Hawaii Department of Land and Natural Resources
Division of Forestry and Wildlife

Pittman-Robertson Wildlife Restoration Program
Game Management Program FY17-FY21

Program Narrative

W-22-G, Segments 17-21

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Hawaii Game Management Program

Introduction

Hawaii's game management program provides opportunities for recreational hunting of 15 spp. of game birds and six spp. of game mammals. However, game species currently hunted in Hawaii are not native, and game mammal species in particular may have negative impacts on sensitive native species and ecosystems. Federal law precludes the use of federal funds in a manner that jeopardizes the continued existence of listed, proposed, or candidate threatened and endangered species. Because a large percentage of Hawaii's game program is funded by the Federal Wildlife Restoration Program (Pittman Robertson or PR Program), game management decisions made for this program greatly influence management policy for public hunting areas in general.

Maintaining a recreational public hunting program that does not threaten the persistence of native species and ecosystems in Hawaii is a complex endeavor. Public hunting can provide a useful tool in controlling game mammals on public and private lands where control is needed and funds are scarce. The Hawaii Division of Forestry and Wildlife (DOFAW) public hunting program supports and facilitates hunting on public and private lands by providing a structured program that promotes and encourages participation. The program aims to direct hunting toward less ecologically sensitive areas, while at the same providing structured hunter access to more remote/pristine sites where recreational hunting can help to control game mammal populations.

Hawaii's Five Year PR Game Management Program consists of eight separate Subgrants (W-22-GC through W-30-NP) and 34 different projects or segments. This program will fund projects for monitoring hunter activities and game species population status, land leases to provide additional areas for public hunting, game habitat improvement, game population management in suitable habitats through control of alien predators, facility and infrastructure development, and projects that will aid in data gathering and analysis. These and other activities are all aimed at maximizing hunter recreational opportunities and staff efficiency, within budgetary constraints, in conjunction with other DOFAW mandates, and in compliance with relevant state and federal laws and regulations. Project statements and a "Schedule of Funded Projects" which provide specifics on planned management activities and expenditures are provided in the following sections.

The State of Hawaii believes that after reviewing the impacts of activities funded in this grant package, findings of "No Effect" or "Not Likely To Adversely Affect Listed Species" are warranted for the Section 7 evaluation on the use of federal funds for this program. A brief overview of the program and additional supporting information is provided below.

Program Overview

With an ever increasing human population, there has been a concomitant increase in demand for both consumptive (hunting) and non-consumptive (wildlife study and observation) wildlife resources. There are approximately 916,000 acres of public hunting areas in Hawaii. Appendix I contains a list of public hunting areas throughout the State and maps of their locations. Hunter checking station data collected throughout the State during FY15 indicated that public hunting areas provided nearly 9,600 hunter trips for game birds and 23,763 trips for game mammals, totaling 33,382 trips (or hunter days). Hunter trips for game birds were up nearly 12% from those reported in the FY14, and trips for game mammals were close to equal to FY14 report data. Game harvest reports from public hunting area check stations in FY15 indicated approximately 13,300 game birds taken (up 73% from FY14) and nearly 4,883 game mammals taken FY14 reports).

The most dramatic increase was an increase in the number of Game birds reported taken from Hawaii Island, up from 6107 in FY14 to 11,654 in FY15. Participating in game-related wildlife activities is an important recreational outlet for many of Hawaii's residents and visitors. According to the U.S. Fish and Wildlife Service 2006 National Survey of Hunting, Fishing and Wildlife-Associated Recreation, 18,000 persons hunted and spent 420,000 days hunting in Hawaii[1]. The survey also indicated that hunters spent $21,000,000 in the State for hunting-related recreation, up 40% from expenditures reported in 2001.

Legal Framework

Hawaii's resources are managed under the authority and mandates of several laws and regulations. State law authorizes and mandates the protection, conservation, development and utilization of wildlife resources of the State. Specifically, Hawaii Revised Statutes (HRS) 171-3 mandates that the Department of Land and Natural Resources shall manage and administer forests, forest reserves, wildlife, wildlife sanctuaries, game management areas, public hunting areas, Natural Area Reserves, and other functions assigned by law. HRS Section 183D-2 mandates that the Department shall manage and administer the wildlife and wildlife resources of the State which, by definition, includes both game and nongame species. Section 183D-3 further mandates that the Department shall adopt rules protecting, conserving, monitoring, propagating, and harvesting wildlife and under 183D-4 the Department is given the authority to maintain, manage, and operate game management areas, wildlife sanctuaries, and public hunting areas for these purposes. Chapter 195D, HRS, provides broad authority to the department for the management of indigenous spp. and provides protection of those spp. by prohibiting take. Within the Department, DOFAW has been delegated the management responsibility for terrestrial wildlife and the game management component of that program.

Development of wildlife management policy in Hawaii involves a broad range of considerations. Natural resources are managed in consultation and collaboration with partners, communities, and constituents, who represent a wide variety of opinions about resource management. Legislative, congressional, and judicial decisions influence, and may even dictate, natural resource management policy. In addition, many of the statutes and rules that direct management are [1]broad in nature and, at times, conflicting.

In order to deal equitably with its varied constituencies and mandates, DOFAW has developed an open and interactive process to determine guidelines for management strategies for all lands under its jurisdiction. This process has often resulted in emotional and, at times, divisive, debates over potential forest land use and wildlife management practices as demands among user groups increase and we attempt to integrate environmental, local community, hunting, and native Hawaiian cultural concerns. Appendix IV describes the Resource Management Guidelines as

[1] Resolution of the very large discrepancies between the USFWS National Survey numbers and hunter checking station data has been previously approached as follows. With questionnaires returned from over 1,300 Hawaii hunters in 2003, the number of hunting days estimated was 5.2 times the number of hunting days reported in check stations for that year. If this factor is applied to FY10 check station data, the result is 204,700 hunting days. When national survey results were adjusted to include only licensed hunters (10,080 in FY10), the national survey estimate was 234,100 hunter days annually, much closer than the more than 10 fold difference between state and federal raw results

they relate to game animal management and how they were used to develop and coordinate activities in this program.

Federal Assistance Section 7 Assessment

In developing these projects, precautions have been taken to evaluate potential impacts to threatened and endangered species and to incorporate measures that will protect listed species that may be affected by project activities. Hawaii currently has 503 species listed as threatened or endangered, an additional 49 proposed or candidate species under consideration for listing. (See Appendix II for a list of endangered and threatened species found on the various Islands throughout the State).
A Federal Assistance Assessment (Section 7 Evaluation Form) has been completed by the State Federal Assistance Coordinator for each project to identify potential impacts to listed species and to incorporate measures to avoid impacts. The following considerations provide a general framework for the game program and the evaluation of potential program impacts on listed species.

1. The majority of the activities carried out under this program are routine, ongoing and located in disturbed areas with no or very few listed species. Improvements are located to avoid impacts to listed species during construction and use.

2. A small percentage of the State's Federal Assistance PR Program is dedicated to Nongame/Endangered Species wildlife activities that directly benefit and enhance listed species.

3. Many of the Game Management Program activities indirectly benefit and enhance listed species. For example, predator control and water unit development for game birds also benefit nene in many areas. Roads, trails and facilities developed or maintained in remote areas increase opportunities for wildlife viewing and increase hunter pressure which helps control game mammal populations. Access also facilitates fire control, which benefits listed species and native species and habitats.

4. DOFAW's Resource Management Guidelines and distribution maps of listed species were used as Planning tools in developing game management project activities and in assessing potential impacts to listed species in completing the State's portion of the Section 7 Assessments. The major focus of the game enhancement program utilizing Federal funds is for game birds, which involves activities that are unlikely to adversely affect listed species.

5. Program activities that might enhance game mammal populations have been purposefully designed, with specific mitigative actions identified, to avoid activities that directly affect listed species. Program activities that do enhance game mammal populations are done in a small number of "Game Production" areas (less than 10% of all hunting areas) and these projects include a commitment to identify and protect listed species in the areas that are at risk from game mammals.

6. Where there is a potential for adverse impacts to listed species, DOFAW has included actions to mitigate impacts such as fencing endangered plants, creation of "No Hunting" safety zones for nene, and educational materials for hunters to increase

Budget Schedule

Hawaii Department of Land & Natural Resources
Division of Forestry and Wildlife
GAME MANAGEMENT PROGRAM FY17-FY21 FY 2016-2021 Schedule of Funded Projects

Hawaii Department of Land aned Natural Resources
Division of Forestry and Wildlife
GAME MANAGEMENT PROGRAM FY17-FY21
W-23-G, Segments 17-21

Subgrant No.	Subgrant, Project or Job Title	Year 1 FY 17	Year 2 FY18	Year 3 FY19	Year 4 FY20	Year 5 FY21	5-YR Total FY17-21
W-22-GC	Game Coordination						
	Project 1: Game Coordination-HNL Admin Segment	$87,000	$125,000	$162,500	$150,000	$250,000	$774,500
	Subgrant Subtotal	$87,000	$125,000	$162,500	$150,000	$250,000	$774,500
W-23-GL	Game Land Acquisition						
	Project 1: Game Land Acquisition - Hawaii	$72,000	$220,000	$312,500	$218,750	$630,000	$1,453,250
	Subgrant Subtotal	$72,000	$220,000	$312,500	$218,750	$630,000	$1,453,250
W-24-GO	Game Operations and Maintenance						
	Project 1: Game Ops and Maintenance - East Hawaii	$116,251	$100,000	$100,000	$35,000	$105,000	$456,251
	Project 2: Game Ops and Maintenance - West Hawaii	$127,500	$228,000	$284,000	$238,000	$300,000	$1,177,500
	Project 3: Game Ops and Maintenance - Maui	$144,750	$85,000	$86,000	$91,000	$92,000	$498,750
	Project 4: Game Ops and Maintenance - Oahu	$129,000	$188,750	$188,750	$188,750	$188,750	$884,000
	Project 5: Game Ops and Maintenance - Kauai	$129,750	$375,000	$390,000	$400,000	$415,000	$1,709,750
	Subgrant Subtotal	$647,251	$976,750	$1,048,750	$952,750	$1,100,750	$4,726,251
W-25-GP	Game Population Management						
	Project 1: Game Population Management - East Hawaii	$101,251	$84,000	$124,000	$211,000	$151,550	$681,801
	Project 2: Game Population Management - West Hawaii	$72,750	$50,000	$175,000	$225,000	$175,000	$697,750
	Project 3: Game Population Management - Maui	$47,400	$6,600	$11,000	$11,000	$14,000	$90,000
	Project 4: Game Population Management - Oahu	$72,000	$75,000	$75,000	$75,000	$75,000	$372,000
	Project 5: Game Population Management - Kauai	$47,250	$89,000	$73,000	$77,000	$81,000	$347,250
	Subgrant Subtotal	$340,651	$294,600	$458,000	$599,000	$496,550	$2,188,801
W-26-GH	Game Habitat Management						
	Project 1: Game Habitat Management - East Hawaii	$67,500	$55,000	$55,000	$55,000	$55,000	$287,500
	Project 2: Game Habitat Management - West Hawaii	$72,000	$25,000	$118,750	$87,500	$120,000	$423,250
	Project 3: Game Habitat Management - Maui	$57,750	$97,000	$53,000	$53,000	$59,000	$319,750
	Project 4: Game Habitat Management - Oahu	$87,000	$96,000	$96,000	$96,000	$96,000	$471,000
	Project 5: Game Habitat Management - Kauai	$65,250	$111,000	$118,000	$125,000	$132,000	$551,250
	Subgrant Subtotal	$349,500	$384,000	$440,750	$416,500	$462,000	$2,052,750
W-27-GF	Game Facilities Construction						
	Project 1: Game Facilities Construction - East Hawaii	$47,250	$45,000	$45,000	$45,000	$45,000	$227,250
	Project 2: Game Facilities Construction - West Hawaii	$10,500	$55,000	$25,000	$45,000	$56,250	$191,750
	Project 3: Game Facilities Construction - Maui	$15,750	$32,000	$22,000	$18,000	$20,000	$107,750
	Project 4: Game Facilities Construction - Oahu	$16,500	$30,000	$35,000	$35,000	$35,000	$151,500
	Project 5: Game Facilities Construction - Kauai	$72,000	$212,000	$240,000	$240,000	$240,000	$1,004,000
	Subgrant Subtotal	$162,000	$374,000	$367,000	$383,000	$396,250	$1,682,250
W-28-GS	Game Surveys						
	Project 1: Game Mammal Surveys						
	Job 1: Game Mammals - East Hawaii	$22,500	$45,000	$45,000	$45,000	$45,000	$202,500
	Job 2: Game Mammals - West Hawaii	$22,500	$43,750	$56,250	$56,250	$56,250	$235,000
	Job 3: Game Mammals - Maui	$43,500	$42,000	$84,000	$47,000	$48,000	$264,500
	Job 4: Game Mammals - Oahu	$22,500	$44,800	$49,000	$49,000	$49,000	$214,300
	Job 5: Game Mammals - Kauai	$74,250	$74,000	$78,000	$84,000	$88,000	$398,250
	Project 2: Game Bird Surveys						
	Job 1: Game Birds - East Hawaii	$13,500	$35,000	$35,000	$35,000	$35,000	$153,500
	Job 2: Game Birds - West Hawaii	$14,250	$7,000	$7,000	$7,500	$8,000	$43,750
	Job 3: Game Birds - Maui	$5,625	$4,000	$4,500	$47,000	$7,000	$68,125
	Job 4: Game Birds - Oahu	$6,750	$1,500	$1,500	$1,500	$1,500	$12,750
	Job 5: Game Birds - Kauai	$6,750	$18,000	$20,000	$22,000	$24,000	$90,750
	Subgrant Subtotal	$232,125	$315,050	$380,250	$394,250	$361,750	$1,683,425
W-29-GR	Game Research						
	Project 3. W-29-GR-1 Game Mammal Research: Developm of Techniques and Initial Estimation of Game Mammals at Pu'u'Wa'awa'a Forest Reserve & Pu'u Anahulu GMA	$58,500	$76,250	$45,000	$45,000	$45,000	$269,750
	Subgrant Subtotal	$58,500	$76,250	$45,000	$45,000	$45,000	$269,750
	Nāpu'u Conservation Project	$289,500	$250,000	$250,000	$250,000	$250,000	$1,289,500
		$0	$0	$0	$0	$0	$0
		$0	$0	$0	$0	$0	$0
	Subtotal	$289,500	$250,000	$250,000	$250,000	$250,000	$1,289,500
	GAME MANAGEMENT PROGRAM GRANT TOTAL	$2,238,527	$2,765,650	$3,214,750	$3,159,250	$3,742,300	$14,830,977
	Costs By Funding Source						
	Total Cost	$2,984,500	$3,687,533	$4,286,333	$4,212,333	$4,989,733	$20,160,432
	Federal Share	$2,238,375	$2,765,650	$3,214,750	$3,159,250	$3,742,300	$15,120,324
	State Share	$746,125	$921,883	$1,071,583	$1,053,083	$1,247,433	$5,040,108
	Cost By County						
	East Hawaii	$368,252	$374,000	$404,000	$426,000	$436,550	$2,008,802
	West Hawaii	$378,000	$485,000	$711,000	$704,250	$760,500	$2,769,000
	Maui County	$314,775	$266,600	$260,500	$267,000	$240,000	$1,348,875
	City & County of Oahu - Oahu Branch	$333,750	$436,050	$445,250	$445,250	$445,250	$2,105,550
	Kauai County	$395,250	$859,000	$919,000	$948,000	$980,000	$4,101,250
	Admin Staff - City & County of Honolulu	$448,500	$595,000	$725,000	$618,750	$1,130,000	$3,517,250
	Total Cost	$2,238,527	$3,015,650	$3,464,750	$3,409,250	$3,992,300	$15,850,727

Job Descriptions

Project 1 W-22-GC-1 State of Hawaii Game Program Planning and Coordination

A. Need

Because of the complexity and volume of the program and geographic separation of project activities, overall coordination must be provided in order to adequately plan, review, administer, and monitor PR game projects. In addition, the Division has begun development of a series of district strategic game management plans to facilitate effective program implementation. Liaison is needed with the U. S. Fish and Wildlife Service, State agencies and other organizations to ensure prompt and efficient handling of project affairs. Statewide program monitoring is needed to ensure compliance with Federal Assistance standards and applicable State and Federal laws, regulations, and directives. Monitoring and response may also be needed to proposed changes in State laws and regulations which may affect State participation in the game portion of the PR program. In addition, possible changes in Division administrative rules which facilitate compliance and cooperation with program partners are continuously reviewed.

B. Objectives

- Establish and maintain a system of planning, review, record keeping, project monitoring, supervision reporting and coordination among staff and outside personnel and agencies adequate to meet the requirements for participation in and administration of the game management portion of the State's Federal Assistance in Wildlife Restoration Program.
- Complete the draft strategic game management plan for the island of Hawaii and develop the same for Maui.
- Persue site-specific game management planning for all current and proposed public hunting areas.
- Assure adequate and diversified long-term funding. The program will seek to leverage PR funds to achieve broader program implementation.

C. Expected Results and Benefits

The Game Program Planning and Coordination Project will provide staff and procedures to ensure that the State meets its responsibilities for participation in the Federal Assistance program, including long-term planning, compliance, record keeping, reporting, field staff supervision, and coordination of game Federal Assistance activities with the Service and other State and agency programs. Coordination of the game portion of the program will help ensure continued participation in the PR Federal Assistance program and thereby improve hunting and increase sport hunting opportunities, protect and enhance wildlife habitat on both public and private land, improve the integration of game management activities with other compatible or competing uses and provide information on the wise management and appropriate use of game species.

D. Approach

The Federal Assistance Coordinator will serve as the principal administrator of the Federal Assistance Wildlife Restoration program and be responsible for compiling and submitting the statewide Grant Proposal Package, annual Grant Agreements and annual progress and status reports. Branch personnel will perform planning, local compliance and coordination activities at the branch level as well as provide the coordinator with project documents, reports, recommendations to be incorporated

in statewide documents and assure long-term diversified funding.
Coordination with staff or other agencies concerning PR project activities will be conducted by written or verbal communication or by attendance at meetings or conferences. The coordinator will provide training sessions for Division staff, review projects in the field throughout the State, and chair PR meetings. The coordinator will assure compliance with audit requirements, Federal Assistance standards, applicable State and Federal laws and regulations and maximize utilization of available Federal Assistance funding. The coordinator or other wildlife staff will attend annual meetings of Region 1 Federal Assistance Coordinators, twice-annual meetings of the Western Association of Fish and Wildlife Agencies (WAFWA), and other national meetings and training as needed. The coordinator will schedule and chair 1-2 statewide federal assistance meetings per year. The coordinator will conduct an annual site visit to each Branch to inspect federal assistance projects for compliance with program guidelines. During FY17-21, the coordinator and Branch project leaders will participate and assist in a scheduled Federal Assistance Program comprehensive audit.

A draft game management plan for Hawaii is being developed through collaboration with a public hunting advisory group, and the same is planned for Maui. The advisory group will appoint a subcommittee to serve as a working group to provide guidance and oversight during the development of the plan. Public input will allow the team to focus on areas of greatest need identified by the hunting community.

The Wildlife Program Manager is the senior wildlife staff position on the administrative staff and has been designated the Division Federal Assistance Coordinator. The Wildlife Program Manager reports to and works through the Administrator who has line authority over all forestry and wildlife programs and activities in the state through branch managers to branch wildlife staff. The Wildlife Program Manager serves in a staff support and advisory function to the Administrator and Division staff. Key personnel, organizational titles, and project functions are as follows:

Jim Cogswell	Wildlife Program Manager
Vacant (Jason Omick TA)	Game Program Coordinator
Vacant (Kanalu Sproat TA)	W. Hawaii Wildlife Manager
Joey Mello	E. Hawaii Wildlife Manager
John Medeiros	Maui Wildlife Manager
Jason Misaki	Oahu Wildlife Manager
Thomas Kaiakapu	Kauai Wildlife Manager
Shane De Mattos	Maui Wildlife Biologist
Kanalu Sproat	West Hawaii Wildlife Biologist
Lindsay Ibara	Kauai Wildlife Biologist

E. Location
The Federal Assistance Coordinator and the Game Program Coordinator are stationed at the Honolulu Office of the Division of Forestry and Wildlife. The Branch Project Leaders are stationed in the respective Branch offices of the Division of Forestry and Wildlife in Lihue, Kauai; Honolulu, Oahu; Wailuku, Maui; Hilo, Hawaii; and Kamuela, Hawaii.

Project 2 W-23-GL-1 Statewide Game Land Access and Acquisition

Project 2 W-23-GL-1 Statewide Game Land Access and Acquisition

A. Need

The Hawaii Department of Land and Natural Resources, Division of Forestry and Wildlife (DOFAW/Division), manages over 1,000,000 acres of state land for wildlife-dependent recreation and conservation, and demand is growing for public hunting on these public lands. However, over half of all land in Hawaii is privately owned, and private landowners—as well as other public landowners—frequently block public access to substantial portions of the DOFAW lands that are designated for public hunting. In order to expand opportunities for public hunting and other wildlife-dependent public uses, it is imperative that DOFAW (1) sustain and optimize public use of areas that are already accessible; (2) establish public access to areas that are not accessible; and (3) acquire new land for public use. If DOFAW does not satisfy the growing demand for access to public hunting areas, and if hunting pressure is not applied across a larger landscape, then game animals will become more scarce in existing hunting areas and will cause more damage on inaccessible public and private lands. DOFAW's partnership with the hunting community to manage ungulate populations will weaken, and hunter safety and satisfaction will decline due to the lack of adequate space for hunting activities.

B. Objectives

- Extend or renew existing leases, licenses, and other access agreements:
  - Extend an existing license to use the Kekaha Game Management Area, Kauai (approximately 13,000 acres) for public hunting for a five year period.
  - Continue to acquire, by annual license fee, 1,000 acres of private ranch lands on Maui, to keep them available for public hunting through September 2018.
    - Renew the license for another ten year period, through September 2028.
  - Continue to acquire, by annual cooperative management agreement fee, 30,000 acres of private land on Lanai, to keep them available for public hunting through February 2018.
    - Renew the cooperative management agreement for another three year term, through February 2021.
- Create new leases, licenses, and access agreements:
  - Create a new license to use portions of the Kipuka Ainahou Wildlife Sanctuary (approximately 11,123 acres) and Humuula (approximately 4,303 acres), Hawaii, for wildlife management and public hunting purposes for a five year period.
  - Establish perpetual access to the Kau Forest Reserve, Hawaii, over lands owned by the Hawaii Department of Agriculture and unencumbered state lands.
  - Establish an agreement with Hawaii County to develop and manage a county easement that provides access to private lands at Makahanaloa.
  - Establish short-term access to the Hilo Forest Reserve, Hawaii, over private lands at Makahanaloa.
  - Establish access agreements for public hunting on Kauai, over state lands owned by the Hawaii Agribusiness Development Corporation.
  - Establish an agreement with Kauai County to develop and manage a segment of county roadway for perpetual access to the Lihue-Koloa Forest Reserve.

- Establish an agreement with the Board of Land and Natural Resources to set-aside state land at Kanaio, Maui, for the establishment and operation of a game management area.
- Establish a cooperative management agreement with private landowners at Kanaio, Maui, for the establishment and operation of a game management area.

- Acquire fee title or agricultural/conservation easements for key land parcels to improve public access and enhance opportunities for public hunting, public recreation, and wildlife management.
  - Acquire fee title for a 1,735 acre addition to Hilo Forest Reserve to expand, and improve access to, existing public hunting areas.
  - Establish the location of two reserved right-of-ways over private land for access to the Moloaa Forest Reserve, Kauai.
  - Identify and revise statewide priorities for land acquisition.
  - Obtain appraisals, boundary surveys, environmental site assessments, and title reports for selected priority acquisitions.
- Conduct outreach and education to landowners and other stakeholders. This will increase DOFAW's capacity to create and maintain public access throughout the state.
  - Participate in public forums organized by other DOFAW programs and partners, such as DOFAW Na Ala Hele Trail and Access System; DOFAW Watershed Partnerships; DLNR Kauai Aquatic Life and Wildlife Advisory Committee, DLNR Soil and Water Conservation Districts; State Game Management Advisory Commission; and Hawaii County Game Management Advisory Commission.
  - Meet regularly with individual landowners and stakeholder groups.
  - Design, plan, and produce statewide workshops on access and acquisition processes and issues, including the rights, privileges, and responsibilities of hunters and landowners, and related problems of trespass, liability, insurance, and indemnification.
- Develop, improve, and maintain roads, parking areas, trails, fences, gates, and other access infrastructure.
  - Lihue-Koloa Forest Reserve, Kauai (two routes)
    - including boundary surveys and environmental assessment
  - Moloaa Forest Reserve, Kauai (two routes)
    - including boundary surveys
  - Kau Forest Reserve, Hawaii (one route)
  - Kanaio Game Management Area (as determined in management plan)
    - including management plan and environmental assessment
  - Hilo Forest Reserve (one route)
    - including boundary survey

C. Expected Results and Benefits

The Access and Acquisitions project will facilitate public and management access to approximately 1,000,000 acres of public lands, and will increase public access and management opportunities on private lands. The program will improve DOFAW's ability to more effectively administer its wildlife management programs as well as significantly increase the size of accessible public hunting areas; improve hunter recruitment and retention; and expand hunter effort (hunter days) and success (animals harvested).

D. Approach

The Access/Acquisitions program will work statewide with DOFAW Administrative and Branch staff as well as hunters and other stakeholders to guide the program and identify and complete priority activities that lead to the achievement of access and acquisition project objectives. Specific planned activities will include:

• Information gathering to guide access and acquisition priorities. This includes interviews with key staff and others knowledgeable on the history of access practices and landowner relations; documentation of historic right-of-way agreements; analysis of GIS spatial data sets; and field reconnaissance.

• Regulatory and fiscal compliance. This includes development of management plans and environmental assessments (including biological and cultural surveys, and fulfillment of federal consultation and administrative requirements).

• Proposal writing and grant management. The project will seek funds from other sources to assist with project implementation.

• On-the-ground project implementation. Project implementation will include clearing of rights-of-ways; surveying and marking affected property boundaries; placement of signage and other infrastructure; and developing and maintaining roads, trails, and other public access corridors.

E. Location

Lands identified for the program include both private and public lands throughout the state.

		FY17	
PA	Planned Activities (PA)	Activity Frequency	Estimated Cost ($)
1	Pay for Kipuka Ainahou/Humuula License (terms in negotiation)	15,427 ac/yr	35,000
2	Pay for Kekaha License (terms in negotiation)	13,000 ac/yr	121,000
3	Pay for Kaonoulu Ranch Lease	940 ac/yr	2,500
4	Land Rental (Lanai)	30,000 ac/yr	35,000
5	Land Negotiation (PA 25)	As needed	salary+admin
6	Create new access agreements and leases (PA 25)	As needed	salary+admin
7	Renew existing leases and access agreements (PA 25)	As needed	salary+admin
8	Gather information to identify access/acquisition (PA 25)	Daily	salary+admin
9	Acquire fee title or conservation easements	*submit a separate funding proposal for each acquisition*	
10	Conduct due diligence/closing for land acquisition (fee title) at Makahanaloa mauka (addition to Hilo Forest Reserve)	1	50,000
11	Prepare Management Plan for Kanaio Game Management Area	1	28,000
12	Prepare EA for Kanaio Game Management Area	1	466,000
13	Construct access improvements for Kanaio Game Management Area	1	200,000
14	Write proposals and manage grants (PA 25)	As needed	salary+admin
15	Conduct outreach and coordination with landowners (PA 25)	Daily	salary+admin

16	Conduct boundary surveys for access to Moloaa Forest Reserve via reserved rights-of-way	2	10,000
17	Construct access corridors to Moloaa Forest Reserve via reserved rights-of-way	2	50,000
18	Conduct boundary survey for access to Lihue-Koloa Forest Reserve via Kua Road	1	5,000
19	Conduct boundary survey for access to Lihue-Koloa Forest Reserve via Puulima Place	1	5,000
20	Prepare EA for access road construction, Lihue-Koloa Forest Reserve, via Puulima Place	1	15,000
21	Construct access corridor to Lihue-Koloa Forest Reserve via Kua Road	1	15,000
22	Construct access road to Lihue-Koloa Forest Reserve via Puulima Place	1	50,000
23	Construct pedestrian access corridor to Hilo Forest Reserve via Makahanaloa mauka	1	2,000
24	Conduct boundary survey for access to Hilo Forest Reserve via Makahanaloa makai	1	5,000
25	Access and Acquisition Coordinator (100% FTE)	1/yr	65,611

Game Land Access and Acquisition Totals

Total Cost/Year	$ 1,160,111
Salary (A):	$ 65,611
Operation (B):	$1,094,500

Actual Budget for FY17

Total Cost/Year	$ 69,420
Salary (A):	$ 9,420
Operation (B):	$ 60,000

Project 3.W-29-GR-1 Game Mammal Research: Accurately Estimate Sheep and Goat Survival Rates, Population Demographics and Habitat Use in the Puu Waawaa Forest Reserve and Puu Anahulu GMA: West Hawaii

A. Need

The Puu Waawaa Forest Reserve (PWW FR) and the Puu Anahulu Game Management Area (PAH GMA) are actively managed for sheep and goat hunting. Currently, there is a Habitat Conservation Plan in development for these two areas that would give the State greater ability to manage game mammal

populations in these areas, while protecting threatened and endangered plant and animal species found there. There is a dearth of information regarding survival rates, population demographics, and habitat use for sheep and goats in these two areas.

B. Objective

- Accurately estimate sheep and goat survival rates, population demographics, and habitat use in the Puu Waawaa Forest Reserve and the Puu Anahulu Game Management Area.

C. Expected Results and Benefits

A capture-mark-recapture analysis will be used to estimate adult survival rates for these two game species in these management areas. By incorporating this information with concurrent sheep and goat abundance estimates bag limits can be more accurately determined to improve the overall hunting experience in these areas. The geographic data collected will also improve home range and habitat use estimates.

D. Approach

This is a continuation of a research project that began in FY16. The marked population of sheep will be augmented capturing approximately 30 more individuals and fitting them with radio/GPS collars. Each collared individual will be visually located weekly. Pertinent geographic (i.e., utm coordinates) and demographic (i.e., group size) data will be recorded. When a mortality occurs the carcass of the animal will be promptly located. If possible, cause of death will be determined. A known-fate analysis will be used in Program MARK to estimate survival rates. Locational data will be used in a geographic information system to determine habitat use, animal movements, and home range sizes. Data from the GPS collars will be compared to data collected from visual locations of radio collared animals.

E. Location

West Hawaii District, Puu Waawaa Forest Reserve and Puu Anahulu Game Management Area.

F. Cost

Year 1	Year 2	Year 3	Year 4	Year 5	5-Yr Total
$80,000	$65,000	$30,000	$30,000	$30,000	$235,00

Project 4 W-30-NP-01 Nāpuʻu Conservation Project – West Hawaii

A. Need

Game mammal hunting has been an important activity in the Puu Waawaa Forest Reserve and the Puu Anahulu GMA (Project Area) for more than a century. Access to hunting areas within the Project Area is via four-wheel drive roads which act as fuel breaks in this highly fore prone environment. The four wheel drive roads need to be actively maintained to prevent overgrowth by invasive weeds, primarily fountain grass and tree tobacco. In addition to being a valuable hunting area, the Project Area is also home to 15 endangered plant species and one endangered moth species. The Division of Forestry and Wildlife has been developing a state Habitat Conservation Plan (HCP) that will protect these endangered species while also implementing game mammal population enhancements. Fenced exclosures as well as propagation and outplanting of native plant species will help avoid and minimize impacts from game mammals as well improve game bird habitat. While the HCP will provide the Division of Forestry and Wildlife with an incidental take license on a State level, a Biological Opinion (BO) will be required before any federal assistance can be applied to game mammal enhancement activities in the Project Area. Data that will be required of the United States Fish and Wildlife Service (USFWS) to complete this BO will be collected by contractors and state employees. Federal assistance is requested to fulfill USFWS requirements to complete the BO.

B. Objectives

- Maintain over 70 miles of hunter and fire access roads within the Project Area.
- Assess current status of existing and proposed critical habitat areas within the Plan based on the informational needs required from the USFWS.
- Implement habitat restoration activities in exclosures to improve game bird habitat and mitigate for game mammals impacts on native species in the Plan Area.

C. Expected Results

- Continued hunter access into the Project Area via cleared four wheel drive roads. A map roads maintained for hunter access and fire minimization.
- Data from field surveys will be provided to the USFWS for the development of a BO for the Plan Area. The BO would instruct the state as to which game mammal management activities would be appropriate for federal assistance.
- Implementation of outplanting activities in fenced exclosures to improve game bird habitat as well as offset negative impacts on native plant species from game mammals.

D. Approach

- Utilize contractors (1 Project Coordinator, 1 Field Crew Leader, and 3Field Assistants) and State employees to collect data required by the USFWS for the completion of the BO.

- Improve game bird and native habitat in fenced exclosures and remove game mammals.

E. Location of Work

Puu Waawaa Forest Reserve and Puu Anahulu GMA.

F. Cost

Year 1	Year 2	Year 3	Year 4	Year 5	5-Yr Total
$259,000	$266,000	$274,000	$283,000	$283,000	$1,365,000

Project 5 W-24-GO-01 Game Operations and Maintenance: Hawaii County - East Hawaii District

A. Need

East Hawaii District is the largest district in the state, with 13 public hunting areas totaling 454,000 acres. Game program operations facilities are scattered throughout the island and maintenance requires considerable travel time and expense. The deterioration of fences, roofs, water storage sheds, and metal pipelines are exacerbated by volcanic fallout. The subtropical climate also leads to rapid rotting of wooden structures. These factors combine to increase the frequency of maintenance work that is needed to maintain the cost/benefit ratio of developmental investments. All nine (9) checking stations must be regularly inspected and kept operational in the face of vandalism.

B. Objectives

Operate and maintain facilities and infrastructure in 13 public hunting areas totaling 454,000 acres in order to support wildlife management activities and provide wildlife oriented recreation opportunities to the people of Hawaii. Maintain baseyard facilities. Conduct nuisance wildlife investigations and solutions throughout the whole district.

C. Expected Results and Benefits

Continue to provide opportunities for wildlife recreation activities, including provision for an estimated 50,000 hunter trips for the five-year duration of the project, and an estimated annual harvest of 400 pigs, 100 goats, 100 mouflon sheep, 100 feral sheep, 500 quail, 500 pheasant, 500 chucker partridge, 500 francolin, 200 turkey, and 200 dove.

D. Approach

Maintain 10 hunter checking stations and other support buildings, 22 game bird water units and feeders; maintain and replace as needed five (5) miles of fence, and 500 hunting area boundary signs. Fifty three miles of roads will be maintained by grading the existing road bed.

Activity – Hunter Chekstation Maintenance

- Inspect and repair any damages, and control vegetation around to 9 check stations throughout the year. Includes purchase of supplies: Lumber, mailboxes, fastners, sign in sheets, etc. Repairs and maintenance to equipment, vehicles, tools

Activity – Sign and Marker upkeep

- Inspect and replace signage in PHAs and GMAs. Includes purchase of signs, posts, fastners, barriers, paint, cement, lumber, etc

Activity - Road and Trail Maintenance

- Maintain 53 miles of roads throughout the year so that they are accessable to the public. Rental of Machinery, equipment to grub road/trail, etc. Purchase of herbicides, power tools, equipment, surge/gravel, fill, etc. For existing road/trail improvement.

Activity - Fence and Gate Maintenance

- Inspect and maintain 5 miles of fence throughout the year. Purchase of: fencing, fastners, related materials, gates, tools, etc.

E. Location

Kapapala Cooperative GMA, Kapapala, Kau, Hilo, Mauna Loa and Waiakea Forest Reserves, Kipuka Ainahou and other public hunting areas throughout the East Hawaii District of Hawaii Island

Year 1	Year 2	Year 3	Year 4	Year 5	5-Yr Total
$90,000	$70,000	$70,000	$70,000	$70,000	$350,000

Project 6 W-24-GO-02 Game Operations and Maintenance Hawaii County - West Hawaii District

A. Need

West Hawaii District oversees 23 public hunting areas covering over 250,000 acres. Many of the popular hunting areas are found within the island's rain shadow and receive a very limited amount of rainfall. There are over 60 wildlife guzzlers scattered throughout these arid Hunting areas and many are in disrepair and need to be replaced or renovated. Exclosures, boundary and informational signs, roads, fences, facilities, and hunter checking stations need to be inspected and maintained.

B. Objectives

Operate and maintain facilities and infrastructure in 23 public hunting areas in order to support wildlife management activities and provide wildlife oriented recreation opportunities to the people of Hawaii.

C. Expected Results and Benefits

Maintaining existing improvements within the hunting areas will facilitate wildlife restoration efforts for game and non-game animals which in turn provide safe and high quality recreational opportunities for hunters and non-hunters alike.

D. Approach

Maintain nine hunter checking stations and other support buildings, boundary fences, and 45 game bird water units and feeders; maintain and replace as needed, five fence exclosures, five miles of waterline, over 77 miles of roads, and 100 hunting information and area boundary signs.

Activity – Hunter Chekstation Maintenance

- Inspect and repair any damages, and control vegetation around to 9 check stations throughout the year. Includes purchase of supplies: Lumber, mailboxes, fastners, sign in sheets, etc. Repairs and maintenance to equipment, vehicles, tools

Activity – Sign and Marker upkeep

- Inspect and replace signage in PHAs and GMAs. Includes purchase of signs, posts, fastners, barriers, paint, cement, lumber, etc

Activity – Gamebird Guzzler Maintenance, Game Mammal Guzzler Maintenance, Gamebird Feeding Site Maintenance

- Inspect and repair 45 game bird guzzlers throughout the year. Purchase of: guzzlers, lumber, plumbing, tools, fastners, etc

Activity - Fence and Gate Maintenance

- Inspect and maintain 5 gates throughout the year. Purchase of: fencing, fastners, related materials, gates, tools, etc.

Activity - Road and Trail Maintenance

- Maintain 20 miles of roads throughout the year so that they are accessable to the public. Rental of Machinery, equipment to grub road/trail, etc. Purchase of herbicides, power tools, equipment, surge/gravel, fill, etc. For existing road/trail improvement.

Activity - Facilities and Building Maintenance

- Inspect and maintain 2 baseyard and 1 remote building throughout the year. Purchase of lumber, paint, or materials for benches, shelters, kiosks, etc. Repairs to buildings, and other facilties.

Activity - District Administration

- RCUH/UH contractors, other contracts for Game releated activities.

E. Location

Island of Hawaii - West Hawaii District

F. Cost

Year 1	Year 2	Year 3	Year 4	Year 5	5-Yr Total
$100,000	$208,700	$204,000	$148,000	$210,000	$710,700

Project 7 W-24-GO-03 Game Operations and Maintenance- Maui County

A. Need

Increased awareness and interest in the outdoors has increased the demand for multi-use areas in Maui County. In the recent past approximately 20,000 acres of public hunting lands within Maui County has been lost because of their withdrawal from public use by private or public landowners. As available

public hunting areas are at a premium and the recreational demands by both the hunting and non-hunting public are beyond the capacity of the available areas, it is ever more important that operation and maintenance of existing facilities be optimized to obtain the fullest recreational benefit from these areas.

B. Objectives

- Operate and maintain facilities and infrastructure in nine (9) public hunting areas totaling 112,311 acres in Maui County (91,311 on Maui, 20,000 on Molokai, and 1,000 on Lanai) in order to support wildlife management activities and provide wildlife oriented recreation opportunities to the residents of Maui County and the rest of the State.
- This includes maintaining both self-check and monitored hunter check stations, upkeep of signs, maintain existing game bird guzzlers, fence and gate maintenance and road and access trail maintenance.
- Purchase of a 4-wheel drive vehicle for the island of Maui and Molokai in FY2017.
- Purchase of a utility vehicle for the island of Lanai in FY 2019 and a 4-wheel drive vehicle in FY2021.

C. Expected Results and Benefits

- For the five year duration of this project, within Maui County, approximately 1,750 days will be available for public hunting and a harvest of 2,400 feral pigs, 1,200 feral goats, 180 Axis deer, 1,000 pheasants, 1,900 chukar, 40 Erckel's francolin, 800 grey francolins, and 300 doves.
- Operation and maintenance of wildlife facilities will ensure survival of huntable species and allow public hunters continued access into public hunting areas.
- Purchase of a vehicle for the islands of Maui, Molokai and Lanai will allow for the completion of projects during this grant period.

D. Approach

- Island of Maui: Routine maintenance of 14 out-buildings (hunter check stations), 50 signs and markers, 2 miles of fence, 18 game bird guzzlers, and maintain and replace nine (9) access gates as needed. Maintain 12 miles of access roads and trails by grading, filling, and hand removal of vegetation at edges.

- Island of Molokai: Routine maintenance of one (1) base yard building, 20 signs and markers, 1 mile of boundary fence, three (3) gates, seven (7) water units, one (1) self-check hunter check station, and removal of vegetation at edge of access roads. Purchase of a 4-wheel drive vehicle.

- Island of Lanai: Routine maintenance of five (5) water units, one hunter check station, 30 signs and markers, three (3)fence enclosures, and five (5) miles of water line maintenance . In addition, there will be nine (9) miles of road maintenance and the maintenance of a building. Equipment purchases include an utv and 4-wheel drive vehicle.

E. Location

Public hunting areas on the islands of Maui, Molokai, and Lanai.

G. Estimated Cost.

Year 1	Year 2	Year 3	Year 4	Year 5	5-Yr

					Total
$124,000	$70,000	$70,000	$75,000	$75,000	$375,000

Project 8 W-24-GO-04 Game Operations and Maintenance: Honolulu County

A. Need

Existing game management improvements, habitat management areas, and facilities require ongoing repair and maintenance in order to provide the maximum opportunity for recreational hunting

B. Objectives

To operate and maintain buildings, structures, and infrastructure in 14 Public Hunting Areas (PHA) and one Game Management Area (GMA), totaling 32,000 acres, to support wildlife management and wildlife oriented recreation opportunities. This includes maintenance of:

- Baseyard buildings used to house equipment, staff and tools for operations
- Game bird guzzler units which provide water for game birds at Kuaokala GMA. Maintenance includes the purchase of guzzlers, lumber, plumbinh, tools and fastners.
- Roads and trails will be monitored and maintained by staff to ensure public access to Hunting Areas. Maintenance includes: Rental of Machinery, equipment to grub road/trail, etc. Purchase of herbicides, power tools, equipment, surge/gravel, fill, etc.
- Signage will be inspected and maintained so information is disseminated properly to hunters and other users in the areas. Includes-purchase of signs, posts, fastners, barriers, paint, cement, lumber, etc.
- Cattle fences will be inspected and maintained to ensure cattle are restricted to paddocks specific to grazing management objectives. DOFAW staff will work with ranchers to ensure objectives are consistent with habitat management needs.
- Hunter Check Stations will be inspected and maintained to ensure that they are serving as an effective structure to collect relevant information. Maintenance includes the purchase of supplies: Lumber, mailboxes, fastners, sign in sheets, etc. Repairs and maintenance to equipment, vehicles and tools
- Program to issue special permits to non-Public Hunting Areas. These are DOFAW lands that have not been designated as PHAs. Permits are issued to allow for public recreational hunting opportunities in these areas

C. Expected Results and Benefits

The wildlife management areas on Oahu are expected to provide approximately 3,500 hunter days of recreation, resulting in a harvest of approximately 500 feral pigs, 200 feral goats, and 300 game birds annually. Maintenance of access trails and roads provides a secondary benefit to non-hunting segments of the public by providing access to hiking and camping areas. Maintenance of infrastructure, water lines, fences are integral to continue to enhance habitat and game populations in Game Management Areas. New areas accessible to hunting will also increase quality and quantity of hunter harvest on Oahu.

D. Approach

The following existing infrastructure will be inspected and maintained (4x/year):

- Two (2) baseyard buildings and one (1) remote storage area at Kuaokala.
- Twenty-six (26) game bird feed stations and water units
- Twenty (20) miles of existing access roads, in heavily disturbed habitat, will be maintained by grading and hand-clearing of vegetation.
- Eighteen (18) miles of existing trails, in heavily disturbed habitat, will be maintained by hand-clearing of vegetation
- Two (2) miles of boundary/cattle fences.
- Inspect and maintain five (5) gate/year
- Signage in PHAs and GMAs (Appx. 150 signs/Year)
- 1.5mi of waterline at Kuaokala GMA per year.

The following existing structures will be inspected and maintained (1x/year)

- 13 hunter check-in stations

The following operations will be conducted to maintain access to non-public hunting areas:

- Issue permits to licensed hunters to the Honolulu Forest Reserve, Tantalus and Moanalua Sections, and the Honouliuli Forest Reserve.
- Track harvest data via permit system
- Establish online permitting and data collection website

E. Location

Public Hunting Areas, and Kuaokala GMA, Oahu.

Year 1	Year 2	Year 3	Year 4	Year 5	5-Yr Total
$100,000	$165,000	$165,000	$165,000	$165,000	$821,000

Project 9 W-24-GO-05 Game Operations and Maintenance Kauai County

A. Need

Existing game management roads, trails, fences, exclosures, game bird and mammal hunter checking stations, storage buildings, campsites, feeding sites, watering units and hunting area management signs will require annual repairs and maintenance to maintain a viable recreational hunting program in areas planned for continued hunting on Kauai. Without maintenance of this infrastructure, recreational mandates for public hunting cannot be adequately accomplished.

B. Objectives

- Maintain and operate 13 mailbox type and seven building type hunter checking stations for the collection of game harvest data and measurement of hunter effort in 13 hunting units.
- Maintain feeding sites in the Kekaha and Wailua GMAs (sustained-yield hunting areas) and Hunting Unit L – Cooperative Management Area to increase game bird productivity in areas that otherwise would support low natural populations.
- Upgrade and maintain 40 game bird water units (rain catchments, tanks and pipes within the

Kekaha Game Management Area (GMA) to increase game bird productivity.

- Maintain approximately 330 hunting area boundary, safety zone and instructional signs to manage public hunting.
- Maintain existing jeep roads and trails in all public hunting areas to facilitate hunter access to both sustained yield hunting areas and to areas needing ungulate control.
- Maintain existing boundary fences, cattle guards and exclosure fences to keep feral livestock out of the forest reserve areas, natural areas, and sites where remnant listed endangered plants occur.
- Maintain hunter campsites in remote areas to encourage hunting pressure in areas needing animal control.
- Maintain five storage buildings necessary for protection of materials, equipment and supplies from theft or damage caused by exposure to the elements.
- Maintain game vehicles and heavy equipment to keep them in good running condition in order to complete game operation and maintenance jobs.
- Replace game trucks and equipment when they are due for retirement.
- Hire one game technician to accomplish the operations and maintenance jobs.

C. Expected Results and Benefits

The maintenance of game bird and mammal infrastructure in public hunting areas, forest reserves, natural areas and portions of State Parks (open to hunting) will enable DOFAW to satisfy the recreational mandates for its public hunting program, as well as manage hunting activity for the benefit to threatened and endangered species and native ecosystem protection.

D. Approach

Thirteen mailbox-type hunter checking stations and seven small building-type hunter checking stations, five storage buildings and campsites need regular maintenance such as cleanning, painting, and routine repairs when damaged by vandals or severe weather.

Forty gamebird water units in the Kekaha GMA need regular cleaning and maintenance to keep them operational. Occasionally, water needs to be hauled by tank trailer during exceptionally dry periods. Newly planned gamebird feeding sites in the Wailua GMA and Hunting Unit L will also require annual maintenance.

Eighty miles of existing jeep roads, and fifty miles of trails used by hunters for access require annual maintenance after storm damage, weed overgrowth, and rutting from heavy use.

Approximately 330 hunting area management signs, for designating hunting area boundaries, safety zones, and instructions to hunters need to be checked for loss and vandalism requiring repairs or replacement.

Approximately 0.75 miles of existing boundary fence, cattle guards, gates, and game range and plant protection fencing require regular checks for needed repairs, and replacement of broken fencing when it occurs.

Game vehicles and heavy equipment need to be maintain and/or replaced to keep the game program running smoothly.

The purchase of a new marine boat for game management along the Na Pali Coast is needed for year-round work. Maintenance of the boat is needed to keep it in good running conditions.

Air transportation into remote hunting areas for trail, fence, signage and campsite maintenance and repair is needed to keep the game program running smoothly.

Hire one full-time game technician to accomplish the game operations and maintenance task.

E. Location.
All game operations and maintenance occur on public hunting areas on the island of Kauai. Game water units and feed sites maintained under this project are located in the Kekaha and Wailua GMAs. Hunting checking stations, storage buildings, jeep roads and foot trails, signs, exclosure fences and boundary fences occur in various forest reserves, natural areas, and portions of State Parks. Facilities maintained in these areas are not intended to enhance game mammal populations, but are maintained to encourage hunting for the reduction of ungulate impacts on native flora and fauna.

Year 1	Year 2	Year 3	Year 4	Year 5	5-Yr Total
$90,000	$250,000	$260,000	$270,000	$280,000	$1,360,000

Project 10 W-25-GP-01Game Population Management Hawaii County-East Hawaii District

A. Need
Demand for recreational game bird hunting continues to increase while mortality continues due to diseases and predation from introduced mongooses, rats, feral cats and feral dogs. Population management is needed to restore game bird populations depressed by predation. There are no native mammalian predators in Hawaii. Niches for small and medium-sized predators are filled by introduced Indian mongooses, feral dogs and cats, and rats. In many instances they are the primary limiting factors on ground-nesting birds. Although game bird population levels are closely linked to annual precipitation, predation is usually the next limiting factor especially during the nesting and brood rearing seasons. Predator population management plays a key role in relieving predation pressure on game bird populations. Where mammal management game is allowed, mineral and feed supplements will improve the health of the population. In areas where control of game mammal populations is conducted, management practices include maximizing use of the hunting community by increasing public access to those game resources whenever safe, feasible, and effective. These practices include deployment of fences to manage game movement, public harvest of game to reduce population levels, staff control of game where needed, and salvage of harvested game for public use. In some areas, fencing is necessary to delineate state boundaries for hunting areas and to prevent mammal populations from encroaching on roads for public safety.

B. **Objectives**

- Enhance game bird populations at Kapapala Ranch, Mauna Loa, and Kipuka Ainahou PHA's by reducing predators and monitoring disease, thus enhancing reproduction and survival of game birds. Continue to maximize hunting opportunities in the reduction of feral cattle numbers in appropriate hunting areas; 350 hunter trips, 90 feral cattle per year. Improving access to public hunting areas

C. Expected Results and Benefits

The reduction in numbers of predators and subsequent increase in game bird reproduction and survival will increase the number of game birds in Kapapala, Mauna Loa, and Kipuka Aina Hou PHA's. Reducing disease and predation by 50% would potentially double game bird populations. Game birds will be checked for pathogens to determine the effects of parasitism and disease as limiting factors. Increased chick production is expected to result in an additional harvest of 2,900 game birds per year and an additional 2,000 hunter recreation days, a substantial increase in wildlife recreation opportunities. Mineral and feed supplements, where warranted, will provide for healthier game mamal populations. Control of feral ungulates in sensitive areas, particularly feral cattle, will reduce damage to sensitive ecosystems while providing

D. Approach

Predators will be reduced by trapping introduced mongooses, rats, feral cats and feral dogs. Disease testing will be done at checking stations and in hunting areas. Game birds will be checked for pathogens to determine the effects of parasitism and disease as limiting factors. Investigations will be conducted in cooperation with the Animal Industry Branch of the State Department of Agriculture. Feed and mineral stations will be placed near water units where feasible. Feral cattle control hunts will be managed for maximum benefit to hunting community and ecosystem protection.

E. Location.

Predator reduction will be conducted at Kapapala Ranch, Mauna Loa, and Kipuka Aina Hou PHA's.

Year 1	Year 2	Year 3	Year 4	Year 5	5-Yr Total
$70,000	$35,000	$35,000	$35,000	$35,000	$175,000

Project 11 W-25-GP-02 Game Population Management Hawaii County - West Hawaii District

A. Need

There are no native mammalian predators in Hawaii. Niches for small and medium-sized predators are filled by introduced Indian mongooses, feral dogs and cats, and rats. In many instances they are the primary limiting factors on ground-nesting birds. There are no naturally occurring large predators to control these introduced predators. Although game bird population levels are closely linked to annual precipitation, predation can be another limiting factor especially during the nesting and brood rearing seasons. Predator population management plays a key role in relieving predation pressure on game bird populations. Where game mammal management is allowed, mineral and feed supplements will be provided to improve the health of the population. In areas where control of game mammals' populations is conducted, the Division implements management practices to increase public access to those game resources whenever safe, feasible, and effective. Those practices include deployment of fences to manage game movement, public harvest of game to reduce population levels, staff control of game where needed, and salvage of harvested game for public use.

It is anticipated that during the next five year cycle a Habitat Conservation Plan (HCP) will be implemented in Puu Waawaa Forest Reserve and Puu Anahulu GMA. This HCP will allow the State to perform various actions, including augmenting game mammal populations using translocations (releasing more game mammals into the area). When appropriate, this management activity will be utilized to improve game mammal populations.

B. Objectives

- Increase game populations at Puu Waawaa Forest Reserve, Mauna Kea Forest Reserve, Kaohe and Puu Anahulu GMA's, and Kahua Special Permit Area by reducing predators, thus enhancing reproduction and survival of game birds. Improve health of game mammal populations where appropriate.
- Increase quality of game bird habitat through outplanting of native species in fenced units at Puu Waawaa and Puu Anahulu.
- Control weeds in and around fenced units to increase the quality of game bird habitat.
- Control game mammal populations, where needed, in public hunting areas using public hunting and staff control.
- Salvage game resources for public use in control areas where practical.
- Augment game mammal populations under the Habitat Conservation Plan at Puu Waawaa and Puu Anahulu.

C. Expected Results and Benefits

The reduction in predation, the increase in quality of game bird habitat, and the subsequent increase in game bird reproduction and survival will increase the annual production of game birds. This will result in increased game bird harvest and hunter success. Supplementation of minerals and feed to mammal population swill improve health, especially during droughts, and draw animals away from ecological sensitive areas. Control of game mammal populations where needed will enhance habitat by reducing the impacts of browsing and grazing. Augmentation of game mammals at Puu Waawaa and Puu Anahulu will help to improve the population of game species in the area and improve overall hunting opportunities.

D. Approach

- 60 -100 traps will be deployed from February through September for rats, mongooses, feral cats and feral dogs
- Utilize supplements for game management.
- Salvage will be conducted using helicopters or other suitable vehicles for transport up to 12 times per year
- Increase sheep population at Puu Waawaa and Puu Anahulu by 200 individuals per year.

Activity - Predator Control

- Purchase of traps, nets, ammo, guns, bait, snares, etc to control predators

Activity – Rodent Control

- Purchase of traps, rodenticide, bait stations, etc. to control rodents

E. Location

Predator reduction and game mammal population management may be conducted at Kaohe GMA, Mauna Kea Forest Reserve, and other public hunting areas. . Predator reduction and game bird population management may be conducted in Puu Anahulu GMA's, Mauna Kea and Puu Waawaa Forest Reserves, and other public hunting areas.

F. Cost

Year 1	Year 2	Year 3	Year 4	Year 5	5-Yr Total
$30,000	$84,000	$89,000	$97,000	$93,000	$457,000

Project 12 W-25-GP-03 Game Population Management: Maui County

A. Need

Demand for recreational game bird and game mammal hunting continues to increase, yet populations of game birds cannot keep pace with demand. One reason for inadequate production is heavy predation losses from introduced mongoose, rats, feral cats and feral dogs. Population management is needed to meet the goals of increased game hunting pressure. In order to restore game birds to their carrying capacity in nesting areas, introduced predators must be severely reduced or eliminated.

B. Objectives

- Restore game bird populations at the Kahakuloa GMA, the Lanai Cooperative GMA, Kanaio GMA, Molokai Forest Reserve PHA, and the Kula Forest Reserve through a predator control program.
- Purchase mongoose and cat traps as needed.

C. Expected Results and Benefits

- The reduction in numbers of predators and subsequent increase in game bird survival and reproduction will increase the number of game birds in the Kahakuloa GMA, Kula Forest Reserve, Kanaio GMA, the Lanai Cooperative GMA, and Molokai Forest Reserve PHA. Reducing predation by 50%, would potentially double the recruitment of young to the game bird population. This increased chick production is expected to result in an additional harvest of 450 game birds per year and an additional 600 hunter days of recreation, a substantial increase in wildlife recreational opportunities to the people of Maui County.
- The purchasing of traps to replace existing traps will allow for the ability to remove unwanted predators

D. Approach

- Predator numbers will be reduced by trapping introduced mongoose, rats, feral cats and feral dogs. Twenty eight traps will be set and checked during the key game bird breeding and nesting season (February through July) on the island of Maui. On Lanai, 12 traps will be set and checked during the months of February and July.
- During FY17, FY19 and FY 21, 30 traps will be purchased to replace damaged or non-functioning traps
-

E. Location

Predator reduction will be conducted at the Kahakuloa GMA, Kanaio GMA and Kula Forest Reserve on Maui, the Lanai Cooperative GMA, and Molokai Forest Reserve Public Hunting Area.

F. Estimated Cost.

Year 1	Year 2	Year 3	Year 4	Year 5	5-Yr Total
$6,000	$1,100	$5,000	$3,000	$6,000	$20,600

Project 13 W-25-GP-04 Game Population Management: Honolulu County

A. Need

There are no native mammalian predators in Hawaii. Niches for small and medium-sized predators are filled by introduced Indian mongooses, feral dogs and cats and rats. In many instances they are the primary limiting factors on ground-nesting birds. There are no naturally occurring large predators to control these introduced predators. Demand for recreational game bird and game mammal hunting continues to increase, yet populations of game birds and mammals cannot keep pace with demand. Game bird populations are kept at very low numbers because of predation from introduced mongooses and rats, and by feral cats and dogs. In order to restore game birds to their carrying capacity in nesting areas, introduced predators must be reduced or eliminated.

B. Objectives

Protect populations of wild francolin, quail, pheasant, partridge, dove, and turkey and other game birds by reducing predation by mongooses, cats, rats and dogs through the use of:
Live trapping: Traps will be deployed near guzzlers to protect chicks and juvenile birds. Traps will also be deployed in areas where birds are most vulnerable, determined by staff. Free roaming animals will also be neutralized opportunistically. Other predators detected in the area will be trapped as situation dictates. The purchase of traps, nets, guns, ammom bait and snares will be used to control predators along with the purchase of rodenticides and bait station to control rodents.

C. Expected Results and Benefits

The reduction in numbers of predators and subsequent increase in game bird reproduction and survival could increase the hunter success ratio per hunter trip by 20 percent over five years.

D. Approach

- 60 live traps will be deployed year-round to control mongoose, cats and other non-native predators.
- Free-roaming feral dogs will be trapped in live cage traps when presence is detected

E. Location.

Honolulu County, Island of Oahu.

Year 1	Year 2	Year 3	Year 4	Year 5	5-Yr Total
$31,500	$70,000	$75,000	$80,000	$75,000	$370,000

Project 14 W-25-GP-05 Game Population Management: Kauai County

A. Need

There are no native mammalian predators in Hawaii. Niches for small and medium-sized predators are filled by introduced feral cats, feral dogs and rodents. In many instances, non-native predators are the primary limiting factors on ground nesting birds. In 2012, two Indian mongooses were caught in Lihue, Kauai prompting the need to increase efforts for detection and trapping. There are no naturally occurring large predators to control these introduced predators. Demand for recreational game bird and game mammal hunting continues to increase, yet game populations cannot keep pace with demand. One reason for the inadequate production is losses to predation. Population management through predator control is needed to meet goals of increased game hunting opportunities.

B. Objectives

Restore game populations at the Kekaha and Wailua Game Management Areas, Forest Reserves, and Cooperative Hunting Areas through the control of non-native predators.

C. Expected Results and Benefits

The reduction in numbers of non-native predators and subsequent increase in game populations will improve harvest success and hunter experience. Reducing predation by 50%, would potentially double the recruitment of young birds. The increased chick survival is expected to result in an additional harvest of 700 game birds per year and additional 600 hunter-days of recreation, a substantial increase in wildlife recreational hunting opportunities

D. Approach

Numbers of predator will be reduced by a combination of trapping, shooting and using bait stations.

E. Location

Kekaha and Wailua Game Management Areas, Hunting Unit L - Cooperative Management Area and Forest Reserves, Kauai, Hawaii.

Year 1	Year 2	Year 3	Year 4	Year 5	5-Yr Total
$10,000	$24,000	$26,000	$28,000	$30,000	$130,000

Project 15 W-26-GH-01 Game Habitat Management: Hawaii County - East Hawaii District

A. Need

Game bird habitat in game management areas is degraded by the dense growth of alien vegetation. Himalayan Raspberry, Gorse, Faya bush, Madagascar ragwort, guinea grass and other invasive plants decrease available habitat. Control of these vegetation types will reduce competition and provide better forage and cover for game birds.

B. Objectives

- Improve game bird habitat annually by clearing 70 acres of dense and otherwise undesirable introduced vegetation in the Kapapala cooperative hunting area.
- Annually clear and plant, up to 5 acres food plots for game birds in the Kapapala Ranch Cooperative GMA, and maintain livestock watering sites to take advantage of cattle grazing to maintain desired vegetation stages.

C. Expected Results and Benefits

This project will improve at least 70 acres per year of wildlife habitat degraded by undesirable growth in the Kapapala CGMA and will clear and plant five (5) acres in the area. The game bird habitat improvement is expected to encourage game birds by 15 to 20% per year. Additionally, enclosure fences around cleared areas and control of livestock water in cooperation with ranch mangagement will direct the grazing activities of ungulates and create a desired edge effect for game birds. These activities are expected to eventually double the carrying capacity for game birds and reduce the threat of total habitat destruction by wildfire from fuel overload.

D. Approach.

Mature, dense stands of fayae bush and guava will be cut and the stumps poisoned by trained technicians in Kapapala Ranch CGMA. Once removed, cleared areas are managed to maintain desirable vegetation stages by mowing, select herbicide, planting and grazing cattle. Managed cattle grazing can be an effective method to maintain habitat with minimal use of manpower and equipment. In areas where managed grazing is not practical, game bird habitat will be maintained by mowing, and controlled burns. Cleared patches will be planted with food crops and areas fenced to control cattle overgrazing.

E. Location.

This project will be conducted primarily in Kapapala Ranch Cooperative GMA.

Year 1	Year 2	Year 3	Year 4	Year 5	5-Yr Total
$15,000	$35,000	$35,000	$35,000	$35,000	$175,000

Project 16 W-26-GH-02 Game Habitat Management: Hawaii County - West Hawaii District

A. Need

Food, water and cover are all important elements of habitat management for game species. Goals for upland game bird habitat management are based on providing and improving these three resources. Typically, upland game birds in the West Hawaii District occur in early successional habitats and/or open canopy forests. This is because most gallinaceous bird species rely on walking and running for general movement over flying. As such, habitat that is easy for them to move through will reduce predation from predators using dense cover for ambush. The management techniques to increase ground mobility of upland game birds include mowing, prescribed burns, and utilizing livestock

grazing. Native outplanting activities in upland fenced exclosures will provide increased quality of game bird habitat. Weed control activities in these fenced units will reduce cover for predators and increase the success of established outplant populations. Mowing and prescribed burns, when used properly, can also provide food opportunities by making seeds and invertebrates more accessible and also encouraging new plant growth outside of large fenced exclosures. Invertebrates can be an important food source especially for juveniles when a high protein diet is essential for growth and development. For food the planting of crops (i.e., legumes, forbs, etc.) can be beneficial but also costly. Water, especially during drought conditions, can be a limiting factor of habitat for the game species. The construction of water units is covered under game facilities construction. The lack of sufficient cover for upland game birds is not as limiting as other habitat constraints. Overall, upland game bird habitat management in the Western District includes mowing, researching the usage of prescribed burns, establishing food plots where appropriate, and outplanting native trees and shrubs to provide food and cover for both game and non- game species.

As noted under the West Hawaii Population Management section, it is anticipated that during the next five year cycle a Habitat Conservation Plan (HCP) will be implemented in Puu Waawaa Forest Reserve and Puu Anahulu GMA. This HCP will allow the State to perform habitat improvements for game mammals, including creating and maintaining food and cover plots. When appropriate, these management activities will be utilized to improve game mammal habitat.

B. Objectives

- Work to alleviate habitat loss in degraded public hunting areas through tree and shrub plantings in the Kaohe GMA and Puu Anahulu GMA.
- Initiate habitat improvements for game birds, including mowing and establishing food plots in areas outside of large exclosures, most hospitable to game, using non-invasive plants.
- Initiate outplanting of native plant species, for increased quality of game bird habitat, up to 1000 plants per year.
- Support livestock grazing where appropriate to maintain game bird habitat.
- Reduce fire threat to game bird habitat plot areas in Puu Anahulu GMA.
- Create or maintain game mammal food and cover plots in Puu Waawaa Forest Reserve and Puu Anahulu GMA
-

C. Expected Results and Benefits

This project will improve annually at least 15 acres of wildlife habitat degraded by undesirable growth in the Kaohe GMA and begin to alleviate habitat loss. These activities are expected to increase the carrying capacity for game birds and reduce the threat of catastrophic habitat destruction by wildfire. Species of shrub/trees planted will provide additional fruit and berries for game birds. Exclosures are to be constructed in Puu Anahulu GMA and Puu Waawaa FR to improve game bird habitat. areas.

D. Approach

- Annually plant up to 1000 shrub/tree seedlings in select areas.
- Construct planting exclosures (2-3 acres) 1-2 per year in degraded habitat to initiate habitat improvements for game species.
- Strip mow 30 acres of game habitat per year.
- Create game habitat and food plots (10ac/yr.)
- Maintain firebreaks around exclosures.
- Install or repair up to 5 miles of waterlines and fences per year.
- Create or maintain 10 acres of game mammal habitat in Puu Waawaa Forest Reserve and Puu Anahulu GMA.

Activity - Strip Mowing

- Pruchase of parts, supplies or to pay for machinery and equipment repair, hauling services to move machinery, rental of machinery.

Activity - Create New Gamebird Habitat

- Rental of machinery or repair of machinery used to create new habitat by removing noxioius weeds

Activity - Plant Propagation

- Purchase of plants, planting tools, protection, irrigation equipment, to establish plants preffered to gamebirds.

Activity - Create/Maintian Food Plots for Game Birds

- Purchase plants, seeds, tools to establish vegeative food plots, prucahse fencing of tools to maintain protective barriers

Activity - Grazing Management

- Purcahse of tools and equipment to support rotational grazing, includes water/irrigation maintenance

E. Location

Kaohe and Puu Anahulu GMA's, Mauna Kea and Puu Waawaa FR's and other areas in the Western District.

F. Cost

Year 1	Year 2	Year 3	Year 4	Year 5	5-Yr Total
$20,000	$72,000	$65,000	$60,000	58,000	325,000

Project 17 W-26-GH-03 Habitat Management: Maui County

A. Need

The increased use by the public hunter coupled with the loss of public hunting lands within Maui County has placed greater demand on the remaining public lands for hunting. One means of keeping up with the per capita use of a given areas is by increasing the game bird species carrying capacity of the remaining areas through habitat management and manipulation.

B. Objectives

- Annually clear and maintain 50-100 acres of brush and undesirable vegetation at the Kahakuloa GMA and Kanaio GMA in order to improve and provide habitat for doves, francolins, quail, chukar and pheasants. Bi-annually mow 1,000 acres of game bird habitat in unit 3 of the Lanai CGMA, which will create desirable habitat for pheasants, turkeys, doves, and francolins.
- Increase game bird habitat by planting desirable vegetation that will serve both for foraging and cover in the Kanaio GMA.
- Seed collection used to propagate plants for eventual outplanting.

C. Expected Results

- To provide an additional 600 hunter days and harvest of 750 game birds.

- Propagating and planting desirable vegetation for game animals will improve habitat conditions and result in increased hunter satisfaction.
- 4-wheel drive vehicle will allow for the completion of projects under this grant during the grant period.

D. Approach

- To provide an additional 600 hunter days and harvest of 750 game birds.
- Propagating and planting desirable vegetation for game animals will improve habitat conditions and result in increased hunter satisfaction.
- 4-wheel drive vehicle will allow for the completion of projects under this grant during the grant period.

E. Location

Kahakuloa Game Management Area and Kanaio Game Management Area on the island of Maui, and Unit 3 of the Lanai Cooperative Game Management Area.

F. Estimated Cost

Year 1	Year 2	Year 3	Year 4	Year 5	5-Year Total
$30,000	$90,000	$45,000	$45,000	$50,000	$270,000

Project 18 W-26-GH-04 Game Habitat Management: Honolulu County

A. Need

Habitat management is necessary in the Kuaokala GMA to improve the feeding, nesting and loafing habitat for game birds. Much of the area is in need of restoration due to a history of inappropriate range management and generally poor soil and weather conditions. The plant species present are dominated by non-native grass species, which provide little food value for game birds unless carefully managed. These grasses grow in dense stands, which offer cover around the edges, but are little utilized because their high density restricts game bird movement, feeding, and loafing.

B. Objectives

- Seeds of local tree species will be collected for propagation and outplanted when appropriate. Stands of native plants will be protected and enhanced by eliminating non-native weeds. Site surveys to locate threatened and endangered plants will be conducted prior to habitat management site selection and vegetation clearing. Threatened and endangered plants will be fenced and excluded from game habitat improvement areas.
- Invasive brush and weeds will be targeted for removal in geographically flat areas. Grasses and brush will be controlled by mowing in cleared areas. Feed sources will be established with food plots in areas most hospitable to game birds. Where appropriate, Paspalum grass, sorghum, corn

and/or millet will be planted to provide plants that provide food and cover for game birds. Grazing will be done on a rotational basis to control grasses in areas that cannot be mowed.

C. Expected Results and Benefits

To increase the number of game birds at the Kuaokala GMA in order to provide hunting for 700 hunters per season, with a harvest of 300 birds

D. Approach

- Strip mow fields to enhance gamebird habitat at Kuaokala GMA (15 ac/year)
  - Pruchase of parts, supplies or to pay for machinery and equipment repair, hauling services to move machinery, rental of machinery,
- Outplant native trees to aid in vegetation management (50 trees/year)
  - Purchase of plants, planting tools, protection, irrigation equipment, to establish plants preffered to gamebirds.
- Create or maintain food plot (1 acre/year)
  - Purchase plants, seeds, tools to establish vegeative food plots, prucahse fencing and tools to maintain protective barriers.
- Create gamebird habitat (1ac/year)
  - Rental of machinery or repair of machinery used to create new habitat by removing noxioius weeds.
- Graze cattle in areas where grass cannot be mowed (200 ac/year)
  - Purcahse of tools and equipment to support rotational grazing, includes water/irrigation maintenance.

E. Location

Kuaokala GMA.

Year 1	Year 2	Year 3	Year 4	Year 5	5-Yr Total
$60,000	$86,000	$90,000	$90,000	$90,000	$362,000

Project 19 W-26-GH-05 Game Habitat Management: Kauai County

A. Need

Game habitat improvements are needed on selected portions of the Kekaha and Wailua Game Management Areas, Hunting Unit L – Cooperative Management Area to enhance game populations, primarily game birds. Plans are to accelerate habitat enhancement for the control of invasive plant species such as Molasses grass (*Milinis minutiflora*), Bushy Beardgrass *Schizachyrium condensatum*) and

Melastoma (*Melastoma candidum*) which can be restored to excellent game bird habitat by mowing, clearing and planting with beneficial grasses such as Bahia grass (*Paspalum notatum*), and Bermuda grass (*Cynodon dactylon*). Game bird productivity and access for hunters to harvest game birds has been hampered by this weedy overgrowth. Planting and maintaining fruit trees within the Kekaha GMA will also help supplement feed for game production.

B. Objective

- Clear, in contour strips, a total of 50 acres (10 acres per year) of undesirable vegetation.
- Plant with Bahia grass and/or Bermuda grass within Kekaha and Wailua GMAs and Hunting Unit L – Cooperative Management Area.
- 1000 acres (200acres/year) of in house staff strip mowing of undesireables
- 15 acres (3 acres/year) of fences fruit trees

C. Expected Results and Benefits

Planned strip mowing, clearing and planting is expected to improve game bird productivity and survival by doubling the available nesting and feeding habitat. It also is expected to improve access for hunters to areas currently overgrown with impenetrable weed growth. This improvement will also reduce the chance of catastrophic brush fires by creating fire breaks within dense stands of flash fuels within Kekaha and Wailua GMAs and Hunting Unit L- Cooperative Management Area

D. Approach

Habitat areas will be cleared by bulldozing, harrowing and/or mowing on 50 to 100 foot wide contour strips, and planted with Bahia grass and/or Bermuda grass. A portion of this job will be by State contract following procurement guidelines and rules due to limited in-house resources to complete the job on time. Mowing will be done with in-house staff operating tractors and 15-20 foot pull-behind mowers. Fruit trees seedlings will be bought, planted and maintained in fenced in areas around the Kekaha and Wailua GMAs.

E. Location

This project will be conducted on the island of Kauai within Kekaha and Wailua GMAs and Unit L – Cooperative Hunting Area

Year 1	Year 2	Year 3	Year 4	Year 5	5-Yr Total
$30,000	$65,000	$70,000	$75,000	$80,000	$350,000

Project 20 W-27-GF-01 Game Facilities Construction Hawaii County - East Hawaii District

A. Need

Large portions of Kapapala and Kipuka Aina Hou CGMA's are only seasonally occupied by game birds because there is no permanent source of water. Additional game bird water units will expand game birds

in the CGMAs. Informational signs are needed to ensure hunter compliance with hunting area boundaries, seasons and other hunting regulations. No hunter check -in station exists to facilitate hunter data recording which is needed for proper management. Hunting trends in the Kau Forest Reserve require accurate assessment.

B. Objectives

- Enhance game bird populations and obtain better distribution of game by installing water guzzlers Kipuka Ainahou CGMA.
- Promote hunter compliance by installing 200 additional informational signs and markers .
- Build hunter check-in station to accommodate Kau hunters

C. Expected Results and Benefits

Increase the number and distribution of game birds in Kapapala GMA by expanding their range to areas where there is no current permanent water source. This is expected to encourage more hunter trips and a broader distribution of game birds.

D. Approach

Purchase and install of water units and 500 signs. Build a hunter check-in station at the trailhead to Mountain House and Wood Valley.

E. Location

Kapapala, Kau, and Kipuka Ainahou CGMA's and other public hunting areas throughout the East Hawaii District of Hawaii Island

Year 1	Year 2	Year 3	Year 4	Year 5	5-Year Total
$10,000	$30,000	$30,000	$30,000	$30,000	$150,000

Project 21 W-27-GF-02 Game Facilities Construction Hawaii County - West Hawaii District

A. Need

Informational signs are also needed to promote hunter compliance with hunting area boundaries and other hunting regulations. Buildings are needed for protection and storage of game management materials and supplies.

B. Objectives

- Promote hunter compliance by installing/replacing informational signs and hunter check stations.
- Storage buildings, baseyard facilities and other infrastructure will be replaced or constructed to ensure they can support game program operations

C. Expected Results and Benefits

Increase in the number and distribution of game in the West Hawaii District by expanding their range to areas where there is no current permanent water source. The result of this improvement will be increased game harvest and hunter success. Hunter check stations and signs will provide hunter effort and success. Construction and improvements to check stations will be done to ensure data can be collected appropriately.

D. Approach

- Construct/replace 1 game guzzlers per year where appropriate
- Construct/repair one hunter check station per year

Activity - Construct/Replace Gamebird Guzzler

- Purchase of materials, supplies parts to completely rebuild or build a guzzler/water unit. Include cost to demo--tools, dump fees, hauling

Activity - Construct/Replace Check Station

- Purchase of materials, supplies parts to completely rebuild or build a check station. Include cost to demo--tools, dump fees, hauling

Activity - Fence Construction

- Materials, parts, supplies to construct new fences, enclosures, cattle guards, gates, etc. Includes contract work

Activity - Construct Campsites and other Public Use Facilities

- Materials, parts, supplies to construct new campsites, and other facilities, etc. Includes contract work

E. Location

Appropriate public hunting areas throughout West Hawaii District

F. Cost

Year 1	Year 2	Year 3	Year 4	Year 5	5-Year Total
$1,000	$15,000	$15,000	$15,000	$15,000	$75,000

Project 22 W-27-GF-03 Game Facilities Construction: Maui County

A. Need

With the expansion of the Kula Forest Reserve/Hunting Unit C, the potential acquisition of an additional 8,000 acres of public hunting areas on Maui; and increased hunting pressure within the Molokai Forest Reserve/Hunting Units C, D, and E, there is a need for additional facilities and infrastructure for recreational hunting, such as game bird water units, signs and markers, hunter check stations, game bird holding pens, game bird feeder units and additional fencing. Expansion of the Lanai Cooperative Game Management Area (Unit 3) also creates a need for additional facilities.

B. Objective

- Establish two (2) hunter check station in the Kanaio Game Management Area to obtain distribution of hunters and hunter usage, and harvest data.
- Construct game bird guzzler units on Maui, Molokai, and Lanai.
- Construct game bird holding pens and establish game bird feed stations on Maui.
- Construct gates to prevent illegal entry into areas.
- Establish new signs and or markers within current and potentially new public hunting areas to ensure hunter compliance and promote better management.

C. Expected Results

- Establishment of new hunter check stations will result in increased awareness of hunter usage and data on hunter harvest of game birds and game mammals.
- The construction of water units are expected to enhance game bird chick survival and increase the carrying capacity for game birds in the area.
- The construction of game bird holding pens will ensure greater game bird chick survival and the establishment of dedicated game bird feeders will ensure year round forage for game bird adults and chicks
- Signs and markers will promote better management and utilization of public hunting areas within Maui County and ensure hunter compliance.

D. Approach

- Two (2) hunter check stations, built on footings, will be constructed at two (2) primary entrances in the newly established Kanaio Game Management Area on the island of Maui (FY18). On Maui, eight (8) storage type water units will be constructed in the newly established Kanaio GMA (FY 18, 19, 20 and 21). On Lanai, two (2) water units, fed by a main water source, will be constructed (FY18 and 21). In FY17, a water unit will be constructed on the island of Molokai.
- Two (2) game bird holding pens will be constructed on the island of Maui, one (1) in FY 18 and one (1) in FY19. These pens will hold pen raised chicks prior to their release into the wild. Acclimating themselves to the surround habitat will potentially ensure that birds will remain in the area and increase overall abundance.
- One game bird feed station will be established each year between FY18 and FY21 to ensure year round forage for game birds.

Potential construction sites will be inspected for native plant species and located to avoid impact to listed species. Site surveys will be conducted prior to building water units and fences in order to lessen the impact of the facilities on listed species.

E. Location

Kahakuloa Game Management Area, Kanaio Game Management Area and Kula Forest Reserve on Maui, Molokai Forest Reserve Public hunting area and Unit 3 of the Lanai Cooperative Game Management Area.

F. Estimated Cost.

Year 1	Year 2	Year 3	Year 4	Year 5	5-Yr Total

$3,000	$32,000	$22,000	$18,000	$20,000	$98,000

Project 23 W-27-GF-04 Game Facilities Construction: Honolulu County

A. Need

Construction and/or replacement of game bird guzzlers are needed at Kuaokala GMA to encourage game birds to establish a more uniform population distribution. The construction and/or replacement of hunter checking stations are also necessary to monitor hunter use of public hunting areas. Buildings are needed for protection and storage of game management materials and supplies.

B. Objectives

- Game bird guzzlers will be monitored and replaced as necessary to ensure that they are operating efficiently.
- Hunter check stations will be inspected to ensure they are able to collect the date necessary monitor hunter effort. Older units that are not able to be repaired will be replaced.
- Storage buildings, baseyard facilities and other infrastructure will be replaced or constructed to ensure they can support game program operations. Shelters and other amenities will be constructed support hunters and provide shade in open areas.

C. Expected Results and Benefits

Hunter check stations will provide hunter effort and success data on 5,200 acres of public hunting areas. Construction and improvements to check stations will be done to ensure data can be collected appropriately. Effort and success data will also be collected by surveying individual hunters in the field or over the phone, and by working with the local hunters associations and clubs. Shelters provide and amenity for hunters in the areas.

D. Approach

- Construct/replace one hunter check-in station per year
  - Purchase of materials, supplies parts to completely rebuild or build a check station. Include cost to demo--tools, dump fees, hauling
- Construct/replace one game bird guzzler per year
  - Purchase of materials, supplies parts to completely rebuild or build a guzzler/water unit. Include cost to demo--tools, dump fees, hauling
- Construct one shelter at the Kuaokala GMA.
  - Materials, parts, supplies to construct new campsites, and other facilities, etc. Includes contract work
- Inspect and repair buildings (1x/year)

E. Location

The game bird guzzlers will be located at Kuaokala GMA and Makua Keaau PHA. Hunter check stations will be located at each Public Hunting Areas public access point. Buildings and infrastructure are located at various locations throughout the District.

Year 1	Year 2	Year 3	Year 4	Year 5	5-Yr Total
$1,000	$20,000	$22,000	$25,000	$20,000	$102,000

Project 24 W-27-GF-05 Game Facilities Construction: Kauai

A. Need

The newly built Kokee Hunter Checking Station's plumbing will need a water catchment tank, water pump and septic system to be installed. The Kokee hunter checking station services more than eight hunting management units on west Kauai. The building will be able to accommodate two wildlife personnel during scheduled hunting seasons and regular working days. The hunter check station is also used as a command post when there are fires in the Kokee area.

The fence line along the western section of the Kekaha GMA will need to be replaced after more than forty years. The fence was maintained for cattle ranching operations by the former Kekaha Sugar Company, which dissolved in 2000 leaving behind remnant cattle and seven miles of fence. Prior to 2000, Kekaha Sugar Company leased portions of the Kekaha GMA from the State. The existing fence is adjacent to the Mana lowlands being used for diversified agriculture. The new fence will need to be upgraded to seven feet high to keep deer from jumping over it. Along the fence, a service route will need to be made for maintenance. Up to a half a mile of new fence per year will need to be constructed to finish the job in ten years.

The newly established Hunting Unit L – Cooperative Management Area located on former Kekaha sugar cane lands will require fencing portions of the range to reduce crop depredation by game animals. The cooperative agreement with the Agribusiness Development Corporation - State Department of Agriculture (ADC) allows the DLNR-DOFAW to assist in game animal population control through public hunting.

Construction of new or replacement of old gamebird water units are needed in the Kekaha GMA and Hunting Unit L. New low-maintenance water units systems will be installed.

The establishment of two new hunter access routes and parking areas in Hunting Unit C of Lihue-Koloa and Moloa'a Forest Reserves are needed to increase hunting pressure and provide more hunting opportunities.

B. Objectives

- Plan, design and install the plumbing system at the Kokee hunter checking station.
- Plan and construct up to 1 mile of fence and access road along the western boundary of the Kekaha GMA per year.

- Plan and construct up to 1 mile of fence in Hunting Unit L – Cooperative Management Area per year.
- Protect remnant endangered plants in highly degraded habitats from ungulate damage by constructing fenced exclosures, allowing for sustained yield hunting in surrounding areas.
- Post appropriate informational signs and markers to effectively manage hunting areas.
- Construct or replace 25 water units (5units/year) for gamebird use.
- Plan, design and contruct two hunter access routes and parking area in Hunting Unit C – Lihue-Koloa and Moloa'a Forest Reserves, Kauai.

C. Expected Results and Benefits

The installation of the plumbing system at the Kokee Hunter Checking Station will allow for more sanitary and healthy working environment for wildlife personnel.
The construction of the hunting area fence lines and maintenance route will greatly reduce crop damage to local farmers and improve hunter access.

Exclosure fences will protect isolated threatened and endangered plants from feral animals, yet enable hunters to utilize the game resources in highly degraded habitats. Appropriate signs will facilitate management of hunters in hunting areas.

The construction and/or replacement of water units will result in less maintenance time for staff and more water available for gamebirds in drier times.

D. Approach

All planning, designing and installation of the plumbing system at the Kokee Hunter Checking Station will be contracted to a qualified vendor.

Portions of the fence construction may also be contracted to a private vendor. Other sections of the fence job will be done through in-house personnel.

Three hundred informational, boundary and safety zone signs and markers (80 per year) will be posted. A total of 0.2 miles of fencing will be used to create small exclosures to protect threatened and endangered plants within GMA's and forest reserves, to enable continued hunting while protecting endangered plants.

New and replacement gamebird water units will be purchased and installed by in–house staff.

The development of the environmental assessments for the new hunter access routes and parking areas will be contracted a qualified vendor. Portions of the assessment including the flora and fauna surveys will be done by staff botanist and wildlife biologist. Actual construction will be done using a combination of in-house operators and equipment and contract vendors.

E. Location

The projects will be conducted with DLNR managed lands including Waimea Canyon State Park, Kekaha and Wailua GMA's, Cooperative Management Areas and Forest Reserves, Kauai, Hawaii.

Year 1	Year 2	Year 3	Year 4	Year 5	5-Yr Total

$30,000	$180,000	$200,000	$200,000	$200,000	$940,000

Project 25 W-28-GS-01 Game Surveys and Inventories (Game Mammal): Hawaii County - East Hawaii District

A. Need

Public hunting pressure has increased in recent years as more hunters compete for the same resources in fewer hunting areas. The purpose of surveys is to document long term population trends to facilitate management through the regulation of bag limits. This is in order to enhance hunting opportunities, maintain sustained yield in appropriate areas, and reduce game mammal population levels in areas designated for protection. Another need is to monitor the impacts of feral game mammals on range quality and determine movements of feral pigs in and around sensitive native wildlife and plant habitats. This information is necessary to ensure that game mammal hunting is conducted to balance recreational opportunities with conservation and restoration of rare and endangered native species. Feral cattle control has recently been offered to hunters and met with tremendous interest. This is expected to continue.

B. Objectives

- Determine the distribution, population densities, reproductive success, status, and trends of game mammals on the island of Hawaii.
- Monitor habitat condition and assess game mammal carrying capacity in PHA's
- Determine game mammal hunter pressure and success, and the effects of hunting on game distribution and numbers.
- Survey new areas for additions to game management areas and expand cattle control efforts.
- Monitor diseases and parasitism in game mammals

C. Expected Results and Benefits

The data collected at hunter check-in stations, and surveys of game mammal populations will be combined with information from previous years to provide a basis for management, development, maintenance actions, and proposals for research involving game mammals and their habitat. The information produced will be used to assess and adjust hunting regulations such as seasons, bag limits, days, and means of take. Application of the recommendations will maximize wildlife recreation opportunities while insuring compatibility with forest and wildlife management objectives.

D. Approach

Quantitative information on game mammal populations, distribution, reproductive success and impact on habitat as well as hunter effort and success will be gathered annually. Game mammal survey will be conducted. These surveys include methods for particular species which have been developed to monitor populations or indices of abundance. Surveys include aerial censuses using fixed winged aircraft or helicopter, strip or total area counts on the ground, density indices based upon the occurrence of spoor correlated to habitat type. Diseases and parasites of game mammals and game birds will be monitored as necessary in coordination with the Hawaii State Department of Agriculture.

E. Location of Work
Island of Hawaii, East Hawaii District

Year 1	Year 2	Year 3	Year 4	Year 5	5-Yr Total
$5,000	$30,000	$30,000	$30,000	$30,000	$150,000

Project 26 W-28-GS-02 Game Surveys and Inventories (Game Mammal): Hawaii County - West Hawaii District

A. Need
Public hunting pressure has increased in recent years as more hunters compete for the same resources in fewer hunting areas. The purpose of surveys is to document long term population trends to facilitate management through the regulation of bag limits. This is in order to enhance hunting opportunities, maintain sustained yield in appropriate areas, and reduce game mammal population levels in areas designated for protection

Data are also needed to monitor the impacts of feral game mammals on range quality and determine movements of game mammals in and around sensitive native wildlife and plant habitats. This information is necessary to ensure that game mammal hunting is conducted to balance recreational opportunities with conservation and restoration of rare and endangered native species

B. Objectives

- Determine the status and distribution, population densities, reproductive success, status and trends of game mammals on the island of Hawaii, West Hawaii District.
- Monitor habitat condition and assess game mammal carrying capacity in PHA's.
- Determine game mammal hunter pressure and success, and the effects of hunting on game distribution and numbers.
- Survey new areas as possible candidates for additional game management areas.
- Monitor diseases and parasitism in game mammals.
- Monitor the distribution, population densities, reproductive success, foraging behavior, status and trends of game mammals in West Hawaii.
- Determine hunter effort and success, and the effects of hunting on game mammal distribution and numbers.

C. Expected Results and Benefits
The data collected at hunter check-in stations, and surveys of game mammal populations will be combined with information from previous years to provide a basis for management, development, maintenance actions, and proposals for research involving game mammals and their habitat.
The information produced will be used as a basis for wildlife management regulations which maximize wildlife recreation opportunities while insuring compatibility with forest and wildlife management objectives.

D. Approach

- Quantitative information on game mammal populations, distribution, reproductive

success and impact on habitat as well as hunter effort and success will be gathered annually.

- Aerial surveys will be conducted at Puu Waawaa and Puu Anahulu and other PHAs for range and distribution of game mammals and habitat quality.
- Track movements of game mammals by utilizing radio and GPS collars
- Diseases and parasites of game mammals will be monitored as necessary in coordination with the Hawaii State Department of Agriculture.

Activity - Aerial Surveys

- Aerial surveys for mammals/birds. Contract for Helo time, supplies and gear for flying surveying

Activity - Ground Surveys

- Purchase of survey equipment or tools needed to survey

Activity - Collect and Analyze Data

- Used if contracting analysis or using RCUH Staff

Activity - Vegetation Impact Surveys

- Purchase of survey equipment or tools needed to survey

Activity - Non PHA Hunt Mgt

- Contract--RCUH to over see Permit Hunting Program

E. Location of Work

Island of Hawaii, West Hawaii District

F. Cost

Year 1	Year 2	Year 3	Year 4	Year 5	5-Yr Total
$8,000	$37,000	$37,000	$38,500	$39,000	$197,000

Project 27 W-28-GS-03 Game Surveys and Inventories (Game Mammal): Maui County.

A. Need

With an ever increasing public demand for recreational game mammal hunting on Maui and Molokai, coupled with the previous loss of lands available for hunting, the quality and quantity of the hunt is declining. A continued influx of the environmentally minded seeking the wonders of the outdoors has placed additional demands on game mammal habitats.

Data on the trends of game mammal populations will be obtained through the collection of hunter harvest information and annual aerial surveys. Hunter checking stations will provide information on hunting pressure and animal harvest. This information is needed to provide hunters with harvest information on the hunts and ensure proper game management.

B. Objective

- To collect harvest data to determine game mammal trends and to provide hunters with information related to game mammal management.
- Conduct aerial surveys to monitor population increases or decreases.

- Transects to determine/evaluate levels of disturbance by feral pigs

C. Expected Results and Benefits

- The information produced will be used to determine trends and to keep hunters informed on the progress of hunts.
- The data will be used to design and implement a program to provide hunters the information on game mammal harvest density trends over the years.
- Information gathered will be used to insure proper game management for the future.

D. Approach

- Fourteen hunter check stations will be operated on a self-checking basis in the District to gather hunter harvest data.
- Telephone and mail interviews with hunters will augment checking station data collection.
- Annual aerial surveys will be conducted over the Public Hunting Areas on Molokai and Maui to monitor habitat conditions and population trends of game mammals.
- Transects within the Koolau Forest Reserve public hunting area will be conducted on a biannual basis to evaluate disturbance levels of feral pigs.
- 4-wheel drive vehicle will allow for completion of projects during this grant period.

E. Location

Public hunting areas on the islands of Maui and Molokai.

F. Estimated Cost

Year 1	Year 2	Year 3	Year 4	Year 5	5-Yr Total
$35,000	$35,000	$76,000	$39,000	$39,000	$224,000

Project 28 W-28-GS-04 Game Surveys and Inventories (Game Mammal): Honolulu County.

A. Need

Data on the status and trends of game mammal populations and the condition of their habitats are needed to manage these populations effectively and to maximize recreational hunting opportunities, while assuring compatibility with other forest and wildlife management objectives. Information on hunter effort and success is needed to assess game mammal population trends. Habitat surveys are needed to assess game mammal habitat conditions, the status of watershed quality and condition, and the effects these introduced animals may be having on native vegetation communities. Management of control hunts in areas that are not designated PHAs are based on ungulate disturbances, nuisance complaints, and native species protection. The control hunts are managed to reduce the number ungulates in the areas.

B. Objectives

- Hunter participation and game harvest information will be collected on a monthly basis from 12 hunter check-in stations Effort and success data will also be collected by surveying individual hunters in the field or over the phone, and by working with the local hunters associations and clubs. This information will be used to manage needs of game program, identify areas of improvements, and obtain overall usage of Hunting Areas.
- Aerial surveys will be conducted to obtain trends in populations of feral goats where they are found on the Island. They will be conducted via elevation transects in the Makua-Keaau and Waianae Kai PHAs. Control hunt data will determine the conditions and stipulations of permits issued to ensure that ungulates are being controlled. Control will be based on decreasing hunter effort/catch. A downward trend will indicate a reduction in populations. Permits and access will be issued relative to this data.

C. Expected Results and Benefits

Information collected on hunter effort and success will be used to assess game mammal population trends and will provide data on which to base recommendations for hunting seasons, which maximize hunting recreation opportunities while ensuring protection of watersheds and native vegetation.

Habitat survey results will be used to assess game mammal habitat, quantify the status of watershed conditions in public hunting areas, and the measure the effects that game animals may be having on native vegetation communities.

D. Approach

- Determine hunter participation and hunter success in 12 PHA's and one GMA on Oahu by data from each area (12x/year)
- Monitor range conditions of feral pigs and goats via aerial surveys (3x/year) at Makua Keeau and Waianae Kai PHA.
- Determine hunter success for permits for the Honolulu Forest Reserve, Moanalua Section, Manoa Tantalus section and the Waimanalo Forest Reserve (12x/year)

E. Location

Public Hunting Areas and Forest Reserves on Oahu

Year 1	Year 2	Year 3	Year 4	Year 5	5-Yr Total
$4,500	$35,800	$35,800	$35,800	$35,800	179,000

Project 29 W-28-GS-05 Game Surveys and Inventories (Game Mammal): Kauai County

A. Need

Measurement of game mammal population trends, habitat conditions and the levels of hunting pressure are needed to effectively manage the game resources for sustained yield hunting where it is appropriate,

and to protect native ecosystems. Measurements of hunting pressure, in terms of hunter trips made, total game killed, and hunter success are needed to gauge the effectiveness of the public hunting program for supplying the demand for recreational hunting on those lands designated for sustained yield hunting, and to protect native flora, fauna and their habitats from damage caused by feral ungulates in areas designated for native ecosystem protection. Without the collection of this information, rational game mammal management decisions cannot be made that will achieve the various mandates of the DOFAW.

B. Objectives

- Measure the population status and trends of feral pigs, feral goats and black-tailed deer on areas under the control and management of DOFAW, to assure maximum recreational opportunity where it is appropriate, and to minimize animal damage to intact native ecosystems where they occur.
- Measure the conditions and trends of feral pig, feral goat and black-tailed deer on Kauai's public lands to protect sustained yield game habitat from being over-used, and to protect native ecosystems from damage.
- Collect and analyze the levels of hunting pressure, harvest of feral pigs, feral goats and black-tailed deer on Kauai's public hunting lands as a measure of the success of recreational hunting program, and to identify areas in need of intensified hunting pressure for the protection of rare native species and their habitats.
- Analyze the data collected for use in making recommendations for hunting seasons and bag limits to ensure maximum recreational benefits are realized in appropriate areas, while providing for the protection of native ecosystems and threatened and endangered flora and fauna in other areas.

C. Expected Results and Benefits

The information collected will provide the necessary information on which to base recommendations for game mammal hunting seasons. It will enable DOFAW to attain the maximum recreational benefit in those lands designated for sustained yield hunting, and protect to the best degree possible, through the use of liberal public hunting seasons, those areas that have significant native resources that need protection. The information collected will be used to monitor long term habitat conditions trends that will be useful for addressing long term actions and priorities in ecosystem management.

Feral goat populations in Waimea Canyon and the Na Pali Coast will be surveyed during the spring months using the previously established helicopter contours method. Black-tailed deer and feral pig population estimates and densities will be assessed by analyzing the results of the annual browse survey transects, and through evaluation of hunter success ratios in the annual hunting season results.

D. Approach

Hunter checking stations will be maintained throughout game mammal hunting seasons, to collect information on total number of hunter trips made, and numbers and species of game mammals taken in each hunting unit.

Game habitat conditions will be monitored at the previously established transects and game range exclosures in the Puu Ka Pele and Na Pali-Kona Forest Reserves and the Na Pali Coast State Park. New transects will be established in other portions of the forest reserves to determine the level of habitat use and the presence of new alien weed species. Photo stations will be re-visited and re-photographed to record long term and broad scale vegetational changes that are not necessarily related to animal impacts.

Recommendations will be made for hunting season and bag limit changes where necessary to maximize recreational hunting opportunity in those land zoned for sustained yield hunting, or to minimize habitat damage in those areas zoned for protection of native ecosystems and threatened and rare plants.

E. Location

The projects will be conducted on State forest reserves, game management areas, and cooperative hunting areas on the island of Kauai, Hawaii.

Year 1	Year 2	Year 3	Year 4	Year 5	5-Yr Total
$37,000	$38,000	$40,000	$42,000	$44,000	$200,000

Project 30 W-28-GS-01Game Surveys and Inventories: Hawaii County (Game Bird) -East Hawaii District

A. Need

Data on the status and trends of game bird populations and the condition of the habitats in which they are found are needed to manage these populations effectively and to maximize recreational hunting opportunities. Analysis of hunting effort and success and population survey data will provide information on species distribution and abundance, habitat trends in game bird hunting areas and the effectiveness of habitat management programs. There is also a need to monitor diseases and seek ways to accommodate bird hunting and nene restoration in the same areas to accomplish multi-resource management.

B. Objectives

- Determine the status and distribution, population densities, reproductive success, status, and trends of game birds and in East Hawaii.
- Monitor habitat conditions.
- Determine hunter pressure and success.
- Survey new areas as possible candidates for additional PHA's.
- Monitor diseases and parasitism.

C. Expected Results and Benefits

The data collected at hunter checking stations, along with information from previous years, will provide a basis for management, development, and maintenance actions.

D. Approach

- Quantitative data on game bird populations, distributions, reproductive success, and hunter effort and success will be obtained from surveys and hunter checking stations.
- Surveys may incorporate the use of aerial surveys, ground based strip-transect routes, call counts, and telephone surveys
- Collection of game birds for crop analysis in conjunction with vegetation surveys during various seasons can give the Division insight in game birds foraging behavior.

- Other lands with a potential for eventual incorporation into public hunting will be surveyed and pursued.

E. Location of Work
Island of Hawaii, East Hawaii District

Year 1	Year 2	Year 3	Year 4	Year 5	5-Yr Total
$10,000	$20,000	$20,000	$20,000	$20,000	$100,000

Project 31 W-28-GS-02 Game Surveys and Inventories (Game Bird): Hawaii County -West Hawaii District

A. Need
Data on the status and trends of game bird populations and the condition of the habitats in which they are found are needed to manage these populations effectively and to maximize recreational hunting opportunities. Analysis of hunting effort and success and population survey data will provide information on species distribution and abundance, habitat trends in game bird hunting areas and the effectiveness of habitat management programs.

B. Objectives
- Monitor the distribution, population densities, reproductive success, foraging behavior, status and trends of game birds in West Hawaii.
- Determine hunter effort and success, and the effects of hunting on game bird distribution and numbers.
- Evaluate the success of implemented habitat improvement and predator control programs on game bird productivity and hunter success.
- Assess the effects of limiting factors, including disease, parasitism, predation, and weather, on the distribution density and reproductive success of game birds and on their habitats.

C. Expected Results and Benefits
The surveys proposed will provide the basis to formulate and design new management programs that eventually lead to improved public hunting opportunities. Data produced from surveys will aid in the evaluation of management practices and techniques, and enable us to identify potential lands suitable for use as game bird hunting areas. Data obtained will be combined with information gathered in previous years for use in making wildlife management decisions.

D. Approach
- Roadside and aerial surveys will be conducted 1-2x per year at Mauna Kea FR, Puu Waawaa FR and Puu Anahulu GMA and other PHAs for range and distribution of game birds. Quantitative data hunter effort and success will be obtained from surveys and hunter checking stations and reported annually. Other lands with a potential for eventual incorporation into public hunting will be surveyed and pursued.

E. Location of Work
Island of Hawaii, West Hawaii District

Year 1	Year 2	Year 3	Year 4	Year 5	5-Yr Total
$5,000	$2,000	$2,000	$2,500	$3,000	$11,500

Project 32 W-28-GS-03 Game Surveys and Inventories (Game Bird): Maui

A. Need
With a yearly increase in demand for game bird hunting opportunities coupled with the loss of lands for public game bird hunting on Maui, Molokai, and Lanai, hunting in terms of quality and quantity are on the decline. An increase of non-hunting, multi use activities within the same public game bird hunting areas on Maui, Molokai, and Lanai have negatively impacted the hunting program and adversely affected game bird survival, productivity, and availability. Therefore there is a need to manage game bird resources and their habitats more intensely in order to maximize productivity, increase hunter opportunities and harvest, and to improve the quality of the hunting experience.

B. Objective

- Monitor the distribution, population densities, reproductive success, status and establish trends for game birds in the District of Maui-Maui, Lanai and Molokai.
- Determine/evaluate hunter effort and success, and the effects of hunting on game bird distribution and numbers.
- Evaluate the success of habitat improvements in improving game bird productivity/survival and hunter success.
- Assess the effects of human activities and land uses on game bird distribution and reproductive success in terms of alterations to their habits and habitats.
- Determine the effects of limiting factors, such as disease, parasitism, predation and weather, on the distribution, density, and reproductive success of game birds and their habitats.
- Purchase of a 4-wheel drive vehicle for the island of Maui (FY20).

C. Expected Results and Benefits.

- The gathering, interpretation, evaluation, and reporting of the information will provide a basis for game bird management, development, maintenance and proposals for research programs involving game birds and their habitats within the Maui District, and to make recommendations concerning compatible and non-compatible uses within public game bird hunting areas.
- Game bird survey information will be used to evaluate efficacy of previous management practices and hunting seasons. This information will form the basis for the design and implementation of new management programs and public hunting season regulations. It will be utilized to seek out new areas for game management.

- Studies of the causes of decreasing game bird productivity will provide answers for management and the means for reversing such trends.
- Data obtained will be combined with information gathered in previous years for use in making wildlife management decisions.
- Utilize survey information to identify potential land suitable for use as game bird hunting areas, then actively pursue development of additional lands for the purpose of public hunting to replace lost areas.
- Purchase of a vehicle will allow for the completion of projects that are part of this grant.

D. Approach

- Hunter check stations on Maui, Molokai, and Lanai will be run on a self check basis throughout the game bird season for the collection of harvest data.
- Distribution maps will be maintained to show current range of established game birds.
- Game bird population densities, distribution, and brood survival will be monitored to assess the status and track population trends.
- Game bird habitats on public hunting areas and potential public game bird hunting areas will be surveyed to determine the effect of the environment and hunter's activities on game bird production and hunting.
- The value of habitat improvements within public hunting areas in Maui County will be assessed and utilized in planning further improvement and/or development projects.
- Brood survival and total game bird densities will be correlated with rainfall within the game management areas.
- Reports with recommendations for management programs, habitat development, public hunting area acquisition, and leaser or Cooperative Agreement will be prepared periodically and annually.

E. Location

Public hunting areas on the islands of Maui, Molokai and Lanai.

F. Estimated Cost

Year 1	Year 2	Year 3	Year 4	Year 5	5-Yr Total
$2,000	$4,000	$4,500	$43,000	$7,000	$75,000

Project 33 W-28-GS-04 Game Surveys and Inventories (Game Bird): Honolulu County.

A. Need

Data on the status and trends of game bird populations and the condition of the habitats in which they are found are needed to manage these populations effectively and to maximize recreational hunting opportunities. Analysis of hunting effort and success and population survey data will provide

information on species distribution and abundance, habitat trends in game bird hunting areas and the effectiveness of habitat management programs.

B. Objectives

- Game birds will be surveyed by line transect methods and mapping of individual birds. The surveys will be conducted on three miles of roads in the Kuaokala GMA and Makua Keaau PHA.
- Hunter effort and success in the Kuaokala GMA and the Mokuleia and Makua Keaau PHA's will be determined using check in data.
- Hunter participation and game bird harvest information will be collected during the game bird season (Nov- Jan).
- Effort and success data will also be collected by surveying individual hunters in the field or over the phone, and by working with the local hunters associations and clubs.
- Checking station data will be analyzed to determine hunter effort and success.
- Habitat assessments will be made based on vegetation type and condition.

C. Expected Results and Benefits

The surveys will provide data on game bird population distribution, trends, and limiting factors, which can be used as a basis for wildlife management actions. Habitat survey results will be used regulate hunter pressure on game bird populations.

D. Approach

- Monitor game bird distribution and abundance in public hunting and game management areas on Oahu (2x/year).
- Determine hunter effort and success in the Kuaokala GMA and Mokuleia and Makua Keaau PHA's by analyzing check station data (12x/year).
- Survey and interview hunters for information and feedback on hunting conditions (16x/year)

E. Location

Kuaokala, Mokuleia and Makua Keaau PHA's, Oahu

Project 34 W-28-GS-05: Game Bird Surveys and Inventories (Game Bird): Kauai County

A. Need

The monitoring of game bird populations, their habitats, and levels of hunting pressure are needed to effectively manage the resources for maximum public benefit. Measurements of hunting pressure, in terms of hunter trips made, and hunter success ratios are needed to measure the effectiveness of recent habitat improvements and management actions. The newly established Hunting Unit L – Cooperative

Management Area adds 5,000 acres of former sugar cane lands for public hunting. The new hunting unit requires additional surveying effort.

B. Objectives

- Conduct pre-season surveys to measure the status of game populations and forecast the hunting season.
- Man hunter checking stations to gather data on gamebird harvest, and input from gamebird hunters.
- Compile monthly harvest to obtain the number of gamebirds harvested by species, hunter effort measured by hours spent in the field, and hunter success ratio measured by the number of gamebirds harvested per hunter trip.

C. Expected Results and Benefits.

The information collected will measure the effectiveness of habitat development projects and hunting season management in meeting our annual harvest goal of 1.0 game bird per hunter trip in Kauai public hunting areas.

D. Approach.

Gamebird hunter checking stations will be maintained throughout the game bird hunting season to collect information on total hunter trips made, hours hunted, and the numbers and species of game birds taken in each area. Data will be analyzed to measure hunting pressure, hunter success, and species composition for each area. Pre-hunting season surveys will be made in game management areas with volunteers and their bird dogs to determine relative game bird availability. Hunting season recommendations and habitat management decisions will be based upon the results of those surveys.

E. Location

The projects will be conducted in the Kekaha and Wailua GMAs, Unit L – Cooperative Management Area and State forest reserves on the island of Kauai, Hawaii.

Year 1	Year 2	Year 3	Year 4	Year 5	5-Yr Total
$3,000	$4,000	$5,000	$6,000	$7,000	$25,000

Budget Activities

W-22-GC-1 State of Hawaii Game Planning and Coordination							
		FY17	FY18	FY19	FY20	FY21	5-yr. Total
	Planned Activities	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	
	Review record, reports, procedures, & accounting	daily, as needed	daily, as needed	daily, as needed	daily, as needed	daily, as needed	
	Coordinate & assist with Statewide Audit	2 / yr, Jan -March	2 / yr, Jan -March	2 / yr, Jan -March	2 / yr, Jan -March	2 / yr, Jan -March	
	Prepare & compile annual grant agreement and report	1/yr; An. Rpt-Sept; Grant Agr.	1/yr; An. Rpt-Sept; Grant Agr	1/yr; An. Rpt-Sept; Grant Agr	1/yr; An. Rpt-Sept; Grant Agr	1/yr; An. Rpt-Sept; Grant Agr	
	Prepare 5 year Grant Proposal Package	-	-	-	-	1	
	Statewide Federal Aid Staff Meeting	2/yr	2/yr	2/yr	2/yr	2/yr	
	R1 Coordinator Mtg	1/yr	1/yr	1/yr	1/yr	1/yr	
	WAFWA & IAFWA Meetings	2/yr	2/yr	2/yr	2/yr	2/yr	
	Annual Site Visits to each District	1/yr	1/yr	1/yr	1/yr	1/yr	
	Proposal development University of Hawaii	As needed	As needed	As needed	As needed	As needed	
	IAFWA Meeting	1/yr	1/yr	1/yr	1/yr	1/yr	
	Game Management Plan: draft, review, revise	Weekly as needed	-	-	-	1	

	Hunting License Administration and Stamp Development	April 01 each year	April 01 each year	April 01 each year	April 01 each year	April 01 each year	
	Wildlife Core Group Meetings for Game Program	2x/year	2x/year	2x/year	2x/year	2x/year	
	Hawaii Conservation Conference			10 Staff 1/yr	10 Staff 1/yr	10 Staff 1/yr	

Game Coordination Totals						
Annual Totals	$83,485	$125,000	$162,500	$150,000	$250,000	$770,985
Salary (A)	$63,485	$25,000.00	$42,500.00	$50,000	$150,000	$330,985
Operating (B)	$20,000	$100,000	$120,000	$100,000	$100,000	$440,000

W-23-GL Statewide Game Land Access and Acquisition								
		FY12	FY13	FY14	FY15	FY16		5Year Total
	Planned Activities	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	Est. Cost	
1	Pay for Kipuka Aina Hou Lease	15,426 acre/ year	15,426.9 ac/yr	15,426.9 ac/yr	15,426.9 ac/yr	15,426.9 ac/yr *(through October 2016)*	$36,000	
2	Pay for Kaonoulu Ranch lease	940 acres/yr	940 acres/yr	940 acres/yr	940 acres/yr	940 acres/yr	$2,600	
3	Land Rental	1,000 acs/ yr	1,000 acs/ yr	1,000 acs/ yr	1,000 acs/ yr	30,000 acs/ yr (Lanai March 2016-2017)	$5,000	
4	Land Negotiation	1/ yr	1/ yr	1/ yr	1/ yr	1/ yr		
5	Create new access agreements and leases	As needed	As needed	As needed	As needed	As needed	$5,000	
6	Renewal of existing leases and access agreements	As needed	As needed	As needed	As needed	As needed	$5,000	
7	Information gathering to identify access/acquisition	Daily	Daily	Daily	Daily	Daily (*PA 20-21)*	$2,000	
8	Acquire fee title or conservation easements	As needed	As needed	As needed	As needed	As needed	*submit separate funding proposals for each acquisition*	
9	Conduct Environmental compliance	As needed	As needed	As needed	As needed	As needed	$15,000	
10	Prepare EA for Kanaio Game Management Area (Maui)			1 x /year			$200,000	
11	Conduct Botanical and other			1 x /year				

	surveys for Kanaio GMA							
12	Prepare EA for Keamuku GMA			1 x /year			Dropped	
13	Proposal writing and grant management	As needed	As needed	As needed	As needed	As needed (*PA 20-21)*		
14	Conduct on-the-ground coordination with Landowners	Daily	Daily	Daily	Daily	Daily	$2,000	
15	Conduct on-the-ground project implementation	As needed	As needed	As needed	As needed	As needed *(PA 16-19)*		
16	Create access corridor to Kalaheo section Lihue via *Puulima Place and Kua Road*			1 x /year		2	$100,000	
17	Create access corridor to Hilo Forest Reserve via *Makahanaloa mauka*			1 x /year		1	$2,000	
18	Conduct survey for access to Hilo Forest Reserve via *Makahanaloa makai*			1 x /year			$5,000	
19	Conduct survey for access to Ka'u Forest Reserve via *Department of Agriculture route*			1 x /year			$15,000	
20	Access and Acquisition Coordination (100%FTE)			1	1	1	$70,064	
21	Access and Acquisition Assistant (60%FTE)			1	1	1	$24,678	

Game Land Access and Acquisition Totals						
Total Cost/ Year	$69,091	$220,000	312,500	$218,750	$630,000	$1,450,341
Salary (A)	$9,091	$50,000	$62,500.00	$74,000.00	$183,400	$378,991
Operation (B)	$60,000	$170,000	$250,000	$144,000	$446,600	$1,070,600

W-29-GR-01 Game Mammal Research Accurately Estimate Sheep and Goat Survival Rates, Population Demographics and Habitat Use in the Puu Waawaa Forest Reserve and Puu Anahulu GMA: West Hawaii							
		FY17	*FY18	FY19	FY20	FY21	5 year total
	Planned Activities	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	
1	Develop & revise research proposal	1/yr; May	1/yr; May	-	-	-	
2	Issuance of Contract	1/yr; July	1/yr; July	-	-	-	
3	Coordination with field work & monitoring contract	2/month	2/month	-	-	-	
4	Conduct mail survey	1/island	1/island	-	-	-	
5	Conduct pilot phone survey	1/island	1/island	-	-	-	
6	Publish Results	-	-	1	-	-	
	Annual Totals	$48,250	$76,250	$45,000	$45,000	$45,000	$259,500
	Salary (A)	$19,137	$11,250.00	$15,000	$15,000	15,000	$67,500
	Operating (B)	$37,000	$65,000	$30,000	$30,000	$30,000	$192,000

*Game Bird Research begins – Graduate level research project to estimate bird guzzler use and effects. Narrative will be submitted in FY18

	W-24-GO-01 Game Operations and Maintenance: Hawaii County - East Hawaii District						
		FY17	FY18	FY19	FY20	FY21	5-yr. Total
	Planned Activities	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	
1	Maintain hunter check stations	10/mo	10/mo	10/mo	10/mo	10/mo	
2	Sign and marker upkeep	300/yr	500/yr	500/yr	500/yr	500/yr	
3	Game waterunit maintenance	22/yr	22/yr	22/yr	22/yr	22/yr	
4	Boundary fence maintenance	5 mi/yr	5 mi/yr	5 mi/yr	5 mi/yr	5 mi/yr	
5	Roadside brushing and upkeep	10 mi/year	11 mi/year	11 mi/year	11 mi/year	11 mi/year	
	Total Cost/Year	$120,000	$100,000	$100,000	$105,000	$105,000	$530,000
	Salary (A):	$21,554	$30,000	$30,000	$35,000	$35,000	$160,000
	Operation (B):	$90,000	$70,000	$70,000	$70,00	$70,000	$370,000

W-25-GP -01 Game Population Management Hawaii County East Hawaii District						
	FY17	FY18	FY19	FY20	FY21	5-yr. Total
Planned Activities	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	
Predator Control	20 traplines/mo	20 traplines/mo	20 traplines/mo	20 traplines/mo	20 traplines/mo	
Manage Feral Cattle Control Hunt	52/days /yr	4x/month	4x/month	4x/month	4x/month	
Total Cost/Year	$97,160	$75,000	$72,000	$75,000	$75,000	$394,160
Salary (A):	$27,160	$40,000	$40,000	$40,000	$40,000	$187,160
Operation (B):	$70,000	$35,000	$35,000	$35,000	$35,000	$210,000

W-26-GH-01 Game Habitat Management: Hawaii County - East Hawaii District							
		FY17	FY18	FY19	FY20	FY21	5-yr. Total
	Planned Activities	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	
1	Habitat restoration	70 acres/yr	70 acres/yr	70 acres/yr	70 acres/yr	70 acres/yr	
	Total Cost/Year	$62,478	$55,000	$55,000	$55,000	$55,000	$282,478
	Salary (A):	$47,478	$20,000	$20,000	$20,000	$20,000	$1274,478
	Operation (B):	$15,000	$35,000	$35,000	$35,000	$35,000	$155,000

W-27-GF-01 Game Facilities Construction Hawaii County - East Hawaii District							
		FY17	FY18	FY19	FY20	FY21	5-yr. Total
	Planned Activities	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	
1	Game Bird Waterunits	1/yr	1/yr	1/yr	1/yr	1/yr	
2	Check Stations	1/yr	1/yr	1/yr	2/yr	-	
3	Sign and Marker Placement	000/yr	300/yr	300/yr	300/yr	300/yr	
	Total Cost/Year	$45,341	$45,000	$45,000	$45,000	$45,000	$225,341
	Salary (A):	$35,341	$15,000	$15,000	$15,000	$15,000	$95,341
	Operation (B):	$10,000	$30,000	$30,000	$30,000	$30,000	$130,000

W-28-GS-01 Game Surveys and Inventories (Game Mammal): Hawaii County - East Hawaii District							
		FY17	FY18	FY19	FY20	FY21	5-yr. Total
	Planned Activities	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	
1	Aerial Survey Comprehensive	12hrs/yr	12hrs/yr	08hrs/yr	08hrs/yr	08hrs/yr	
2	Pig Study (nos.& habitat use)	2 x/yr	4 x/yr	4 x/yr	4 x/yr	4 x/yr	
3	Evaluate Hunter Use	12 day/yr	12 day/mo	12 day/mo	12 day/mo	12 day/mo	
	Total Cost/Year	$21,591	$45,000	$45,000	$45,000	$45,000	$201,591
	Salary (A):	$16,591	$15,000	$15,000	$15,000	$15,000	$76,591
	Operation (B):	$5,000	$30,000	$30,000	$30,000	$30,000	$125,000

W-28-GS-01Game Surveys and Inventories: Hawaii County (Game Bird) - East Hawaii District							
		FY17	FY18	FY19	FY20	FY21	5-yr. Total
	Planned Activities	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	
1	Field Surveys	3mo/yr	3mo/yr	3mo/yr	3mo/yr	3mo/yr	
2	Vet diagnosis	3x/yr	3x/yr	3x/yr	3x/yr	3x/yr	
3	Collect and analyze hunting data	12 wks/yr	12 wks/yr	12 wks/yr	12 wks/yr	12 wks/yr	
4	Expanded hunting area appraisal	2 days/mo	2 days/mo	2 days/mo	2 days/mo	2 days/mo	
	Total Cost/Year	$12,995	$35,000	$35,000	$35,000	$35,000	$152,995
	Salary (A):	$2,955	$15,000	$15,000	$15,000	$15,000	$62,955
	Operation (B):	$10,000	$20,000	$20,000	$20,000	$20,000	$90,000

Hawaii County, East Hawaii District Totals						
	FY17	FY18	FY19	FY20	FY21	5-yr. Total
Total Cost/Year	$335,000	$355,000	$355,000	$360,000	$360,000	$1,765,000
Salary (A):	$135,000	$135,000	$135,000	$140,000	$140,000	$685,000
Operation (B):	$200,000	$220,000	$220,000	$220,000	$220,000	$1,080,000

W-30-HP-01 Nāpuʻu Conservation Project						
	FY17	FY18	FY19	FY20	FY21	5-yr. Total
Planned Activity	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	
Contractor	1/year					
Contractor	1/year					
Contractor	3/year					
Total Cost/Year	$277,804	$250,000	$250,000	$250,000	$250,000	$1,390,000
Salary (A):	$18,804	$10,000	$10,000	$10,000	$10,000	$58,804
Operation (B):	$259,000	$240,000	$240,000	$240,000	$240,000	$1,219,000

W-24-GO-02 Game Operations and Maintenance Hawaii County - West Hawaii District							
		FY17	FY18	FY19	FY20	FY21	5-yr. Total
	Planned Activities	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	
1	Hunter check station	9/yr	3/yr	3/yr	3/yr	3/yr	
2	Sign and marker upkeep	100/yr	100/yr	100/yr	100/yr	100/yr	
3	Game bird guzzler & feeder maintenance	45/yr	45/yr	45/yr	45/yr	45/yr	
4	Self-check station	5/mo	5/mo	5/mo	5/mo	5/mo	

	maintenance						
5	Boundary fence and gate maintenance	5 /yr	5 /yr	5 /yr	5 /yr	5 /yr	
6	Roadside and Trail Maintenance	50 mi/yr Roads 10 mi/yr Trails	77 mi/yr Roads 10 mi/yr Trails	77 mi/yr Roads 10 mi/yr Trails	77 mi/yr Roads 10 mi/yr Trails	77 mi/yr Roads 10 mi/yr Trails	
7	Facility and Building Maintenance	3 bldgs/year	3 bldgs/year	3 bldgs/year	3 bldgs/year	3 bldgs/year	
8	Vehicle Purchase		1				
	Total Cost / Year	$118,014	$228,000	$284,000	$238,000	$300,000	$1,168,014
	Salary (A):	$18,014	$20,000.00	$30,000.00	$30,000	$30,000	$128,014
	Operation (B):	$100,000	$208,000	$204,000	$148,000	$210,000	$870,000

W-25-GP-02 Game Population Management Hawaii County – West Hawaii District

		FY17	FY18	FY19	FY20	FY21	**5-year Total**
	Planned Activities	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	
1	Predator Control	60 traps/yr	60 traps/yr	60 traps/yr	60 traps/yr	60 traps/yr	
2	Salvage operations	8 trips/ year	8 trips/ year	8 trips/ year	8 trips/ year	8 trips/ year	
3	Game Mammal Population Augemntation	200/year	200/year	200/year	200/year	200/year	
	Total Cost / Year	$69,811	$94,000	$124,000	$211,000	$151,550	$650,361
	Salary (A):	$39,811	$30,000	$35,000	$30,000	$30,550	$165,361
	Operation (B):	$30,000	$84,000	$89,000	$97,000	$93,000	$393,000

W-26-GH Game Habitat Management : Hawaii County - West Hawaii							
		FY17	FY18	FY19	FY20	FY21	5- yr Total
	Planned Activities	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	
1	Strip Mowing	30/yr	30/yr	30/yr	30/yr	30/yr	
2	Creat and maintain food plots for Game birds	3 ac/yr	3 ac/yr	3 ac/yr	3 ac/yr	3 ac/yr	
3	Create and and maintain Game Mammal Habitat	1ac/yr	10 ac/yr	10 ac/yr	10 ac/yr	10 ac/yr	
4	Grazing Management	5 miles/yr	5 miles/yr	5 miles/yr	5 miles/yr	5 miles/yr	
	Total Cost / Year	$69,091	$25,000	$118,750	$87,500	$120,000	$420,341
	Salary (A):	$49,091	$35,000	$15,766	$50,000	$59,350	$209,207
	Salary (B):	$20,000	$72,000	$65,000	$60,000	$58,000	$275,000

W-27-GF-02 Game Facility Construction Hawaii County – West Hawaii District							
		FY17	FY18	FY19	FY20	FY21	5- yr Total
	Planned Activities	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	
1	Install waterline	1mi/yr	2mi/yr	2mi/yr	4mi/yr	2mi/yr	
2	Install game bird guzzlers of waterline	1/yr	10/yr	10/yr	10/yr	10/yr	
3	Game bird guzzler construction	0/yr	4/yr	4/yr	4/yr	4/yr	
4	Install informational sings	10/yr	2/yr	2/yr	5/yr	2/yr	
5	Repair base yard facility	-	-	1	1	2ac/yr	
	Total Cost / Year	$10,076	$55,000	$25,000	$45,000	$56,250	$191,326
	Salary (A):	$9076	$40,000	$10,000	$30,000	$41,750	$130,826
	Salary (B):	$1,000	$15,000	$15,000	$15,000	$15,000	$61,000

W-28-GS-02 Game Surveys and Inventories (Game Mammals): Hawaii County - West Hawaii District							
		FY17	FY18	FY19	FY20	FY21	5- yr Total
	Planned Activities	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	
1	Aerial survey	1/yr	2/yr	2/yr	2/yr	2/yr	
2	Ground Surveys	1/yr	15/yr	15/yr	15/yr	15/yr	
	Total Cost / Year	$21,591	$43,750	$56,250	$50,000	$56,250	$227,841
	Salary (A):	$13,591	$8,750	$11,250	$23,000	$11,250	$67,000
	Salary (B):	$8,000	$37,000	$37,000	$38,500	$39,000	$159,500

W-28-GS-02 Game Surveys and Inventories (Game Bird): Hawaii County - West Hawaii District							
		FY17	FY18	FY19	FY20	FY21	5- yr Total
	Planned Activities	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	
1	Ground surveys	4/yr	4/yr	4/yr	4/yr	4/yr	
2							
3							
4							
5							
6							
	Total Cost / Year	$13,674	$7,000	$7,000	$7,500	$8,000	$43,174
	Salary (A):	$8,674	$5,000	$5,000	$5,000	$5,000	$28,674
	Salary (B):	$5,000	$2,000	$2,000	$2,500	$3,000	$14,500

Hawaii County, West Hawaii District Totals

	FY17	FY18	FY19	FY20	FY21	5-yr. Total
Total Cost / Year	$315,931	$556,750	$519,016	$529,000	$595,900	$2,484,666
Salary (A):	$138,257	$138,750	$107,016	$168,000	$177,900	$711,666.00
Operation (B):	$164,000	$418,000	$412,000	$361,000	$418,000	$1,773,000

W-24-GO-03 Game Operations and Maintenance- Maui County							
		FY17	FY18	FY19	FY20	FY21	5- yr Total
	Planned Activities	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	
1	Hunter Check Station Maintenance	1 @ 2x per month	1 @ 2x per month	1 @ 2x per month.	1 @ 2x per month	1 @ 2x per month	
2	Sign and marker upkeep	30 @ 2x per month	30 @ 2x per month	30 @ 2x per month	30 @ 2x per month	30 @ 2x per month	
3	Game Bird Guzzler Maintenance	4 @ 1x per week	4 @ 1x per week	4 @ 1x per week	4 @ 1x per week	4 @ 1x per week	
4	Fence and Gate Maintenance	3 @ 2x per year	5 miles @ 1x per month/3 @ 2x per year	5 miles @ 1x per month/3 @ 2x per year	5 miles @ 1x per month/3 @ 2x per year	5 miles @ 1x per month/3 @ 2x per year	
5	Road and Trail maintenance	9 mi/yr	9 mi/yr	9 mi/yr	9 mi/yr	9 mi/yr	
6	Building and Facilities Maintenance	1 @ 2x per year	1 @ 2x per year	1 @ 2x per year	1 @ 2x per year	1 @ 2x per year	
7	Purchase 4WD vehicle					Lanai- 1	
8	Utility Vehicle			Lanai- 1			
	Total Cost / Year	$138,902	$85,000	$86,000	$91,000	$92,000	$492,902
	Salary (A):	$14,902	$15,000	$16,000	$16,000	$16,000	$77,902
	Salary (B):	$70,000	$70,000	$70,000	$75,000	$75,000	$414,000

Island of Molokai							
		FY17	FY18	FY19	FY20	FY21	5- yr Total
	Planned Activities	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	
1	Maintain Hunter Check Station	1 @ 2x per month	1 @ 2x per month	1 @ 2x per month	1 @ 2x per month	1 @ 2x per month	
2	Sign and marker upkeep	20 @ 1x per month	20 @ 1x per month	20 @ 1x per month	20 @ 1x per month	20 @ 1x per month	
3	Gamebird Guzzler Maintenance	6 @ 2x per month	7 @ 2x per month	7 @ 2x per month	7 @ 2x per month	7 @ 2x per month	
4	Fence and Gate Maintenance	3 gates 3x / yr check/maintain 1 mi of fence per yr	3 gates 3x / yr check/maintain 1 mi of fence per yr	3 gates 3x / yr check/maintain 1 mi of fence per yr	3 gates 3x / yr check/maintain 1 mi of fence per yr	3 gates 3x / yr check/maintain 1 mi of fence per yr	
5	Building and facilities maint	1 @ 2x per month	1 @ 2x per month	1 @ 2x per month	1 @ 2x per month	1 @ 2x per month	
6	Purchase 4WD vehicle	Molokai -1					
	Total Cost / Year	$50,000	$7,500	$10,000	$10,500	$11,500	$88,500
	Salary (A):	$5,000	$5,000	$7,500	$7,500	$8,000	$33,000
	Salary (B):	$44,000	$2,500	$2,500	$3,000	$3,500	$55,500

Island of Lanai							
		FY17	FY18	FY19	FY20	FY21	5- yr Total
	Planned Activities	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	
1	Maintain Hunter Check Station	1 @ 2x per month	1 @ 2x per month	1 @ 2x per month	1 @ 2x per month	1 @ 2x per month	
2	Sign and marker upkeep	30 @ 2x per month	30 @ 2x per month	30 @ 2x per month	30 @ 2x per month	30 @ 2x per month	
3	Gamebird Guzzlers Maintenance	4 @ 1x per week 5 miles @ 1x per month.	4 @ 1x per week 5 miles @ 1x per month.	4 @ 1x per week 5 miles @ 1x per month	4 @ 1x per week 5 miles @ 1x per month.	4 @ 1x per week 5 miles @ 1x per month.	
4	Road and Trail Maintenance	9 mi/yr	9 mi/yr	9 mi/yr	9 mi/yr	9 mi/yr	
5	Fence and Gate Maintenance	3 @ 2x per year	3 @ 2x per year	3 @ 2x per year	3 @ 2x per year	3 @ 2x per year	
6	Building and Facilities Maintenance	1 @ 2x per year	1 @ 2x per year	1 @ 2x per year	1 @ 2x per year	1 @ 2x per year	
7	Utility Vehicle						
8	4-Wheel drive vehicle					1- Lanai	
	Total Cost / Year	$20,000	$20,000	$42,000	$24,000	$71,000	$177,000
	Salary (A):	$12,500	$10,000	$12,000	$12,000	$14,000	$60,500
	Salary (B):	$10,000	$10,000	$30,000	$12,000	$57,000	$119,000

W-25-GP-03 Game Population Management: Maui County							
		FY17	FY18	FY19	FY20	FY21	5- yr Total
	Planned Activities	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	
1	Predator control - Maui	28 traps / week checked daily. (February - July) 8 traps @ Kahakuloa 8 traps @ Kula Forest 12 traps @ Lanai	40 traps / week checked daily. (February - July) 8 traps @ Kahakuloa 8 traps @ Kula Forest 12 traps @ Kanaio 12 traps @ Lanai	40 traps / week checked daily. (February - July) 8 traps @ Kahakuloa 8 traps @ Kula Forest 12 traps @ Kanaio 12 traps @ Lanai	40 traps / week checked daily. (February - July) 8 traps @ Kahakuloa 8 traps @ Kula Forest 12 traps @ Kanaio 12 traps @ Lanai	40 traps / week checked daily. (February - July) 8 traps @ Kahakuloa 8 traps @ Kula Forest 12 traps @ Kanaio 12 traps @ Lanai	
2	Cat and Mongoose trap purchase	30 / yr		30 / yr		30 / yr	
	Total Cost / Year	$45,491	$6,600	$11,000	$11,000	$14,000	$88,091
	Salary (A):	39,491	$5,500	$6,000	$7,000	$8,000	$65,991
	Salary (B):	$6,000	$1,100	$5,000	$3,000	$6,000	$21,100

W-26-GP-03 Game Habitat Management Maui County							
		FY17	FY18	FY19	FY20	FY21	5- yr Total
	Planned Activities	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	
1	Strip mowing to maintain game bird habitat	50 acres per year (Kahakuloa) 500 acres per year - Lanai (Mowing to be done 2x/year during Fall and Spring)	50 acres per year (Kahakuloa) 500 acres per year -Lanai (Mowing to be done 2x/year during Fall and Spring)	75 acres per year (Kahakuloa/Kanaio) 500 acres per year - Lanai (Mowing to be done 2x/year during Fall and Spring)	75 acres per year (Kahakuloa/Kanaio) 500 acres per year - Lanai (Mowing to be done 2x/year during Fall and Spring)	100 acres per year (Kahakuloa/Kanaio) 500 acres per year - Lanai (Mowing to be done 2x/year during Fall and Spring)	
2	Crop propogation		1,500 plants/yr planted (Kanaio) 2 days/month seed collection (Kanaio)	1,500 plants/yr planted (Kanaio) 2 days/month seed collection (Kanaio)	1,500 plants/yr planted (Kanaio) 2 days/month seed collection (Kanaio)	1,500 plants/yr planted (Kanaio) 2 days/month seed collection (Kanaio)	
3	Create new gamebird habitat		25 acres/year (Kanaio)	25 acres/year (Kanaio)	25 acres/year (Kanaio)	25 acres/year (Kanaio)	
4	4-wheel drive vehicle		1- Lanai				
5	Crop propogation		1 per year	1 per year		1 per year	
	Total Cost / Year	$55,417	$97,000	$53,000	$53,000	$59,000	$317,417
	Salary (A):	$25,417	$7,000	$8,000	$8,000	$9,000	$57,417
	Salary (B):	$30,000	$90,000	$45,000	45,000	$50,000	$260,000

W-27-GF-03 Game Facilities Construction: Maui County							
		FY17	FY18	FY19	FY20	FY21	5- yr Total
	Planned Activities	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	
1	Replace or construct new game bird guzzler	1/yr			1 /yr		
2	Replace or construct new check station		Maui - 2			1 /yr	
3	Game Bird holding pen		1/ year	1/year	1 /yr		
4	Game Bird Feed units		1 /yr	1 /yr	51/yr	1 /yr	
5	Construct fence (includes gates/cattle guards, etc)	1/year	2/year	1/year			
	Total Cost / Year	$15,114	$32,000	$22,000	$18,000	$20,000	$107,114
	Salary (A):	$12,114	$7,000	$7,000	$8,000	$8,000	$42,114
	Salary (B):	$3,000	$25,000	$15,000	$10,000	$12,000	$65,000

W-28-GS-03 Game Surveys and Inventories (Game Mammal): Maui County							
		FY17	FY18	FY19	FY20	FY21	5- yr Total
	Planned Activities	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	
1	Aerial Survey	1x / yr (South Maui, and Kula Forest) 1x/yr (Molokai Forest Reserve)	1x / yr (South Maui, Kanaio and Kula Forest) 1x/yr (Molokai Forest Reserve)	1x / yr (South Maui, Kanaio and Kula Forest) 1x/yr (Molokai Forest Reserve)	1x / yr (South Maui, Kanaio and Kula Forest) 1x/yr (Molokai Forest Reserve)	1x / yr (South Maui, Kanaio and Kula Forest) 1x/yr (Molokai Forest Reserve)	
2	Ground Surveys	2x /yr (Spring and Fall)	2x /yr (Spring and Fall)	2x /yr (Spring and Fall)	2x /yr (Spring and Fall)	2x /yr (Spring and Fall)	
3	Collect and Analyze Data from Hunter Check Station	2x/wk @ 12 hunter check stations.	2x/wk @ 12 hunter check stations.	2x/wk @ 14 hunter check stations.	2x/wk @ 14 hunter check stations.	2x/wk @ 14 hunter check stations.	
4	Purchase new 4WD vehicle			Maui -1			
	Total Cost / Year	$41,743	$42,000	$84,000	$47,000	$48,000	$262,743
	Salary (A):	$6,743	$7,000	$8,000	$8,000	$9,000	$38,743
	Salary (B):	$35,000	$35,000	$76,000	$39,000	$39,000	$224,000

W-28-GS-03 Game Surveys and Inventories (Game Bird): Maui County							
		FY17	FY18	FY19	FY20	FY21	5- yr Total
	Planned Activities	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	
1	Ground surveys	1x / mo (Kahakuloa, Kula Forest, Lanai and Molokai.) Once a year - (Sept. or Oct.) Lanai	1x / mo (Kahakuloa, Kula Forest, Lanai and Molokai.) Once a year - (Sept. or Oct.) Lanai and Kanaio	1x / mo (Kahakuloa, Kula Forest, Kanaio, Lanai and Molokai.) Once a year - (Sept. or Oct.) Lanai and Kanaio	1x / mo (Kahakuloa, Kula Forest, Kanaio, Lanai and Molokai.) Once a year - (Sept. or Oct.) Lanai and Kanaio	1x / mo (Kahakuloa, Kula Forest, Kanaio, Lanai and Molokai.) Once a year - (Sept. or Oct.) Lanai and Kanaio	
2	Collect and analyze hunter harvest data	2x/wk @ 5 hunter stations during game bird season (Nov-Jan)	2x/wk @ 5 hunter stations during game bird season (Nov-Jan)	2x/wk @ 5 hunter stations during game bird season (Nov-Jan)	2x/wk @ 5 hunter stations during game bird season (Nov-Jan)	2x/wk @ 5 hunter stations during game bird season (Nov-Jan)	
3	Purchase new 4-wheel drive vehicle				Maui - 1		
	Total Cost / Year	$5,398	$4,000	$4,500	$47,000	$7,000	$67,898
	Salary (A):	$3,398	$3,000	$3,500	$4,000	$4,500	$18,398
	Salary (B):	$2,000	$1,000	$1,000	$43,000	$2,500	$49,500

Maui County Totals

	FY17	FY18	FY19	FY20	FY21	5-yr. Total
Total Cost/Year	$302,065	$266,600	$260,600	$266,000	$239,000	$1,334,165

Salary (A):	$102,065	$44,500	$48,500	$51,000	$54,500	$300,565
Operation (B):	$200,000	222,100	212,100	215,000	184,500	1,033,600

W-24-GO-04 Game Operations and Maintenance: Honolulu County

		FY17	FY18	FY19	FY20	FY21	5- yr Total
	Planned Activities	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	
1	Hunter Check Station Mainteance	12/ year	15/ year	15/ year	15/ year	15/ year	
2	Sign and Marker Upkeep	150/year	150/year	150/year	150/year	150/year	
2	Game bird guzzler and feeder maintenance	26/year	26/year	26/year	26/year	26/year	
3	Road &Trail maintenance	20mi/year -Trail 10mi/year -Roads	20mi/year -Trail 10mi/year -Roads	20mi/year -Trail 10mi/year -Roads	20mi/year -Trail 10mi/year -Roads	20mi/year -Trail 10mi/year -Roads	
4	Boundary fence and gate maintenance	2mi/year & 5/year gate maintainence	2mi/year & 5/year gate maintainence	2mi/year & 5/year gate maintainence	2mi/year & 5/year gate maintainence	2mi/year & 5/year gate maintainence	
5	Facilities and Building Maintenance	3 bldgs/year	3 bldgs/year	3 bldgs/year	3 bldgs/year	3 bldgs/year	
7	District Administration	1	1	1	1	1	
	Total Cost / Year	$123,788	$188,750	$188,750	$188,750	$188,750	$878,788
	Salary (A):	$23,788	$23,750	23,750	23,750	23,750	$118,788
	Salary (B):	$100,000	$165,000	$165,000	$165,000	$165,000	$760,000

W-25-GP-04 Game Population Management: Honolulu County							
		FY17	FY18	FY19	FY20	FY21	5- yr Total
	Planned Activities	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	
1	Live trap for feral cat/mongoose	30 traps/mo	60 traps/mo	60 traps/mo	60 traps/mo	60 traps/mo	
	Total Cost / Year	$69,091	75,000	75,000	75,000	$75,000	$369,091
	Salary (A):	$37,591	5,000	5,000	5,000	5,000	$57,591
	Salary (B):	$31,500	70,000	70,000	70,000	70,000	$311,500

W-26-GH-04 Game Habitat Management: Honolulu County							
		FY17	FY18	FY19	FY20	FY21	5- yr Total
	Planned Activities	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	
1	Grazing Management	200ac/year	200ac/year	200ac/year	200ac/year	200ac/year	
2	Create new game bird habitat	1 ac/year	1 ac/year	1 ac/year	1 ac/year	1 ac/year	
3	Strip mowing	15 ac/ yr	15 ac/ yr	15 ac/ yr	15 ac/ yr	15 ac/ yr	
4	Create and Maintain Food Plots	1ac/year	1/year	1ac/year	1ac/year	1ac/year	
5	District Administration	1	1	1	1	1	
	Total Cost / Year	$83,485	$96,000	$96,000	$96,000	$96,000	$467,845
	Salary (A):	$23,485	$10,000	$10,000	$10,000	$10,000	$63,485
	Salary (B):	$60,000	$86,000	$86,000	$86,000	$86,000	$404,00

W-27-GF-04 Game Facilities Construction: Honolulu County							
		FY17	FY18	FY19	FY20	FY21	5- yr Total
	Planned Activities	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	
1	Hunter check station construct /replacement	0/yr	1/yr	1/yr	1/yr	1/yr	
2	Game bird guzzler construct/ replacement	0/yr	1/yr	1/yr	1/yr	1/yr	
	Total Cost / Year	$15,833	$30,000	$35,000	$35,000	$35,000	$150,833
	Salary (A):	$14,833	$15,000	$15,000	$15,000	$15,000	$74,833
	Salary (B):	$1000.00	$15,000	$20,000	$20,000	$20,000	$76,000

W-28-GS-04 Game Surveys and Inventories (Game Mammal): Honolulu County							
		FY17	FY18	FY19	FY20	FY21	5- yr Total
	Planned Activities	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	
1	Ground Surveys	1 transects/yr	5 transects/yr	5 transects/yr	5 transects/yr	5 transects/yr	
2	Aerial surveys	1x/year	3x/year	3x/year	3x/year	3x/year	
3	Non-PHA Hunt Mgt	0	1x/year	1x/year	1x/year	1x/year	
	Total Cost / Year	$21,591	$44,800	$49,000	49,000	$49,000	$213391
	Salary (A):	$17091	$10,000	$10,000	$10,000	$10,000	$59091
	Salary (B):	$4,500	$34,800	$39,000	$39,000	$39,000	$156300

W-28-GS-04 Game Surveys and Inventories (Game Bird): Honolulu County							
		FY17	FY18	FY19	FY20	FY21	5- yr Total
	Planned Activities	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	
1	Gamebird Surveys (Ground)	1x/year	3x/year	3x/year	3x/year	3x/year	
	Total Cost / Year	$6,477	$1500	$1500	$1500	$1500	$12,477
	Salary (A):	$2,477	$500	$500	$500	$500	$4,477
	Salary (B):	$4,000	$1,000	$1,000	$1,000	$1,000	$8,000

Honolulu County Totals

	FY17	FY18	FY19	FY20	FY21	5-yr. Total
Total Cost / Year	$320,265	$436,050	$445,250	$445,250	$445,250	$2,092,065
Salary (A):	$119,265	$64,250	$64,250	$64,250	$64,250	$376,265
Operation (B):	$201,000	$371,800	$381,000	$381,000	$381,000	$1,715,800

W-24-GO-05 Game Operations and Maintenance Kauai County							
		FY17	FY18	FY19	FY20	FY21	5- yr Total
	Planned Activities	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	
1	Hunter check station maintenance	15 stations/month	15 stations/month	15 stations/month	15 stations/month	15 stations/month	
2	Game bird feeding site maintenance	12 sites/month (Apr. - Oct)	12 sites/month (Apr. - Oct)	18 sites/month (Apr.-Oct.)	18 sites /month (Apr.-Oct.)	18 sites /month (Apr.-Oct.)	
3	Game bird water unit maintenance	12 units/month	12 units/month	12 units/month	18 units/month	18 units/month	
4	Sign and Marker Upkeep	60/year as needed	60/year as needed	60/year as needed	60/year &as needed	60/year as needed	
5	Hunting Area Road Maintenance	80 miles/year as needed	80 mile/year as needed	80 miles/year as needed	80 mile/year as needed	80 miles/year as needed	
6	Hunting Area Trail Maintenance	50 miles/year as needed	50 miles/year as needed	50 miles/year as needed	50 miles/year as needed	50 miles/year as needed	
7	Exclosure fence maintenance	0.1 mile/month as needed	0.1 mile/month as needed	0.1 mile/month as needed	0.1 mile/month as needed	0.1 mile/month as needed	
8	Fence and Gate maintenance	.75 mile/month as needed	.75 mile/month as needed	.75 mile/month as needed	.75 mile/month as needed	.7 mile/month as needed	
9	Building and Facilities Maintenance	2 buildings/month	2 buildings/month	2 buildings/month	2 buildings/month	2 buildings/month	
10	Purchase new 4 WD trucks	-	1- Replace #12	1 -Replace #45	1 – Replace #3	-	

11	Purchase new marine boat 25’	$100k	-	-	-	-	
12	Purchase Heavy-equipment Attachments	Dozer blade	Mega Mower	Side Arm cutter	-	-	
13	Marine Boat maintenance	-	Twice/year	Twice/year	Twice/year	Twice/year	
14	Helicopter Transportation	20 hours/year	20 hours/year	20 hours/year	20 hours/year	20 hours/year	
15	Game Tech Salary (#1) (50% of Effort)	1040 hours/year	1040 hours/year	1040 hours/year	1040 hours/year	1040 hours/year	
16	Hire new Game Tech (#4) (50% of Effort)	-	1040 hours/year	1040 hours/year	1040 hours/year	1040 hours/year	
17	Game Biologist Salary (25% of Effort)	520 hours/year	520 hours/year	520 hours/year	520 hours/year	520 hours/year	
18	Wildlife Manager Salary (2.5% of Effort)	52 hours/year	52 hours/year	52 hours/year	52 hours/year	52 hours/year	
	Annual Totals	$124,508	$375,000	$390,000	$400,000	$415,000	$1,704,508
	Salary (A)	$34,508	$125,000	$130,000	$130,000	$135,000	$554,508
	Operating (B)	$90,000	$250,000	$260,000	$270,000	$280,000	$1,150,000

W-25-GP-05 Game Population Management: Kauai County

		FY17	FY18	FY19	FY20	FY21	5-yr. Total
	Planned Activities	Output Measure	Output Measure	Output Measure	Output Measure	Output Measure	
1	Service Diphacinone bait stations	10/month	10/month	10/month	10/month	10/month	
2	Purchase trapping equipment	50 traps	50 traps	50 traps	50 traps	50 traps	
3	Game Tech (#1) Salary 5% of Effort)	104 hours/year	104 hours/year	104 hours/year	104 hours/year	104 hours/year	
3	Game Tech (#2) Salary (50% of Effort)	1040 hours/year	1040 hours/year	1040 hours/year	1040 hours/year	1040 hours/year	
4	Game Tech (#3) Salary (50% of Effort)	1040 hours/year	1040 hours/year	1040 hours/year	1040 hours/year	1040 hours/year	
5	Hire new Game Tech (#4) (5% of Effort)	-	104 hours/year	104 hours/year	104 hours/year	104 hours/year	
6	Game Biologist Salary (5% of Effort)	104 hours/year	104 hours/year	104 hours/year	104 hours/year	104 hours/year	
7	Wildlife Manager Salary (2.5% of Effort)	52 hours/year	52 hours/year	52 hours/year	52 hours/year	52 hours/year	
	Total Cost / Year	$45,341	$69,000	$73,000	$77,000	$81,000	$345,341
	Salary (A):	$35,341	$45,000	$47,000	$49,000	$51,000	$227,341
	Operation (B):	$10,000	$24,000	$26,000	$28,000	$30,000	$118,000

W-26-GP-05 Game Habitat Management: Kauai County							
		FY17	FY18	FY19	FY20	FY21	5-yr. Total
	Planned Activities	Output Measure	Output Measure	Output Measure	Output Measure	Output Measure	
1	Create new gamebird habitat	10 acres/year	10 acres/year	10 acres/year	10 acres/year	10 acres/year	
2	Establish food plots - Kekaha GMA	3 acres/ year	3 acres/ year	3 acres/ year	3 acres/ year	3 acres/ year	
3	Range mowing – Kekaha GMA	100 acres/year	100 acres/year	100 acres/year	100 acres/year	100 acres/year	
4	Range mowing - Wailua GMA	-	50 acres/year	50 acres/year	50 acres/year	50 acres/year	
5	Range mowing – Hunting Unit L	50 acres/year	50 acres/year	50 acres/year	50 acres/year	50 acres/year	
4	Food plot maintenance	3 acres/year	6 acres/year	9 acres/year	9 acres/year	9 acres/year	
5	Game Tech Salary (#1) (5% of Effort)	104 hours/year	104 hours/year	104 hours/year	104 hours/year	104 hours/year	
5	Game Tech Salary (#2) (50% of Effort)	1040 hours/year	1040 hours/year	1040 hours/year	1040 hours/year	1040 hours/year	
6	Game Tech Salary (# 3) (50% of Effort)	1040 hours/year	1040 hours/year	1040 hours/year	1040 hours/year	1040 hours/year	
7	Hire new Game Tech (#4) (5% of Effort)	-	104 hours/year	104 hours/year	104 hours/year	104 hours/year	
8	Game Biologist Salary (10% of Effort)	208 hours/year	208 hours/year	208 hours/year	208 hours/year	208 hours/year	
9	Wildlife Manager Salary (2.5% of Effort)	52 hours/year	52 hours/year	52 hours/year	52 hours/year	52 hours/year	
	Annual Totals	$62,614	$111,000	$118,000	$125,000	$132,000	$544,614
	Salary (A)	$32,614	$46,000	$48,000	$50,000	$52,000	$228,614
	Operating (B)	$30,000	$65,000	$70,000	$75,000	$80,000	$320,000

W-27-GF-05 Game Facilities Construction: Kauai County							
		FY17	FY18	FY19	FY20	FY21	5- yr Total
	Planned Activities	Output Measure	Output Measure	Output Measure	Output Measure	Output Measure	
1	Construct Kokee HCS restroom	1 Septic system	1 Water system	-	-	-	
2	Construct exclosure to protect T E plants	As needed	As needed	As needed	As needed	As needed	
3	Construct new gamebird water units	5 units/year	5 units/year	5units/year	5 units/year	5units/year	
4	Construct Kekaha GMA Fence	Plan and design	1 mile/year	1 mile/year	1 mile/year	1 mile/year	
5	Construct new Hunting Unit L Fence	Plan and design	1 mile/year	1 mile/year	1 mile/year	1 mile/year	
6	Construct new hunter access to Unit C Lihue-Koloa Forest Reserve	Draft EA	Draft EA	1 Access route 1 Parking area	Finish any uncompleted	Finish any uncompleted	
7	Construct new hunter access to Unit C Moloa'a Forest Reserve	Draft EA	Draft EA	1 Access route 1 Parking area	Finish any uncompleted	Finish any uncompleted	
8	Game Tech Salary (#1) (25% of Effort)	520 hours/year	520 hours/year	520 hours/year	520 hours/year	520 hours/year	
9	Hire new Game Tech (#4) (25% of Effort)	-	520 hours/year	520 hours/year	520 hours/year	520 hours/year	
10	Game Biologist Salary (10% of Effort)	208 hours/year	208 hours/year	208 hours/year	208 hours/year	208 hours/year	
11	Wildlife Manager Salary (5% of Effort)	104 hours/year	104 hours/year	104 hours/year	104 hours/year	104 hours/year	
	Annual Totals	$69,091	$212,000	$240,000	$240,000	$240,000	$1,131,091
	Salary (A)	$39,091	$32,000	$40,000	$40,000	$40,000	$191,091

	Operating (B)	$30,000	$180,000	$200,000	$200,000	$200,000	$940,000

W-28-GS-05 Game Surveys and Inventories (Game Mammal): Kauai County

		FY17	FY18	FY19	FY20	FY21	5- yr Total
	Planned Activities	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	
1	Aerial Goat Census	1 x / year	1 x / year	1 x / year	1 x / year	1 x /year	
2	B.T. Deer Survey	1 x / year	1 x / year	1 x / year	1 x / year	1 x /year	
3	Game Exclosure Analysis	1 x / year	1 x / year	1 x / year	1 x / year	1 x /year	
4	Feral Pig Surveys	1 x / year	1 x / year	1 x / year	1 x / year	1 x /year	
5	Check Station Record Collection	Twice / month	Twice / month	Twice / month	Twice / month	Twice / month	
6	Helicopter Transportation – Surveillance	25 hours/year	25 hours/year	25 hours/year	25 hours/year	25 hours/year	
7	Deer Checking Station Operation	Sept. to Nov.	Sept. to Nov.	Sept. to Nov.	Sept. to Nov.	Sept. to Nov.	
8	Analyze data and prepare report	1 x / month	1 x / month	1 x / month	1 x / month	1 x / month	
9	Game Tech Salary (#1) (10% of Effort)	208 hours/year	208 hours/year	208 hours/year	208 hours/year	208 hours/year	
10	Hire new Game Tech (#4) (10% of Effort)	-	208 hours/year	208 hours/year	208 hours/year	208 hours/year	
11	Game Biologist Salary (40% of Effort)	832 hours/year	832 hours/year	832 hours/year	832 hours/year	832 hours/year	
12	Wildlife Manager Salary (20% of Effort)	416 hours/year	416 hours/year	416 hours/year	416 hours/year	416 hours/year	
	Total Cost/Year	$71,250	$74,000	$78,000	$84,000	$88,000	$395,250
	Salary (A):	$34,250	$36,000	$38,000	$42,000	$44,000	$192,250
	Operation (B):	$37,000	$38,000	$40,000	$42,000	$44,000	$201,000

W-28-GS-05: Game Bird Surveys and Inventories (Game Bird): Kauai County							
		FY17	FY18	FY19	FY20	FY21	5- yr Total
	Planned Activities	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	Activity Frequency	
1	Check Station Record Collection	Nov. - Jan Weekly	Nov. - Jan. Weekly	Nov.- Jan. Weekly	Nov. - Jan. Weekly	Nov. - Jan. Weekly	
2	Pre-Season Survey - Kekaha GMA	1 x /year	1 x /year	1 x /year	1 x /year	1 x /year	
3	Pre-Season Survey - Wailua GMA	1 x /year	1 x /year	1 x /year	1 x /year	1 x /year	
4	Pre-Season Survey - Hunting Unit L	1 x /year	1 x /year	1 x /year	1 x /year	1 x /year	
5	Gamebird Check Station Operation	Nov. to Jan.	Nov. to Jan.	Nov. to Jan.	Nov. to Jan.	Nov. to Jan.	
6	Analyze Data and Prepare Annual Report	1 x /yr.	1 x /yr.	1 x /yr.	1 x /yr.	1 x /yr.	
7	Game Tech (#1) Salary (5% of Effort)	104 hours/year	104 hours/year	104 hours/year	104 hours/year	104 hours/year	
8	Hire new Game Tech (#4) (5% of Effort)	-	104 hours/year	104 hours/year	104 hours/year	104 hours/year	
9	Game Biologist Salary (10% of Effort)	208 hours/year	208 hours/year	208 hours/year	208 hours/year	208 hours/year	
10	Wildlife Manager Salary (5% of Effort)	104 hours/year	104 hours/year	104 hours/year	104 hours/year	104 hours/year	
	Total Cost/Year	$6,477	$18,000	$20,000	$22,000	$24,000	$90,477
	Salary (A):	$3,477	$14,000	$15,000	$16,000	$17,000	$65,477
	Operation (B):	$3,000	$4,000	$5,000	$6,000	$7,000	$25,000

Kauai County Total

Game Program Totals	FY17	FY18	FY19	FY20	FY21	5- yr Total
Total Cost / Year	$876,000	$901,000	$966,000	$995,000	$1,023,000	$4,764,000
Salary (A):	$275,000	$320,000	$341,000	$351,000	$363,000	$1,649,000
Operation (B):	$200,000	$582,000	$623,000	$645,000	$665,000	$3,115,000

Appendices

I. DOFAW Game Management Guidelines

To formulate and use a consistent philosophy for game management priorities and actions by DOFAW, and to make those known to agency personnel, partners, and the general public, the Division has developed a set of working guidelines for game management policy on DOFAW managed lands. The guidelines recognize and prioritize the importance and sustainability of native ecosystems. They are intended to provide administrative policy direction and prioritize resource management activities based on the integrity of existing natural resources. The guidelines were developed through meetings held with the public, cooperating agencies, and researchers and provide a mechanism for public and agency interaction that improves the understanding of our management programs by the community, other agencies and policy makers. The basis of DOFAW's Resource Management Guidelines is the status of the native vegetation in an area. The character of the vegetation is classified as: "Most Pristine Native", "Predominantly Native", "Considerably Disturbed", or "Badly Degraded or Highly Altered". The vegetation status is then considered in conjunction with public safety, public demand for specific resources, and the effect of the proposed use on the vegetation. Potential game management strategies have been divided into four categories, called Game Animal Management Classifications. These are:

Game Production. Game is a primary objective. Areas are managed for public hunting on a sustained yield basis. Habitat may be manipulated for the purpose of increasing or maintaining the game carrying capacity of the habitat. Hunting seasons and bag limits are set to provide sustained public hunting opportunities and benefits. Some of the GMA’s are in this class.

Mixed Game and Other Uses. Production of game is an objective integrated with other uses such as hiking, production of forest products, and protection of native resources. Game populations are managed to acceptable levels using public hunting. Habitat manipulation for game enhancement may be conducted, but only when it is consistent with other uses. Seasons and bag limits are designed to ensure compatibility with other uses. These areas include portions of forest reserves and some GMA’s.

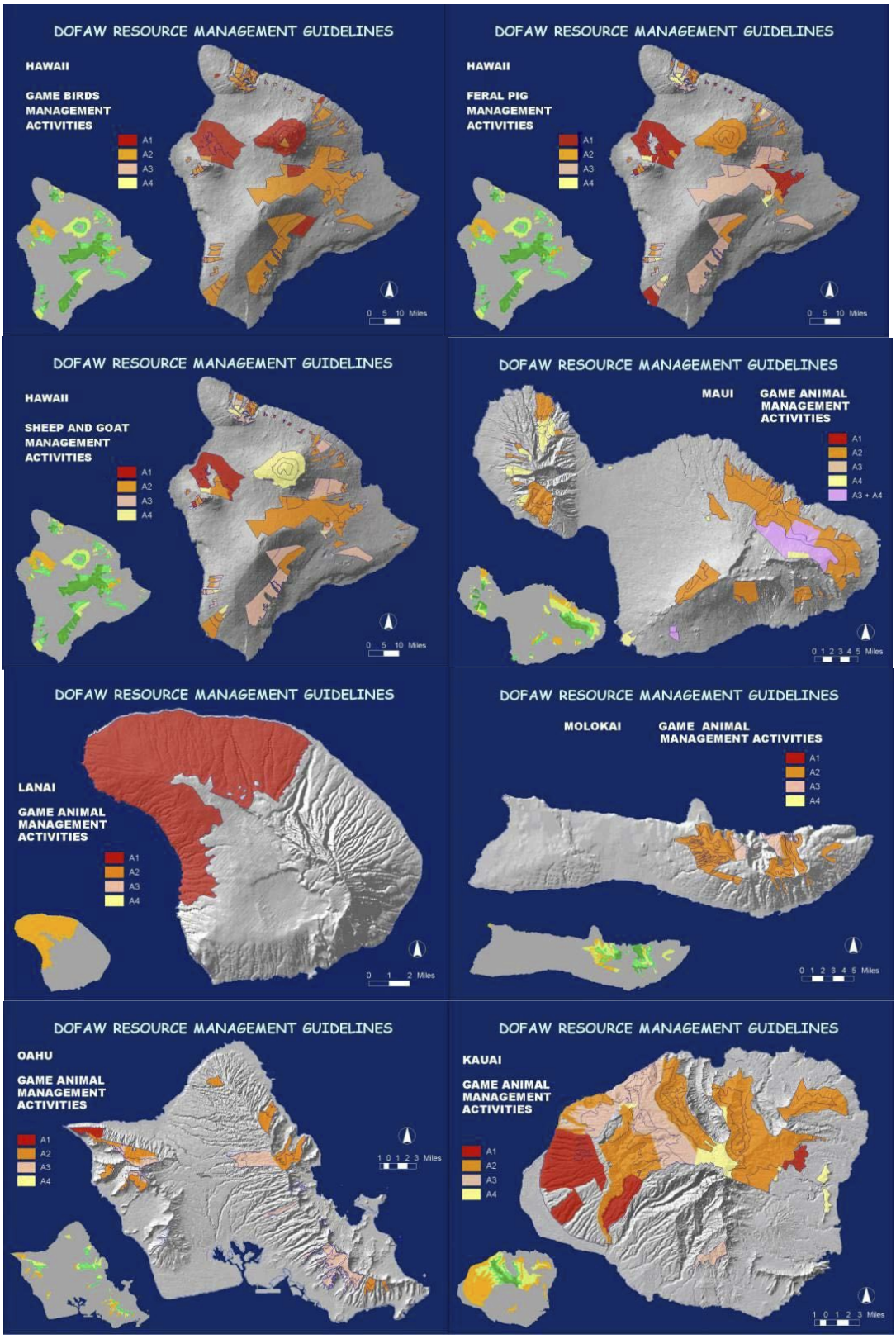
Game Control. Protection of resources is the primary objective, with emphasis on native plant community and watershed protection. Hunting is used to reduce animal impacts to those resources. Bag limits or seasons are liberal. These areas include watershed areas, portions of forest reserves, Natural Area Reserves, and wilderness preserves.

Staff Control. Areas designated for animal removal by staff or agency designees because of remoteness, environmental sensitivity, or public safety. Game mammal control is the objective. Control actions can include but are not limited to staff shooting or animal translocation.

These 79 areas include portions of forest reserves, Natural Area Reserves, wilderness reserves, and plant and wildlife sanctuaries. Under DOFAW's Resource Management Guidelines, maintaining game bird populations is considered compatible with other uses in most areas. Game birds are managed for "Game Production" or "Mixed Game and Other Uses" in most areas. Because of potential detrimental effects of game mammals on native ecosystems, management strategy for game mammals is more complex. Areas managed for game mammal production, i.e. "Game Production", are located primarily in areas classified as "Badly Degraded or Highly Altered". These areas have a preponderance of weedy species, contain very few native plants, and are managed to produce game animals for recreational hunting. Under this management approach, known individuals or populations of listed plants are fenced or otherwise protected from feral ungulates. Areas classified as "Predominantly Native" and "Considerably Disturbed" are managed as "Mixed Game and Other Uses" for game mammals and have seasons and bag limits designed to ensure compatibility with other uses, including native ecosystem protection. Areas classified as "Most Pristine Native" are managed for "Game Control or Staff Control" and have the most liberal hunting seasons to minimize the pressure of feral animals on native ecosystems.

The following maps provide guidelines for each island with management categories described as follow:

- A-1: Game Production Game is a primary objective in these areas. Hunting seasons and bag limits provide maximal sustained public hunting opportunities and benefits. Areas include Game Management Areas.
- A-2: Mixed Game and Other Uses In these areas game management is an objective integrated with other uses. Habitat may be manipulated for game enhancement. Game populations are managed to acceptable levels using public hunting.
  A-3: Game Control (public) In these areas resource protection is the primary objective, with emphasis on native plant communities and watersheds. Seasons and bag limits are designed for public hunting to reduce impacts to native resources.
- A-4: Game Control (supervised) These areas are designated for animal removal by staff or agency designees because of environmental sensitivity, remoteness, or public


DOFAW RESOURCE MANAGEMENT GUIDELINES
HAWAII
GAME BIRDS MANAGEMENT ACTIVITIES
A1
A2
A3
A4
0 5 10 Miles
DOFAW RESOURCE MANAGEMENT GUIDELINES
HAWAII
FERAL PIG MANAGEMENT ACTIVITIES
A1
A2
A3
A4
0 5 10 Miles
DOFAW RESOURCE MANAGEMENT GUIDELINES
HAWAII
SHEEP AND GOAT MANAGEMENT ACTIVITIES
A1
A2
A3
A4
0 5 10 Miles
DOFAW RESOURCE MANAGEMENT GUIDELINES
MAUI
GAME ANIMAL MANAGEMENT ACTIVITIES
A1
A2
A3
A4
A3 + A4
0 1 2 3 4 5 Miles
DOFAW RESOURCE MANAGEMENT GUIDELINES
LANAI
GAME ANIMAL MANAGEMENT ACTIVITIES
A1
A2
A3
A4
0 1 2 Miles
DOFAW RESOURCE MANAGEMENT GUIDELINES
MOLOKAI
GAME ANIMAL MANAGEMENT ACTIVITIES
A1
A2
A3
A4
0 1 2 3 4 5 Miles
DOFAW RESOURCE MANAGEMENT GUIDELINES
OAHU
GAME ANIMAL MANAGEMENT ACTIVITIES
A1
A2
A3
A4
1 0 1 2 3 Miles
DOFAW RESOURCE MANAGEMENT GUIDELINES
KAUAI
GAME ANIMAL MANAGEMENT ACTIVITIES
A1
A2
A3
A4
1 0 1 2 3 Miles

Appendix II. List of Endangered (E), Threatened (T) and Proposed Endangered (PE) Species.

Marine Species Listed as Threatened or Endangered

Status	TaxonGroup	SciName
E	Crustacean Species	Spelaeorchestia koloana
E	Crustacean Species	Vetericaris chaceorum
E	Fish Species	Sphyrna lewini
E	Mammal-Marine Species	Balaenoptera borealis
E	Mammal-Marine Species	Balaenoptera musculus
E	Mammal-Marine Species	Balaenoptera physalus
E	Mammal-Marine Species	Eubalaena japonica
E	Mammal-Marine Species	Megaptera novaeangliae
E	Mammal-Marine Species	Monachus schauinslandi
E	Mammal-Marine Species	Physeter macrocephalus
E	Mammal-Marine Species	Pseudorca crassidens
E	Reptile-Marine Species	Caretta caretta
E	Reptile-Marine Species	Dermochelys coriacea
E	Reptile-Marine Species	Eretmochelys imbricata
E	Reptile-Marine Species	Lepidochelys kempii
T	Reptile-Marine Species	Chelonia mydas
T	Reptile-Marine Species	Lepidochelys olivacea

Avian Species Listed as Threatened and Endangered

Status	TaxonGroup	SciName
E	Bird Species	Anas wyvilliana
E	Bird Species	Branta sandvicensis
E	Bird Species	Buteo solitarius
E	Bird Species	Chasiempis sandwichensis ibidis
E	Bird Species	Corvus hawaiiensis
E	Bird Species	Fulica americana alai
E	Bird Species	Gallinula chloropus sandvicensis
E	Bird Species	Hemignathus lucidus
E	Bird Species	Hemignathus munroi
E	Bird Species	Hemignathus procerus
E	Bird Species	Himantopus mexicanus knudseni
E	Bird Species	Loxioides bailleui
E	Bird Species	Loxops caeruleirostris
E	Bird Species	Loxops coccineus coccineus
E	Bird Species	Loxops coccineus ochraceus
E	Bird Species	Melamprosops phaeosoma
E	Bird Species	Moho braccatus
E	Bird Species	Myadestes lanaiensis rutha
E	Bird Species	Myadestes myadestinus
E	Bird Species	Myadestes palmeri
E	Bird Species	Oreomystis bairdi
E	Bird Species	Oreomystis mana
E	Bird Species	Palmeria dolei
E	Bird Species	Paroreomyza flammea
E	Bird Species	Paroreomyza maculata
E	Bird Species	Pseudonestor xanthophrys
E	Bird Species	Psittirostra psittacea
E	Bird Species	Pterodroma phaeopygia sandwichensis
E	Bird Species	Acrocephalus familiaris kingi
E	Bird Species	Anas laysanensis

E	Bird Species	Phoebastria albatrus
E	Bird Species	Telespyza cantans
E	Bird Species	Telespyza ultima
E	Bird Species	Puffinus auricularis newelli

Plant Species Listed as Threatened and Endangered

Status	TaxonGroup	SciName
E	Fern and Fern Ally Species	Adenophorus periens
E	Fern and Fern Ally Species	Asplenium fragile var. insulare
E	Fern and Fern Ally Species	Ctenitis squamigera
E	Fern and Fern Ally Species	Diellia erecta
E	Fern and Fern Ally Species	Diellia falcata
E	Fern and Fern Ally Species	Diellia mannii
E	Fern and Fern Ally Species	Diellia pallida
E	Fern and Fern Ally Species	Diellia unisora
E	Fern and Fern Ally Species	Diplazium molokaiense
E	Fern and Fern Ally Species	Doryopteris angelica
E	Fern and Fern Ally Species	Doryopteris takeuchii
E	Fern and Fern Ally Species	Dryopteris crinalis var. podosorus
E	Fern and Fern Ally Species	Huperzia mannii
E	Fern and Fern Ally Species	Huperzia nutans
E	Fern and Fern Ally Species	Marsilea villosa
E	Fern and Fern Ally Species	Pteris lidgatei
E	Flowering Plant Species	Cenchrus agrimonioides
E	Flowering Plant Species	Cyperus pennatiformis
E	Flowering Plant Species	Pritchardia remota
E	Flowering Plant Species	Sesbania tomentosa
E	Flowering Plant Species	Abutilon eremitopetalum
E	Flowering Plant Species	Abutilon menziesii
E	Flowering Plant Species	Abutilon sandwicense
E	Flowering Plant Species	Acaena exigua
E	Flowering Plant Species	Achyranthes mutica
E	Flowering Plant Species	Achyranthes splendens var. rotundata
E	Flowering Plant Species	Alectryon macrococcus
E	Flowering Plant Species	Alsinidendron lychnoides
E	Flowering Plant Species	Alsinidendron viscosum
E	Flowering Plant Species	Argyroxiphium kauense
E	Flowering Plant Species	Argyroxiphium sandwicense ssp. sandwicense
E	Flowering Plant Species	Astelia waialealae
E	Flowering Plant Species	Bidens amplectens
E	Flowering Plant Species	Bidens campylotheca ssp. pentamera
E	Flowering Plant Species	Bidens campylotheca ssp. waihoiensis
E	Flowering Plant Species	Bidens conjuncta
E	Flowering Plant Species	Bidens hillebrandiana ssp. hillebrandiana
E	Flowering Plant Species	Bidens micrantha ssp. ctenophylla
E	Flowering Plant Species	Bidens micrantha ssp. kalealaha
E	Flowering Plant Species	Bidens wiebkei
E	Flowering Plant Species	Bonamia menziesii
E	Flowering Plant Species	Brighamia insignis
E	Flowering Plant Species	Brighamia rockii
E	Flowering Plant Species	Calamagrostis hillebrandii
E	Flowering Plant Species	Canavalia molokaiensis
E	Flowering Plant Species	Canavalia napaliensis

E	Flowering Plant	Species	Canavalia pubescens
E	Flowering Plant	Species	Centaurium sebaeoides
E	Flowering Plant	Species	Chamaesyce celastroides var. kaenana
E	Flowering Plant	Species	Chamaesyce deppeana
E	Flowering Plant	Species	Chamaesyce eleanoriae
E	Flowering Plant	Species	Chamaesyce halemanui
E	Flowering Plant	Species	Chamaesyce herbstii
E	Flowering Plant	Species	Chamaesyce kuwaleana
E	Flowering Plant	Species	Chamaesyce remyi var. kauaiensis
E	Flowering Plant	Species	Chamaesyce remyi var. remyi
E	Flowering Plant	Species	Chamaesyce rockii
E	Flowering Plant	Species	Charpentiera densiflora
E	Flowering Plant	Species	Clermontia drepanomorpha
E	Flowering Plant	Species	Clermontia lindseyana
E	Flowering Plant	Species	Clermontia oblongiflora ssp. brevipes
E	Flowering Plant	Species	Clermontia oblongiflora ssp. mauiensis
E	Flowering Plant	Species	Clermontia peleana
E	Flowering Plant	Species	Clermontia pyrularia
E	Flowering Plant	Species	Clermontia samuelii
E	Flowering Plant	Species	Colubrina oppositifolia
E	Flowering Plant	Species	Cyanea acuminata
E	Flowering Plant	Species	Cyanea asarifolia
E	Flowering Plant	Species	Cyanea asplenifolia
E	Flowering Plant	Species	Cyanea calycina
E	Flowering Plant	Species	Cyanea copelandii ssp. copelandii
E	Flowering Plant	Species	Cyanea copelandii ssp. haleakalaensis
E	Flowering Plant	Species	Cyanea crispa
E	Flowering Plant	Species	Cyanea dolichopoda
E	Flowering Plant	Species	Cyanea dunbariae
E	Flowering Plant	Species	Cyanea duvalliorum
E	Flowering Plant	Species	Cyanea eleeleensis
E	Flowering Plant	Species	Cyanea glabra
E	Flowering Plant	Species	Cyanea grimesiana ssp. grimesiana
E	Flowering Plant	Species	Cyanea grimesiana ssp. obatae
E	Flowering Plant	Species	Cyanea hamatiflora ssp. carlsonii
E	Flowering Plant	Species	Cyanea hamatiflora ssp. hamatiflora
E	Flowering Plant	Species	Cyanea horrida
E	Flowering Plant	Species	Cyanea humboldtiana
E	Flowering Plant	Species	Cyanea kolekoleensis
E	Flowering Plant	Species	Cyanea koolauensis
E	Flowering Plant	Species	Cyanea kuhihewa
E	Flowering Plant	Species	Cyanea kunthiana
E	Flowering Plant	Species	Cyanea lanceolata
E	Flowering Plant	Species	Cyanea lobata
E	Flowering Plant	Species	Cyanea longiflora
E	Flowering Plant	Species	Cyanea macrostegia ssp. gibsonii
E	Flowering Plant	Species	Cyanea magnicalyx
E	Flowering Plant	Species	Cyanea mannii
E	Flowering Plant	Species	Cyanea maritae
E	Flowering Plant	Species	Cyanea marksii
E	Flowering Plant	Species	Cyanea mauiensis
E	Flowering Plant	Species	Cyanea mceldowneyi
E	Flowering Plant	Species	Cyanea munroi
E	Flowering Plant	Species	Cyanea obtusa
E	Flowering Plant	Species	Cyanea pinnatifida

E	Flowering Plant	Species	Cyanea platyphylla
E	Flowering Plant	Species	Cyanea procera
E	Flowering Plant	Species	Cyanea profuga
E	Flowering Plant	Species	Cyanea purpurellifolia
E	Flowering Plant	Species	Cyanea remyi
E	Flowering Plant	Species	Cyanea shipmanii
E	Flowering Plant	Species	Cyanea solanacea
E	Flowering Plant	Species	Cyanea st.-johnii
E	Flowering Plant	Species	Cyanea stictophylla
E	Flowering Plant	Species	Cyanea superba
E	Flowering Plant	Species	Cyanea tritomantha
E	Flowering Plant	Species	Cyanea truncata
E	Flowering Plant	Species	Cyanea undulata
E	Flowering Plant	Species	Cyperus trachysanthos
E	Flowering Plant	Species	Cyrtandra crenata
E	Flowering Plant	Species	Cyrtandra cyaneoides
E	Flowering Plant	Species	Cyrtandra dentata
E	Flowering Plant	Species	Cyrtandra ferripilosa
E	Flowering Plant	Species	Cyrtandra filipes
E	Flowering Plant	Species	Cyrtandra giffardii
E	Flowering Plant	Species	Cyrtandra gracilis
E	Flowering Plant	Species	Cyrtandra kaulantha
E	Flowering Plant	Species	Cyrtandra munroi
E	Flowering Plant	Species	Cyrtandra nanawaleensis
E	Flowering Plant	Species	Cyrtandra oenobarba
E	Flowering Plant	Species	Cyrtandra oxybapha
E	Flowering Plant	Species	Cyrtandra paliku
E	Flowering Plant	Species	Cyrtandra polyantha
E	Flowering Plant	Species	Cyrtandra sessilis
E	Flowering Plant	Species	Cyrtandra subumbellata
E	Flowering Plant	Species	Cyrtandra tintinnabula
E	Flowering Plant	Species	Cyrtandra viridiflora
E	Flowering Plant	Species	Cyrtandra wagneri
E	Flowering Plant	Species	Cyrtandra waiolani
E	Flowering Plant	Species	Delissea rhytidosperma
E	Flowering Plant	Species	Delissea rivularis
E	Flowering Plant	Species	Delissea subcordata
E	Flowering Plant	Species	Delissea undulata
E	Flowering Plant	Species	Dubautia herbstobatae
E	Flowering Plant	Species	Dubautia imbricata ssp. imbricata
E	Flowering Plant	Species	Dubautia kalalauensis
E	Flowering Plant	Species	Dubautia kenwoodii
E	Flowering Plant	Species	Dubautia latifolia
E	Flowering Plant	Species	Dubautia pauciflorula
E	Flowering Plant	Species	Dubautia plantaginea ssp. humilis
E	Flowering Plant	Species	Dubautia plantaginea ssp. magnifolia
E	Flowering Plant	Species	Dubautia waialealae
E	Flowering Plant	Species	Eragrostis fosbergii
E	Flowering Plant	Species	Eugenia koolauensis
E	Flowering Plant	Species	Euphorbia haeleeleana
E	Flowering Plant	Species	Euphorbia skottsbergii var. skottsbergii
E	Flowering Plant	Species	Exocarpos luteolus
E	Flowering Plant	Species	Festuca molokaienesis
E	Flowering Plant	Species	Flueggea neowawraea
E	Flowering Plant	Species	Gardenia brighamii

E	Flowering Plant	Species	Gardenia mannii
E	Flowering Plant	Species	Geranium arboreum
E	Flowering Plant	Species	Geranium hanaense
E	Flowering Plant	Species	Geranium hillebrandii
E	Flowering Plant	Species	Geranium kauaiense
E	Flowering Plant	Species	Geranium multiflorum
E	Flowering Plant	Species	Gouania hillebrandii
E	Flowering Plant	Species	Gouania meyenii
E	Flowering Plant	Species	Gouania vitifolia
E	Flowering Plant	Species	Haplostachys haplostachya var. angustifolia
E	Flowering Plant	Species	Hedyotis cookiana
E	Flowering Plant	Species	Hedyotis mannii
E	Flowering Plant	Species	Hedyotis schlechtendahliana var. remyi
E	Flowering Plant	Species	Hedyotis st.-johnii
E	Flowering Plant	Species	Hesperomannia arborescens
E	Flowering Plant	Species	Hesperomannia arbuscula
E	Flowering Plant	Species	Hesperomannia lydgatei
E	Flowering Plant	Species	Hibiscadelphus distans
E	Flowering Plant	Species	Hibiscadelphus giffardianus
E	Flowering Plant	Species	Hibiscadelphus hualalaiensis
E	Flowering Plant	Species	Hibiscadelphus woodii
E	Flowering Plant	Species	Hibiscus arnottianus ssp. immaculatus
E	Flowering Plant	Species	Hibiscus brackenridgei
E	Flowering Plant	Species	Hibiscus clayi
E	Flowering Plant	Species	Hibiscus waimeae ssp. hannerae
E	Flowering Plant	Species	Ischaemum byrone
E	Flowering Plant	Species	Isodendrion hosakae
E	Flowering Plant	Species	Isodendrion laurifolium
E	Flowering Plant	Species	Isodendrion pyrifolium
E	Flowering Plant	Species	Kadua coriacea
E	Flowering Plant	Species	Kadua degeneri
E	Flowering Plant	Species	Kadua parvula
E	Flowering Plant	Species	Kanaloa kahoolawensis
E	Flowering Plant	Species	Keysseria erici
E	Flowering Plant	Species	Keysseria helenae
E	Flowering Plant	Species	Kokia cookei
E	Flowering Plant	Species	Kokia drynarioides
E	Flowering Plant	Species	Kokia kauaiensis
E	Flowering Plant	Species	Korthalsella degeneri
E	Flowering Plant	Species	Labordia cyrtandrae
E	Flowering Plant	Species	Labordia helleri
E	Flowering Plant	Species	Labordia lydgatei
E	Flowering Plant	Species	Labordia pumila
E	Flowering Plant	Species	Labordia tinifolia var. lanaiensis
E	Flowering Plant	Species	Labordia tinifolia var. wahiawaensis
E	Flowering Plant	Species	Labordia triflora
E	Flowering Plant	Species	Lepidium arbuscula
E	Flowering Plant	Species	Lipochaeta fauriei
E	Flowering Plant	Species	Lipochaeta kamolensis
E	Flowering Plant	Species	Lipochaeta lobata ssp. leptophylla
E	Flowering Plant	Species	Lipochaeta micrantha
E	Flowering Plant	Species	Lipochaeta venosa
E	Flowering Plant	Species	Lipochaeta waimeaensis
E	Flowering Plant	Species	Lobelia gaudichaudii ssp. koolauensis

E	Flowering Plant	Species	Lobelia monostachya
E	Flowering Plant	Species	Lobelia niihauensis
E	Flowering Plant	Species	Lobelia oahuensis
E	Flowering Plant	Species	Lysimachia daphnoides
E	Flowering Plant	Species	Lysimachia filifolia
E	Flowering Plant	Species	Lysimachia iniki
E	Flowering Plant	Species	Lysimachia lydgatei
E	Flowering Plant	Species	Lysimachia maxima
E	Flowering Plant	Species	Lysimachia pendens
E	Flowering Plant	Species	Lysimachia scopulensis
E	Flowering Plant	Species	Lysimachia venosa
E	Flowering Plant	Species	Mariscus fauriei
E	Flowering Plant	Species	Melanthera tenuifolia
E	Flowering Plant	Species	Melicope adscendens
E	Flowering Plant	Species	Melicope balloui
E	Flowering Plant	Species	Melicope christophersenii
E	Flowering Plant	Species	Melicope degeneri
E	Flowering Plant	Species	Melicope haupuensis
E	Flowering Plant	Species	Melicope hiiakae
E	Flowering Plant	Species	Melicope knudsenii
E	Flowering Plant	Species	Melicope lydgatei
E	Flowering Plant	Species	Melicope makahae
E	Flowering Plant	Species	Melicope mucronulata
E	Flowering Plant	Species	Melicope munroi
E	Flowering Plant	Species	Melicope ovalis
E	Flowering Plant	Species	Melicope pallida
E	Flowering Plant	Species	Melicope paniculata
E	Flowering Plant	Species	Melicope puberula
E	Flowering Plant	Species	Melicope quadrangularis
E	Flowering Plant	Species	Melicope reflexa
E	Flowering Plant	Species	Melicope saint-johnii
E	Flowering Plant	Species	Melicope zahlbruckneri
E	Flowering Plant	Species	Mezoneuron kavaiensis
E	Flowering Plant	Species	Mucuna sloanei var. persericea
E	Flowering Plant	Species	Munroidendron racemosum
E	Flowering Plant	Species	Myrsine juddii
E	Flowering Plant	Species	Myrsine knudsenii
E	Flowering Plant	Species	Myrsine mezii
E	Flowering Plant	Species	Myrsine vaccinioides
E	Flowering Plant	Species	Neraudia angulata
E	Flowering Plant	Species	Neraudia ovata
E	Flowering Plant	Species	Neraudia sericea
E	Flowering Plant	Species	Nothocestrum breviflorum
E	Flowering Plant	Species	Nothocestrum peltatum
E	Flowering Plant	Species	Nototrichium humile
E	Flowering Plant	Species	Ochrosia kilaueaensis
E	Flowering Plant	Species	Panicum carteri
E	Flowering Plant	Species	Panicum niihauense
E	Flowering Plant	Species	Peperomia subpetiolata
E	Flowering Plant	Species	Phyllostegia bracteata
E	Flowering Plant	Species	Phyllostegia floribunda
E	Flowering Plant	Species	Phyllostegia glabra var. lanaiensis
E	Flowering Plant	Species	Phyllostegia hirsuta
E	Flowering Plant	Species	Phyllostegia hispida
E	Flowering Plant	Species	Phyllostegia kaalaensis

E	Flowering Plant	Species	Phyllostegia knudsenii
E	Flowering Plant	Species	Phyllostegia mannii
E	Flowering Plant	Species	Phyllostegia mollis
E	Flowering Plant	Species	Phyllostegia parviflora
E	Flowering Plant	Species	Phyllostegia racemosa
E	Flowering Plant	Species	Phyllostegia renovans
E	Flowering Plant	Species	Phyllostegia velutina
E	Flowering Plant	Species	Phyllostegia waimeae
E	Flowering Plant	Species	Phyllostegia warshaueri
E	Flowering Plant	Species	Phyllostegia wawrana
E	Flowering Plant	Species	Pittosporum halophilum
E	Flowering Plant	Species	Pittosporum hawaiiense
E	Flowering Plant	Species	Pittosporum napaliense
E	Flowering Plant	Species	Plantago hawaiensis
E	Flowering Plant	Species	Plantago princeps
E	Flowering Plant	Species	Plantago princeps var. longibracteata
E	Flowering Plant	Species	Plantago princeps var. princeps
E	Flowering Plant	Species	Platanthera holochila
E	Flowering Plant	Species	Platydesma cornuta var. cornuta
E	Flowering Plant	Species	Platydesma cornuta var. decurrens
E	Flowering Plant	Species	Platydesma remyi
E	Flowering Plant	Species	Platydesma rostrata
E	Flowering Plant	Species	Pleomele fernaldii
E	Flowering Plant	Species	Pleomele forbesii
E	Flowering Plant	Species	Pleomele hawaiiensis
E	Flowering Plant	Species	Poa mannii
E	Flowering Plant	Species	Poa sandvicensis
E	Flowering Plant	Species	Poa siphonoglossa
E	Flowering Plant	Species	Portulaca sclerocarpa
E	Flowering Plant	Species	Pritchardia affinis
E	Flowering Plant	Species	Pritchardia hardyi
E	Flowering Plant	Species	Pritchardia kaalae
E	Flowering Plant	Species	Pritchardia lanigera
E	Flowering Plant	Species	Pritchardia munroi
E	Flowering Plant	Species	Pritchardia napaliensis
E	Flowering Plant	Species	Pritchardia schattaueri
E	Flowering Plant	Species	Pritchardia viscosa
E	Flowering Plant	Species	Psychotria grandiflora
E	Flowering Plant	Species	Psychotria hexandra ssp. oahuensis
E	Flowering Plant	Species	Psychotria hobdyi
E	Flowering Plant	Species	Pteralyxia kauaiensis
E	Flowering Plant	Species	Pteralyxia macrocarpa
E	Flowering Plant	Species	Remya kauaiensis
E	Flowering Plant	Species	Remya mauiensis
E	Flowering Plant	Species	Remya montgomeryi
E	Flowering Plant	Species	Sanicula mariversa
E	Flowering Plant	Species	Sanicula purpurea
E	Flowering Plant	Species	Santalum haleakalae var. lanaiense
E	Flowering Plant	Species	Scaevola coriacea
E	Flowering Plant	Species	Schiedea adamantis
E	Flowering Plant	Species	Schiedea apokremnos
E	Flowering Plant	Species	Schiedea attenuata
E	Flowering Plant	Species	Schiedea diffusa ssp. macraei
E	Flowering Plant	Species	Schiedea haleakalensis
E	Flowering Plant	Species	Schiedea hawaiiensis

E	Flowering Plant	Species	Schiedea helleri
E	Flowering Plant	Species	Schiedea hookeri
E	Flowering Plant	Species	Schiedea jacobii
E	Flowering Plant	Species	Schiedea kaalae
E	Flowering Plant	Species	Schiedea kauaiensis
E	Flowering Plant	Species	Schiedea kealiae
E	Flowering Plant	Species	Schiedea laui
E	Flowering Plant	Species	Schiedea lydgatei
E	Flowering Plant	Species	Schiedea membranacea
E	Flowering Plant	Species	Schiedea nuttallii
E	Flowering Plant	Species	Schiedea obovata
E	Flowering Plant	Species	Schiedea salicaria
E	Flowering Plant	Species	Schiedea sarmentosa
E	Flowering Plant	Species	Schiedea spergulina var. spergulina
E	Flowering Plant	Species	Schiedea stellarioides
E	Flowering Plant	Species	Schiedea trinervis
E	Flowering Plant	Species	Sicyos alba
E	Flowering Plant	Species	Silene alexandri
E	Flowering Plant	Species	Silene lanceolata
E	Flowering Plant	Species	Silene perlmanii
E	Flowering Plant	Species	Solanum incompletum
E	Flowering Plant	Species	Solanum sandwicense
E	Flowering Plant	Species	Spermolepis hawaiiensis
E	Flowering Plant	Species	Stenogyne angustifolia var. angustifolia
E	Flowering Plant	Species	Stenogyne bifida
E	Flowering Plant	Species	Stenogyne campanulata
E	Flowering Plant	Species	Stenogyne cranwelliae
E	Flowering Plant	Species	Stenogyne kanehoana
E	Flowering Plant	Species	Stenogyne kauaulaensis
E	Flowering Plant	Species	Stenogyne kealiae
E	Flowering Plant	Species	Tetramolopium arenarium
E	Flowering Plant	Species	Tetramolopium capillare
E	Flowering Plant	Species	Tetramolopium filiforme
E	Flowering Plant	Species	Tetramolopium lepidotum ssp. lepidotum
E	Flowering Plant	Species	Tetramolopium remyi
E	Flowering Plant	Species	Tetraplasandra bisattenuata
E	Flowering Plant	Species	Tetraplasandra flynnii
E	Flowering Plant	Species	Tetraplasandra gymnocarpa
E	Flowering Plant	Species	Tetraplasandra lydgatei
E	Flowering Plant	Species	Trematolobelia singularis
E	Flowering Plant	Species	Urera kaalae
E	Flowering Plant	Species	Vicia menziesii
E	Flowering Plant	Species	Vigna o-wahuensis
E	Flowering Plant	Species	Viola chamissoniana ssp. chamissoniana
E	Flowering Plant	Species	Viola helenae
E	Flowering Plant	Species	Viola kauaensis var. wahiawaensis
E	Flowering Plant	Species	Viola lanaiensis
E	Flowering Plant	Species	Viola oahuensis
E	Flowering Plant	Species	Wikstroemia villosa
E	Flowering Plant	Species	Wilkesia hobdyi
E	Flowering Plant	Species	Xylosma crenatum
E	Flowering Plant	Species	Zanthoxylum dipetalum var. tomentosum
E	Flowering Plant	Species	Zanthoxylum hawaiiensis
E	Flowering Plant	Species	Zanthoxylum oahuense
E	Flowering Plant	Species	Amaranthus brownii

E	Flowering Plant	Species	Schiedea verticillata
T	Flowering Plant	Species	Argyroxiphium sandwicense ssp. macrocephalum
T	Flowering Plant	Species	Cyanea recta
T	Flowering Plant	Species	Cyrtandra limahuliensis
T	Flowering Plant	Species	Isodendrion longifolium
T	Flowering Plant	Species	Myrsine linearifolia
T	Flowering Plant	Species	Peucedanum sandwicense
T	Flowering Plant	Species	Silene hawaiiensis
T	Flowering Plant	Species	Tetramolopium rockii

Invertebrate Species Listed as Threatened and Endangered

Status	TaxonGroup	SciName
E	Insect Species	Drosophila aglaia
E	Insect Species	Drosophila differens
E	Insect Species	Drosophila digressa
E	Insect Species	Drosophila hemipeza
E	Insect Species	Drosophila heteroneura
E	Insect Species	Drosophila montgomeryi
E	Insect Species	Drosophila musaphila
E	Insect Species	Drosophila neoclavisetae
E	Insect Species	Drosophila obatai
E	Insect Species	Drosophila ochrobasis
E	Insect Species	Drosophila sharpi
E	Insect Species	Drosophila substenoptera
E	Insect Species	Drosophila tarphytrichia
E	Insect Species	Manduca blackburni
E	Insect Species	Megalagrion leptodemas
E	Insect Species	Megalagrion nesiotes
E	Insect Species	Megalagrion nigrohamatum nigrolineatum
E	Insect Species	Megalagrion oceanicum
E	Insect Species	Megalagrion pacificum
T	Insect Species	Drosophila mulli
E	Snail Species	Achatinella abbreviata
E	Snail Species	Achatinella apexfulva
E	Snail Species	Achatinella bellula
E	Snail Species	Achatinella buddii
E	Snail Species	Achatinella bulimoides
E	Snail Species	Achatinella byronii
E	Snail Species	Achatinella caesia
E	Snail Species	Achatinella casta
E	Snail Species	Achatinella cestus
E	Snail Species	Achatinella concavospira
E	Snail Species	Achatinella curta
E	Snail Species	Achatinella decipiens
E	Snail Species	Achatinella decora
E	Snail Species	Achatinella dimorpha
E	Snail Species	Achatinella elegans
E	Snail Species	Achatinella fulgens
E	Snail Species	Achatinella fuscobasis
E	Snail Species	Achatinella juddii
E	Snail Species	Achatinella juncea
E	Snail Species	Achatinella lehuiensis
E	Snail Species	Achatinella leucorrhaphe
E	Snail Species	Achatinella lila
E	Snail Species	Achatinella livida

E	Snail Species	Achatinella lorata
E	Snail Species	Achatinella mustelina
E	Snail Species	Achatinella papyracea
E	Snail Species	Achatinella phaeozona
E	Snail Species	Achatinella pulcherrima
E	Snail Species	Achatinella pupukanioe
E	Snail Species	Achatinella rosea
E	Snail Species	Achatinella sowerbyana
E	Snail Species	Achatinella spaldingi
E	Snail Species	Achatinella stewartii
E	Snail Species	Achatinella swiftii
E	Snail Species	Achatinella taeniolata
E	Snail Species	Achatinella thaanumi
E	Snail Species	Achatinella turgida
E	Snail Species	Achatinella valida
E	Snail Species	Achatinella viridans
E	Snail Species	Achatinella vittata
E	Snail Species	Achatinella vulpina
E	Snail Species	Newcombia cumingi
E	Snail Species	Partulina semicarinata
E	Snail Species	Partulina variabilis
T	Snail Species	Erinna newcombi

Mammal Species Listed as Threatened and Endangered

Status	TaxonGroup	SciName
E	Mammal-Terrestrial Species	Neomonachus schauinslandi
E	Mammal-Terrestrial Species	Lasiurus cinereus semotus

Marine Species Listed as Proposed Endangered

Definition	TaxonGroup	Scientific Name
PE	Crustacean Species	Procaris hawaiana

Avian Species Listed as Proposed Endangered

Definition	TaxonGroup	SciName
PE	Bird Species	Oceanodroma castro

Plant Species Listed as Proposed Endangered

Definition	TaxonGroup	SciName
PE	Fern and Fern Ally Species	Asplenium diellaciniatum
PE	Fern and Fern Ally Species	Cyclosorus boydiae
PE	Fern and Fern Ally Species	Deparia kaalaana
PE	Fern and Fern Ally Species	Dryopteris glabra var. pusilla
PE	Fern and Fern Ally Species	Huperzia stemmermanniae
PE	Fern and Fern Ally Species	Hypolepis hawaiiensis var. mauiensis
PE	Fern and Fern Ally Species	Microlepia strigosa var. mauiensis
PE	Flowering Plant Species	Portulaca villosa
PE	Flowering Plant Species	Solanum nelsonii
PE	Flowering Plant Species	Calamagrostis expansa
PE	Flowering Plant Species	Cyanea kauaulaensis
PE	Flowering Plant Species	Cyperus neokunthianus
PE	Flowering Plant Species	Cyrtandra hematos

PE	Flowering Plant	Species	Exocarpos menziesii
PE	Flowering Plant	Species	Festuca hawaiiensis
PE	Flowering Plant	Species	Gardenia remyi
PE	Flowering Plant	Species	Joinvillea ascendens ssp. ascendens
PE	Flowering Plant	Species	Kadua fluviatilis
PE	Flowering Plant	Species	Kadua haupuensis
PE	Flowering Plant	Species	Labordia lorenciana
PE	Flowering Plant	Species	Lepidium orbiculare
PE	Flowering Plant	Species	Myrsine fosbergii
PE	Flowering Plant	Species	Nothocestrum latifolium
PE	Flowering Plant	Species	Ochrosia haleakalae
PE	Flowering Plant	Species	Phyllostegia brevidens
PE	Flowering Plant	Species	Phyllostegia helleri
PE	Flowering Plant	Species	Phyllostegia stachyoides
PE	Flowering Plant	Species	Pritchardia bakeri
PE	Flowering Plant	Species	Pseudognaphalium sandwicensium ssp. molokaiense
PE	Flowering Plant	Species	Ranunculus hawaiensis
PE	Flowering Plant	Species	Ranunculus mauiensis
PE	Flowering Plant	Species	Sanicula sandwicensis
PE	Flowering Plant	Species	Santalum involutum
PE	Flowering Plant	Species	Schiedea diffusa ssp. diffusa
PE	Flowering Plant	Species	Schiedea pubescens
PE	Flowering Plant	Species	Sicyos lanceoloideus
PE	Flowering Plant	Species	Sicyos macrophyllus
PE	Flowering Plant	Species	Stenogyne kaalae ssp. sherffii
PE	Flowering Plant	Species	Wikstroemia skottsbergiana

Invertebrate Species Listed as Proposed Endangered

Definition	TaxonGroup	SciName
PE	Insect Species	Hylaeus anthracinus
PE	Insect Species	Hylaeus assimulans
PE	Insect Species	Hylaeus facilis
PE	Insect Species	Hylaeus hilaris
PE	Insect Species	Hylaeus kuakea
PE	Insect Species	Hylaeus longiceps
PE	Insect Species	Hylaeus mana
PE	Insect Species	Megalagrion xanthomelas

III. Federal Assistance Section 7 Evaluation Forms

In developing these game management projects, precautions have been taken to evaluate potential impacts to threatened and endangered species and to incorporate measures that will protect listed species that may be affected by project activities. Hawaii currently has 503 species listed as threatened or endangered, an additional 49 proposed or candidate species under consideration for listing (See Appendix II for a list of endangered and threatened species found on the various Islands throughout the State). A Federal Assistance Assessment (Section 7 Evaluation Form) has been completed by the State Federal Aid Coordinator for each project to identify potential impacts and, where needed, incorporate additional measures that the State will take to avoid impacts or ensure that listed species are identified and protected.

The Division believes that Findings of "No Effect" or "Not Likely To Adversely Affect Listed Species" are warranted for the project activities in this grant package. The following considerations and mitigation measures were factors in reaching those findings.

1. The majority of the activities carried out under this program are routine, ongoing and located in disturbed areas with no or very few listed species. Improvements are located to avoid impacts to listed species during construction and use.

2. A small portion of the State's Federal Aid PR Program is dedicated to Nongame/Endangered Species wildlife activities that directly benefit and enhance listed species.

3. Many of the Game Management Program activities benefit and enhance listed species. For example, predator control and water unit development for game birds also benefit nene in many areas. Roads, trails and facilities developed or maintained in remote areas increase hunter pressure which help control game mammals.

4. DOFAW's Draft Resource Management Guidelines and distribution maps of listed species were used as planning tools in developing game management project activities and in assessing potential impacts to listed species in completing the State's portion of the Section 7 Assessments. The major focus of the game enhancement program utilizing Federal funds is for game birds, which involves activities that are unlikely to adversely affect listed species.

5. Program activities that might enhance game mammal populations have been purposefully designed, and specific mitigation actions recommended, in order to avoid negatively affecting listed species. Program activities that do enhance game mammal populations are done in "Game Production" areas and these projects include a commitment to identify and protect any listed species in the area that are at risk from game mammals.

6. Where there is a potential for adverse impacts to listed species, DOFAW has included actions to mitigate impacts such as fencing endangered plants, creation of "No Hunting" safety zones for nene, and educational materials for hunters to increase their awareness of endangered species that may be found in public hunting areas.