "Do not apply more than a total of 7.5 quarts of this product..."
11. Update Mode of Action banner to reflect provisions in PR Notice 2017-01.

Terms and Conditions of Use

If terms of the following Warranty Disclaimer, Inherent Risks of Use, and Limitation of Remedies are not acceptable, return unopened package at once to the seller for a full refund of purchase price paid. Otherwise, to the extent permitted by law, use by the buyer or any other user constitutes acceptance of the terms under Warranty Disclaimer, Inherent Risks of Use and Limitations of Remedies.

Warranty Disclaimer

Dow AgroSciences warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes stated on the label when used in strict accordance with the directions, subject to the inherent risks set forth below. TO THE EXTENT PERMITTED BY LAW, Dow AgroSciences MAKES NO OTHER EXPRESS OR IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER EXPRESS OR IMPLIED WARRANTY.

Inherent Risks of Use

It is impossible to eliminate all risks associated with use of this product. Crop injury, lack of performance, or other unintended consequences may result because of such factors as use of the product contrary to label instructions (including conditions noted on the label, such as



INDUCE®

Nonionic Surfactant and Antifoaming Agent

***PRINCIPAL FUNCTIONING AGENTS:**

Alkyl phenol ethoxylate, alcohol ethoxylate, tall oil fatty acids	90.0%
Constituents ineffective as spray adjuvants	<u>10.0%</u>
TOTAL	100.0%

*All ingredients are accepted for use under CFR 40, 180.

KEEP OUT OF REACH OF CHILDREN
WARNING
 See Inside Panel for Additional Precautionary Statements

WASN 080111

WA Reg. No. 5905-11002

Manufactured For
HELENA CHEMICAL COMPANY
 225 SCHILLING BOULEVARD, SUITE 300 • COLLIERVILLE, TENNESSEE 38017

OPM #119090

PEEL BACK BOOK HERE AND RESEAL AFTER OPENING ►

NET CONTENTS:

PRECAUTIONARY STATEMENTS HAZARDS TO HUMANS AND DOMESTIC ANIMALS WARNING

BEFORE USING THIS PRODUCT, READ ALL PRECAUTIONS, DIRECTIONS FOR USE, CONDITIONS OF SALE-LIMITED WARRANTY AND LIMITATIONS OF LIABILITY AND REMEDIES.

Causes substantial but temporary eye injury. Harmful if inhaled or absorbed through skin. Avoid contact with skin, eyes or clothing. Wear protective eye-wear (goggles or face shield) and chemical-resistant gloves. Avoid breathing spray mist. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco or using the toilet. Remove and wash contaminated clothing before reuse.

FIRST AID

IF IN EYES:	<ul style="list-style-type: none"> • Hold eye open and rinse slowly and gently with water for 15-20 minutes. • Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. • Call a poison control center or doctor for treatment advice.
IF SWALLOWED:	<ul style="list-style-type: none"> • Call a poison control center or doctor immediately for treatment advice. • Have person sip a glass of water if able to swallow. • Do not induce vomiting unless told to do so by a poison control center or doctor. • Do not give anything by mouth to an unconscious person.
IF INHALED:	<ul style="list-style-type: none"> • Move person to fresh air. • If not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth, if possible. • Call a poison control center or doctor for further treatment advice.
IF ON SKIN OR CLOTHING:	<ul style="list-style-type: none"> • Take off contaminated clothing. • Rinse skin immediately with plenty of water for 15-20 minutes. • Call a poison control center or doctor for treatment advice.

HOT LINE NUMBER

Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact 1-800-424-9300 for emergency medical treatment information.

PERSONAL PROTECTIVE EQUIPMENT

Some materials that are chemical resistant to this product are listed below.

Applicators and other handlers must wear:

- Long-sleeved shirt and long pants
- Chemical-resistant gloves, such as barrier laminate, butyl rubber, nitrile rubber or viton
- Shoes plus socks
- Protective eyewear

Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry.

STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage or disposal.

STORAGE: Store in original container only. Keep container tightly closed. Do not allow water to be introduced into the contents of this container. Do not store near heat or open flame. Do not store with oxidizing agents or ammonium nitrate.

PESTICIDE DISPOSAL: Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility. Do not contaminate water sources by runoff from cleaning of equipment, disposal of cleaning equipment washwaters, or spray waste.

CONTAINER DISPOSAL: Do not reuse empty container. Triple rinse (or equivalent) during mixing and loading and add rinse water to spray tank. Recycling decontaminated containers is the best option of container disposal. The Agricultural Container Recycling Council (ACRC) operates the national recycling program. To contact your State and local ACRC recycler, visit the ACRC web page at www.acrecycle.org. Decontaminated containers may also be disposed of in a sanitary landfill.

For help in chemical emergencies involving spill, leak, fire or exposure, call toll free 1-800-424-9300.

GENERAL INFORMATION

INDUCE® is a nonionic wetter/spreader surfactant. **INDUCE®** incorporates the properties of a wetter/spreader surfactant when used in pesticidal spray mixtures. **INDUCE®** is designed to quickly wet and spread a more uniform spray deposit over leaf and stem surfaces. **INDUCE®** can positively affect pesticide spray application and pesticide efficacy. **INDUCE®** is recommended for use with those pesticides whose label recommends a non-ionic wetter/spreader-type adjuvant.

DIRECTIONS FOR USE

WITH PRODUCTS REGISTERED FOR: AGRICULTURAL, FORESTRY, INDUSTRIAL, MUNICIPAL, NON-CROPLAND, ORNAMENTAL, RIGHTS-OF-WAY, TURF AND OTHER USES. (NOT FOR AQUATIC USES IN WASHINGTON.)

The addition of an adjuvant to some pesticides or pesticide tank mix combinations may cause phytotoxicity to the foliage and/or fruit of susceptible crops. Prior to the addition of **INDUCE®** to spray tank mixes, the user or application advisor must have experience with the combination or must have conducted a phytotoxicity trial or must take the recommendations from the labels of the products to be tank mixed.

INDUCE® may be applied by Ground, CDA, Aerial, or spray equipment. For most applications, use enough **INDUCE®** to allow for uniform wetting and deposition of the spray onto leaf surfaces without undue runoff.

Ground, Aerial, CDA: Use 1/2–3 pints per 100 gallons of spray.

For uniform deposition and distribution of applied moisture:

Lawns and Turf: Use **INDUCE®** at 0.50% v/v concentration.

Greens and Tees: Use **INDUCE®** at 0.125–0.25% v/v concentration.

Feeding Trees: Use **INDUCE®** at 0.25–0.50% v/v concentration.

Application of **INDUCE®** through irrigation systems are possible provided that recommended use rates and dilutions are maintained and local, State, and Federal guidelines are followed.



MIXING

Prior to any pesticide application all spray mixing and application equipment must be cleaned. Carefully observe all cleaning directions of the pesticide label.

Fill spray tank one-half full with water and begin agitation. Add pesticides as directed by labeling or in the following sequence:

1. Dry flowables or water dispersible granules.
2. Wettable powders
3. Flowables
4. Solutions
5. Emulsifiable concentrates

and continue filling. Add **INDUCE**® last and continue agitation.

CONDITIONS OF SALE – LIMITED WARRANTY AND LIMITATIONS OF LIABILITY AND REMEDIES

Read the Conditions of Sale – Warranty and Limitations of Liability and Remedies before using this product. If the terms are not acceptable, return the product, unopened, and the full purchase price will be refunded.

The directions on this label are believed to be reliable and should be followed carefully. Insufficient control of pests and/or injury to the crop to which the product is applied may result from the occurrence of extraordinary or unusual weather conditions or the failure to follow the label directions or good application practices, all of which are beyond the control of Helena Chemical Company (the "Company") or seller. In addition, failure to follow label directions may cause injury to crops, animals, man or the environment. The Company warrants that this product conforms to the chemical description on the label and is reasonably fit for the purpose referred to in the directions for use subject to the factors noted above which are beyond the control of the Company. The Company makes no other warranties or representations of any kind, express or implied, concerning the product, including no implied warranty of merchantability or fitness for any particular purpose, and no such warranty shall be implied by law.

The exclusive remedy against the Company for any cause of action relating to the handling or use of this product shall be limited to, at Helena Chemical Company's election, one of the following:

1. Refund of the purchase price paid by buyer or user for product bought, or
2. Replacement of the product used

To the extent allowed by law, the Company shall not be liable and any and all claims against the Company are waived for special, indirect, incidental, or consequential damages or expense of any nature, including, but not limited to, loss of profits or income. The Company and the seller offer this product and the buyer and user accept it, subject to the foregoing conditions of sale and limitation of warranty, liability and remedies.

© Copyright Helena Holding Company, 2011.

INDUCE® is a registered trademark of Helena Holding Company.

Nonionic Surfactant and Antifoaming Agent

*PRINCIPAL FUNCTIONING AGENTS:

Alkyl phenol ethoxylate, alcohol ethoxylate, tall oil fatty acids.....	90.0%
Constituents ineffective as spray adjuvants	<u>10.0%</u>
TOTAL	100.0%

*All ingredients are accepted for use under CFR 40, 180.

KEEP OUT OF REACH OF CHILDREN
WARNING
 See Inside Panel for Additional Precautionary Statements

WASN 080111

WA Reg. No. 5905-11002

Manufactured For
HELENA CHEMICAL COMPANY
 225 SCHILLING BOULEVARD, SUITE 300 • COLLIERVILLE, TENNESSEE 38017





NON-STAINING BLUE SPRAY INDICATOR

Active Constituent: Polymer Blue Colourant
Poison Schedule: Unscheduled
APVMA Approval No: n/a



Eligible containers
 5L
 25L

Pack Size:

5L (4 x 5L per carton)
 25L with tap connection

Dangerous Goods Class:

Not classified as a dangerous good under the Australian Code for Transport and Storage of Dangerous Goods in Australia.

Blazon is a non-staining spray indicator used to identify blocked nozzles and reduce costly overlapping. Blazon indicates areas that have been sprayed.

Blazon is used with pesticide, fertiliser and PGR solutions to temporarily identify treated areas. Blazon is not intended for use on edible crops.

DIRECTIONS FOR USE	
Boom Sprayer	2mL-3mL per litre of spray solution (200mL-300mL per 100L of spray solution)
Backpack Sprayer	8mL per litre of spray solution (80mL per 10L of spray solution)
Termiticide pretreatments	2mL-4mL per litre of solution
Rates can be varied to suit the operators colour preference.	

Add Blazon to the spray tank after all other chemicals. Agitate as appropriate. These application rates and other information provided on this label are believed to be accurate; However such information does not constitute product specifications or an expressed or implied warranty.

HEALTH HAZARD AND FIRST AID INFORMATION

Avoid contact with eyes and skin- may cause temporary irritation. In case of contact flush eyes/skin with large amounts of water. If irritation persists seek prompt medical attention. Do not ingest. In case of ingestion, drink two glasses of water and seek prompt medical attention.

STORAGE AND DISPOSAL

Store in closed container. Do not reuse container. Small spills can be washed away with water. Large spills should be contained and salvaged. Disposal must comply with local, state and federal regulations.

CONDITIONS OF SALE

Agricultural, horticultural and pastoral preparations in their application involve varying factors such as differing conditions, soil, climate and methods of application over which the vendor does not have control, Whilst Colin Campbell (Chemicals) Pty. Ltd believes that all goods sold by it are true to label and are effective and safe for purpose indicated the company and the seller hereby expressly negate and exclude any express or implied condition, statement or warranty, statutory or otherwise, as to quality or fitness of any goods sold for any purpose or purposes whatsoever except such warranties and conditions, if any, as are implied by the Trade Practices Act 1974 (Commonwealth). The company and the seller accept no responsibility for any loss, harm or damage whatsoever suffered from the use of such goods for any purpose or purposes irrespective of whether or not the buyer was acting in reliance upon the advice recommendation or representation of the seller or any representative agent of employee of the company as to such use except in respect of breaches of conditions and warranties, if any, implied by the Trade practices Act and in respect of such breaches the liability of the company and the seller shall be limited to the replacement of the goods or the supply of equivalent goods, or the payment of the cost of replacing the goods.

*Blazon is a registered trademark and product made by Milliken Chemical

Specimen Label



Garlon^{*} 3A

Specialty Herbicide

*Trademark of Dow AgroSciences LLC

For the control of woody plants, broadleaf weeds and vines in forests and industrial non-crop areas, including manufacturing and storage sites, rights-of-way such as electrical power lines, communication lines, pipelines, roadsides, railroads, fence rows, non-irrigation ditch banks, and around farm buildings; including application to grazed areas, and establishment and maintenance of wildlife openings on these sites, and in Christmas tree plantations. Use within production forests and industrial non-crop sites may include applications to control target vegetation in and around standing water sites, such as marshes, wetlands, and the banks of ponds and lakes.

Active Ingredient:

triclopyr: 3,5,6-trichloro-2-pyridinyloxyacetic acid, triethylamine salt	44.4%
Inert Ingredients	55.6%
Total	100.0%

Acid equivalent: triclopyr - 31.8% - 3 lb/gal

EPA Reg. No. 62719-37

Keep Out of Reach of Children

DANGER PELIGRO

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail.)

Precautionary Statements

Hazard to Humans and Domestic Animals

Corrosive • Causes Irreversible Eye Damage • Harmful If Swallowed Or Absorbed Through Skin • Prolonged Or Frequently Repeated Skin Contact May Cause Allergic Reaction In Some Individuals

Do not get in eyes or on skin or clothing.

Personal Protective Equipment (PPE)

Applicators and other handlers must wear:

- Long-sleeved shirt and long pants
- Shoes plus socks
- Protective eyewear
- Chemical resistant gloves (≥ 14 mils) such as butyl rubber, natural rubber, neoprene rubber or nitrile rubber

Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them. Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

Engineering Controls

When handlers use closed systems, enclosed cabs, or aircraft in a manner that meets the requirements listed in the WPS (40 CFR 170.240(d)(4-6)), the handler PPE requirements may be reduced or modified as specified in the WPS.

User Safety Recommendations

Users should:

- Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

First Aid

If in eyes: Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice.

If on skin or clothing: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.

If swallowed: Call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by a poison control center or doctor. Do not give anything by mouth to an unconscious person. Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact 1-800-992-5994 for emergency medical treatment information.

Note to Applicator: Allergic skin reaction is not expected from exposure to spray mixtures of Garlon 3A herbicide when used as directed.

Note to Physician: Probable mucosal damage may contraindicate the use of gastric lavage.

Environmental Hazards

Do not contaminate water when cleaning equipment or disposing of equipment washwaters. Under certain conditions, treatment of aquatic weeds can result in oxygen depletion or loss due to decomposition of dead plants, which may contribute to fish suffocation. This loss can cause fish suffocation. Therefore, to minimize this hazard, do not treat more than one-third to one-half of the water area in a single operation and wait at least 10 to 14 days between treatments. Begin treatment along the shore and proceed outwards in bands to allow fish to move into untreated areas. Consult with the State agency for fish and game before applying to public water to determine if a permit is needed.

This chemical has properties and characteristics associated with chemicals detected in groundwater. The use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in groundwater contamination.

Physical or Chemical Hazards

Combustible. Do not use or store the product near heat or open flame.

Notice: Read the entire label. Use only according to label directions. **Before using this product, read Warranty Disclaimer, Inherent Risks of Use, and Limitation of Remedies elsewhere on this label. If terms are unacceptable, return at once unopened.**

In case of emergency endangering health or the environment involving this product, call 1-800-992-5994. If you wish to obtain additional product information, visit our web site at www.dowagro.com.

Agricultural Chemical: Do not ship or store with food, feeds, drugs or clothing.

Directions for Use

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

Read all Directions for Use carefully before applying.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your state or tribe, consult the agency responsible for pesticide regulation

Agricultural Use Requirements

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE), and restricted-entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not enter or allow worker entry into treated areas during the restricted entry interval (REI) of 48 hours.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is:

- Coveralls
- Shoes plus socks
- Protective eyewear
- Chemical-resistant gloves (≥ 14 mils) such as butyl rubber, natural rubber, neoprene rubber or nitrile rubber

Non-Agricultural Use Requirements

The requirements in this box apply to uses of this product that are NOT within the scope of the Worker Protection Standard for Agricultural Pesticides (40 CFR Part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries, or greenhouses.

Entry Restrictions for Non-WPS Uses: For applications to non-cropland areas, do not allow entry into areas until sprays have dried, unless applicator and other handler PPE is worn.

Storage and Disposal

Do not contaminate water, food, or feed by storage and disposal. Open dumping is prohibited.

Pesticide Storage: Store above 28°F or agitate before use.

Pesticide Disposal: Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

Container Disposal for Refillable Containers: Seal all openings which have been opened during use. Return the empty container to a collection site designated by Dow AgroSciences. If the container has been damaged and cannot be returned according to the recommended procedures, contact Dow AgroSciences Customer Service Center at 1-800-258-1470 to obtain proper handling instructions.

Container Disposal (Metal): Do not reuse container. Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities.

Container Disposal (Plastic): Do not reuse container. Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

General: Consult federal, state, or local disposal authorities for approved alternative procedures.

General Information for Production Forests and Industrial Non-Crop Areas

Garlon® 3A specialty herbicide is recommended for the control of woody plants, broadleaf weeds and vines in forests and industrial non-crop areas including manufacturing and storage sites, rights-of-way such as electrical power lines, communication lines, pipelines, roadsides, railroads, fence rows, non-irrigation ditch banks, and around farm buildings, including application to grazed areas, and establishment and maintenance of wildlife openings on these sites, and in Christmas tree plantations. Use within production forests and industrial non-crop sites may include applications to control target vegetation in and around standing water sites, such as marshes, wetlands, and the banks of ponds and lakes.

Obtain Required Permits: Consult with appropriate state or local water authorities before applying this product to public waters. State or local public agencies may require permits.

General Use Precautions and Restrictions

In Arizona: The state of Arizona has not approved Garlon 3A for use on plants grown for commercial production, specifically forests grown for commercial timber production, or on designated grazing areas.

When applying this product in tank mix combination, follow all applicable use directions, precautions and limitations on each manufacturer's label.

Chemigation: Do not apply this product through any type of irrigation system.

Do not apply Garlon 3A directly to, or otherwise permit it to come into direct contact with grapes, tobacco, vegetable crops, flowers, or other desirable broadleaf plants, and do not permit spray mists containing it to drift into them.

It is permissible to treat non-irrigation ditch banks, seasonally dry wetlands (such as flood plains, deltas, marshes, swamps, or bogs) and transitional areas between upland and lowland sites.

- **Do not** apply to salt water bays or estuaries.
- **Do not** apply directly to un-impounded rivers or streams.
- **Do not** apply on ditches or canals used to transport irrigation water. It is permissible to treat non-irrigation ditch banks.
- **Do not** apply where runoff water may flow onto agricultural land as injury to crops may result.
- When making applications to control unwanted plants on banks or shorelines of moving water sites, minimize overspray to open water.
- The use of a mistblower is not recommended.
- Apply no more than 2 lb ae of triclopyr (2/3 gallon of Garlon 3A) per acre per growing season on range and pasture sites, including rights-of-way, fence rows or any area where grazing or harvesting is allowed.
- On forestry sites, Garlon 3A may be used at rates up to 6 lb ae of triclopyr (2 gallons of Garlon 3A) per acre per year.
- For all terrestrial use sites other than range, pasture, forestry sites, and grazed areas, the maximum application rate is 9 lb ae of triclopyr (3 gallons of Garlon 3A) per acre per year.

Precautions for Potable Water Intakes for Emerged Aquatic Weed Control

See chart below for specific setback distances near functioning potable water intakes. **Note:** Existing potable water intakes which are no longer in use, such as those replaced by potable water wells or connections to a municipal water system, are not considered to be functioning potable water intakes. These setback restrictions do not apply to terrestrial applications made adjacent to potable water intakes.

Area Treated (acres)	Garlon 3A Application Rate, qt/acre			
	2 qt/acre	4 qt/acre	6 qt/acre	8 qt/acre
	Setback Distance (ft)			
4	0	200	400	500
>4 - 8	0	200	700	900
>8 - 16	0	200	700	1000
>16	0	200	900	1300

To apply Garlon 3A around and within the distances noted above from a functioning potable water intake, the intake must be turned off until the triclopyr level in the intake water is determined to be 0.4 parts per million (ppm) or less by laboratory analysis or immunoassay.

- **Recreational Use of Water in Treatment Area:** There are no restrictions on use of water in the treatment area for recreational purposes, including swimming and fishing.
- **Livestock Use of Water from Treatment Area:** There are no restrictions on livestock consumption of water from the treatment area.

Grazing and Haying Restrictions

Except for lactating dairy animals, there are no grazing restrictions following application of this product.

- **Grazing Lactating Dairy Animals:** Do not allow lactating dairy animals to graze treated areas until the next growing season following application of this product.
- Do not harvest hay for 14 days after application.
- Grazed areas of non-cropland and forestry sites may be spot treated if they comprise no more than 10% of the total grazable area.

Slaughter Restrictions: During the season of application, withdraw livestock from grazing treated grass at least 3 days before slaughter.

Avoiding Injurious Spray Drift

Applications should be made only when there is little or no hazard from spray drift. Very small quantities of spray, which may not be visible, may seriously injure susceptible plants. Do not spray when wind is blowing toward susceptible crops or ornamental plants near enough to be injured. It is suggested that a continuous smoke column at or near the spray site or a smoke generator on the spray equipment be used to detect air movement, lapse conditions, or temperature inversions (stable air). If the smoke layers or indicates a potential of hazardous spray drift, do not spray.

Aerial Application: For aerial application on rights-of-way or other areas near susceptible crops, apply through a Microfoil[†] or Thru-Valve boom[†], or use an agriculturally labeled drift control additive. Other drift reducing systems or thickened sprays prepared by using high viscosity inverting systems may be used if they are made as drift-free as mixtures containing agriculturally labeled thickening agents or applications made with the Microfoil or Thru-Valve boom. Keep spray pressures low enough to provide coarse spray droplets. Spray boom should be no longer than 3/4 of the rotor length. Do not use a thickening agent with the Microfoil or Thru-Valve booms, or other systems that cannot accommodate thick sprays. Spray only when the wind velocity is low (follow state regulations). Avoid application during air inversions. If a spray thickening agent is used, follow all use recommendations and precautions on the product label.

[†] Reference within this label to a particular piece of equipment produced by or available from other parties is provided without consideration for use by the reader at its discretion and subject to the reader's independent circumstances, evaluation, and expertise. Such reference by Dow AgroSciences is not intended as an endorsement of such equipment, shall not constitute a warranty (express or implied) of such equipment, and is not intended to imply that other equipment is not available and equally suitable. Any discussion of methods of use of such equipment does not imply that the reader should use the equipment other than is advised in directions available from the equipment's manufacturer. The reader is responsible for exercising its own judgment and expertise, or consulting with sources other than Dow AgroSciences, in selecting and determining how to use its equipment.

Spray Drift Management

Avoiding spray drift at the application site is the responsibility of the applicator. The interaction of many equipment and weather related factors determine the potential for spray drift. The applicator and the grower are responsible for considering all these factors when making decisions.

The following drift management requirements must be followed to avoid off-target drift movement from aerial applications:

1. The distance of the outer most operating nozzles on the boom must not exceed 3/4 the length of the rotor.
2. Nozzles must always point backward parallel with the air stream and never be pointed downwards more than 45 degrees.

Where states have more stringent regulations, they should be observed.

The applicator should be familiar with and take into account the information covered in the following Aerial Drift Reduction Advisory. [This information is advisory in nature and does not supersede mandatory label requirements.]

Aerial Drift Reduction Advisory

Information on Droplet Size: The most effective way to reduce drift potential is to apply large droplets. The best drift management strategy is to apply the largest droplets that provide sufficient coverage and control. Applying larger droplets reduces drift potential, but will not prevent drift if applications are made improperly, or under unfavorable environmental conditions (see Wind, Temperature and Humidity, and Temperature Inversions).

Controlling Droplet Size:

- **Volume** - Use high flow rate nozzles to apply the highest practical spray volume. Nozzles with higher rated flows produce larger droplets.
- **Pressure** - Do not exceed the nozzle manufacturer's recommended pressures. For many nozzle types, lower pressure produces larger droplets. When higher flow rates are needed, use higher flow rate nozzles instead of increasing pressure.
- **Number of Nozzles** - Use the minimum number of nozzles that provide uniform coverage.
- **Nozzle Orientation** - Orienting nozzles so that the spray is released parallel to the airstream produces larger droplets than other orientations and is the recommended practice. Significant deflection from horizontal will reduce droplet size and increase drift potential.
- **Nozzle Type** - Use a nozzle type that is designed for the intended application. With most nozzle types, narrower spray angles produce larger droplets. Consider using low-drift nozzles. Solid stream nozzles oriented straight back produce the largest droplets and the lowest drift.

Boom Length: For some use patterns, reducing the effective boom length to less than 3/4 of the wingspan or rotor length may further reduce drift without reducing swath width.

Application Height: Applications should not be made at a height greater than 10 feet above the top of the largest plants unless a greater height is required for aircraft safety. Making applications at the lowest height that is safe reduces exposure of droplets to evaporation and wind.

Swath Adjustment: When applications are made with a crosswind, the swath will be displaced downwind. Therefore, on the up and downwind edges of the field, the applicator must compensate for this displacement by adjusting the path of the aircraft upwind. Swath adjustment distance should increase, with increasing drift potential (higher wind, smaller drops, etc.).

Wind: Drift potential is lowest between wind speeds of 2-10 mph. However, many factors, including droplet size and equipment type, determine drift potential at any given speed. Application should be avoided below 2 mph due to variable wind direction and high inversion potential. **Note:** Local terrain can influence wind patterns. Every applicator should be familiar with local wind patterns and how they affect spray drift.

Temperature and Humidity: When making applications in low relative humidity, set up equipment to produce larger droplets to compensate for evaporation. Droplet evaporation is most severe when conditions are both hot and dry.

Temperature Inversions: Applications should not occur during a local, low level temperature inversion because drift potential is high. Temperature inversions restrict vertical air mixing, which causes small suspended droplets to remain in a concentrated cloud. This cloud can move in unpredictable directions due to the light variable winds common during inversions. Temperature inversions are characterized by increasing temperatures with altitude and are common on nights with limited cloud cover and light to no wind. They begin to form as the sun sets and often continue into the morning. Their presence can be indicated by ground fog; however, if fog is not present, inversions can also be identified by the movement of the smoke from a ground source or an aircraft smoke generator. Smoke that layers and moves laterally in a concentrated cloud (under low wind conditions) indicates an inversion, while smoke that moves upward and rapidly dissipates indicates good vertical air mixing.

Sensitive Areas: The pesticide should only be applied when the potential for drift to adjacent sensitive areas (e.g., residential areas, bodies of water, known habitat for threatened or endangered species, non-target crops) is minimal (e.g., when wind is blowing away from the sensitive areas).

Ground Equipment: To aid in reducing spray drift, Garlon 3A should be used in thickened (high viscosity) spray mixtures using an agriculturally labeled drift control additive, high viscosity invert system, or equivalent as directed by the manufacturer. With ground equipment, spray drift can be reduced by keeping the spray boom as low as possible; by applying 20 gallons or more of spray per acre; by keeping the operating spray pressures at the lower end of the manufacturer's recommended pressures for the specific nozzle type used (low pressure nozzles are available from spray equipment manufacturers); and by spraying when wind velocity is low (follow state regulations). In hand-gun applications, select the minimum spray pressure that will provide adequate plant coverage (without forming a mist). Do not apply with nozzles that produce a fine-droplet spray.

High Volume Leaf-Stem Treatment: To minimize spray drift, do not use pressure exceeding 50 psi at the spray nozzle and keep sprays no higher than brush tops. An agriculturally labeled thickening agent may be used to reduce drift.

Plants Controlled by Garlon 3A

Woody Plant Species

alder	Douglas-fir	poplar
arrowwood	dogwood	salt-bush (<i>Baccharis</i> spp.)
ash	elderberry	sassafras
aspen	elm	scotch broom
bear clover (bearmat)	gallberry	sumac
beech	hazel	sweetbay magnolia
birch	hornbeam	sweetgum
blackberry	kudzu†	sycamore
blackgum	locust	tanoak
Brazilian pepper	madrone	thimbleberry
casacara	maples	tulip poplar
ceanothus	mulberry	waxmyrtle
cherry	oaks	western hemlock
chinquapin	persimmon	wild rose
choke cherry	pine	willow
cottonwood	poison ivy	winged elm
crataegus (hawthorn)	poison oak	salmonberry

†For complete control, retreatment may be necessary.

Annual and Perennial Broadleaf Weeds

bindweed	dandelion	ragweed
burdock	field bindweed	smartweed
Canada thistle	lambsquarter	tansy ragwort
chicory	plantain	vetch
curly dock	Purple loosestrife	wild lettuce

Application Methods

Use Garlon 3A at rates of 3/4 to 9 lb ae of triclopyr (1/4 to 3 gallons of Garlon 3A) per acre to control broadleaf weeds and woody plants. In all cases use the amount specified in enough water to give uniform and complete coverage of the plants to be controlled. Use only water suitable for spraying. Use of an agriculturally labeled non-ionic surfactant is recommended for all foliar applications. When using surfactants, follow the use directions and precautions listed on the surfactant manufacturer's label. Use the higher recommended concentrations of surfactant in the spray mixture when applying lower spray volumes per acre. The recommended order of addition to the spray tank is water, spray thickening agent (if used), additional herbicide (if used), and Garlon 3A. Surfactant should be added to the spray tank last or as recommended on the product label. If combined with emulsifiable concentrate herbicides, moderate continuous adequate agitation is required.

Before using any recommended tank mixtures, read the directions and all use precautions on both labels.

For best results, applications should be made when woody plants and weeds are actively growing. When hard to control species such as ash, blackgum, choke cherry, elm, maples, oaks, pines, or winged elm are prevalent and during applications made in late summer when the plants are mature and during drought conditions, use the higher rates of Garlon 3A alone or in combinations with Tordon* 101 Mixture herbicide. (Tordon 101 Mixture is a restricted use pesticide. See product label.)

When using Garlon 3A in combination with 2,4-D 3.8 lb amine, like DMA 4 IVM, or low volatile ester herbicides, generally the higher rates should be used for satisfactory brush control.

Use the higher dosage rates when brush approaches an average of 15 feet in height or when the brush covers more than 60% of the area to be treated. If lower rates are used on hard to control species, resprouting may occur the year following treatment.

On sites where easy to control brush species dominate, rates less than those recommended may be effective. Consult State or Local Extension personnel for such information.

Foliage Treatment With Ground Equipment

High Volume Foliage Treatment

For control of woody plants, use Garlon 3A at the rate of 3 to 9 lb ae of triclopyr (1 to 3 gallons of Garlon 3A) per 100 gallons of spray solution, or Garlon 3A at 3/4 to 3 lb ae of triclopyr (1 to 4 quarts of Garlon 3A) may be tank mixed with 1/4 to 1/2 gallons of 2,4-D 3.8 lb amine, like DMA 4 IVM, or low volatile ester or Tordon 101 Mixture and diluted to make 100 gallons of spray solution. Apply at a volume of 100 to 400 gallons of total spray per acre depending on size and density of woody plants. Coverage should be thorough to wet all leaves, stems, and root collars. (See General Use Precautions and Restrictions.) Do not exceed maximum allowable use rates per acre (see table below).

Maximum Labeled Rate versus Spray Volume per Acre

Total Spray Volume (gal/acre)	Maximum Rate of Garlon 3A		
	Rangeland and Pasture Sites [†] (gal/100 gal of spray)	Forestry Sites ^{**} (gal/100 gal of spray)	Other Non-Cropland Sites ^{***} (gal/100 gal of spray)
400	Do not use	0.5	0.75
300	Do not use	0.67	1
200	Do not use	1	1.5
100	0.67	2	3
50	1.33	4	6
40	1.67	5	7.5
30	2.33	6.65	10
20	3.33	10	15
10	6.67	20	30

[†] Do not exceed the maximum use rate of 2 lb ae of triclopyr (2/3 gal of Garlon 3A)/acre/year.

^{**} Do not exceed the maximum use rate of 6 lb ae of triclopyr (2 gal of Garlon 3A)/acre/year.

^{***} Do not exceed the maximum use rate of 9 lb ae of triclopyr (3 gal of Garlon 3A)/acre/year on non-cropland use sites other than rangeland, pasture, forestry, and grazed areas.

Low Volume Foliage Treatment

To control susceptible woody plants, apply up to 15 lb ae of triclopyr (5 gallons of Garlon 3A) in 10 to 100 gallons of finished spray. The spray concentration of Garlon 3A and total spray volume per acre may be adjusted according to the size and density of target woody plants and kind of spray equipment used. With low volume sprays, use sufficient spray volume to obtain uniform coverage of target plants including the surfaces of all foliage, stems, and root collars (see General Use Precautions and Restrictions). For best results, a surfactant should be added to all spray mixtures. Match equipment and delivery rate of spray nozzles to height and density of woody plants. When treating tall, dense brush, a truck mounted spray gun with spray tips that deliver up to 2 gallons per minute at 40 to 60 psi may be required. Backpack or other types of specialized spray equipment with spray tips that deliver less than 1 gallon of spray per minute may be appropriate for short, low to moderate density brush.

Tank Mixing: As a low volume foliar spray, up to 9 lb ae of triclopyr (3 gallons of Garlon 3A) may be applied in tank mix combination with 1/2 to 1 gallon of Tordon K or 1 to 2 gallons of Tordon 101 Mixture in 10 to 100 gallons of finished spray.

Broadcast Applications With Ground Equipment

Make application using equipment that will assure uniform coverage of the spray volumes applied. To improve spray coverage, add an agriculturally labeled non-ionic surfactant as described later under Directions for Use. See Maximum Labeled Rate versus Spray Volume per Acre table above for relationship between mixing rate, spray volume and maximum application rate.

Woody Plant Control

Foliage Treatment: Use 6 to 9 lb ae of triclopyr (2 to 3 gallons of Garlon 3A) in enough water to make 20 to 100 gallons of total spray per acre or 1 1/2 to 3 lb ae of triclopyr (1/2 to 1 gallon of Garlon 3A) may be combined with 1 to 2 gallons of 2,4-D 3.8 lb amine, like DMA 4 IVM, or

low volatile esters or Tordon 101 Mixture in sufficient water to make 20 to 100 gallons of total spray per acre.

Broadleaf Weed Control

Use Garlon 3A at rates of 1 to 4 1/2 lb ae of triclopyr (1/3 to 1 1/2 gallons of Garlon 3A) in a total volume of 20 to 100 gallons of water per acre. Apply any time during the growing season. Garlon 3A at 1 to 3 lb ae of triclopyr (1/3 to 1 gallon of Garlon 3A) may be tank mixed with 1/2 to 1 gallon of Tordon K, Tordon 101 Mixture or 2,4-D 3.8 lb amine, like DMA 4 IVM, or low volatile herbicides to improve the spectrum of activity.

Aerial Application (Helicopter Only)

Aerial sprays should be applied using suitable drift control. (See General Use Precautions and Restrictions.) Add an agriculturally labeled non-ionic surfactant as described under Directions for Use. See Maximum Labeled Rate versus Spray Volume per Acre table above for relationship between mixing rate, spray volume and maximum application rate.

Foliage Treatment (Non-Grazed Rights-of-Way)

Non-grazed areas: Use 6 to 9 lb ae of triclopyr (2 to 3 gallons of Garlon 3A) or 3 to 4 1/2 lb ae of triclopyr (1 to 1 1/2 gallons of Garlon 3A) in a tank mix combination with 1 to 2 gallons of 2,4-D 3.8 lb amine, like DMA 4 IVM, or low volatile esters or Tordon 101 Mixture, and apply in a total spray volume of 10 to 30 gallons per acre. Use the higher rates and volumes when plants are dense or under drought conditions.

Interspersed areas in non-grazed rights-of-ways that may be subject to grazing may be spot treated if the treated area comprises no more than 10% of the total grazable area.

Forest Management Applications

For best control from broadcast applications of Garlon 3A, use a spray volume which will provide thorough plant coverage. Recommended spray volumes are usually 10 to 25 gallons per acre by air or 10 to 100 gallons per acre by ground. To improve spray coverage of spray volumes less than 50 gallons per acre, add an agriculturally labeled non-ionic surfactant as described under Directions for Use. Application systems should be used to prevent hazardous drift to off-target sites. Nozzles or additives that produce larger droplets of spray may require higher spray volumes to maintain brush control.

Forest Site Preparation (Not for Conifer Release)

Use up to 6 lb ae of triclopyr (2 gallons of Garlon 3A) and apply in a total spray volume of 10 to 30 gallons per acre or Garlon 3A at 3 to 4 1/2 lb ae of triclopyr (1 to 1 1/2 gallons of Garlon 3A) may be used with 1 to 2 gallons of Tordon 101 Mixture or 2,4-D 3.8 lb low volatile ester in a tank mix combination in a total spray volume of 10 to 30 gallons per acre. Use of a non-ionic agricultural surfactant is recommended for all foliar applications as described under Directions for Use.

Note: Conifers planted sooner than one month after treatment with Garlon 3A at less than 4 lb ae of triclopyr (1 1/3 gallons of Garlon 3A) per acre or sooner than two months after treatment at 4 to 9 lb ae of triclopyr (1 1/3 to 3 gallons of Garlon 3A) per acre may be injured. When tank mixtures of herbicides are used for forest site preparation, labels for all products in the mixture should be consulted and the longest recommended waiting period before planting observed.

Directed Spray Applications for Conifer Release

To release conifers from competing hardwoods such as red maple, sugar maple, striped maple, sweetgum, red and white oaks, ash, hickory, alder, birch, aspen, and pin cherry, mix 3 to 6 lb ae triclopyr (1 to 2 gallons of Garlon 3A) in enough water to make 100 gallons of spray mixture. To improve spray coverage, add an agriculturally labeled non-ionic surfactant as described under Directions for Use. The spray mixture should be directed onto foliage of competitive hardwoods using knapsack or backpack sprayers with flat fan nozzles or equivalent any time after hardwoods have reached full leaf size, but before autumn coloration. The majority of treated hardwoods should be less than 6 feet in height to ensure adequate spray coverage. Care should be taken to direct spray away from contact with conifer foliage, particularly foliage of desirable pines.

Note: Spray may cause temporary damage and growth suppression where contact with conifers occurs; however, injured conifers should recover and grow normally. Over-the-top spray applications can kill pines.

Broadcast Application for Conifer Release in the Northeastern United States

To release spruce, fir, red pine and white pine from competing hardwoods, such as red maple, sugar maple, striped maple, alder, birch (white, yellow or gray), aspen, ash, pin cherry and *Rubus* spp. and perennial and annual broadleaf weeds, use Garlon 3A at rates of 1 1/2 to 3 lb ae triclopyr (2 to 4 quarts of Garlon 3A) per acre alone or plus 2,4-D amine, like DMA 4 IVM, or 2,4-D ester to provide no more than 4 pounds acid equivalent per acre from both products. Applications should be made in late summer or early fall after conifers have formed their overwintering buds and hardwoods are in full leaf and prior to autumn coloration.

Broadcast Applications for Douglas Fir Release in the Pacific Northwest and California

To release Douglas fir from susceptible competing vegetation such as broadleaf weeds, alder, blackberry or Scotch broom, apply Garlon 3A at 1 to 1 1/2 lb ae triclopyr (1 1/3 to 2 quarts of Garlon 3A) per acre alone or in combination with 4 lb per acre of atrazine. Mix all sprays in a water carrier with a non-ionic surfactant. Applications should be made in early spring after hardwoods begin growth and before Douglas fir bud break ("early foliar" hardwood stage) or after Douglas fir seasonal growth has "hardened off" (set winter buds) in late summer, but while hardwoods are still actively growing. When treating after Douglas fir bud set, apply prior to onset of autumn coloration in hardwood foliage. **Note:** Treatments applied during active Douglas fir shoot growth (after spring bud break and prior to bud set) may cause injury to Douglas fir trees.

Cut Surface Treatments

To control unwanted trees of hardwood species such as elm, maple, oak and conifers in rights-of-way and other non-crop areas, apply Garlon 3A, either undiluted or diluted in a 1 to 1 ratio with water, as directed below.

With Tree Injector Method

Applications should be made by injecting 1/2 milliliter of undiluted Garlon 3A or 1 milliliter of the diluted solution through the bark at intervals of 3 to 4 inches between centers of the injector wound. The injections should completely surround the tree at any convenient height. **Note: No Worker Protection Standard worker entry restrictions or worker notification requirements apply when this product is injected directly into plants.**

With Hack and Squirt Method

Make cuts with a hatchet or similar equipment at intervals of 3 to 4 inches between centers at a convenient height around the tree trunk. Spray 1/2 milliliter of undiluted Garlon 3A or 1 milliliter of the diluted solution into each cut.

With Frill or Girdle Method

Make a single girdle through the bark completely around the tree at a convenient height. Wet the cut surface with undiluted or diluted solution.

Both of the above methods may be used successfully at any season except during periods of heavy sap flow of certain species - for example, maples.

Stump Treatment

Spray or paint the cut surfaces of freshly cut stumps and stubs with undiluted Garlon 3A. The cambium area next to the bark is the most vital area to wet.

Christmas Tree Plantations

Garlon 3A is recommended for the control of woody plants and annual and perennial broadleaf weeds in established Christmas tree plantations. For best results, applications should be made when woody plants and weeds are actively growing. Garlon 3A does not control weeds which have not emerged at the time of application. If lower rates are used on hard to control woody species, resprouting may occur the year following treatment. Brush over 8 feet tall is difficult to treat efficiently using hand equipment such as backpack or knapsack sprayers. When treating large brush or trees or hard to control species such as ash, blackgum, choke cherry, elm, hazel, madrone, maples, oaks or sweetgum, and for applications made during drought conditions or in late summer when the leaves are mature, use the higher rates of Garlon 3A or use cut surface application methods. For foliar applications, apply in enough water to give uniform and complete coverage of the plants to be controlled. Applications made under drought conditions may provide less than desirable results.

Use Precautions

- Do not use on newly seeded grass until well established as indicated by vigorous growth and development of secondary root system and tillering
- Newly seeded turf (alleyways, etc.) should be mowed two or three times before any treatment with Garlon 3A.
- Do not reseed Christmas tree areas treated with Garlon 3A for a minimum of three weeks after application.
- Do not use Garlon 3A if legumes, such as clover, are present and injury cannot be tolerated.

Spray Preparation

The recommended order of addition to the spray tank is water, drift control agent (if used), non-ionic agricultural surfactant and Garlon 3A. Continue moderate agitation while mixing and spraying. Use of a non-ionic agricultural surfactant is recommended for all applications. When using surfactants, follow use directions and precautions listed on the manufacturer's label. Use the higher recommended concentrations of surfactant in the spray mixture when applying lower spray volumes per acre.

Application

Make applications in late summer or early autumn after terminal growth of Christmas trees has hardened off, but before leaf drop of, target weeds. Apply at a rate of 3/4 to 1 3/4 lb ae triclopyr (2 to 5 pints of Garlon 3A) per acre as a foliar spray directed toward the base of Christmas trees. Use sufficient spray volume to provide uniform coverage of target plants (20 to 100 gallons per acre). **Do not apply with 2,4-D.** Application rates of Garlon 3A recommended for Christmas trees will only suppress some well established woody plants that are greater than 2 to 3 years old (see table below). Broadcast sprays may also be applied in bands between the rows of planted trees. Use spray equipment that will assure uniform coverage of the desired spray volume.

Spray solution from Garlon 3A can cause needle and branch injury to Christmas trees. To minimize injury to Christmas trees, it is recommended that sprays be directed so as to minimize contact with foliage. Blue spruce, white spruce, balsam fir and Fraser fir are less susceptible to injury than white pine and Douglas fir.

Restriction: Apply Garlon 3A only to established Christmas trees that were planted at least one full year prior to application.

Application Rates and Species Controlled:

Garlon 3A		
2 pints/acre (3/4 lb ae triclopyr)	3 to 4 pints/acre (1 1/2 lb ae triclopyr)	5 pints/acre (1 3/4 lb ae triclopyr)
clover	bindweed, field (TG)	arrowwood (SDL)
dandelion	blackberry [†]	aspen
dock, curly	chicory (s)	beech (SDL)
lambsquarters	fireweed	birch (SDL)
lespedeza	ivy, ground	chinquapin
plantain, broadleaf	lettuce, wild	cottonwood (SDL)
plantain, buckhorn	oxalis	elderberry
ragweed, common	poison ivy	grape, wild
vetch	smartweed (TG)	mulberry (SDL)
	thistle, Canada (TG)	poplar (SDL)
	violet, wild	sassafras (SDL)
	Virginia creeper [†]	sumac (SDL)
		sycamore (SDL)

(TG) Top growth control, retreatment may be necessary

(S) Suppression

(SDL) Seedlings less than 2-3 years old

[†]Use 4 pint per acre rate

Directed Applications

To control hardwoods such as red maple, sugar maple, striped maple, sweetgum, red and white oaks, ash, alder, birch, aspen, and pin cherry mix 4 to 20 fluid ounces of Garlon 3A in enough water to make 3 gallons of spray mixture. For directed applications, do not exceed 6 lb ae triclopyr (2 gallons of Garlon 3A) per acre per year. To improve coverage, add a non-ionic agricultural surfactant to the spray. This spray mixture should be directed onto foliage of competitive hardwoods using knapsack or backpack sprayers with flat fan nozzles or equivalent any time after hardwoods have reached full leaf size, but before autumn coloration (when plants are actively growing). The majority of treated hardwoods should be less than 8 feet in height to ensure adequate spray coverage. **Note:** To prevent Christmas tree injury, care should be taken to direct spray away from contact with Christmas tree foliage.

Cut Surface Treatments

When treating large brush or trees or hard to control species such as ash, blackgum, choke cherry, elm, hazel, madrone, maples, oaks or sweetgum, and for applications made during drought conditions or in late summer when the leaves are mature, use cut surface treatments. (See directions for Cut Surface Treatments in preceding section of this label.)

Wetland Sites in Production Forests and Industrial Non-Crop Areas

Garlon 3A may be used within production forests and industrial non-crop sites to control target vegetation in and around standing water sites, such as marshes, wetlands, and the banks of ponds and lakes and transition areas between upland and lowland sites.

For control of woody plants and broadleaf weeds in these sites, follow use directions and application methods on this label for forestry and terrestrial non-cropland sites.

Use Precautions

Minimize overspray to open water when treating target vegetation in and around non-flowing, quiescent or transient water. When making applications to control unwanted plants on banks or shorelines of flowing water, minimize overspray to open water. **Note:** Consult local public water control authorities before applying this product in and around public water. Permits may be required to treat such areas.

Terms and Conditions of Use

If terms of the following Warranty Disclaimer, Inherent Risks of Use, and Limitation of Remedies are not acceptable, return unopened package at once to the seller for a full refund of purchase price paid. Otherwise, use by the buyer or any other user constitutes acceptance of the terms under Warranty Disclaimer, Inherent Risks of Use and Limitations of Remedies.

Warranty Disclaimer

Dow AgroSciences warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes stated on the label when used in strict accordance with the directions, subject to the inherent risks set forth below. Dow AgroSciences MAKES NO OTHER EXPRESS OR IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER EXPRESS OR IMPLIED WARRANTY.

Inherent Risks of Use

It is impossible to eliminate all risks associated with use of this product. Plant injury, lack of performance, or other unintended consequences may result because of such factors as use of the product contrary to label instructions (including conditions noted on the label, such as unfavorable temperature, soil conditions, etc.), abnormal conditions (such as excessive rainfall, drought, tornadoes, hurricanes), presence of other materials, the manner of application, or other factors, all of which are beyond the control of Dow AgroSciences or the seller. All such risks shall be assumed by buyer.

Limitation of Remedies

The exclusive remedy for losses or damages resulting from this product (including claims based on contract, negligence, strict liability, or other legal theories), shall be limited to, at Dow AgroSciences' election, one of the following:

1. Refund of purchase price paid by buyer or user for product bought, or
2. Replacement of amount of product used.

Dow AgroSciences shall not be liable for losses or damages resulting from handling or use of this product unless Dow AgroSciences is promptly notified of such loss or damage in writing. In no case shall Dow AgroSciences be liable for consequential or incidental damages or losses.

The terms of the Warranty Disclaimer, Inherent Risks of Use, and this Limitation of Remedies cannot be varied by any written or verbal statements or agreements. No employee or sales agent of Dow AgroSciences or the seller is authorized to vary or exceed the terms of the Warranty Disclaimer or this Limitation of Remedies in any manner.

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Dow AgroSciences LLC • Indianapolis, IN 46268 U.S.A.

Label Code: D02-101-037
Replaces Label: D02-101-036
LOES Number: 010-00084

EPA-Accepted 12/03/02

Revisions:

1. Corrected Example Calculation 2 on page 10: = $(800 \times 3.912) - 160/3.33$.

GLUFOSINATE GROUP 10 HERBICIDE

Cheetah Pro

**A COMPLETE BROAD SPECTRUM
NONSELECTIVE POSTEMERGENCE
HERBICIDE**

ACTIVE INGREDIENT:

Glufosinate ammonium* 24.5%**

OTHER INGREDIENTS: 75.5%

TOTAL: 100.0%

*CAS Number 77182-82-2

**Equivalent to 2.34 pounds of active ingredient per gallon

Shake Well, Agitate or Recirculate Before Use

**KEEP OUT OF REACH OF
CHILDREN
CAUTION**

Si usted no entiende la etiqueta busque a alguien para que se la explique a usted en detalle. (If you do not understand the label find someone to explain it to you in detail)

SEE INSIDE BOOKLET FOR ADDITIONAL FIRST AID AND PRECAUTIONARY STATEMENTS

For Chemical Spill, Leak, Fire, or Exposure,
Call CHEMTREC (800) 424-9300

For Medical Emergencies Only, Call (877) 325-1840

FIRST AID	
IF SWALLOWED	<ul style="list-style-type: none"> • Call a poison control center or doctor immediately for treatment advice. • Have person sip a glass of water if able to swallow. • Do not induce vomiting unless told to do so by a poison control center or doctor. • Do not give anything by mouth to an unconscious person.
IF ON SKIN OR CLOTHING	<ul style="list-style-type: none"> • Take off contaminated clothing. • Rinse skin immediately with plenty of water for 15 to 20 minutes. • Call a poison control center or doctor for treatment advice.
IF IN EYES	<ul style="list-style-type: none"> • Hold eye open and rinse slowly and gently with water for 15 to 20 minutes. • Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. • Call a poison control center or doctor for treatment advice.
IF INHALED	<ul style="list-style-type: none"> • Move person to fresh air. • If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible. • Call a poison control center or doctor for treatment advice.
HOT LINE NUMBER	
Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact 1-877-325-1840 for emergency medical treatment information.	
NOTE TO PHYSICIAN	
If this product is ingested, endotracheal intubation and gastric lavage should be performed as soon as possible, followed by charcoal and sodium sulfate administration.	

EPA Reg. No. 228-743

Manufactured for
Nufarm Americas Inc.
11901 S. Austin Avenue
Alsip, IL 60803



**Net Contents
2.5 Gal.
(9.46 L)
Nonrefillable Container**

**PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS AND DOMESTIC ANIMALS**

CAUTION

Harmful if swallowed or absorbed through skin. Causes moderate eye irritation. Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals. Avoid contact with skin, eyes or clothing. Avoid breathing vapor.

Personal Protective Equipment (PPE)

Applicators and other handlers must wear:

- Long sleeved shirt and long pants;
- Chemical-resistant gloves;
- Shoes and socks;
- Protective eyewear (goggles, face shield or safety glasses).

Mixers/loaders supporting aerial applications must wear a minimum of a NIOSH approved filtering face piece respirator with any N filter (TC-84A). You can also use other NIOSH approved particulate respirators that offer more protection.

Applicators using groundboom equipment with open cabs to treat cotton must wear long-sleeve shirts, long pants, shoes, and socks plus chemical-resistant gloves.

Mixers/loaders supporting groundboom applications to corn, canola, soybean, cotton, citrus fruit, pome fruit, stone fruit, and olives must wear long-sleeve shirts, long pants, shoes, and socks plus chemical-resistant gloves.

Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product. Do not reuse them. Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry.

USER SAFETY RECOMMENDATIONS

Users should:

- Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon possible, wash thoroughly and change into clean clothing.

ENGINEERING CONTROLS STATEMENT

When handlers use closed systems, enclosed cabs, or aircraft in a manner that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides [(40 CFR 170.240(d)(4-6)], the handler PPE requirements may be reduced or modified as specified in the WPS.

ENVIRONMENTAL HAZARDS

Do not apply directly to water or to areas where surface water is present. Do not apply to intertidal areas below the mean high water mark. Do not contaminate water by cleaning of equipment or disposal of equipment washwaters or rinsate.

This pesticide is toxic to vascular plants and must be used strictly in accordance with the drift and run-off precautions on this label in order to minimize off-site exposures.

Under some conditions, this product may have a potential to run-off to surface water or adjacent land. Where possible, use methods which reduce soil erosion, such as no tillage to reduce pesticide run-off. Use of vegetation filter strips along rivers, creeks, streams, wetlands, etc. or on the downhill side of fields where run-off could occur to minimize water run-off is recommended.

PHYSICAL AND CHEMICAL HAZARDS

Do not mix or allow contact with oxidizing agents. Hazardous chemical reaction may occur.

Combustible. Do not use or store near heat or open flame.

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

Do not use this product until you have read the entire label. Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.

In the State of New York Only: Not for use in Nassau and Suffolk Counties.

AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses; and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE), and restricted-entry intervals. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Restricted entry-interval (REI) 12 hours for all post-application activities, with the following exception: Workers engaged in scouting or irrigation activities in corn, canola, and soybeans is 4 days. The REI for workers to move irrigation piping is 7 days for all crops.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is:

- Coveralls worn over short-sleeved shirt and short pants;
- Chemical resistant gloves;
- Chemical resistant footwear plus socks;
- Protective eyewear (goggles, face shield or safety glasses).

NON-AGRICULTURAL USE REQUIREMENTS

The requirements in this box apply to uses of this product that are NOT within the scope of the Worker Protection Standard for agricultural pesticides (40 CFR Part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, or greenhouses. Do not enter or allow others to enter treated areas until sprays have dried.

PRODUCT INFORMATION

This product may be applied for the control of undesirable plant vegetation, including emerged annual and perennial grass, sedge and broadleaf weeds in a variety of settings. This product is foliar-active with little or no activity in soil. Weeds that emerge after application will not be controlled. Necrosis of leaves and young shoots occur within 2 to 4 days after application under active growing conditions.

RESISTANCE MANAGEMENT

For resistance management, this product is a Group 10 herbicide. Any weed population may contain or develop plants naturally resistant to this product and other Group 10 herbicides. The resistant biotypes may dominate the weed population if these herbicides are used repeatedly in the same area. Appropriate resistance management strategies should be followed.

To delay herbicide resistance take one or more of the following steps:

- Rotate the use of this product or other Group 10 herbicides within a growing season sequence or among growing seasons with different herbicide groups that control the same weeds.
- Use tank mixtures with herbicides from a different group if such use is permitted; where information on resistance in target weed species is available, use the less resistance-prone partner at a rate that will control the target weed(s) equally as well as the more resistance-prone partner. Consult your local extension service or certified crop advisor if you are unsure as to which active ingredient is currently less prone to resistance.
- Adopt an integrated weed-management program for herbicide use that includes scouting and uses historical information related to herbicide use and that considers mechanical control methods, cultural (e.g., timing to favor the turf and not the weeds), biological (weed-competitive varieties) and other management practices.
- Scout before and after herbicide application to monitor weed populations for early signs of resistance development. Indicators of possible herbicide resistance include: (1) failure to control a weed species normally controlled by the herbicide at the dose applied, especially if control is achieved on adjacent weeds; (2) a spreading patch of non-controlled plants of a particular weed species; (3) surviving plants mixed with controlled individuals of the same species. If resistance is suspected, prevent weed seed production in the affected area by an alternative herbicide from a different group or by a mechanical method. Prevent movement of resistant weed seeds to other areas by cleaning equipment.
- If a weed pest population continues to progress after treatment with this product, discontinue use of this product, and switch to another management strategy or herbicide with a different mode of action, if available.
- Contact your local extension specialist or certified crop advisors for additional pesticide resistance-management and/or integrated weed-management recommendations for specific crops and weed biotypes.
- For further information or to report non-performance or suspected resistance, contact Nufarm at 1-800-345-3330

APPLICATION METHODS

When applied as directed in this label, this herbicide controls annual and perennial weeds. Applications may be made on a broadcast, banded or spot treatment basis. Avoid direct spray or drift to desirable vegetation. Regrowth may occur due to the weed stage of growth at application, low use rate, or environmental conditions. Repeat treatments may be necessary to control plants generating from underground parts or seed.

Application Restrictions:

- Do not apply this product through any type of irrigation system.
- Do not apply directly to or allow drift to contact desirable green tissue or green, thin, or uncalloused bark of desirable vegetation.
- Do not allow grazing of vegetation treated with this product.

Application Precautions:

- Uniform, thorough spray coverage is necessary to achieve consistent weed control.
- This product is rainfast 4 hours after application to most weed species; therefore, rainfall within 4 hours may necessitate retreatment or may result in reduced weed control.
- Weed control may be reduced if application is made when heavy dew, fog, and mist/rain are present; or when weeds are under stress due to environmental conditions such as drought, cool temperatures, or extended periods of cloudiness.
- Plants may be safely planted into treated areas after spray has dried.

Compatibility Testing:

- If this product is to be mixed with pesticides, test the compatibility of the intended tank mixture prior to mixing the products in the spray tank. The following procedure assumes a spray volume of 25 gallons per acre. For other spray volumes, adjust the amount of the water used accordingly. Check compatibility as follows:
- Place 1 pint of water from the source that will be used to prepare the spray solution in a clear 1 quart jar.
- For each pound of a dry tank mix partner to be applied per acre, add 1.5 teaspoons to the jar.
- For each 16 fluid ounces of a liquid tank mix partner to be applied per acre, add 0.5 teaspoon to the jar.
- For each 16 fluid ounces of this product to be applied per acre, add 0.5 teaspoon to the jar.
- After adding all the ingredients, place a lid on the jar and tighten. Invert 10 times to mix.
- Let the mixture stand for 15 minutes and evaluate the solution for uniformity and stability. Look for separation, large flakes, precipitates, gels, heavy oily film on the jar, or other signs of incompatibility. If the tank mix partners are not compatible, do not use the mixture in a spray tank.
- After compatibility testing is complete, dispose of any pesticide wastes in accordance with the STORAGE AND DISPOSAL section of this label.

MIXING INSTRUCTIONS:

Tank Mix Instructions: It is the pesticide user's responsibility to ensure that all products are registered for the intended use. Read and follow the applicable restrictions and limitations and directions for use on all product labels involved in tank mixing. Users must follow the most restrictive directions for use and precautionary statements of each product in the tank mixture. Prior to adding this product to the spray tank, ensure that the spray tank is thoroughly clean, particularly if an herbicide with the potential to injure crops was previously used (see Cleaning Instructions).

Mix this product with water to make a finished spray solution as follows:

1. Properly calibrate and clean equipment
2. Fill the spray tank half full with water.
3. Start agitation.
4. If mixing with a flowable/wettable powder tank mix partner, prepare a slurry of the proper amount of the product in a small amount of water. Add the slurry to the spray tank.
5. If hard water is a concern, add 17 lbs per 100 gallons of spray solution of ammonium sulfate (AMS) to the spray tank. No surfactant is required when applying this product.
6. If mixing with a liquid tank mix partner, add the liquid mix partner next.
7. Complete filling the spray tank with water before adding this product, as foaming may occur.
8. Add the proper amount of this product and continue agitation.
9. If foaming occurs, use a silicone-based antifoam agent.

Ensure that all spray system lines including pipes, booms, etc. have the correct concentration of spray solution by flushing out the spray system lines before starting the crop application. Maintain good agitation at all times until contents of the tank are sprayed. If the spray mixture is allowed to settle, thorough agitation is required to re-suspend the mixture before spraying is resumed. Keep bypass line on or near bottom of tank to minimize foaming. Screen size in nozzles or line strainers must be 50 mesh or larger.

Cleaning Instructions:

Before using this product, thoroughly clean bulk storage tank, refillable tank, nurse tanks, spray tank, lines, and filter, particularly if an herbicide with the potential to injure crops was previously used. Thoroughly rinse equipment using a commercial tank cleaner and as instructed on the prior herbicide label.

After using this product, triple rinse the spray equipment and clean with a commercial tank cleaner before using the equipment. Make sure any rinsate or foam is thoroughly removed from spray tank and boom. Rinsate may be disposed following the pesticide disposal directions on this label.

MANDATORY SPRAY DRIFT MITIGATION

- When applying to crops via aerial application equipment, the spray boom must be mounted on the aircraft so as to minimize drift caused by wing tip or rotor blade vortices. The boom length must not exceed 75% of the wingspan or 90% of the rotor blade diameter.
- When applying to crops via aerial application equipment, applicators must use ½ swath displacement upwind at the downwind edge of the field.
- Do not apply when wind speeds exceed 10 miles per hour at the application site.
- Do not apply during temperature inversions.
- Spray the appropriate boom height based on nozzle selection and nozzle spacing, but do not exceed a boom height of 24 inches above target pest or crop canopy. Set boom to lowest effective height over the target pest or crop canopy based on equipment manufacturer's directions. Automated boom height controllers are recommended with large booms to better maintain optimum nozzle to canopy height. Excessive boom height will increase the potential for spray drift.
- For aerial applications, do not release spray at a height greater than 10 feet above the crop canopy, unless a greater application height is required for pilot safety.
- For non-crop vegetation management ground applications, apply with the nozzle height no more than 4 feet above the ground or target vegetation, unless necessitated by the application equipment. Examples would include roadside, railroad, utility rights of way, forestry and other industrial vegetation management applications where safety or natural barriers obstruct application.
- For ground applications and aerial applications, select nozzle and pressure that deliver medium to coarse spray droplets as indicated in nozzle manufacturer's catalogues and in accordance with ASABE Standard 572.1.

ADVISORY SPRAY DRIFT LANGUAGE

POLLINATOR ADVISORY STATEMENT

This product contains an herbicide. Follow all label directions and precautions to minimize potential off-target exposure in order to prevent effects to non-target plants adjacent to the treated site which may serve as habitat or forage for pollinators.

SPRAY DRIFT MANAGEMENT

The interaction of many equipment and weather-related factors determines the potential for spray drift. The applicator is responsible for considering all these factors when making application decisions.

• Importance of Droplet Size

The most effective way to reduce drift potential is to apply large droplets. The best drift management strategy is to apply the largest droplets that provide sufficient coverage and control. The presence of sensitive species nearby, the environmental conditions, and pest pressure may affect how an applicator balances drift control and coverage. **APPLYING LARGER DROPLETS REDUCES DRIFT POTENTIAL, BUT WILL NOT PREVENT DRIFT IF APPLICATIONS ARE MADE IMPROPERLY OR UNDER UNFAVORABLE ENVIRONMENTAL CONDITIONS!** See Wind, Temperature and Humidity, and Temperature Inversions sections of this label.

• Techniques for Controlling Droplet Size

• Volume – Use high flow rate nozzles to apply the highest practical spray volume. Nozzles with higher rated flows produce larger droplets.

• Pressure – Use the lower spray pressures recommended for the nozzle. Higher pressure reduces droplet size and does not improve canopy penetration. **WHEN HIGHER FLOW RATES ARE NEEDED, USE A HIGHER-CAPACITY NOZZLE INSTEAD OF INCREASING PRESSURE.**

• Nozzle Type – Use a nozzle type that is designed for the intended application. With most nozzle types, narrow spray angles produce larger droplets. Consider using low-drift nozzles.

• Controlling Droplet Size – Aircraft

• Number of Nozzles – Use the minimum number of nozzles with the highest flow rate that provide uniform coverage.

• Nozzle Orientation – Orienting nozzles so that the spray is emitted backwards, parallel to the airstream will produce larger droplets than other orientations. **AVOIDING SPRAY DRIFT IS THE RESPONSIBILITY OF THE APPLICATOR.**

• Nozzle Type – Solid stream nozzles (such as disc and core with swirl plate removed) oriented straight back produce larger droplets than other nozzle types.

• Boom Length – Longer booms increase drift potential. Therefore a shorter boom length is recommended.

• Application height – Application more than 10 ft. above the canopy increases the potential for spray drift.

• Boom Height

Setting the boom at the lowest referenced height (if specified) which provides uniform coverage reduces the exposure of droplets to evaporation and wind. For ground equipment, the boom should remain level with the crop and have minimal bounce.

• Drift Reduction Technology (DRT)

The EPA Drift Reduction Technology (DRT) Program was developed to encourage the manufacturer, marketing, and use of spray technologies scientifically verified to significantly reduce pesticide drift. The use of DRTs should result in significantly less pesticide from spray applications drifting and being deposited in areas not targeted by those applications, compared to spray technologies that do not meet the minimum DRT standard. EPA-verified drift reduction technologies (DRTs) and their ratings will be added to the following webpage when they become available: <https://www.epa.gov/reducing-pesticide-drift/epa-verified-and-rated-drift-reduction-technologies>

- Wind

Drift potential increases at wind speeds of less than 3 mph (due to inversion potential) or more than 10 mph. However, many factors including droplet size and equipment type determine drift potential at any given wind speed. **AVOID APPLICATIONS DURING GUSTY OR WINDLESS CONDITIONS.** Note: Local terrain can influence wind patterns. Every applicator needs to be familiar with local wind patterns and how they affect spray drift.

- Temperature and Humidity

When making applications in hot and dry conditions, set up equipment to produce larger droplets to reduce effects of evaporation.

- Temperature Inversions

Drift potential is high during a temperature inversion. Temperature inversions restrict vertical air mixing, which causes small suspended droplets to remain close to the ground and move laterally in a concentrated cloud. Temperature inversions are characterized by increasing temperature with altitude and are common on nights with limited cloud cover and light to no wind. They begin to form as the sun sets and often continue into the morning. Their presence can be indicated by ground fog; however, if fog is not present, inversions can also be identified by the movement of smoke from a ground source or an aircraft smoke generator. Smoke that layers and moves laterally in a concentrated cloud (under low wind conditions) indicates an inversion, while smoke that moves upward and rapidly dissipates indicates good vertical air mixing.

- Shielded Sprayers

Shielding the boom or individual nozzles can reduce the effects of wind. However, it is the responsibility of the applicator to verify that the shields are preventing drift and not interfering with uniform deposition of the product.

USE SITES AND APPLICATION DIRECTIONS

When applied as directed, this product non-selectively controls undesirable plant vegetation in the following areas: airfields, airports, alleys, lanes, paths, trails, access roads, around commercial or industrial structures or outbuildings, around farm and ranch structures and outbuildings, around ornamental gardens, around ornamental trees and shrubs (including Christmas trees), bare ground, beaches*, campgrounds, construction sites, ditch banks, drive-in theaters, driveways and ramps, dry ditches and canals, fences and fencerows, firebreaks, golf courses, gravel yards, habitat restoration and management areas, highways and roadsides (including aprons, medians, guardrails and right of ways), industrial plant sites, industrial areas, lumber yards, landscapes and mulched areas, natural areas, parking areas, parks, paved areas, petroleum and other tank farms, pumping installations, pipeline, power, telephone and utility rights-of-way, power stations, preplant to turf and ornamental plants, railroad rights-of-way, recreation areas, refineries, resorts, schools, sidewalks, sports areas, storage areas, substations, tennis courts, shelter belts, uncropped farmstead areas, vacant lots, walkways, wastelands, wildlife habitat areas.

*Not for use in CA

RESTRICTIONS

Maximum Rate – Annual

- Do not apply more than 82 fl. oz. of this product per acre per year (1.5 lb. ai/A/year).

Maximum Rate – Single Application

- Do not apply more than 82 fl. oz. of this product per acre per single application (1.5 lb. ai/A/application).

Maximum Number of Applications Per Year

Do not apply more than a total of 3 broadcast applications per year when using reduced application rates (not to exceed a maximum of 1.5 lb. ai/A/year).

Re-treatment Interval:

- Minimum re-treatment interval is 5 days.

APPLICATION RATES

Mix 0.5 to 2.0 fl. oz. (0.009 to 0.036 lb. ai) of this product per gallon of spray solution (24 to 82 fl. oz./A (0.44 to 1.5 lb. ai/A) and apply 1 gallon of spray solution to 1,000 square feet to actively growing weeds. Determine proper use rate based on weed size in Table 1. Larger weeds will require a higher use rate and see Table 1 for details.

Table 1: USE RATE FOR THIS HERBICIDE

Apply this product at the rates listed below for broadcast applications based on weed size and stage of growth.

Weed Size and Stage	Rate of this product (Per Gallon of Water)	Rate of this product (Per Acre)
Easily Controlled Weeds < 3 in height*	0.5 fl. oz. (0.009 lb. ai)	24 fl. oz./A (0.44 lb. ai)
Weeds < 3 in height	1.0 fl. oz. (0.018 lb. ai)	48 fl. oz./A (0.88 lb. ai)
Weeds < 6 in height pre-tiller grasses	1.25 fl. oz. (0.023 lb. ai)	56 fl. oz./A (1.0 lb. ai)
Weeds > 6 in height and/or grasses that have tillered	1.25 to 2.0 fl. oz. (0.023 to 0.036 lb. ai)	56-82 fl. oz./A (1.0 to 1.5 lb. ai)

*See Weeds Controlled Table below for details.

For spot or directed spray applications by backpack sprayers, mix this product at 0.5 to 2.0 fl. oz. of product (0.009 to 0.036 lb. ai) per gallon of water. Larger and more difficult to control weeds require a higher use rate. When using the per gallon rate, calibrate sprayers to deliver 1 gallon of spray solution per 500 to 1,000 square feet. Thorough spray coverage of weeds is necessary to maximize weed control. Spray coverage needs to be uniform, but do not spray to the point of runoff. Thoroughly clean the sprayer following use. Do not make spot or directed spray applications to desired plant foliage or stems as injury may occur.

Use Restrictions:

- Do not apply this product within any enclosed structure in residential or commercial landscapes.
- Do not apply this product over-the-top as a broadcast application to ornamentals.
- Do not allow spray of this product to contact or drift onto the foliage, green stems, exposed roots or fruit of desirable plants. Avoid application of this product under conditions that favor drift of sprays onto desired ornamentals or residential lawns.

This product offers postemergence control of susceptible grasses, sedges and broadleaf weeds (See WEEDS CONTROLLED Table), as well as additional mode of action to assist in the control of resistant weeds.

IMPORTANT: Contact with spray or spray drift of this product may cause severe injury or destruction of certain desirable plants, especially herbaceous species such as bedding plants or direct seeded annual and perennial flowers. The use of spray shields that limit the plant exposure to this product is highly advised when applying this product near desirable plants.

Trim and Edge: This product may be used to trim and edge around trees, buildings, sidewalks, roads, potted plants and other objects in a nursery setting, along fences, in dry ditches and canals, and prior to planting landscape ornamentals.

Site Preparation: Following preplant applications of this product, any ornamental, nursery species or Christmas Tree species may be planted. Precautions need to be taken to protect nontarget plants during site preparation applications.

Greenhouse: This product may be used to control weeds listed on this label which are growing in greenhouses. Desirable vegetation must not be present during application and air circulation fans must be turned off.

Industrial: This product may be used to improve line-of-sight at railroad crossings and reduce the need for mowing along rights-of-way, and wayside structures. This product may be tank mixed with other herbicides for these use sites unless specifically prohibited by the product label.

Conservation Reserve Program (CRP)*: This product can be used to control undesirable vegetation when rotating out of CRP acres or to suppress competitive growth and seed production of undesirable vegetation in CRP acres. For selective applications with broadcast spray equipment, apply 48 to 56 fl. oz./A (0.88 to 1.0 lb. ai/A) of this product in early spring before desirable CRP grasses, including crested and tall wheatgrass, break dormancy and initiate green growth. Late fall applications can be made after desirable perennial grasses have reached dormancy. Some stunting of CRP perennial grasses will occur if applications are made when plants are not dormant.

* Not for use in CA

Wildlife Food Plots: This product may be used as a site preparation treatment prior to planting wildlife food plots. Any wildlife food species may be planted after applying this product, or native species may be allowed to repopulate the area. If tillage is needed to prepare a seedbed, wait 7 days after applying this product before tilling.

Dormant Bermudagrass and/or Bahiagrass*: When applied to dormant Bermudagrass and/or Bahiagrass*, this product will provide control or suppression of many winter annual weeds. Treat with 56 to 82 fl. oz./A (1.0-1.5 lb. ai/A) only when residential lawns are fully dormant in late fall or winter and prior to spring green-up. Spot treatments or broadcast applications of this product to non-dormant turfgrass may result in injury or delayed green-up. Avoid high volume and spot applications where spray volume exceeds 80 gallons per acre or injury or delayed green-up may occur. Applications to residential lawns are limited to spot treatments only. The maximum application rate must not exceed 4 fl. oz./gal. of water/1000 sq. ft. (corresponding to a rate of 0.0312 lb. ai/100 sq. ft.). Applications for renovating Bermudagrass lawns must be conducted when the weather is cool and Bermudagrass is dormant.

*Not for use in CA

Tank Mixtures: It is the pesticide user's responsibility to ensure that all products are registered for the intended use. Read and follow the applicable restrictions and limitations and directions for use on all product labels involved in tank mixing. Users must follow the most restrictive directions for use and precautionary statements of each product in the tank mixture.

This herbicide can be tank mixed with other non-selective herbicides including glyphosate and preemergence residual herbicides including flumioxazin. Follow the most restrictive label restrictions and precautions for each product. A combination with a residual herbicide including flumioxazin provides effective control of existing weeds as well as lasting residual weed control in areas such as landscape beds and xeriscapes.

WEEDS CONTROLLED

Alfalfa+	Cutleaf eveningprimrose	Mayweed	<i>Rubus</i> spp.
Alkali sida	Dallisgrass	Milkweed, common***+	Rice, red+
Amaranth, Palmer+	Dandelion	Milkweed, honeyvine***+	Rice, volunteer+
Ammannia, purple	Devil's claw*^	Millet, wild proso+	Rush, toad***
Anoda, spurred*^	Dock, curly	Millet, proso volunteer+	Ryegrass, annual**
Arrowhead, California	Dock, smooth+	Morningglory, entireleaf	Sandbur, field
Artichoke, Jerusalem+	Dodder	Morningglory, ivyleaf	Senna coffee+
Aster, white heath	Dogbane (hemp)	Morningglory, pitted	Shattercane
Barley, volunteer*^	Eclipta	Morningglory, sharppod*^	Shepherd's Purse
Barnyardgrass*	Fescue	Morningglory, smallflower+	Sicklepod (java bean)+
Beggarweed, Florida+	Fleabane, annual	Morningglory, tall+	Sida, prickly+
Bermudagrass+	Fiddleneck	Muhly, wirestem***+	Signalgrass, broadleaf*^
Bindweed, field	Filaree	Mullein, common	Smartweed, Pennsylvania
Bindweed, hedge	Filaree, redstem	Mullein, turkey	Smellmelon+
Black medic+	Foxtail, bristly+	Mustard, tansy	Sowthistle, annual
Bluegrass, annual	Foxtail, giant	Mustard, wild	Sowthistle, perennial+
Bluegrass, Kentucky	Foxtail, green	Nettle	Soybean, volunteer+
Blueweed, Texas+	Foxtail, robust purple+	Nightshade, black	Sprangletop
Brome, ripgut	Foxtail, yellow*^	Nightshade, eastern black	Spurge, prostrate*^
Bromegrass, downy	Gallinsoga, hairy+	Nightshade, hairy	Spurge, leafy
Bromegrass, smooth	Gallinsoga, small flower+	Nightshade, silverleaf+	Spurge, spotted*^
Buckwheat, wild	Geranium, cutleaf+	Nutsedge, purple	Starbur, bristly+
Buffalobur	Goosefoot	Nutsedge, yellow	Starthistle, yellow
Bulrush***	Goosegrass*^	Oat, wild*^	Stinkgrass
Burclover, California	Goldenrod, gray	Onion, wild	Sunflower, common
Burcucumber+	Gromwell, field	Orchardgrass	Sunflower, prairie*^
Burdock	Groundcherry, cutleaf	Panicum, fall*^	Sunflower, volunteer
Bursage, woolyleaf+	Groundsell, common	Panicum, Texas	Swinecress
Canarygrass	Guineagrass	Paragrass	Thistle, bull
Carpetweed	Hempnettle+	Pennycress	Thistle, Canada
Catchweed bedstraw (cleavers) *^	Henbit	Pigweed, redroot*^	Thistle, musk
Chess, soft	Horsenettle, Carolina*^	Pigweed, prostrate*^	Thistle, Russian
Chickweed, common	Horsetail	Pigweed, spiny*^	Timothy+
Chickweed, mouse-ear+	Johnsongrass, rhizome+	Pigweed, smooth*^	Torpedograss
Chinese thornapple	Johnsongrass, seedling*^	Pigweed, tumble*^	Turnip, wild
Clover, Alsike	Jimsonweed	Pineapple weed	Vaseygrass
Clover, red	Junglerice*^	Plantain	Velvetleaf*^
Clover, white	Knotweed*^	Pointsettia, wild+	Vervain
Cocklebur, common	Kochia	Poison ivy/oak	Vetch
Copperleaf, hophornbeam+	Ladysthumb+	Pokeweed+	Waterhemp, common+
Copperleaf, Virginia	Lambsquarters, common	Puncturevine	Waterhemp, tall+
Corn, volunteer+	Lettuce, miners	Purslane, common*^	Wheat, volunteer
Cotton, volunteer+	Lettuce, prickly	Pusley, Florida+	Willowherb, panicle
Crabgrass, large*^	London rocket	Quackgrass	Windgrass
Crabgrass, smooth*^	Lovegrass	Radish, wild	Witchgrass
Croton, tropic*^	Mallow, common	Ragweed, common	Woodsorrel
Croton, woolly*^	Mallow, Venice+	Ragweed, giant	Wormwood, biennial+
Cudweed	Malva (little mallow)	Redmaids	Yarrow, common
Cupgrass, woolly	Marestail	Rocket, yellow	
	Marshelder, annual+	Rose, wild	

+Not for use in CA

^Use rate in CA 24 fl. oz./A (0.44 lb. ai)

*easily controlled species

**apply to annual ryegrass prior to 3 inches in height

***indicates suppression only

STORAGE AND DISPOSAL

Do not contaminate water, food, feed or seed by storage or disposal.

PESTICIDE STORAGE: Do not use or store near heat or open flame. Keep container tightly closed and dry in a cool, well ventilated place. Storage temperature must not exceed 125° F. If storage temperature of this product is below 32° F, the material must not be pumped until its temperature exceeds 32° F. Protect against direct sunlight.

PESTICIDE DISPOSAL: Pesticide wastes are toxic. Improper disposal of excess pesticide, spray mixture or rinsate is a violation of Federal law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency or the Hazardous Waste Representative at the nearest EPA Regional Office for guidance.

CONTAINER HANDLING:

NOTE: This product is available in multiple containers. Refer to the Net Contents section of this products labeling for the applicable "No refillable" or "Refillable" designation. Follow the container handling instructions below that apply to your container type / size.

Non-refillable Containers 5 Gallons or Less: Non-refillable container. Do not reuse or refill this container. Offer for recycling if available. Triple rinse container (or equivalent) promptly after emptying. **Triple rinse as follows:** Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedures approved by State and local authorities. Plastic containers are also disposable by incineration, or, if allowed by State and local authorities, by burning. If burned stay out of smoke.

Non-refillable Containers Larger than 5 Gallons: Non-refillable container. Do not reuse or refill this container. Offer for recycling if available. Triple rinse or pressure rinse container (or equivalent) promptly after emptying. **Triple rinse as follows:** Empty the remaining contents into application equipment or a mix tank. Fill the container 1/4 full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times. **Pressure rinse as follows:** Empty the remaining contents into application equipment or a mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container, and rinse at about 40 psi for at least 30 seconds. Drain for 10 seconds after the flow begins to drip.

Refillable Containers Larger than 5 Gallons: Refillable container. Refill this container with pesticide only. Do not reuse this container for any other purpose. Cleaning the container before final disposal is the responsibility of the person disposing of the container. Cleaning before refilling is the responsibility of the refiller. To clean the container before final disposal, empty the remaining contents from this container into application equipment or a mix tank. Fill the container about 10% full with water and, if possible, spray all sides while adding water. If practical, agitate vigorously or recirculate water with the pump for two minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times. Then offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration, or by other procedures allowed by state and local authorities.

Refillable Container: Refill this container with pesticide only. Do not reuse this container for any other purpose. Close all openings and replace all caps. Contact Nufarm's Customer Service Department at 1-800-345-3330 to arrange for return of the empty refillable container.

WARRANTY DISCLAIMER

The directions for use of this product must be followed carefully. TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, (1) THE GOODS DELIVERED TO YOU ARE FURNISHED "AS IS" BY MANUFACTURER OR SELLER AND (2) MANUFACTURER AND SELLER MAKE NO WARRANTIES, GUARANTEES, OR REPRESENTATIONS OF ANY KIND TO BUYER OR USER, EITHER EXPRESS OR IMPLIED, OR BY USAGE OF TRADE, STATUTORY OR OTHERWISE, WITH REGARD TO THE PRODUCT SOLD, INCLUDING, BUT NOT LIMITED TO MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, USE, OR ELIGIBILITY OF THE PRODUCT FOR ANY PARTICULAR TRADE USAGE. UNINTENDED CONSEQUENCES, INCLUDING BUT NOT LIMITED TO INEFFECTIVENESS, MAY RESULT BECAUSE OF SUCH FACTORS AS THE PRESENCE OR ABSENCE OF OTHER MATERIALS USED IN COMBINATION WITH THE GOODS, OR THE MANNER OF USE OR APPLICATION, INCLUDING WEATHER, TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, ALL OF WHICH ARE BEYOND THE CONTROL OF MANUFACTURER OR SELLER AND ASSUMED BY BUYER OR USER. THIS WRITING CONTAINS ALL OF THE REPRESENTATIONS AND AGREEMENTS BETWEEN BUYER, MANUFACTURER AND SELLER, AND NO PERSON OR AGENT OF MANUFACTURER OR SELLER HAS ANY AUTHORITY TO MAKE ANY REPRESENTATION OR WARRANTY OR AGREEMENT RELATING IN ANY WAY TO THESE GOODS.

LIMITATION OF LIABILITY

TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, IN NO EVENT SHALL MANUFACTURER OR SELLER BE LIABLE FOR SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, OR FOR DAMAGES IN THEIR NATURE OF PENALTIES RELATING TO THE GOODS SOLD, INCLUDING USE, APPLICATION, HANDLING, AND DISPOSAL. TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, MANUFACTURER OR SELLER SHALL NOT BE LIABLE TO BUYER OR USER BY WAY OF INDEMNIFICATION TO BUYER OR TO CUSTOMERS OF BUYER, IF ANY, OR FOR ANY DAMAGES OR SUMS OF MONEY, CLAIMS OR DEMANDS WHATSOEVER, RESULTING FROM OR BY REASON OF, OR ARISING OUT OF THE MISUSE, OR FAILURE TO FOLLOW LABEL WARNINGS OR INSTRUCTIONS FOR USE, OF THE GOODS SOLD BY MANUFACTURER OR SELLER TO BUYER. TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, ALL SUCH RISKS SHALL BE ASSUMED BY THE BUYER, USER, OR ITS CUSTOMERS. TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, BUYER'S OR USER'S EXCLUSIVE REMEDY, AND MANUFACTURER'S OR SELLER'S TOTAL LIABILITY SHALL BE FOR DAMAGES NOT EXCEEDING THE COST OF THE PRODUCT.

If you do not agree with or do not accept any of directions for use, the warranty disclaimers, or limitations on liability, do not use the product, and return it unopened to the Seller, and the purchase price will be refunded.

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NOTES

NOTES

GLUFOSINATE GROUP 10 HERBICIDE

Cheetah Pro

A COMPLETE BROAD SPECTRUM NONSELECTIVE POSTEMERGENCE HERBICIDE

ACTIVE INGREDIENT:

Glufosinate ammonium* 24.5%**
OTHER INGREDIENTS: 75.5%
TOTAL: 100.0%

*CAS Number 77182-82-2

**Equivalent to 2.34 pounds of active ingredient per gallon

Shake Well, Agitate or Recirculate Before Use

KEEP OUT OF REACH OF CHILDREN CAUTION

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand this label, find someone to explain it to you in detail.)
SEE INSIDE LABEL BOOKLET FOR ADDITIONAL PRECAUTIONARY STATEMENTS AND DIRECTIONS FOR USE

For Chemical Spill, Leak, Fire, or Exposure, Call CHEMTREC (800) 424-9300. For Medical Emergencies Only, Call (877) 325-1840.

FIRST AID	
IF SWALLOWED	<ul style="list-style-type: none"> • Call a poison control center or doctor immediately for treatment advice. • Have person sip a glass of water if able to swallow. • Do not induce vomiting unless told to do so by a poison control center or doctor. • Do not give anything by mouth to an unconscious person.
IF ON SKIN OR CLOTHING	<ul style="list-style-type: none"> • Take off contaminated clothing. • Rinse skin immediately with plenty of water for 15 to 20 minutes. • Call a poison control center or doctor for treatment advice.
IF IN EYES	<ul style="list-style-type: none"> • Hold eye open and rinse slowly and gently with water for 15 to 20 minutes. • Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. • Call a poison control center or doctor for treatment advice.
IF INHALED	<ul style="list-style-type: none"> • Move person to fresh air. • If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible. • Call a poison control center or doctor for treatment advice.
HOT LINE NUMBER	
Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact 1-877-325-1840 for emergency medical treatment information.	
NOTE TO PHYSICIAN	
If this product is ingested, endotracheal intubation and gastric lavage should be performed as soon as possible, followed by charcoal and sodium sulfate administration.	

EPA Reg. No. 228-743

EPA Est. No. indicated by the first two letters of the batch number on this package
(VA) 70815-GA-002, (GR) 228-MS-001

Manufactured for
 Nufarm Americas Inc.
 11901 S. Austin Avenue
 Alsip, IL 60803

PRECAUTIONARY STATEMENTS HAZARDS TO HUMANS AND DOMESTIC ANIMALS CAUTION

Harmful if swallowed or absorbed through skin. Causes moderate eye irritation. Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals. Avoid contact with skin, eyes or clothing. Avoid breathing vapor.

STORAGE AND DISPOSAL

Do not contaminate water, food, feed or seed by storage or disposal. **PESTICIDE STORAGE:** Do not use or store near heat or open flame. Keep container tightly closed and dry in a cool, well ventilated place. Storage temperature must not exceed 125° F. If storage temperature of this product is below 32° F, the material must not be pumped until its temperature exceeds 32° F. Protect against direct sunlight. **PESTICIDE DISPOSAL:** Pesticide wastes are toxic. Improper disposal of excess pesticide, spray mixture or rinsate is a violation of Federal law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency or the Hazardous Waste Representative at the nearest EPA Regional Office for guidance. **CONTAINER HANDLING: NOTE:** This product is available in multiple containers. Refer to the Net Contents section of this products labeling for the applicable "No refillable" or "Refillable" designation. Follow the container handling instructions below that apply to your container type / size. **Non-refillable Containers 5 Gallons or Less:** Non-refillable container. Do not reuse or refill this container. Offer for recycling if available. Triple rinse container (or equivalent) promptly after emptying. **Triple rinse as follows:** Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedures approved by State and local authorities. Plastic containers are also disposable by incineration, or, if allowed by State and local authorities, by burning. If burned stay out of smoke. **Non-refillable Containers Larger than 5 Gallons:** Non-refillable container. Do not reuse or refill this container. Offer for recycling if available. Triple rinse or pressure rinse container (or equivalent) promptly after emptying. **Triple rinse as follows:** Empty the remaining contents into application equipment or a mix tank. Fill the container 1/4 full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times. **Pressure rinse as follows:** Empty the remaining contents into application equipment or a mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container, and rinse at about 40 psi for at least 30 seconds. Drain for 10 seconds after the flow begins to drip. **Refillable Containers Larger than 5 Gallons:** Refillable container. Refill this container with pesticide only. Do not reuse this container for any other purpose. Cleaning the container before final disposal is the responsibility of the person disposing of the container. Cleaning before refilling is the responsibility of the refiller. To clean the container before final disposal, empty the remaining contents from this container into application equipment or a mix tank. Fill the container about 10% full with water and, if possible, spray all sides while adding water. If practical, agitate vigorously or recirculate water with the pump for two minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times. Then offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration, or by other procedures allowed by state and local authorities. **Refillable Container:** Refill this container with pesticide only. Do not reuse this container for any other purpose. Close all openings and replace all caps. Contact Nufarm's Customer Service Department at 1-800-345-3330 to arrange for return of the empty refillable container.

PULL HERE TO OPEN

RV091918

Appendix G
**Recommended Florida Native
Beach and Dune Plants for
Beachfront Properties and
Dune Restoration (FDEP)**



Appendix G

Recommended Florida Native Beach and Dune Plants for Beachfront Properties and Dune Restoration

Notes:

1. Salt tolerance: high (tolerant of heavy and frequent salt spray, salt water flooding); moderate (tolerant of salt spray but subject to leaf burn from heavy salt spray or root damage from flooding); low (tolerant of salt laden air and short duration, infrequent salt water flooding but usually in protected areas).
2. Region: NW = northwest Florida Panhandle; SW = Pinellas to Collier counties; NE = Nassau to Volusia counties; SE = Brevard to Dade counties; Keys = restricted to the Florida Keys and adjacent Dade and Monroe County islands. Regions have primarily been determined by the historic distribution of the plant in Florida's coastal upland natural communities, not necessarily by the range of areas or habitats where the plant could survive.
3. Soil Moisture: moist (subject to flooding as within low dune swales); moderate (not subject to frequent flooding but not adapted to deepest sands or driest conditions); dry (adapted to deep sands, dune ridges, or well drained rocky soils); and variations for plants adapted across a range of conditions.

References:

1. Nelson, Gil. 2003. Florida's Best Native Landscape Plants: 200 readily available species for homeowners and professionals. Florida Association of Native Nurseries. University Presses of Florida.
2. Williams, M.J. 2007. Native Plants for Coastal Dune Resotration: what, when and how for Florida. USDA, NRCS, Brooksville Plant Materials Center, Brooksville, Florida.
3. Wunderlin, Richard P., etal. Plant Atlas. University of South Florida (www.plantatlas.usf.edu).

Scientific Name	Common Name	Salt tolerance	Region (NW/SW/NE/SE/Keys)	Soil Moisture
Dune Grasses				
<i>Distichlis spicata</i>	salt grass	high	all	moist
<i>Muhlenbergia capillaris</i> var. <i>filipes</i>	Gulf hairawn muhly grass	moderate	all	moderate
<i>Panicum amarum</i>	bitter panic grass	high	all	dry
<i>Panicum vaginatum</i>	seashore paspalum	high	all	moderate
<i>Schizachyrium scoparium</i>	coastal bluestem	high	all	moderate
<i>Spartina patens</i>	marshhay	high	all	moderate
<i>Sporobolus virginicus</i>	seashore dropseed	high	all	moist
<i>Uniola paniculata</i>	sea oats	high	all	dry

Scientific Name	Common Name	Salt tolerance	Region (NW/SW/NE/SE/Keys)	Soil Moisture
Groundcovers				
Borrichia arborescens	sea oxeye	high	SW, SE, Keys	moist
Borrichia frutescens	sea oxeye	high	all	moist
Ernodea littoralis	golden beach creeper	high	SW, SE, Keys	moderate - dry
Gaillardia pulchella	blanket flower	moderate	all	dry
Helianthus debilis	East Coast dune sunflower	high	NE, SE, Keys	dry
Helianthus debilis spp. cucumerifolius	cucumber leaf dune sunflower	high	NW, SW	dry
Helianthus debilis ssp. vestitus	West Coast dune sunflower	high	SW	dry
Hymenocallis latifolia	beach spider lily	high	SW, NE, SE, Keys	moist - dry
Ipomoea imperati	beach morning glory	high	all	moderate - dry
Ipomoea pes-caprae	railroad vine	high	all	moderate - dry
Iva imbricata	beach elder	high	all	moist – dry
Sesuvium portulacastrum	sea purslane	high	all	moist - moderate
Solidago sempervirens	seaside goldenrod	high	NW, SW, NE, SE	moist – moderate
Yucca filamentosa	Adam’s needle	moderate	NW, SW, NE, SE	dry

Coastal Construction Control Line Program
Division of Water Resource Management
Florida Department of Environmental Protection
2600 Blair Stone Road, Mail Station 3522
Tallahassee, Florida 32399
850/245-7672
john.wettstein@dep.state.fl.us
www.floridadep.org/beaches

Appendix H

DMMA Site Inspection Sheet



Sebastian Inlet District
Dredge Material and Management Area (DMMA) Inspection Sheets
Inspection Date:



Inspector Name:	
Inspection Time:	
Contacted SID/SISP (Date)	

Inspection Item	Previous Maintenance	Maintenance YES	Maintenance NO	Observation and General Notes <i>(Please Include DMMA Aerial With Inspection Sheets)</i>
Vegetation				
<i>General Veg Coverage (Denote Problems, Observations)</i>				
<i>Nuisance / Exotic Veg (Denote Name and Areas)</i>				
<i>Is Woody Vegetation Present</i>				
<i>Identify Bare / Open Areas</i>				
<i>Is Nuisance Treatment Required</i>				
<i>Is Mowing / Hand Trimming Required</i>				
<i>Is Fence Spraying Required</i>				
Berm				
<i>Erosion Issues (Denote Area)</i>				
<i>Is Seeding Required (Denote Area)</i>				
<i>Geotextile Liner Visible</i>				
Structures				
<i>Security Fence (Denote Breeches in Structure, Stability)</i>				
<i>Main Gate (Denote Condition Including Roller Bar and Wheel Conditions)</i>				
<i>Side Gate (Denote Condition)</i>				
<i>Gate Lock and Chain (Condition, Replacement)</i>				
<i>Berm Road (Denote Condition, Issues)</i>				
<i>Stormwater Structures (Stop Logs, Junction Box and Mitered-End Sections)</i>				
Wildlife				
<i>Gopher Tortoise Burrows Observed</i>				
<i>Dig Defence (Denote Condition and Issue Areas)</i>				
<i>Main Gate Belting (Denote Gaps, Tears, Missing/Replacement Carabiners)</i>				
<i>Side Gate Belting (Denote Gaps, Tears, Missing/Replacement Carabiners)</i>				
<i>Noted Wildlife Utilization</i>				
General				
<i>Trash and Debris</i>				
<i>Additional Issues/Concerns</i>				

Appendix I

Lessons Learned Memorandum



