

Ironwood Forest National Monument

Natural History Synopsis

Overview The Ironwood Forest National Monument (IFNM) comprises 129,000 acres of prime Sonoran Desert northwest of the Tucson basin. There are eight mountain ranges and two large valleys with elevations ranging from 1550 to 4195 ft. The mountains have complex and variable geological histories, some being entirely volcanic in origin and others having significant intrusions of limestone and other rocks. This variability impacts the kinds of plants and animals that live here. About 45% of IFNM is classified as the Arizona Upland subdivision of the Sonoran Desert and the remainder is considered the Lower Colorado River Valley subdivision. Nearly 600 plant species and 121 vertebrate animal species are found within IFNM. The area is maintained by the Bureau of Land Management (BLM). No permits are required to visit the area, but you should consult the BLM leaflet that describes access and gives a map of the monument. There are no facilities so precautions should be taken to avoid excessive heat and lack of water. Temperatures range from below freezing in the winter and up to 110 F in summer. Rain averages about 10 inches per year with a winter rainy season and a monsoon period of July-September. The Sonoran Desert supports a beautifully diverse flora and fauna that rivals most of the world's deserts.

Plants Of the 594 taxa of plants on IFNM, 91 are "sunflowers" (family Asteraceae), 82 are grasses (Poaceae), 43 are cacti (Cactaceae), 36 are bean/pea relatives (Fabaceae), and 61 (about 10%) are exotic (i.e. introduced non-native species) but only six of these seem widespread and aggressive with Buffelgrass being the most problematic.

The most ecologically important or keystone species include the ubiquitous Ironwood Tree, Paloverde (2 species), Saguaro Cactus, and Velvet Mesquite. Cacti include cholla (9 taxa plus 10 hybrids), prickly pear (7 plus 3 hybrids), hedgehog (3), pincushion (3), and barrel cactus (3). Ironwood is an abundant tree (to 30' high) on the slopes and ravines of the mountains and is known to serve over 640 associated species of plants and animals for shade, food, perches and shelter. Like many other legumes its roots host nitrogen fixing bacteria that enrich the soils. Foothill or Yellow Paloverde and Saguaro or Giant Cacti are also important dominants of the slopes. Mesquite trees serve similarly important roles in the flatland deserts of the valleys often dominated by grasses and Creosote. Abundant bushes include Ocotillo, White Thorn and Catclaw Acacia, Triangle Bursage, Jojoba, White Ratany, Canyon Ragweed, Wolfberry, and Gray-thorn. Along the lower washes Blue Paloverde is common. Numerous and colorful annual flowers appear in early spring after good winter rains and in early fall. A number of unique species are mentioned in the areas described on back.

Animals Insects are the most abundant types of animals, and ants are especially common, for example there are several kinds of harvester ants (feed primarily on seeds), leaf cutter ants (grow fungus gardens underground), and army ants (raid opportunistic food sources). Grasshoppers, beetles, cicadas, butterflies, and true bugs are common with each species being abundant according to its particular life cycle. Spiders and centipedes are common.

More conspicuous animals such as vertebrates include 15 mammals, 55 birds, 43 reptiles, and 8 amphibians. Diurnal mammals (Black-tailed Jack Rabbit, Desert Cottontail, Harris' Antelope Squirrel) are the most conspicuous but nocturnal or crepuscular species (Collared Peccary or Javelina, Kit & Gray Foxes, Bobcat, Mule Deer and Badger) are common. However, the most spectacular is the Bighorn Sheep. Once widespread in southern Arizona, these sheep reach their eastern-most AZ natural distribution in IFNM. Commonly observed birds include Gila Woodpecker, Roadrunner, Cactus Wren, Mourning Dove, Pyrrhuloxia, Gambel's Quail, Red-tailed Hawk, and Turkey Vulture, but many other birds are easily recognized by experienced bird watchers. Reptiles include five species of rattlesnakes, Gila Monster, Desert Tortoise, and an assortment of lizards (Tiger Whiptail and Zebra-tailed lizard most frequently seen). The large Colorado River Toad may be seen during the monsoon season.

Natural History of IFNM major areas

Avra Valley This valley just west of the Santa Cruz River borders the eastern edge of the IFNM. Some valley agriculture occurs, but natural areas of IFNM are dominated by Velvet Mesquite trees and Creosote bushes. A total of 246 plant taxa are recorded in this Sonoran Desert scrubland. Blue Paloverde and large Velvet Mesquite trees with an occasional Desert Hackberry and Wolfberry are common along the major washes as well as a diversity of lush bushes. Prickly Pear Cacti and Burroweed may be common in overgrazed areas, with abundant spring flowers.

Roskrige Mountains This is a long range oriented south to north in the southern part of IFNM. Its main body extends south of the IFNM where its maximum altitude is 3,717'. A total of 327 taxa of plants are recorded and 21 taxa are unique in IFNM to this area. This is the only area in which an Organ Pipe Cactus occurs. Typically found west and south into Baja California, one large old OPC represents the ~~second~~^{third} most easterly found plant of this species in the U.S. Some of the largest ironwood trees are found in these mountains.

Pan Quemado Mountains The "burnt bread mountains" are a small range near the southeastern border of IFNM east southeast of the Waterman Mountains. Two of the 276 plant taxa here are unique to IFNM.

Waterman Mountains These complex mountains, with considerable limestone, lie south of the larger Silver Bells. A total of 312 plant taxa are recorded with 17 that are found in IFNM only here including Desert Agave, Yellow Trumpet-bush of tropical affinity, *Canotia* (one of three Arizona plants called Crucifixion Thorn that are more common below the Mogollon Rim), and Turk's Head Cactus (Nicol's variety here is on the endangered species list). The Elephant Tree (of Baja California and Sonora Mexico) reaches its eastern-most U.S. limit here.

Silver Bell Mountains Only the eastern slopes of these largest mountains in the area are in IFNM. Its western slopes are outside the monument and heavily altered by the copper mining operation that started at the end of the 19th century. The highest elevation here is 4,195'. Plant taxa number 332 (56% of those in IFNM) with 7 plants unique in IFNM found only here. Until 1984 there was a permanent water stream in the Silver Bells but extensive mining killed the source which has no doubt affected both plant and animals distributions, especially frogs. The Arizona (Banana) Yucca is found as well in a rare vegetation association, a Jojoba plant chaparral, on the north slope of the Silver Bell Mountains.

Ragged Top This iconic peak, at 3907' and its smaller adjacent Wolcott Peak contain some of the most interesting plants and animals. There are 410 plant taxa (69% of the IFNM flora) including a few Shrub Live Oaks and a tropical plant of the four o'clock flower family, *Pisonia capita*, found nowhere else in the U.S. A herd of Desert Mountain Bighorn Sheep occur here and these range south into the Silver Bell and Waterman Mountains. The Chuckwalla and Desert Iguana reach their southeastern distributional limit here. The Desert Tortoise is common here and on several adjacent mountain slopes such as the Waterman, Silver Bell and West Silver Bell Mountains.

Samaniego Hills The low hills north of Ragged Top have 252 plant taxa but only one unique species, an exotic weed. Ironwood, Saguaro, Foothill Paloverde, and many cholla species dominate the slopes as elsewhere in IFNM.

West Silver Bell Mountains These mountains west of the main Silver Bell Mountains are relatively low (2947'). They have 213 plant taxa but only one unique species, a grass.

Sawtooth Mountains These mountains extend along the northwestern edge of the monument and are not easily accessible from Avra Valley roads. They are very dry (only 9" per year) with 323 taxa including 22 unique to IFNM. A distinctive sand-hills area and its associated biota occur near the northwest border of IFNM.

Aguirre Valley This valley occurs to the west of the Sawtooth Mountains south to the Silver Bells. It has 165 taxa, including one unique species, a barrel cactus (*Ferocactus emoryi*).

Waterman Mts., Pima County, Arizona; all exposures; limestone, quartzite; Thomas R. Van Devender, John F. Wiens, et al.; updated 2/2014

Ferns & Allies

Pteridaceae

Astrolepis cochisensis
Astrolepis jonesii
Astrolepis sinuata
Cheilanthes lindheimeri
Cheilanthes villosa
Cheilanthes wrightii
Cheilanthes yavapense
Notholaena standleyi
Pellaea truncata

Selaginellaceae

Selaginella arizonica

Gymnosperms

Ephedraceae

Ephedra nevadensis

Angiosperms: Dicots

Acanthaceae

Carlowrightia arizonica
Justicia longii

Aizoaceae

Trianthema portulacastrum

Amaranthaceae

Amaranthus fimbriatus
Amaranthus palmeri
Amaranthus xtucsonensis
Tidestromia lanuginosa

Apiaceae

Bowlesia incana
Daucus pusillus
Spermolepis echinata

Apocynaceae

Asclepias nyctaginifolia
Haplophyton cimcidium
Metastelma arizonica
Matelea parviflora

Aristolochiaceae

Aristolochia watsoni

Asteraceae

Acourtia nana
Acourtia wrightii
Adenophylla porophylloides
Ambrosia ambrosoides
Ambrosia confertiflora
Ambrosia deltoidea
Ambrosia dumosa
Bahia absinthifolia
Baileya multiradiata
Brickellia baccharidea
Brickellia coulteri
Calycoseris wrightii
Chaenactis carphoclinia
Encelia farinosa
Erigeron divergens
Eriophyllum lanosum
Eupatorium solidaginifolium
Evax multicaulis
Gymnosperma glutinosa
Heterotheca psammophila
Isocoma tenuisecta
Machaeranthera gracilis
Malacothrix sonora
Monoptilon bellioides
Parthenium incanum
Pectis papposa
Porophyllum gracile
Psilostrophe cooperi
Rafinesquia neomexicana
Senecio lemmonii
Senecio monoensis
Sochus oleraceus
Stephanomeria pauciflora
Stylocline micropoides
Thymophylla pentachaeta
Trixis californica
Xanthisma spinulosum var. gooddingii
Zinnia acerosa

Boraginaceae

Amsinckia menziesii
Amsinckia tessellata
Cryptantha barbiger
Cryptantha pterocarya
Harpagonella palmeri
Lappula redowskii
Pectocarya platycarpa
Pectocarya recurvata
Tigulia canescens

Brassicaceae

Boechera perennans
Caulanthus lasiophyllus
Descurainia pinnata
Draba cuneifolia
Lepidium lasiocarpum
Physaria gordonii
Sisymbrium irio
Streptanthus carinatus
Thysanocarpus curvipes

Burseraceae

Bursera microphylla

Cactaceae

Carnegiea gigantea
Cylindropuntia acanthocarpa
Cylindropuntia acanthocarpa
× C. leptocaulis
Cylindropuntia bigelovii
Cylindropuntia fulgida var. fulgida
Cylindropuntia fulgida var. mammillata
Cylindropuntia leptocaulis
Cylindropuntia spinosior
Echinocactus horizontalis var. nicholii
Echinocereus fasciculatus
Echinocereus nicholii
Ferocactus cylindraceus
Ferocactus wislizeni
Mammillaria grahamii
Opuntia chlorotica
Opuntia engelmannii
Opuntia engelmannii × phaeacantha
Opuntia macrocentra
Opuntia phaeacantha var. flavispina
Opuntia phaeacantha var. major

Peniocereus greggii

Campanulaceae

Nemacladus glanduliferus

Cannabaceae

Celtis pallida

Capparidaceae

Koeberlinia spinosa

Caryophyllaceae

Herniaria cinerea
Silene antirrhina

Celastraceae

Canotia holacantha

Chenopodiaceae

Atriplex canescens
Atriplex elegans
Chenopodium murale
Chenopodium neomexicanum
Salsola iberica

Convolvulaceae

Evolvulus alsinoides
Ipomoea hederacea

Crassulaceae

Graptopetalum rusbyi

Crossosomataceae

Crossosoma bigelovii

Euphorbiaceae

Bernardia incana
Croton sonorae
Ditaxis lanceolata
Ditaxis neomexicana
Euphorbia abramsiana
Euphorbia arizonica
Euphorbia capitellata
Euphorbia eriantha
Euphorbia florida
Euphorbia hyssopifolia
Euphorbia micromera

Euphorbiaceae (con'd)

Euphorbia pediculifera
Euphorbia revoluta
Euphorbia setiloba
Jatropha cardiophylla
Tragia nepetaefolia

Fabaceae

Acmispon brachycarpus
Acmispon maritimus var. brevivexillus
Acmispon strigosus
Astragalus nuttalianus
Calliandra eriophylla
Dalea mollis
Lupinus sparsiflorus
Marina parryi
Nissolia schottii
Olneya tesota
Parkinsonia florida
Parkinsonia microphylla
Prosopis velutina
Senegalia greggii
Senna covesii
Vachellia constricta
Vicia ludoviciana

Fouquieriaceae

Fouquieria splendens

Geraniaceae

Erodium cicutarium
Erodium texanum

Hydrophyllaceae

Eucrypta chrysanthemifolia
Eucrypta micrantha
Nama hispidum
Phacelia coerulea
Phacelia crenulata
Phacelia distans
Pholistoma auritum

Krameriaceae

Krameria bicolor
Krameria erecta

Lamiaceae

Hedeoma nana
Hyptis emoryi
Monardella arizonica
Salvia columbarae
Teucrium cubense

Linaceae

Linum lewisii
Linum usitatissimum

Loasaceae

Mentzelia affinis
Mentzelia involucrata
Mentzelia multiflora

Malpighiaceae

Janusia gracilis

Malvaceae

Abutilon coahuila
Abutilon incanum
Abutilon malacum
Ayenia compacta
Ayenia microphylla
Herissantia crispa
Hermannia pauciflora
Hibiscus coulteri
Hibiscus denudatus
Horsfordia newberryi
Sphaeralcea ambigua
Sphaeralcea coulteri
Sphaeralcea emoryi

Nyctaginaceae

Allionia incarnata
Boerhavia wrightii
Commicarpus scandens
Mirabilis laevis

Oleaceae

Menodora scabra

Onagraceae

Camissonia boothii
Camissonia chamaenerioides
Oenothera primiveris

Orobanchaceae
Castilleja exerta

Phrymaceae
Mimulus rubellus

Plantaginaceae
Maurandya antirrhiniflora
Penstemon parryi
Plantago fastigiata
Plantago rhodosperma
Plantago patagonica

Polemoniaceae
Eriastrum diffusum
Gilia flavocincta ssp. australis
Gilia stellata
Linanthus bigelovii

Polygalaceae
Polygala macradenia

Polygonaceae
Chorizanthe brevicornu
Chorizanthe rigida
Eriogonum abertianum
Eriogonum deflexum
Eriogonum inflatum
Eriogonum thomasii
Eriogonum trichopes

Portulacaceae
Callandrinia ciliata
Talinum aurantiacum

Primulaceae
Androsace occidentalis

Ranunculaceae
Anemone tuberosa
Delphinium scaposum

Resedaceae
Oligomeris linifolia

Rhamnaceae
Condalia warnockii var. kearneyana

Ziziphus obtusifolius

Rubaiaceae
Galium proliferum
Galium stellatum

Solanaceae
Datura discolor
Lycium berlandieri
Lycium parishii
Nicotiana trigonophylla
Physalis sp.
Solanum elaeagnifolium

Urticaceae
Parietaria hespera

Verbenaceae
Aloysia wrightii
Tetradlea coulteri
Verbena neomexicana

Violaceae
Hybanthus verticillatus

Viscaceae
Phorodendron californicum

Zygophyllaceae
Fagonia laevis
Kallstroemia californica
Larrea tridentata

Angiosperms: Monocots

Asparagaceae
Agave deserti
Dichelostemma pulchellum
Yucca arizonica

Amaryllidaceae
Allium macropetalum

Poaceae
Aristida adscensionis
Aristida purpurea var. nealleyi
Aristida ternipes var. ternipes
Bothriochloa barbinodis

Poaceae (con'd)

Bouteloua aristidoides
Bouteloua barbata
Bouteloua curtipendula
Bouteloua eriopoda
Bouteloua repens
Bouteloua trifida
Bromus carinatus
Bromus rubens
Cottea pappophoroides
Cynodon dactylon
Dasyochloa pulchella
Digitaria californica
Enneapogon cenchroides
Enneapogon desvauxii
Eragrostis cilianensis
Heteropogon contortus
Hilaria belangeri
Hopia obtusa
Hordeum murinum ssp. glaucum
Leptochloa panacea ssp. brachiata
Muhlenbergia microsperma
Muhlenbergia porteri
Panicum hallii
Panicum hirticaule
Pappophorum vaginatum
Pennisetum ciliare
Phlaris minor
Poa bigelovii
Schismus barbatus
Setaria leucopila
Sporobolis contractus
Sporobolis cryptandrus
Tridens muticus
Trisetum interruptum
Urochloa arizonica
Vulpia octoflora

Xanthorrhoeaceae

Aloe barbadensis

Waterman's / Limestone - sea

Calcium carbonate
alkalia / salty soils

E.T.
N.T.H.C.

B.C.I. / BLM Agreement

25 people
total

April 4th
Manville