Endangered and Threatened Animals of Utah

Quinney Professorship for Wildlife Conflict Management

Jack H. Berryman Institute

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Utah Department of Natural Resources

Division of Wildlife Resources

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Endangered and Threatened Animals of Utah

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Contents

Purpose of this Guide

This guide is for landowners, county planners, educators, county commissioners, legislators, natural resource agency professionals, and other decision makers who are concerned about growth, natural resource conservation, and open space issues in Utah. Although Utah is predominately publicly-owned, how private lands are used and managed can have important consequences for preserving Utah's open spaces and biodiversity.

The fate of Utah's open spaces and many of our rare and not so rare wildlife species depends on adoption and implementation of a statewide land stewardship and conservation ethic. Land stewardship and conservation are not new concepts for Utah landowners. Many private landowners realize the importance and value of retaining diverse landscapes and open spaces for agricultural, recreational, and wildlife conservation purposes.

However, with increasing numbers of wildlife species being considered for listing as endangered or threatened species, landowners and other Utah decision makers are becoming more concerned about how current land uses, and more specifically the vitality of their farms, ranches, and communities, may be affected. This guide presents and discusses the legal implications of management activities on current land uses should a threatened or endangered species be identified. In addition, we describe Utah's threatened and endangered animals and provide information on what is and can be done to assist in recovery of rare species or to eliminate the need to list other species.

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Introduction

Utah's wildlife heritage is unparalleled in the United States. This is partly because our state exhibits tremendous variation in geographic and topographic diversity. This diversity translates into a wide variety of habitats for wildlife. It also means that Utah is becoming more attractive to nonresidents as a place to live.

Wildlife diversity and abundance of all living things are determined by interactions among and between organisms and their physical environments. The distribution and abundance of the human species have increased due to the development of agriculture and industry. Since settlers first entered the Salt Lake Valley in the 1850's, dramatic changes have occurred in Utah's natural environment. The need to survive and prosper provided little incentive for early Utahns to consider the environmental consequences of their actions. With escalating population growth and technological advancements, humans continued to exert even greater influence over the environment.

In Europe the impacts of population growth on native species were moderated by the establishment of royal forests that were closed to the common people. When settlers arrived on the North American continent, access to a remarkable abundance and diversity of wildlife was largely unrestricted. As a result of habitat changes and hunting pressures, many game species declined rapidly.

As Utah's population grows, so will the demand for natural resources. Since the 1970's the states population growth has exceeded national growth rate. Despite the fact that almost 60 percent of the state's land is federally-owned, Utah ranks sixth in the percent of our population that lives in urban areas. By 2050, an estimated 5 million people will live in Utah's urban areas. This steady and rapid urban population growth places an additional strain on the regional and local environments because many of these areas are bounded by mountain ranges and water bodies and include land that is essentially arid. Increasing urbanization will continue to impact air quality, land use, and water supplies. Other threats to Utah's biodiversity and open spaces associated with urbanization are the increased risks of invasion by introduced plants and animals from gardens and landscaped yards that border Utah's open areas.

One of the most difficult issues facing Utah citizens is managing the development of our state's natural resources to support a growing population while conserving open spaces and wildlife diversity. The most compelling and controversial aspect of this issue is the growing rate at which animal and plant species are becoming extinct or threatened with extinction. Low rates of species loss are a natural part of evolution. However, as a result of our human population growth and expansion, species extinction rates have greatly accelerated. Declines in species diversity and abundance have increased as more natural areas have been converted into farms, towns, and cities. Over 70% of the species extinctions recorded in North America since the 1500's occurred in the 20th century.

To address this conservation dilemma, the Utah Legislature in 1971 passed a Wildlife Resources Code that gave the authority and charge to the Utah Division of Wildlife Resources to protect, propagate, manage, conserve, and distribute protected wildlife in Utah. Two years later, the U.S. Congress passed the Endangered Species Act of 1973. By enacting these pieces of legislation, the Utah Legislature and U.S. Congress demonstrated an understanding that our nation's wildlife resource are finite, and reflected the public's increased sensitivity and concern about how human land uses can impact native animals and plants, and ultimately our quality of life.

What are endangered and threatened species?

The Endangered Species Act of 1973 (ESA) provides a formal definition of what constitutes an endangered or threatened species. The term "endangered species" means a species which is in danger of extinction throughout all or a significant portion of its range. The term "threatened species" means any species which is likely to become an endangered species in the near future.

Some species may be classified as threatened or endangered based on similarity of appearance to an endangered species. For example, the American alligator is locally abundant across the southeastern United States. Because it is very similar in appearance to the American crocodile which occurs only in a few places, regulations allowing the harvest of American alligators might also be detrimental to the American crocodile if not implemented properly. Thus, because of the high potential that exists for mistaken harvest of the crocodile, the alligator also is protected.

In addition, a species may be endangered, threatened, common, or abundant in different parts of its range all at the same time. For example, the Bald Eagle was previously identified as an endangered species in the lower 40 states while it was considered to be common in Alaska. Thus, in Alaska, the Bald Eagle was not listed as being endangered.

Why some species become endangered or threatened?

The list of federally protected species that are classified as endangered or threatened is continually changing. This list is maintained by the U.S. Fish and Wildlife Service. The Utah Division of Wildlife Resources also maintains a list of protected wildlife species found in the state.

As habitat or environmental conditions change so do animal populations. The primary reason for population declines and subsequent listing as an endangered or threatened species is the loss of habitat that is critical for survival. Unfortunately, continued habitat loss appears inevitable until human population and per capita consumption of natural resources can be stabilized.

These factors also contribute to recent awareness about and concerns regarding preservation of open spaces in the face of an increasingly urbanized Utah landscape. Additional causes of declines may include deaths caused by people collecting or taking a species, death by pests or predators, natural disasters, introduction of non-native (exotic) species, over harvest, pollution, and pesticides.

Why protect endangered species?

Indicators of environmental health

Although species become extinct as a natural occurrence, we should be concerned if human activities are increasing the rate of extinction. Humans and wildlife inhabit the same natural environment. As such, our life support system depends on maintaining an intricate balance of interactions between plants, animals, and their environments. Anything we do to undermine that balance that results in immediate effects on wildlife populations may ultimately impact the ability of our environment to sustain human life-support systems.

Our natural environment is much like a multi-level building. This building consists of everything from structural components such as bricks and mortar to internal wiring; each serving a specific purpose. When constructing a building we can skimp on a few items such as a light here and there and it will not affect the overall function of the building. However, if we eliminate some of the wiring to entire sections of the building or a support structure here and there, we will reduce the usefulness of the building and may actually make it unsafe. If we continue to discard additional components, the building could collapse. Our quality of life and

the ultimate survival of our species, much like the integrity of our buildings, depends on our ability to recognize and keep our natural systems functioning.

Humans are very mobile and capable of modifying their immediate surroundings to cope with harsh or changing environmental conditions. Less mobile specialized plant and animal species are more sensitive to environmental changes. By studying declines in Bald Eagles and Peregrine Falcons, we became more alert about the impact certain pesticides were having on the natural environment. In this way, endangered and threatened species can be critical early warning systems of potentially serious environmental problems.

Value to agriculture

All of our domesticated plants and animals were developed from wild species as humans sought to provide themselves with food, shelter, medicines, companionship, and satisfy other needs and wants. Annually, new species are developed, planted, cultivated or raised, and harvested for human use. Although over 80,000 species of plants are considered to be edible, fewer than 20 species provide over 90% of the world's food. Additionally, diseases and pests that can affect production of these crops are continually evolving and adapting to current methods of control. To ensure future agricultural productivity, scientists must continue to seek alternative foods from other new sources.

One way to improve disease and pest resistance of agricultural crops may be to introduce germ plasm from wild varieties into domestic strains. Using these techniques, new crop varieties may be developed that could be grown in areas that currently have no food sources. Natural pest control agents could also be developed through this research.

The potential values of plant and animal species to human survival are difficult to determine. However, past experiences with a limited number of species supports the idea that these values have yet to be tapped.

Medicine

The value of rare or unique species to human survival is best attested to by the field of medicine. Each plant and animal species has a unique biochemical composition. Only a small fraction of the plants and animals in the world have been studied to determine their unique chemistries. Yet, in the last quarter century, over 50 percent of all prescription medicines dispensed have active ingredients extracted from plants and animals. These chemicals are used to manufacture medicines to treat heart disease, cancer, and a host of other illnesses and diseases.

The question yet to be answered is how much medical value is contained in untested species? By eliminating a particular plant and animal species, are we forfeiting an opportunity to cure cancer or some other diseases that plague humankind? Once an organism is extinct, there is no way to recreate it.

Lastly, many animals also exhibit unique adaptations that allow them to survive and thrive in some of the most inhospitable environments on this earth. By studying how species adapt to specific survival problems, we can learn more about how biological systems respond to harsh conditions. This information could provide us with insights on how to solve medical and health problems associated with natural catastrophes or ultimately space travel.

Ecological values

Each environment has characteristic life forms. Each plant or animal species has a particular function in the natural environment. Plants and animals found in natural environments are related in some way to the other species that share their environments. Each species contributes to the functioning of the overall system. Consequently, one species cannot be removed without affecting others species that inhabit the system.

Unfortunately, our current knowledge of many of these relationships or how a particular species functions in a system is limited. Consequently, the full impact of an extinction on a

natural system may not be apparent for some time until parts of the natural environment cease to function. If a species is declining or barely maintaining itself, some part of the system may have been disrupted. Knowledge of these relationships may help us to determine the problems.

We know that some species play a key role in defining a given natural environment. For example, prairie dog towns in Utah define a unique community on which many species depend. The Black-footed ferret, Burrowing owl, rattlesnake, coyote, badger, and several species of raptors are linked to the community or system that forms as a result of prairie dogs. A decrease in the number of prairie dog towns has resulted in declining populations of several of the associated wildlife species. In particular, the Black-footed ferret (an endangered species) relies heavily on prairie dogs as its primary food source.

Aesthetical and economic values

Public opinion surveys conducted of Utah residents indicate that wildlife is an important economical, sociological, and aesthetical resource. An abundance and diversity in Utah's wildlife resources afford citizens the opportunity to participate in wildlife-associated recreational activities that enrich their lives. In 1996, some 650,000 U.S. residents 16 years of age and older participated in watchable wildlife activities in Utah. These individuals spend an estimated $237 million to watch wildlife. This compares to $231 million and $150 million spent by angler's and hunters, respectively during the same year.

Based on these estimates, preserving Utah's wildlife diversity makes good economic sense. Between 1986 and 1997 the fastest growing wildlife-based recreation sport in the United States was bird watching. Participation increased by 155%. In 1996 over 63 million Americans spent $29.2 billion to watch, feed, and photograph birds and other wildlife.

The Federal Endangered Species Act of 1973 (ESA)

Purpose and process

The ESA provides a means by which endangered and threatened species and the natural environments (ecosystems) upon which they depend may be protected and conserved. ESA establishes a comprehensive program that is administered by the U.S. Fish and Wildlife Service to identify and actively conserve endangered and threatened species. The ultimate goal of the ESA is recovery of the species.

The U.S. Fish and Wildlife Service determines which species may face extinction and if the threat is the result of natural causes or human activities that altered habitats or directly eliminated the species. The ESA allows the U.S. Fish and Wildlife Service to consider listing species that are in extremely low numbers or have limited distributions. However, rarity or a limited distribution alone is not a sufficient reason to list a species. When considering a request for listing, the federal agency must review all available information about the species to include: (1) the potential for threatened destruction, modifications, or curtailment of its habitat or range; (2) over-utilization for commercial, recreational, scientific, or educational purposes; (3) disease or predation; (4) inadequacy of existing regulatory mechanisms; and (5) other natural or manmade factors affecting its continued existence.

The U.S. Fish and Wildlife Service publishes a notice of review for species that are considered as candidates for listing. These notices are published to seek additional biological information and input regarding the candidate species that can be used to make a final decision. Before a final decision regarding the listing of a candidate species can be made, the agency must also determine if existing or potential threats exist to both the species and its habitat. Only those species that have been subjected to this exhaustive review, that includes both scientific and public comment, can be added to the list. Species also may be removed from the list if research shows that they are not in danger of becoming extinct.

Legal implications

Plants or animals listed under the ESA are legally protected. No one can "kill, harm, harass, possess, or remove protected animals from the wild." The parts or products of listed animals and plants cannot be possessed, taken or transported without special permission of the U.S. Fish and Wildlife Service. The ESA consists of several sections. Of these, sections 6, 7, 9, and 10 have important consequences for state conservation efforts.

Section 6 identifies the role of the states in carrying out provisions of the ESA. This section requires that the Secretary of Interior cooperate with states before acquiring any land or water for the purpose of conserving an endangered or threatened species. States may enter into cooperative agreements with the federal government to administer programs and manage areas established for the conservation of a listed species. Under this section, the federal government is authorized to allocate funding to the states for this purpose.

Section 7 requires that all federal agencies (to include regulatory agencies such as the Environmental Protection Agency (EPA)) ensure that all agency actions will not jeopardize the existence of endangered or threatened species. Both the species and its critical habitat must be considered and protected. This section applies to lands owned by the federal government and state and private lands in which there is some type of federal involvement. Federal involvement usually includes any activities or programs of any kind authorized, funded or carried out, in whole or part, by a federal agency. If a landowner performs a management activity on land that has federal involvement or may affect a listed species, then the U.S. Fish and Wildlife Service must be contacted. This does not apply to activities of an entirely private nature on private lands. Activities that are cost-share or come under the auspices of a federal program may not be exempt. If a protected species resides on their land and the land is enrolled in a federal program, then the landowners may be required to contact the U.S. Fish and Wildlife Service. In cases involving private land, the U.S. Fish and Wildlife Service will typically offer alternative management options.

Section 9 prohibits "taking" of any endangered or threatened species. Again, this section applies both to private and public actions or activities. "Take" is defined as, to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in such conduct. "Taking" of a species includes willfully harming an endangered or threatened animal. It also includes habitat destruction or degradation that significantly interferes with essential breeding, feeding, or seeking shelter.

Section 10 allows for non-federal entities to apply for permission to incidentally take a listed species in the course of an otherwise lawful activity. Applications for incidental take permits require that the applicant has developed an approved Habitat Conservation Plan or HCP. An HCP is essentially an environmental assessment conducted on private land that includes a public notice and review process. HCP's describe how a proposed activity will effect a species and what actions or activities are being done to minimize any adverse impacts on the species. Once an HCP is approved, the Secretary of Interior may issue incidental take permits for a period of up to one year. Approval for an incidental take permit under a HCP requires a lengthy review process and may likely take over a year to be granted.

Critical habitat

Critical habitat is often the most misunderstood part of the Endangered Species Act. When a species is proposed for listing, areas of habitat essential to continued existence of the species may be designated as "critical habitat." Critical habitat is that specific area where the physical and biological features exist that are (1) essential to the conservation of a species, and (2) require special management considerations or protection. This usually includes not only occupied habitats but may also include areas outside the species' current range when they are considered to be important to the species survival and recovery.

Critical habitat may be designated on federal, state or private lands. However, activities on state or private lands are not restricted by the ESA unless they directly harm the listed species or there is some type of federal involvement as discussed above under Section 7. If an area is

designated as critical habitat, the U.S. Fish and Wildlife Service must consider the economic impacts of the designation. Areas may be excluded from this designation if the economic benefits outweigh the benefits of conserving the area. Areas may not be excluded if the species extinction is the end result.

Making the ESA Work Better

Over the past several years, the Clinton Administration has taken major steps toward making the ESA work better, by tapping into the flexibility contained in current legislation. These changes are making the ESA more effective in recovering listed and candidate species while enhancing its flexibility for businesses and private landowners.

1. Ensuring the use of sound science

All actions taken under the ESA must be based on the best scientific information available. This requires that expert opinions must be obtained from appropriate and independent specialists regarding the quality of the data on species that are being considered for listing, and must be included in the final decision document. This change ensures that independent peer reviews will be used throughout the listing process.

2. Focusing on candidate conservation

The U.S. Fish and Wildlife Service has increased its efforts to work with other public and private partners to identify candidate species for listing. Landowners in both the public and private sector are being encouraged to enter into voluntary conservation agreements with the U.S. Fish and Wildlife Service to conserve candidate species. Successful completion of conservation agreements can eliminate the need for listing the species. Examples of actions landowners can take include habitat protection, management, restoration actions such as fencing, control of access, stream rehabilitation, and the reintroduction of species into suitable habitats. In Utah, candidate conservation agreements have resulted in the withdrawal of proposals to list the Virgin Spinedace and Arizona willow.

3. Addressing private landowner concerns

The Section 10 Habitat Conservation Planning (HCP) process is an opportunity to provide species protection and habitat conservation within the context of existing land uses. For private landowners and local governments, Section 10 provides a means of reconciling species conservation efforts with economic land uses and developments. The section provides for negotiated solutions to resolve conflicts regarding endangered species conservation and proposed land uses without resorting to litigation. Under the HCP process landowners are given an assurance (no surprises) that the federal government will not require additional commitments in terms of land or financial resources from its partners beyond what was initially agreed upon.

4. Working with other federal programs

Section 7 of the ESA requires other federal agencies to consult with the U.S. Fish and Wildlife Service prior to implementing an action that may impact a protected species. This process has been streamlined to encourage federal agencies to consult with the U.S. Fish and Wildlife Service early during project planning.

5. Increasing state involvement

The U.S. Fish and Wildlife Service recognizes that the states possess broad powers and authorities over fish and wildlife populations contained in their boundaries. The states also have tremendous expertise regarding the status and distribution of fish and wildlife species. Consequently, the U.S. Fish and Wildlife Service is required to solicit state involvement throughout the ESA process, in particular candidate conservation agreements, Safe Harbor agreements, recovery plans, and Habitat Conservation Plans.

6. Addressing Native American concerns

The federal government has renewed efforts to recognize and harmonize federal and tribal goals of conserving candidate, proposed and listed species. The federal government recognizes the rights of the tribes as governmental sovereigns and the need to maintain effective relationships when implementing the ESA.

7. Increasing the effectiveness of recovery activities

Safe Harbor agreements are new ESA incentives designed to encourage non-federal landowners to manage their lands for the benefit of listed species. Under "Safe Harbors," landowners are protected from additional ESA restrictions when they voluntarily cooperate with the U.S. Fish and Wildlife Service to benefit or attract a listed species to their property. At the end of a Safe Harbor Agreement, participating landowners can return their property to its original conditions without fear of repercussion.

The U.S. Fish and Wildlife Service is required to minimize the economic and social impacts when implementing species recovery plans. This is accomplished by ensuring that all effected parties have the opportunity to participate in the recovery planning and implementation process as members of the formal recovery team.

The U.S. Fish and Wildlife Service recognizes that controlled propagation of plants and animals can be used to assist in the recovery of a species. Propagation programs have assisted in recovery of the California condor and Black-footed ferret. Although propagation has been recognized as an important recovery tool, it is not a substitute for habitat recovery efforts.

Black-footed Ferret

(*Mustela nigripes*)—Endangered

Description

The Black-footed ferret is a member of the weasel family. It has a long, slinky body with short legs. The total adult length is about 21 to 25 inches. Adult males may weigh up to 2.5 pounds with females being slightly smaller. This handsomely colored animal has a yellow to buff colored body that gradually lightens on the underside and on the face. In contrast, the fur becomes darker along the mid-back and forehead. These elusive animals have a black looking mask, have black-tipped tails and feet. Black-footed ferrets have relatively large rounded ears. The ferret is sometimes confused with the mink and the southwest variety of the long-tailed weasel. The mink is smaller but close to the same size. Mink are a solid dark, chocolate brown in color. The Southwestern long-tailed weasel found in parts of Arizona also has a mask but does not have black feet.

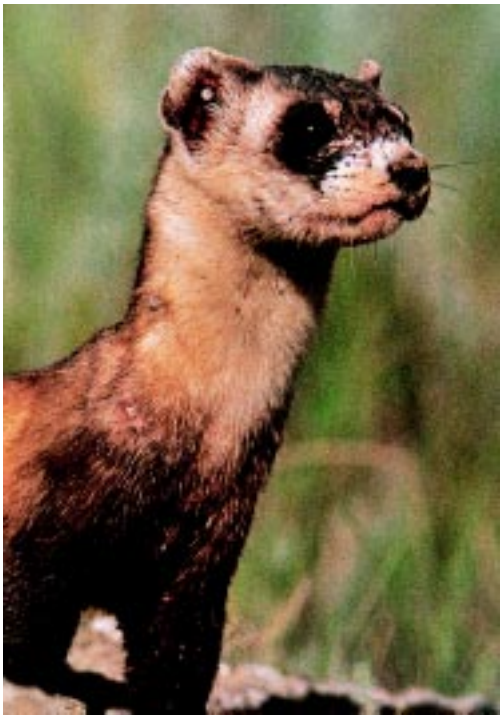


Photo courtesy of U.S. Fish and Wildlife.

Habitat

Black-footed ferrets are specialists, and are almost exclusively found in prairie dog towns. If they are seen elsewhere it is usually because it is the season for dispersal. Prairie dog towns found in basins, semi arid grasslands, and prairies provide the main food for the ferrets. A study by the South Dakota Cooperative Wildlife Research Unit found that 32% of the animal material in scat consisted of mice hair and bones while the remaining 68% was of course, prairie dog. In another study the percentages were 18% and 82% respectively. Even though prairie dog towns are valuable habitat for over one hundred other animals, the ferrets obviously prefer the prairie dogs.

Prairie dog towns provide a food source and offer shelter for Black-footed ferrets. Prairie dog burrows become a ferret's burrow after a meal or an abandonment. The burrows they inhabit offer protection from predators and also help to moderate extreme hot and cold temperatures. A burrow is also the place where a female will deliver and raise her young.

For the ferret, the spatial arrangement and size of prairie dog colonies is important to maintain a healthy, reproducing ferret population. Prairie dog colonies need to be close enough to one another to facilitate movement within the Black-footed ferret population. The Meeteetse prairie dog complex was once an area with a very healthy ferret population estimated at 130 individuals. While the population was isolated, it showed no evidence of inbreeding. Because Meeteetse is the only research source for quality habitat, it is the standard by which the U.S. Fish and Wildlife Service and other conservation agencies can learn. The mean prairie dog intercolony distance at Meeteetse was .6 miles. The study found the mean Black-footed ferret intercolony movement was 1.5 miles with a maximum of 4 miles. Biologists estimate that 6000 acres of prairie dog town should exist to sustain a minimum viable population with 120 acres per ferret.

Little is known about previous abundance and distribution of the Black-footed ferrets in Utah. The last verified report for ferret in Utah was from a specimen collected in San Juan County in 1937. Durrant, author of *Mammals in Utah*, believes these ferrets are unlikely to be found anywhere north of the Colorado River. Adjacent to Utah, Wyoming's population has been observed mostly in the eastern and southern parts of the state.

Life History

The Black-footed ferret is primarily nocturnal and lives in burrows, making it difficult for us to learn anything more than what we are able to observe above ground at night. Mating probably begins in March and April. The gestation period lasts 42 to 45 days. Unlike other mustelids, delayed implantation does not occur in Black-footed ferrets. Parturition occurs in May and the female could have two to six kits. The average litter size is four.

The female alone cares for her young even though her mate may be observed in the same prairie dog town. After a female kills a prairie dog, attacking the back of the neck and head, she will drag it to her family. By June or July, when the kits are more mature, she will move them to the kill location rather than bring the kill to them. First, the mother cautiously emerges from the burrow using her night vision, large ears, and acute sense of

smell to scan the area for any dangers. After she determines it is safe for her young family, she goes back into the burrow to coax them out. Because her young usually struggle to remain in the burrow, the mother will sometimes grab them by the nape of the neck and force them out. They may still run in and out of the burrow, but ultimately they will follow their mother. The juveniles become less timid about leaving the burrow as they grow older. In July and August they can be observed playing outside the burrows with their mother during the early morning and evening hours. The female Black-footed ferret will position her young in separate burrows in early August. Dispersion occurs in late August and September. Dispersion time is an especially precocious time for young ferrets. They are more subject to predation from birds of prey, coyotes, badgers, foxes, bobcats, domestic dogs, and cats. Forty-three percent of ferret mortality outside of the prairie dog community occurs between August and October.

In the winter, Black-footed ferrets probably den-up during extremely cold days; however, they do not hibernate.

Threats and Reasons for Decline

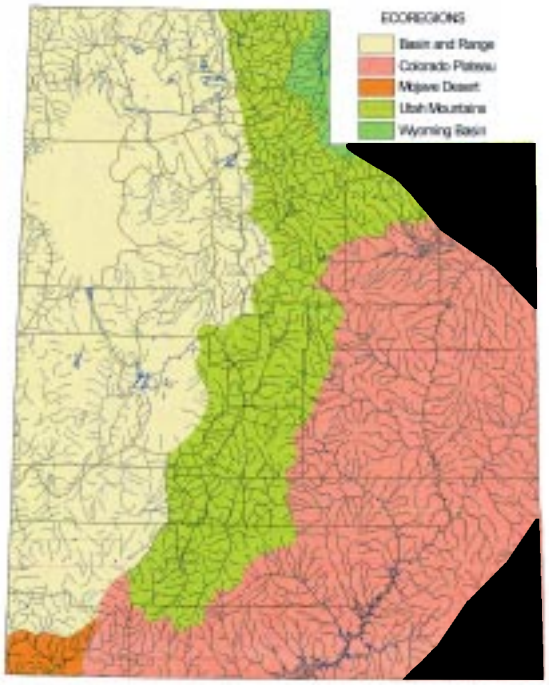
The primary threat to Black-footed ferrets has been the widespread extermination of prairie dog towns. They were thought to compete with livestock for forage. Recent evidence has shown that prairie dog competition is insignificant. However, the government, private landowners and developers exterminated 98% of the historical prairie dog town distribution. The poisons used by land managers likely had secondary effects, killing ferrets and other predators feeding on prairie dog carcasses. By 1978 no wild populations of Black-footed ferrets were known.

The Meeteetse colony was found in 1981. At the time, it was the only known complex of prairie dog towns to support Black-footed ferrets. A healthy ferret population existed there with approximately 120 individuals. Researchers were able to use the site to study the ferret's movements, population dynamics, behavior, etc., until canine distemper entered the colony, probably introduced through a domestic dog, and began to fatally take its toll. The remaining suvivors were taken into a captive breeding program in a desperate effort to perpetuate the species. The last known wild ferret was captured February 1987 and added to the captive colony.

Recovery Efforts

The purpose of a captive breeding program is not to replace a wild population, but to create enough individuals so that reintroductions can be successful. The program must have a large enough ferret population to compensate for natural events that will occur like disease epidemics, predation, weather catastrophes, infertility, etc. Captive breeding must produce enough ferrets so that casualties will leave at least one successfully breeding family.

The original eighteen Black-footed ferrets in captivity have increased to more than 330 individuals. These ferrets are spread out between several zoos and the



Probable historical range of the black-footed ferret.

Wyoming Game and Fish Research Facility in Sybille. Reintroductions have recently been successful, in South Dakota, Montana and Arizona. Future release sights currentlly being considered include Colorado and Utah. Release projects in Shirley Basin, Wyoming, have been suspended untill further notice. Conservationists hope that these reintoduced populations will help to bring back the black-footed ferrets to their native habitat. Educating ranchers on recent prairie dog and cattle relationship studies has been important to Black-footed ferret conservation.

What You Can Do

The first captive breeding and reintroduction attempts were not successful. It wasn't until after years of research, experience, and expense that we have the results we do today. The captive breeding program in Wyoming has a budget of $250,000 every year. Portions of this budget come from the U.S. Fish and Wildlife Service. The facility in Sybille, and in Utah will need more funding from the private sector. You can send donations to:

Utah Division
of Wildlife Resources
1594 West North Temple
Salt Lake City, Utah 84114

Land owners can seek to understand the prairie dog's impact on range according to recent scientific development and be open to various means to maintain or improve the prairie dog towns on their land. Land owners can be on the lookout for Black-footed ferret signs. Scat, tracks, and covered up burrows can be evidences of the ferret. However, the unmistakable sign is a small trench about 3 to 5 inches wide and 11 feet long. If you suspect a ferret is on your property call the Division of Wildlife Resources for verification and procedure.

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Grizzly Bear

(*Ursus arctos*)—Endangered

Description

The grizzly bear gets its name from its frost-tipped dorsal hairs. The fur color varies from dark brown and nearly black to pale yellow. The hump between its shoulders is a muscle overlying the shoulder blades. The total length of the adult body ranges from 6 to 7 feet. The height at the shoulders can be 3 to 3.5 feet. Grizzly bears weigh between 325 and 850 pounds. Grizzlies walk flat-footed, hence they are not adapted for fast locomotion. They can stand up on their hind feet.

Habitat

Grizzlies are opportunistic omnivores and need plenty of space to exploit the land's resources. A grizzly may have a home range of up to 150 square miles depending on habitat quality. Food supply must be both diverse and abundant, allowing bears to cope better with competitive pressures. Bears must work hard to meet their body's present demands for energy and nutrition and still have some left over for hibernation.

Photo courtesy of Barrie Gilbert.

The habitat must have enough potential den sites to accommodate the bears. The bears select sites usually in the subalpine zone where snow deposition is high. Snow acts as insulation. They may also choose sites close to a body of water, because of water's mediating effect on harsh, cold temperatures. Grizzlies may dig their own dens or modify another. Den openings are usually found on the side of a slope that is protected from prevailing winds.

While it is true that grizzlies are generalist consumers, they also have food preferences. The habitat's supply of *Vaccinium* berries and pine nuts has an effect on how far the bears will travel. If habitat yields are low for these preferred fruits, bears may enlarge their home range or sustain themselves on grasses, forbs, and sedges. In this case, the bears will most likely lose weight. One study shows that weight gain for a bear is largely determined by the pine nut harvest within its home range.

Over half of the grizzly diet is animals. Much of the animal protein a grizzly gets is from carrion. They will locate the carrion by smell, sometimes traveling as much as 18.6 miles to a large carcass. The grizzly may also kill, trapping small rodents in its powerful 4 to 6 inch claws or bringing down a large malnutritioned game animal in deep snow.

Grizzlies seasonally migrate to rich sources of food like garbage dumps, berry crops, and salmon runs. The bears may move up to 54 miles to congregate at these common feeding stations. During dry seasons, wetlands become a very important aspect of habitat because of the high plant productivity. Wetland plants are succulent and high in protein. Travel corridors connecting food sources are essential during these migrations. Cover along these corridors is also important. It lessens a grizzly's chances of a human encounter while migrating. The grizzly bear thrives best when isolated from human disturbance.

Grizzlies once extended across the plains. They were most abundantly distributed along drainages. They were found throughout the lower 48 states where only 1% of their historic range exists today. However, the Alaskan and Canadian populations are considered to be healthy.

Life History

The breeding season begins from mid-May to mid-July for the grizzlies in Yellowstone. Even though the timing is different every year, the duration of the season is about 26 days. During this time bears are promiscuous. Several males may mate with a single female. Maximum recorded duration of estrus is 27 days. Bears in their first year of sexual maturity (average age is 3.5 years old) are in estrus for a week or less. These younger females do not conceive. The earliest known conception occurred in female bears who were 4.5 years old. The age at first conception varies with latitude and within populations. It is possibly a function of available forage or the female's weight.

When fertilization is successful the zygote develops and then stops at the blastocyst stage or in the middle of development until the female dens, a process called delayed implantation. It allows females to mate during the season when quality foods are the most available and determine if the summer's resources are going to be enough to support gestation and subsequent lactation. Gesta-

tion and lactation are nutritionally demanding and may drain the mother of the essential elements she needs to sustain herself. As a result, this strategy grants both the mother and her cubs a better chance for survival. Including the time implantation is delayed, the gestational period is six months.

Grizzlies begin to prepare their dens in October and November. Some may even start preparations in September while they are still completely alert to insure safety for themselves. They can gain up to 400 pounds of fat before hibernation.

The cubs are born between January and March. The mother and her new cubs emerge from their den anytime from late March to early May. Six month old cubs begin eating solid food, supplementing their mother's milk. At this time the mother teaches her cubs where to forage and how to hunt small animals including ground squirrels. She also protects her cubs from male grizzlies, wolves, and other predators who welcome a bear cub meal. Mortality rates for first year cubs are high. One study shows almost 50% of grizzly cubs die during this time from malnutrition and predation. Surviving cubs will den with their mother for their first two winters.

No females reproduce every year. In fact, out of 19 bears studied 12 had reproductive cycles of three years or higher. The average reproductive rate for this study was 0.70 cub/year.

Grizzles usually live for 15 years. However, there are a few cases of bears living 30 years or more in the wild.

Threats and Reasons for Decline

The grizzly needs a large area of quality habitat. This demand has placed bears in direct competition with human progress. The soils most valued by farmers yield the high protein plants grizzlies require. The presence of grizzlies hinders efforts to extract minerals, coal, and oil. Some ranchers believe the grizzly bear is a threat to their livestock. Perceived as pests, these bears are eliminated. Thus, the most serious threats to grizzlies are humans.

Some efforts to control poaching have been in vain. Humans who fear or contend with the bears easily bait and kill them. It is difficult for law enforcers to detect illegal kills. Enforcers and conservationists need to know a grizzly population's dynamics well enough to protect them. However, grizzly populations are always difficult and expensive to monitor.

Another threat to grizzly survival is encroaching human urbanization and recreational development. Human development continues to move steadily into grizzly home ranges. Wilderness connections between the grizzlies in the western U.S. and the larger Canadian Alaskan population have been severed, isolating grizzly populations and thus, gene flow. Reduced habitats are unable to support healthy populations of grizzlies. In these cases, malnutrition and parasite susceptibility kill the bears.

Recovery Efforts

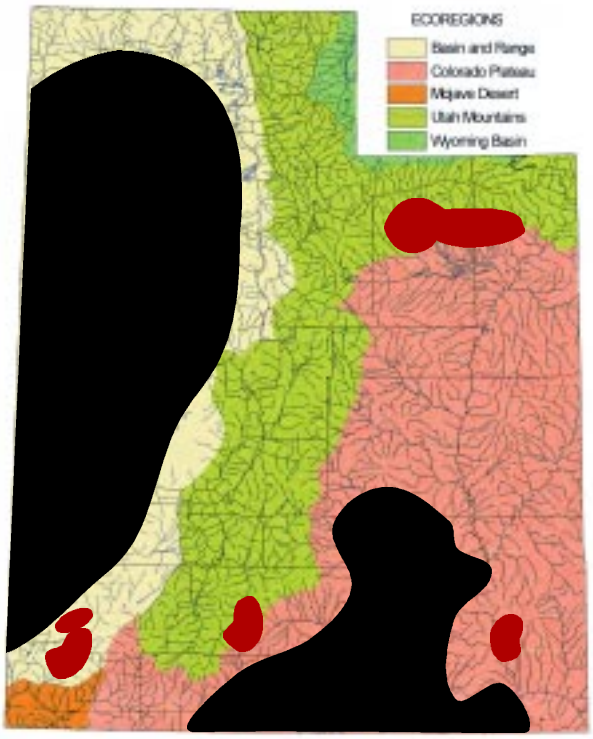
Investigations are underway to claim land as critical habitat for the grizzly bear. The Endangered Species Act of 1973 protects land that satisfies spatial and nutritional needs and includes sites for breeding, reproduction, and shelter. Research biologists are working hard on delineating such habitat. Modern techniques for determining grizzly habitat are being developed. Satellite imagery analysis coupled with ground truthing has proven to be a useful method for habitat delineation.

Conservationists also work to have more population data. They use radio collars, biotelemetry, scat analysis, marking/tagging, and mandatory hunter reports to learn more about grizzly movements, diet, behavior, physiology, etc. Management must closely follow the research. However, enormous costs plague the management programs designed to protect the grizzlies from poaching and maintain their habitat.

There has also been talk of reintroducing the grizzly bear in the Bitterroot region of Idaho. A population here would be the first step to link the two populations in the Yellowstone ecosystem and in Montana. Restoring gene flow between these populations would increase genetic variation and thus adaptability and survival.

What You Can Do

You can respect the restrictions placed on hikers, campers, hunters, and other nature users to avoid wilderness areas reserved for grizzlies. You can go to Yellowstone and Glacier National Parks and learn more about the grizzly bear through the educational programs offered there. Do not allow fear to dictate whether or not you support grizzly bear reintroductions. Remember that most grizzly bear attacks have occurred in National Parks where there are high human densities. The bears have learned to associate humans with food and have become more bold. These reintroductions under consideration are supposed to occur in wilderness areas.



Distribution of the Grizzly Bear in 1850.

Distribution of the Grizzly Bear in 1920.

Grizzly Bear habitat photo courtesy of Barrie Gilbert.

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Gray Wolf

(*Canis lupus*)—Endangered

Description

Gray wolves are large canids most commonly with grizzly gray fur. They may also be pure white or solid black. They have thick, coarse guard hairs with soft, short underfur. With such a coat, gray wolves are able to survive in –40°F temperatures. With relatively long legs, a keel-like chest and especially designed to run on their toes, they are able to move at 35-45 miles per hour. Their keen sense of smell enables them to detect prey 1.5 miles away under good conditions. An adult female and male weigh 55 to 120 pounds and 45 to 120 pounds, respectively. They may be as long as 6 feet and 3 feet tall at the shoulder.

Habitat

The quality of gray wolf habitat depends on prey availability. Wolves are carnivorous and prefer large game animals. One study done in Minnesota shows that 59 to 96% of their diet is the size of a beaver and larger. Wolf distribution depends on prey densities. Other aspects of the habitat like vegetation, topography, and climate indirectly effect gray wolf distribution. In North America, the only unsuitable habitats for gray wolf are hot deserts and some mountain peaks. In Mammals of Utah, Durrant believes that gray wolves were "formerly statewide except [for the] west desert region." Now there are no wolves in Utah.

Gray wolves will eat almost anything including domestic livestock. They usually cull off the less fit individuals in wild herds enabling the healthier segment's vigor to increase. Wolves will select the old, the young, and the sick animals because they are the easiest catch. However, even a high percentage of the weak can escape wolf attacks. In Isle Royale National Park, where moose is their primary source of food, only 8% of wolf attacks are successful. When a wolf pack does kill, all the parts of the animal are consumed except for large bones and chunks of hide. Their stomachs are especially adapted to hold 15-20 pounds of food at one time. The remains provide food for some scavengers like ravens, foxes and bald eagles. Digestion occurs quickly and soon after eating the pack is on its way to find another meal.

How far they travel depends on the prey density of the area and whether or not the pack has pups at a den or romping site. Obviously, the smaller the prey density the larger the wolf's home range. On the tundra where prey members are few, wolves may travel up to thirty kilometers away from the den site to hunt. In the winter, when most pups are able to keep up with the pack, the wolves are no longer bound to a den and increase their home range to satisfy their energy demands. They may travel 60 kilometers a day locating prey with their sense of smell, with tracking skills or by chance encounters. Gray wolf home range in the winter is the largest of the year. Winter range can be 26 square miles per wolf where food is plentiful and 1,300 square miles per wolf where wolves are migratory. The farthest any wolf has been known to travel is 220 miles on the tundra while following caribou herds.

Photo courtesy of Eric Gese.

Life History

Gray wolf courtship begins between January and April. The timing depends on the location of the wolves. The wolves in the Arctic court later than those in Montana and Idaho. Courtship can occur between two adults in a pack or two lone wolves and last a few days to a few months. The bonds formed between mates at this time may last for a lifetime.

A female gray wolf has an estrus period of five to seven days. She may have an average of 7.3 ova available for fertilization during this time. It is interesting to note that only 60% of adult females breed in populations unexploited by man; whereas in exploited populations, 90% breed. Females who have already bred come into heat two weeks earlier than other females in the same pack.

Copulation involves "a tie" between the male and female when the bulb-like base of the penis locks into the vagina. After mounting a female, the male may then lift one leg over her body and turn 180 degrees so that they are facing opposite directions. Copulation may last up to 30 minutes during which time multiple ejaculations occur to insure fertilization. Gestation lasts 63 days and an average litter size is six.

The pups are born helpless with their eyes closed and little hair. They are born in a rock crevice, a hollow log, or a den, possibly one the pack has used before. Their dens are usually near a source of water. Studies of dens show entrances are 1.2 to 2 feet in diameter and tunnels extend 4 to 15 feet. The mother usually stays with the pups the first two months. The pups are dependent on their mother's milk for at least the first five weeks. During this time the pack hunts for her. Between days 11 and 15, the pup's eyes open. Three weeks after their birth, their milk teeth are present. After five weeks the pups are weaned from their mother. They begin to eat regurgitated, softened meat the pack brings them from their hunt. The pups are moved to an above ground nest or romping site at eight weeks old. This site gives the pups the opportunity to play. Wolf pup play is important because it helps them prepare for adulthood. They wrestle, ambush, and chase one another developing skills later used in the hunt. Playing helps pups create strong social bonds and hierarchal relationships essential to the maintenance of the pack. They may remain at the romp site through a winter or may begin to travel with the pack as early as October.

A pack may begin with a breeding pair and their pups. The strong bonds formed between members of the family keep the pack together. The primal parent usually become the dominant male and female or the alpha male and alpha female of the pack. Most packs consist of eight wolves or less. Each of the remaining wolves is aware of its position in the pack's social structure. When competition arises at a carcass, during a breeding season, or over a preferred space, the winner is predetermined. The alpha male has the privilege of choosing how much and what parts of the carcass he will eat. In return, the alpha male and other dominant males lead the pack determining when to rest and where to hunt for food. They may also serve as the pack's guardians and lead attacks on threatening intruders like a grizzly bear near the pack's den. This social order limits intrapack fighting.

The pack's pups reach sexual maturity during their second year. They usually will not breed until the third year. At this time an adult may separate from the pack. Building powerful bonds the males and a mate may begin their own pack with their new litter. Separation may occur during food shortages.

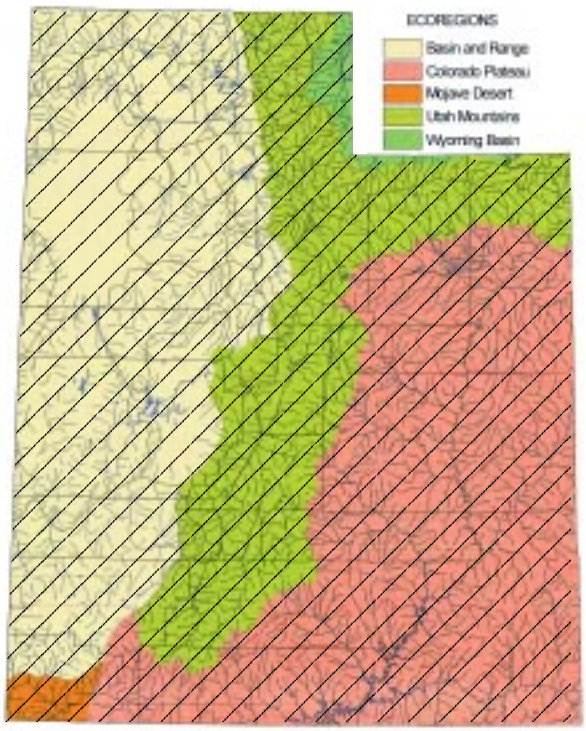
Even when a gray wolf population is protected from human exploitation, survival is precocious. Between 6 and 43% of gray wolf pups survive the first winter. About 55% survive to the second winter. Eighty percent of gray wolf adults survive every year.

Reasons for Decline

Gray wolves prey on domestic livestock. Ranchers and others have developed a hatred for gray wolves because they consider them a threat to the safety of sheep, cattle, and humans. As the livestock industry in the United States increased, the distribution of the gray wolf decreased. In the 1930s, federal and state governments headed programs to control the wolf population. Michigan, for example, offered $15 and $20 for every male and female wolf respectively. Governments also used poison to cut wolf numbers. These programs occurred in 95% of the lower United States. The livestock industry reached a peak during the 1940s and by that time gray wolf distribution had become what it is today. In the forties and fifties wolf packs were shot from aircraft and poisoning continued. Threats still exist in the form of wolf control and poaching in the northern parts of the gray wolf's distribution.

Recovery Efforts

Gray wolves are protected by the 1973 Endangered Species Act. Under this federal regulation, the taking of wolves in the lower United States except for Minnesota (with a gray wolf population of 1,650) is prohibited. The Fish and Wildlife Service in 1987 approved the revised Recovery Plan for the gray wolf. The plan calls for gray wolf reintroductions to northwestern Montana, central Idaho and the Yellowstone ecosystem. In January 1995, gray wolves were brought to acclimation pens in Yellowstone National Park from Alberta, Canada. They were subsequently released in March. Defenders of Wildlife has offered $5,000 to private land owners to allow wolves to successfully breed on their property.



Probable historical distribution of the gray wolf.

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Utah Prairie Dog

(*Cynomys parvidens*)—Threatened

Description

Members of the squirrel family, Utah prairie dogs are colonial and most of their activity occurs during the day. They are not as gregarious as their cousins, the Black-tailed prairie dog. The Utah prairie dog may have colonies as small as 10 to 20 individuals. They have a short, white-tipped tail. Their cinnamon clay colored back distinguishes them from the white-tailed prairie dog's pinkish buff colored back. The Utah prairie dog has black eyebrows, brown patches on its cheeks resembling rouge, and a whitish mouth and chin. They have short legs with claws for burrowing. They are well adapted for digging, have short ears and torpedo shaped bodies. Adults are 11 to 15 inches long and weigh between 1.5 and 3 pounds.

Photo courtesy of Gar Workman.

Habitat

Utah prairie dogs live on south-central Utah's steppe and get most of their water from plant moisture and possibly from dew. In captivity, Utah prairie dogs drink very little free water and researchers propose they drink even less in the wild. Thus, water availability to plants is a more important element of the habitat than free water for drinking. Irrigation and wet meadows are positively associated with Utah prairie dog abundance and occur more often at lower elevations.

Some biologists believe that the precipitation pattern in south-central Utah has directed this prairie dog's vegetation preference to forbs and grasses. In this region, rainfall reaches its peak in the summer, after the Utah prairie dog reproduction in the spring. Water is probably most essential in the spring, so Utah prairie dogs have adapted and prefer forbs at this time. They especially like to eat alfalfa. Grasses hold most of their water in their stems and these prairie dogs will choose to only eat this part of the plant. Good habitat for the Utah prairie dog means low shrub density with a high grass and forb density.

Plant diversity is important to the survival of a Utah prairie dog town. Droughts have occurred in south-central Utah and prairie dog towns with a more diverse plant community seem to have survived better. With biodiversity some plants in the communities will be able to survive with severe aridity and continue to supply nutrition and water to the prairie dog.

Utah prairie dogs need deep and highly permeable soils for their burrows. The burrows protect them from extreme temperatures while they are dormant. High permeability is essential to prevent prairie dogs from drowning. Burrows also protect them from some predators.

According to some researchers, Utah prairie dogs covered an 1846 square mile area in the 1920s. Since that time there has been an 87% decline in the area occupied by these rodents. They now occur in Wayne, Garfield, Iron, Piute, Sevier, Beaver, Sanpete, Millard, Kane, and possibly Washington counties. Their ranges are limited by dense vegetation, possible competition with Uintah ground squirrel, topography, and mild winter climate.

Life History

The mating season begins in the early spring. At higher elevations reproduction may occur 2 to 4 weeks later. Gestation lasts 30 days. Pups are usually born in the early summer, April and May. A female may have anywhere from three to six pups and the average litter size is five. Ninety-seven percent of one-year old females have the potential to reproduce every year.

Juveniles will emerge from their burrow six weeks after their birth. The burrow may have more than one entrance, depending on how old it is. The juveniles begin to forage with other adult prairie dogs. The adults, who begin their foraging as early as mid-March will enter dormancy from mid-July to mid-August. The juveniles, on the other hand, enter dormancy from early October to November.

Juveniles have very high mortality rates. One study showed only 17% survive the first year because of over-winter and dispersal casualties. Utah prairie dogs may live to a ripe old age of three.

Reasons for Decline

A study in 1971 showed that 63% of Utah prairie dog towns were found on private land, 30% on public and the remaining 7% on combinations of public and private land. Private land owners considered them pests to their cattle operations or farms. They treated grain with poison and scattered it around the prairie dog towns.

Concurrent with the poisoning, in 1971 and 1972 a drought was also responsible for the dramatic decrease in the population. Some researchers consider the drought more detrimental than the poisoning. Prairie dogs in higher elevations (8,800-9,300 feet) did not feel the effects of the drought as much because they received more rainfall there than on the lowlands. The prairie dog population dropped from about 8,500 to 4,300 between 1970 and 1972. Of the original 57, south-central Utah only had 39 Utah prairie dog towns left. The greatest reduction occurred on private lands.

Utah prairie dog numbers seem to be continuously fluctuating back and forth between relatively stable and dangerously small populations. Recent research suggests a delicate carrying capacity exists in each town. As members increase and boundaries remain the same there is not enough food to support all the dogs in the town. Thus, intraspecific competition for food reduces their numbers.

Other possible reasons for their decline are predators and disease. Predator-caused deaths become significant during juvenile transplantation or dispersal. Their major predator is the badger, but coyotes, birds of prey, and long-tailed weasels prey upon Utah prairie dogs, as well. Bubonic Plague is a suspected culprit for the decline that occurred in 1983.

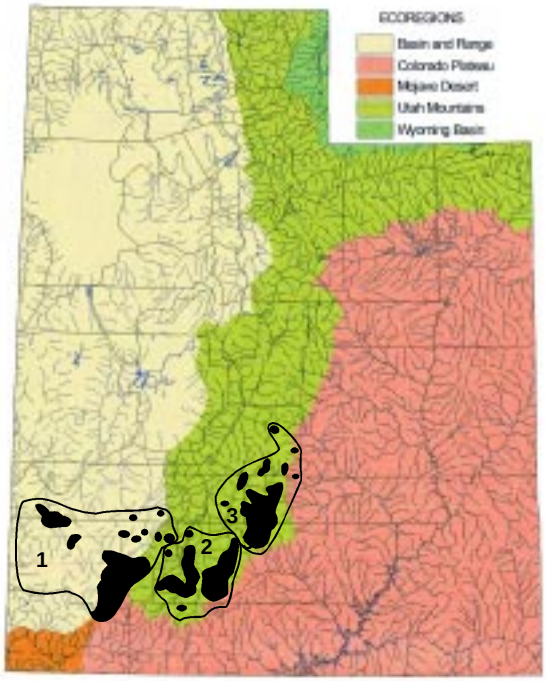
Recovery Efforts

Utah prairie dogs are classified as an endangered species by the U.S. Bureau of Sport Fisheries and Wildlife. They have full protection under Utah law. Recently, there has been significant increases in population numbers because of transplanting programs, when the prairie dogs are moved from private lands onto public lands proven to be good habitat. Protection from predators (i.e. badgers and hunters) makes the transition easier on the prairie dogs. Good habitats that provide a plant water source other than precipitation would help to insure survival even during drought.

Transplanting into already established colonies has not been as beneficial for the prairie dogs as attempting to reestablish extinct colonies with transplantation. Research funded by the Utah Division of Wildlife Resources suggests there is a need to switch the focus of conservation efforts from total population numbers to the number of colonies because increasing the number of individuals in a colony proves to drive it to extinction. Too many prairie dog individuals overwhelm the carrying capacity of the town.

What You Can Do

Understand that researchers have evidence showing that the white-tailed prairie dog is not conspecific with the Utah prairie dog. Some confusion with this argument has sometimes mislead the public to think the Utah prairie dog does not need protection.



1. West Desert 2. Paunsaugunt 3. Awapa Plateau

Present and past distribution of the Utah prairie dog.

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Bald Eagle

(*Haliaeetus leucocephalus*)—Threatened

Description

The Bald Eagle is one of the largest birds that occurs in Utah. Its height ranges from 30 to 43 inches and its wingspan is between 7 and 8 feet. Adults are characterized by a white head and tail, chocolate brown wings and body and a massive yellow bill. However, Bald Eagles typically do not attain their full adult plumage (white head and tail) until they are 4 years old or older. Immature Bald Eagles are as large as adults, but have brown heads and tails matching their body color and a black bill. Between the ages of 1 and 4 years, Bald Eagle plumages vary widely, some have mostly white bodies while others have mostly brown bodies; tails and heads also have varying amounts of white or brown. One consistent feature is the presence of white diagonal lines on the upper half of the underwings (only visible in flight). Golden Eagles (*Aquila chrysaetos*) are similar in size, but have golden feathers on the back of their heads and necks. Ospreys (*Pandion haliaetus*) differ from Bald Eagles by being smaller and having a dark stripe across their white heads, through the eye; also ospreys, unlike eagles, are often seen hovering over water.

Distribution and Habitat

Very few Bald Eagles nest in Utah; only four nest sites are currently (1997) known. Eagles have nested recently along the Colorado River in Grand County, in a shelterbelt in Emery County (all in the Colorado Plateau ecoregion) and along the Jordan River in Salt Lake County (Basin and Range). These eagles build huge stick nests in tall trees, usually cottonwoods or conifers; habitat around the actual nest can vary, but nests are almost always near open water. Eagles feed primarily on fish and waterfowl, but often scavenge dead fish and mammals including rabbits and deer.

While we have very few nesting eagles in Utah, we have thousands of Bald Eagles in Utah during the winter. Most of these eagles breed in the northern U.S. and Canada, then migrate to Utah where they spend the winter fishing ice-free waters and feeding on dead waterfowl, rabbits and deer. Eagles often congregate in areas of open water to feed; however, they also use a variety of drier foraging habitats from mid-elevation canyons to low elevation valleys and deserts. Winter eagles roost primarily in forested canyons or tall cottonwoods along streams and reservoirs. Several hundred eagles can use a single large roost, but it's more typical to see 10 or 20 eagles in a winter roost. Wintering eagles can be found in each of the Utah Ecoregions, but their numbers and distribution vary with severity of the winter here and farther north.

Photo courtesy of U.S. Fish and Wildlife Service.

Life History

Even though pairs often mate for life, courtship displays can often be seen before and during migration in late winter. Courtship displays include elaborate rolling and diving flights, talon locking, and food exchanges between mates. Bald Eagles usually begin nesting in late winter. In Utah, nests are usually constructed in January (by adding materials to an old nest) and eggs are usually laid in February. Both males and females incubate the eggs (usually 2) for 34-36 days. After the eggs hatch (usually in March), both adults take turns protecting the nest and feeding the young. Eaglets can often be seen exercising their wings on the edge of the nest at about 50 days old. They will begin flying at about age 70 days but often remain in the nest area for several months, leaving sometime from June through August. During the late spring and summer months, adults teach their young how to capture prey.

It's not known whether the eagles that nest in Utah remain here throughout the winter, but most eagles migrate south during the fall. Eagles that nest north of here usually arrive on their Utah wintering grounds in November. These eagles may remain in Utah from a few to several months, but most have left the state by April or May.

Threats and Reasons for Decline

Bald Eagle population declines resulted from habitat loss, shooting, trapping, and widespread pesticide contamination and pollution. Much of the population decline started in the 19th century and continued through the 1970s. Human disturbance of nesting sites may have also lead to reductions in eagle productivity in some areas.

Nationally, Bald Eagle populations have rebounded dramatically since the 1970s when the Bald Eagle Protection Act and the Endangered Species Act were established. The population has recently increased to the point where Bald Eagles are no longer considered Endangered and are now listed as Threatened. The nesting population in Utah has increased, though not as dramatically as in other areas, and the Utah population has still not met the recovery goal of 10 nesting pairs.

Despite their range wide improvement, Bald Eagles still face threats from habitat loss, environmental contaminants, human disturbance, indiscriminate poisoning and shooting.

Recovery Efforts

A plan outlining the efforts needed to recover Bald Eagles in Utah was published in 1983 (Northern State Bald Eagle Recovery Plan). Ongoing endeavors to recover and monitor the Utah eagle populations include: protection of known nesting sites, annual nest inventory and monitoring and development of nest management plans. These efforts involve private landowners, volunteers and state and federal agencies.

The Utah winter population is also sampled annually on standardized routes throughout the state. Winter roost sites are also being identified and mapped, and roost site characteristics are being determined. Public awareness of eagles is being promoted each year through Bald Eagle Day.

Survival of eagles is being increased by reducing mortality on power lines (through constructing raptor-safe power poles), reducing accidental or intentional trapping, shooting and poisoning (through education and prosecution), rehabilitation of sick and injured birds, reduction of lead pellets in the environment (eagles frequently ingest lead pellets from scavenged ducks resulting in lead poisoning), and reduction of disturbance at nest sites. Habitat conservation and management has also increased survival by providing adequate nesting and foraging sites.

How You Can Help

You can help by reporting the location of any **adult** Bald Eagles seen in Utah between **June and September**. Adults seen during this period are likely to have nested here, or they may be looking for suitable nesting habitat. Utah has a large amount of potential Bald Eagle nesting habitat that appears to be unused, and given the range wide increase in eagles, we would expect to see more eagles nesting in Utah.

If you find an injured eagle, contact your local Utah Division of Wildlife Resources office. They will help recover the bird and find the nearest raptor rehabilitator. If you find a dead eagle or witness a shooting or other illegal activity, contact any state or federal law enforcement office and notify them of its location. You should not pick up a dead eagle since it may have been poisoned.

You can participate in Bald Eagle Day (first Saturday of February) by visiting any one of the eagle viewing sites in the state. Contact your local Division of Wildlife Resources office for a location near you.

Where To Learn More

The Utah Division of Wildlife Resources has published a Wildlife Notebook Series (No. 3) featuring the Bald Eagle. Several books on Bald Eagles and raptors are available at bookstores and libraries. These range from technical to general accounts. Other educational materials such as video tapes and CD ROMs are available through specialty (nature) bookstores and (wild) bird shops. Web sites can be found by searching for the keywords "Bald Eagles," "eagles," "raptors," and "birds of prey."

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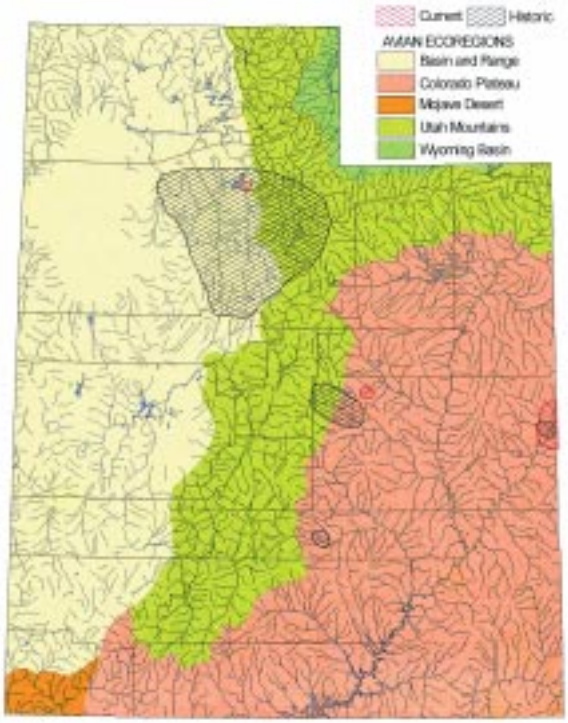

Bald Eagle distribution.

Bald Eagle habitat in Utah photo courtesy of Bob Walters.

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Peregrine Falcon

(*Falco peregrinus*)—Endangered

Description

The peregrine is a relatively large falcon (16-20" tall) with a wingspan of 3 to 4 feet; all falcons are distinguished from other raptors by their pointed wings. Peregrine adults have a distinctive black "helmet" (black crown and back of neck with a black wedge extending below the eye). Adults also have a steel blue to black back with light horizontal barring across the chest and belly. Immatures have a brown "helmet" and back and have vertical streaks on the chin, chest and belly. Prairie Falcons (*Falco mexicanus*) are similar to immature peregrines but are usually a lighter brown and have distinctive black "armpits" (axillaries).

Distribution and Habitat

The subspecies which breeds in Utah is the American Peregrine Falcon (*F.p.anatum*); The Arctic subspecies (*F.p. tundrius*) occurs occasionally during the winter.

Photo courtesy of U.S. Fish and Wildlife Service.

The nesting population in Utah is increasing and breeding sites occur in the Utah Mountain, Basin and Range, Mojave and Colorado Plateau ecoregions. The largest concentrations are along the Colorado River and its tributaries in the southeastern portion of the state. The historic distribution is well documented along the Wasatch Front, but is less well understood for the remote and rugged canyon country of southern Utah.

Peregrines nest on tall cliffs (usually below 6000 feet elevation) near and often directly above streams, rivers, or reservoirs, though some sites can be several miles from water. Nests are shallow scrapes placed in cracks, holes, and small caves on cliff faces. Peregrines forage on a variety of birds which are associated with open water, streamside, wetland, cliff, and open meadow habitats. Typical prey includes waterfowl, shorebirds, doves, swallows, swifts and meadowlarks.

Life History

While many peregrines migrate from Utah in the winter, some remain throughout the year. While nesting dates may vary across the state, courtship displays in the breeding area usually begin around late March and early April. In mid to late April, the female scrapes a shallow depression in which she lays 3 - 4 (sometimes 5) eggs. Incubation is done primarily by the female and lasts from 29 to 32 days. During the incubation period, the male frequently delivers food items to the female. Hatching usually occurs in late May; nestlings are tended by both adults and fledge when they are about 35 to 42 days old (June–July). Immatures may remain in the nest area until September or October, where they can be seen with the adults.

The timing of fall migration can vary with local conditions, but usually begins in late September or early October. Adults often migrate before immature birds. Wintering destinations also vary widely, with some peregrines remaining in Utah year-round. Most Utah migrants probably winter in the southwestern U.S. and portions of west Mexico, though some may travel as far as South America. Migrants may return to their Utah breeding grounds as early as February in some years.

Threats and Reasons for Decline

Peregrine populations declined dramatically in the 1940's-1960's. Much of the decline can be attributed to the effects of pesticide residues (particularly residues of organochlorines such as DDT) which caused egg shell thinning and lead to decreased productivity. Other factors that probably contributed to the population decline include climatic change (long-term drying of wetlands), botulism, and human disturbance (shooting, nest site disturbance, etc.).

Peregrine populations have rebounded since the late 1960's, particularly after 1985. This population recovery has been so dramatic that the species is currently being considered for delisting or downlisting (from Endangered to Threatened). In Utah, the number of nesting peregrines has increased greatly, and the distribution of peregrines has expanded. Some of the increase and expansion probably represents the discovery of previously unknown nesting areas.

Several threats still exist to the peregrine in Utah. The primary threat is loss of foraging habitat and disturbance of nests sites associated with urban encroachment along the Wasatch Front. Also, increased outdoor recreation poses a potential threat to nest sites even in remote locations of Utah. Outbreaks of botulism (a disease which can cause adult mortality) regularly occur in the state's wetlands, particularly around the Great Salt Lake. And, while the use of organochlorines has been banned on the breeding grounds, peregrines are exposed to a variety of pesticides, including organochlorines, on their wintering grounds. Several pesticides are used on breeding season foraging areas, and their influence on peregrine productivity is not well understood.

Recovery Efforts

The American Peregrine Falcon Rocky Mountain/Southwest Population Recovery Plan was published in 1984. This plan outlines the steps which need to be taken in order to recover the peregrine population in Utah and many other western states.

Utah has been very active in recovery efforts. Peregrine nest sites and adjacent habitats are protected and a significant portion of nest sites are monitored annually to determine occupancy and productivity (number of young produced). Peregrines have been reintroduced around the Great Salt Lake on a number of nesting towers (which are still maintained and regularly used by peregrines). Information on nest site locations, occupancy, and productivity is being compiled to determine the magnitude of the peregrine population increase in Utah. In addition, Utah is working closely with other southwestern states to assess the extent of population recovery. Utah's recovery efforts have been made possible through close coordination of several state and federal agencies, nongovernmental organizations, universities, researchers, private corporations, and private landowners.

How You Can Help

You can help by reporting the location of peregrine nesting sites to regional Utah Division of Wildlife Resources offices; if the nest is on federal land, you can report the site to the local office of the Bureau of Land Management, National Park Service, or U.S. Forest Service. If you see an adult peregrine fly into a crack or cave in a tall (>100 ft) cliff during the spring or summer, it is likely a nesting site. Also, nestling peregrines can often be observed standing on the cliff face near the nest site.

If you find an injured falcon, contact your local Utah Division of Wildlife Resources office. They will help recover the birds and find the nearest raptor rehabilitator. If you find a dead peregrine or witness a shooting or other illegal activity, contact any state or federal law enforcement office and notify them of its location. You should not pick up a dead falcon since it may have been poisoned.

Where To Learn More

Several books on Peregrine Falcons and raptors are available at bookstores and libraries. These range from technical to general accounts. Other educational materials such as video tapes and CD ROMs are available through specialty (nature) bookstores and (wild) bird shops. Web sites can be found by searching for the keywords "Peregrine Falcons," "falcons," "hawks," "raptors," and "birds of prey."

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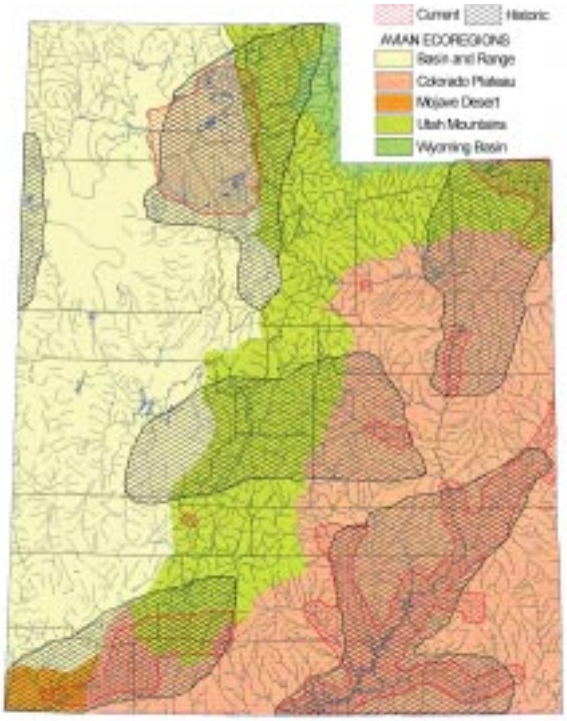

Peregrine Falcon distribution.

Peregrine Falcon habitat photo courtesy of Gar Workman.

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Mexican Spotted Owl

(*Strix occidentalis lucida*)—Threatened

Description

The Mexican Spotted Owl is a large (16-19" tall), dark-eyed owl with brown and white spots on its front, back and head. The owl has a rounded head and lacks ear tufts. Adult and juvenile birds have similar plumage characteristics. Similar owls which occur regularly in Utah include the Great Horned Owl (*Bubo virginianus*), which has prominent ear tufts and yellow eyes, and the Common Barn Owl (*Tyto alba*), which is smaller, has a heart-shaped facial pattern, and a mostly white or tawny front.

Distribution and Habitat

Only the Mexican subspecies of spotted owls occurs in Utah. Close relatives of the Utah owl occur in California—California Spotted Owl (*S.o. occidentalis*) and the Pacific Northwest—Northern Spotted Owl (*S.o. caurina*). In Utah, the owl is known to nest only in steep-walled canyons of the Colorado Plateau ecoregion and adjacent portions of the Utah Mountains ecoregion. Most nesting sites occur in southern Utah, but sites have been found as far north as Dinosaur National Monument in the northeastern corner of the state. Population clusters have been identified around Zion National Park, Capitol Reef National Park, Canyonlands National Park, and the Dark Canyon complex of the Abajo Mountains.

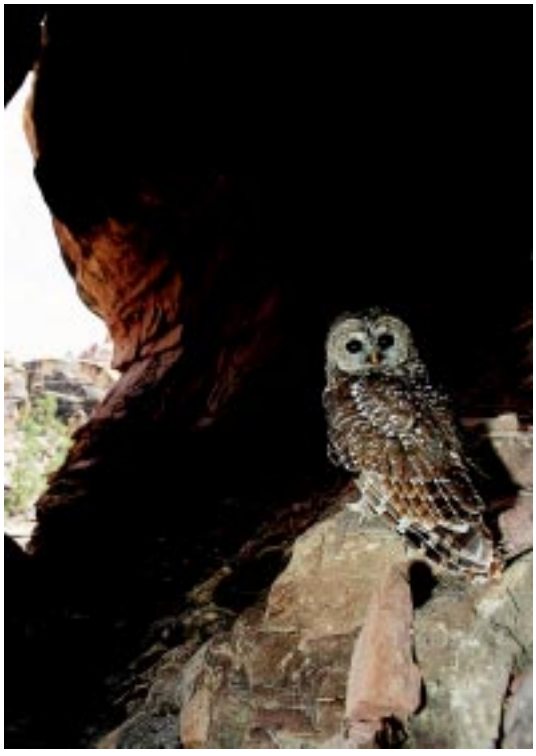

Photo courtesy of Steve Howe.

Unlike owls in other portions of the range which nest primarily in the trees of mature conifer forests, Utah owls nest exclusively in caves in steep-walled, usually narrow, moist canyons. These canyons are typified by streamside woods, and/or narrow stringers of conifer trees though some sites are in relatively dry canyons. Canyons where nests occur are usually part of a rugged, complex canyon system which has several side canyons and hanging canyons. All known nesting sites in Utah are below 8000 feet elevation. Winter habitat is essentially the same as breeding habitat, though owls may seek warmer, more open canyons in the winter.

Owls forage primarily on the canyon floors and on elevated benches within the canyons. However, owls also occasionally forage on mesa tops which are usually covered by pinyon/juniper or shrubland habitats. Owls will forage on a variety of prey including mice, voles, bats, birds, and beetles, but their primary prey is woodrats.

Life History

Spotted Owls are residents in Utah, though they may exhibit some movements of a few miles during the winter. Courtship usually begins in March. Females lay 1-3 (usually 2) eggs in early to mid April and incubate the eggs for about 30 days. Males deliver food items to the females during this period. Eggs typically hatch in early to mid May, and both parents tend the young, though females spend more time defending the nestlings while males spend more time foraging. Nestlings usually fledge at 4-5 weeks old in mid to late June. After fledging, juvenile owls spend up to several months in the nest area with the adults learning to hunt. In September or October, juveniles disperse away from the nesting area. They may travel several miles during the dispersal period seeking suitable foraging and future nesting locations (owls do not breed until they are 2 years old). Adults may also undergo some movement at this time and may occasionally accompany the young owls.

During the winter, owls usually forage in the nesting area and in areas adjacent to the nesting area. Occasionally, owls will make journeys out of the nesting area to forage in areas which are warmer and have less snow cover.

Threats and Reasons for Decline

The primary threat to Mexican Spotted Owls across their range is habitat loss because of past, current, and future timber harvest practices. Significant portions of the owls habitat have been lost or modified from diverse, multiple layered forests, which owls prefer, to uniform forests, grasslands, and shrublands with little structural diversity. The population trend of owls is not well understood, but the current number of breeding pairs is probably sufficient to

maintain the population if habitat loss is curtailed and other potential threats are properly managed.

In Utah, potential threats to the owl include human disturbance associated with increasing recreational activities in canyon habitats, overgrazing and timber harvest in foraging areas, road development in canyons, catastrophic wild fire, and oil, gas, and mineral development. These activities may lead to habitat alteration and/or direct disturbance of owls.

Recovery Efforts

A recovery plan for the Mexican Spotted Owl was published in 1995. It lists the steps which need to be taken to insure the long-term survival of the subspecies in Utah, other southwestern states, and Mexico. The owl's range has been divided into several recovery units, and Utah has taken the lead in implementing recovery on the Colorado Plateau Recovery Unit which extends into Arizona, New Mexico and Colorado. Implementation of the Recovery Plan in Utah and the rest of the Colorado Plateau is overseen by a team of representatives from state and federal agencies, private industry, conservation groups, and researchers.

In Utah, all known nesting areas have been mapped and receive protection from habitat destruction and activities that would disturb owls. A significant portion of the known nesting sites have been monitored for occupancy and productivity and surveys have been undertaken to identify additional areas where owls or suitable owl habitat occur. Research on Utah owls, was initiated in 1991, continues to provide information on the extent of owl distribution, habitat requirements (both winter and summer), juvenile dispersal, the size of the area used by individual owls (i.e., home range), and owl prey.

How You Can Help

You can help by reporting the location of spotted owls to regional Utah Division of Wildlife Resources Offices; if the nest is on federal land, you can report the site to the local office of the Bureau of Land Management, National Park Service, or U.S. Forest Service. Since owls are active mostly at night, the best way to identify them is by their call—spotted owls have a four-note call which is a low, unevenly spaced "hoo--hoo-hoo---hoooo".

If you find a dead or injured owl, contact your local Utah Division of Wildlife Resources, National Park, Bureau of Land Management, or U.S. Forest Service office. They will help recover the bird and find the nearest raptor rehabilitator if necessary. You should avoid disturbing owls, particularly young owls, since disturbance might make them vulnerable to predators.

Where To Learn More

A newsletter available through the Utah Division of Wildlife Resources (The Mexican Spotted Owl Recovery Update) features the Mexican Spotted Owl and its status on the Colorado Plateau region of Utah, Colorado, Arizona, and New Mexico. Several books on owls are available at bookstores and libraries; audio tapes may also be available at these sources. Other educational materials such as video tapes and CD ROMs are available through specialty (nature) bookstores and (wild) bird shops. Web sites can be found by searching for the keywords "Spotted Owls," "owls," "nocturnal raptors," and "nocturnal birds of prey."

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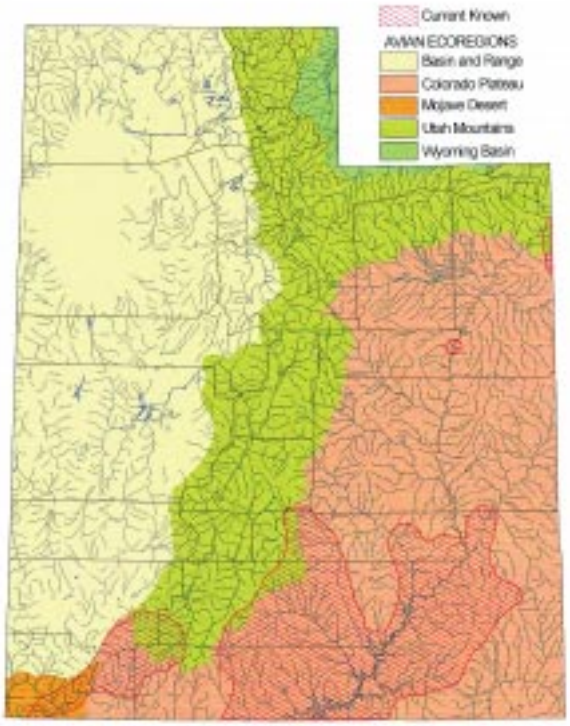

Mexican Spotted Owl distribution.

Mexican Spotted Owl habitat photo courtesy of Steve Howe.

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Southwestern Willow Flycatcher

(*Empidonax traillii extimus*)—Endangered

Description

Willow flycatchers are small (6" tall) birds with greyish-green backs and wings, whitish throats, light grey-green breasts and pale yellowish bellies. They have two white bars on each wing and usually lack the white eye ring of similar small green flycatchers. At extremely close distances, willow flycatchers reveal a bill which is black on the top (upper mandible) and completely yellow on the bottom (lower mandible). Willow flycatchers are so similar in appearance to other flycatchers of the *Empidonax* genus, that the best way to distinguish them is by their song—a sneezy "fitz-bew" or "fitz-a-bew."

Distribution and Habitat

Two subspecies of willow flycatchers breed in Utah and a third may occur during spring and fall migration. These subspecies cannot be distinguished in the field and may interbreed in portions of the state. However, southwestern willow flycatchers are generally considered to breed in southern Utah in the Mojave, Utah Mountains, and Colorado Plateau ecoregions. The other subspecies (*E. t. adastus*) breeds in western and northern Utah. The current distribution of the southwestern subspecies is not well known in Utah. Recent surveys have confirmed only two nesting sites (one on the Virgin River, the other near Fish Lake), though suitable habitat has been located along several streams and rivers including the Virgin River and its tributaries, Kanab Creek, Paria River, and the Colorado River system including the San Juan, Escalante and Green Rivers. Locations with historic records for this subspecies include Virgin and Santa Clara Rivers, Beaver Dam Wash, Kanab Creek, San Juan River and southern portions of the Colorado River. Additional records from the Moab area and the Green River indicate that the subspecies may extend into the Book Cliffs of northeastern Utah.

Photo courtesy of Renee Netter.

The willow flycatcher nests exclusively in streamside shrubs and trees (i.e., riparian habitat), nesting sites are usually characterized by a combination of willows, cottonwoods, and box elders. In some locations where nonnative plants have invaded, these flycatchers may nest in tamarisk and Russian olive dominated habitats. Breeding habitats usually consist of thick, relatively wide stands of riparian vegetation over 10 feet tall. Standing water is often present below or near the nest site. The flycatchers forage extensively in riparian habitats and occasionally feed over open water or in adjacent upland habitats. Their diet consists of a wide variety of flying insects and insect larvae such as caterpillars and beetle grubs.

The wintering grounds of willow flycatchers are not well known, but they probably winter in western Mexico and western Central America. Winter habitat characteristics are not known.

Life History

Willow flycatchers are relatively late nesters in Utah. They arrive on the breeding grounds in late May and usually start nesting in early June. The female builds a small, compact cup nest made of dried weeds, leaves, grasses, bark, and lined with feathers, hair, and plant down. After laying 3-4 eggs, the female incubates for 12-13 days. Eggs hatch in mid to late June and both parents tend the nestlings; nestlings fledge in 12-14 days (late June to early July). Young and adults may stay in the nesting area until August or early September before starting their southerly migration. Willow flycatchers winter in the subtropics, most likely in western Mexico and the Central American isthmus. During their fall and spring migrations, willow flycatchers often travel at night in flocks mixed with flycatchers and other songbirds.

Threats and Reasons for Decline

Southwestern willow flycatcher populations have declined over the last 50 years and there are currently only around 500 breeding pairs remaining. The primary reason for decline is the loss and alteration of riparian habitat in the southwestern U.S. Additional factors in the decline include parasitism by cowbirds. Cowbirds have expanded their range into all of the western states and are experiencing a rapid population increase. Cowbirds remove eggs from flycatcher nests (and nests of many other birds), replacing them with their own eggs, leaving the

host flycatchers to raise cowbird young. Cowbird nestlings grow more rapidly than flycatchers and outcompete the flycatcher nestlings for food brought to the nest by the flycatcher adults. Nests that are parasitized by cowbirds rarely produce any flycatcher fledglings.

Loss of riparian habitat continues to be a major threat to willow flycatchers (and a large diversity of riparian-nesting birds). Riparian habitat is altered or destroyed by urban development, flooding of reservoirs, road construction, overgrazing, conversion to agriculture, invasion of nonnative plants, and some recreational activities. Cowbird parasitism is also a threat in some areas where large numbers of cowbirds congregate near riparian areas.

Recovery Efforts

A recovery plan has not yet been written for the southwestern willow flycatcher. However, a team of Utah biologists has been formed to write a management plan which can be used until a recovery plan is in place. In addition, surveys have been conducted in several parts of the state to locate willow flycatchers and suitable nesting habitat. Once nest sites are located they can receive protection from harmful activities. Both genetic and vocalization research is being conducted to determine the distribution of Willow Flycatcher subspecies in Utah. Because of the importance of riparian habitat to a wide variety of wildlife species, riparian conservation and restoration programs have been initiated in several parts of the state. These efforts will help to preserve and enhance nesting habitat for willow flycatchers.

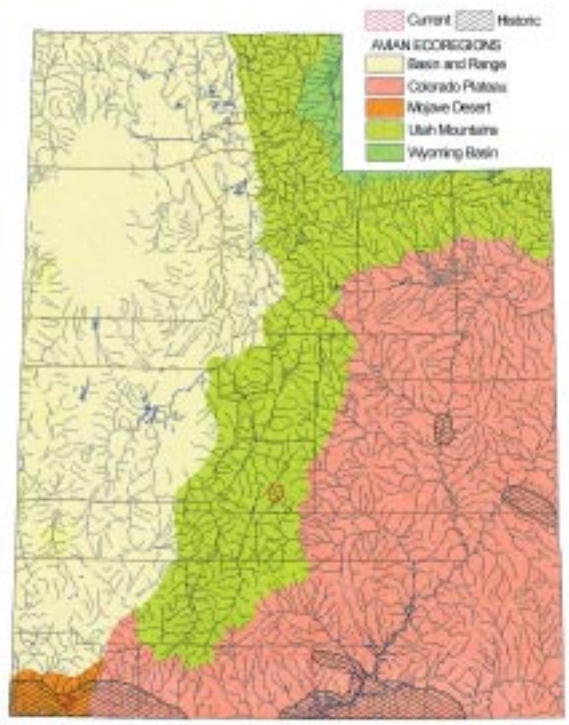
How You Can Help

Several groups are engaged in riparian restoration and conservation as well as clean-ups. You can take part by contributing time or money to these efforts. These groups are often looking for volunteers to help plant riparian trees and shrubs. You can contact your local Utah Division of Wildlife Resources office and ask if they know of any projects in your area.

Willow flycatchers are extremely difficult to identify and can only reliably be distinguished by voice. But, if you are certain you've heard a willow flycatcher **in riparian habitat in June or July**, contact your local Utah Division of Wildlife Resources office to report it.

Where To Learn More

There are a few published books or articles dealing specifically with flycatchers. Check bookstores and libraries for general books and audio tapes on birds and songbirds (see reference provided). Also look for books on riparian birds and riparian restoration or management. Other educational materials such as video tapes and CD ROMs are available through specialty (nature) bookstores and (wild) bird shops. Web sites can be found by searching for the keywords "Willow Flycatchers," "Empidonax flycatchers," "flycatchers," and "riparian birds."



Probable historical Southwestern Willow Flycatcher distribution.

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Southwestern Willow Flycatcher nest photo courtesy of Renee Netter.

Southwestern Willow Flycatcher habitat photo courtesy of Renee Netter.

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Humpback Chub

(*Gila cypha*)—Endangered

Description

Adult humpback chubs may grow to 18 inches in length and weigh over a pound. This fish has a wide, flattened head tending to be concave in profile, with a large, horizontal mouth overhung by a prominent snout. Its lips lack barbels. It has small eyes, and a prominent hump on the anterior most part of its back. The body tapers very suddenly from the dorsal (back) fin to the insertion of the caudal (tail) fin. The area between the fins is pencil-shaped, and the caudal fin is large and strongly forked. The fins are strong, prominent and well developed in general. Its color ranges from brownish-black above, to paler beneath.

Distribution and Habitat

The humpback chub is found in the Colorado River between Nevada and Arizona, the Moapa and Virgin Rivers and the Pahranagat Valley. Originally, humpbacks chubs ranged throughout the whitewater canyons of the Colorado River and some of its tributaries from the Green River south on the Colorado to Lake Mead.

The USFWS has recognized five populations of humpback chub in the Colorado River Basin. Presently, populations are found in canyon reaches of the Colorado River system. The largest and most stable population is also the only population remaining in the Lower Colorado River Basin and resides in Grand Canyon in and near the confluence of the Little Colorado River. The other populations are in Westwater/Blackrocks Canyons and Cataract Canyons of the Colorado River, Desolation/Gray Canyon of the Green River and in Yampa Canyon of the Yampa River. In addition, aggregations of humpback chub or roundtail/humpback hybrids occur sporadically throughout the basin within confined canyon reaches.

The habitat of the humpback chub is in water with a strong, continuous flow. Occupying this habitat type has led to the evolution of a flat, sloping head which tends to hold the fish against the bottom when pointed upstream. Conspicuous dorsal (back) keels also have a stabilizing effect in strong currents.

The chub is an omnivore, eating aquatic arthropods (as well as those that fall into water, smaller fishes and algae.)

Life History

The humpback chub is a summer spawning fish. Spawning occurs when river discharges are near seasonal highs, or are receding. River temperatures at this time are between 60-72 degrees F. The fish move relatively short distances to spawn, and the breeding process takes place at cobble or gravel bars in the river. During breeding, males develop reddish tinges on the venter, and distinctive red marks on the cheeks.

Humpback chub have been difficult to study because of their rarity and residence in swift, turbid and inaccessible riverine environments. The only sex ratios reported suggest they are approximately equal and that fecundity averaged 3,677 eggs/female in the Grand Canyon of the lower Colorado River basin. Egg survival is optimal between 60 degrees F and 72 degrees F and significantly reduced below temperatures of 50 degrees F which could affect reproductive success of mainstem spawning in the Grand Canyon. In Grand Canyon studies, age-0 fish were noted to disperse 1 to 3 months after emergence. Survivorship in years 0, 1 and 2, collectively was 10% but most likely later life stages survived better. Adult survivorship has been reported as 60% in the upper Colorado River basin and 75% in the Grand Canyon. Humpback chub mature in 2 to 3 years (at approximately 8 inches in length), and they may live 20 to 30 years.

Photo courtesy of Utah Division of Wildlife Resources.

Threats and Reasons for Decline

The primary reasons for the decline of the humpback chub are changes in stream flow and water temperature, direct loss of habitat due to inundation by reservoirs, blockage of migration routes, and the introduction of non-native fishes.

Recovery Efforts

The humpback chub was listed as an endangered species under the federal Endangered Species Act in 1967. A Colorado River System Endangered Species Recovery Program agreement, signed in January 1988, includes five basic steps to aid in the recovery of the humpback chub:

1. Provision of instream flow
2. Habitat development and maintenance
3. Native fish stocking
4. Management of non-native species and sport fishing
5. Research, monitoring, and data management

The goal of this program is to maintain and protect self-sustaining populations and sufficient natural habitat to sustain these populations. The program should also be beneficial to other endangered fish species sharing the humpback chub habitat, including the razorback sucker, bonytail chub, and the Colorado squawfish.

Humpback Chub distribution.

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Bonytail

(*Gila elegans*)—Endangered

Description

The bonytail has a wide, flattened head which is concave in profile. An adult may grow up to 17 inches in length and weigh over 1 pound. However, most usually range between 8 and 13 inches in length and weigh less than a pound. Its mouth is large, with the corner of the mouth extending to the front part of the eye. The lips lack barbels. The eyes are small and eliptical. Its back hump is less pronounced than the Humpback chub. The body is slender but enlarged, making the head appear smaller. This fish either lacks body scales or has tiny embedded scales.

Bonytails feed on insects, with larger members eating terrestrial insects such as beetles, grasshoppers and ants. They also eat surface drift composed of insects and plant matter.

Distribution and Habitat

The bonytail is found in larger channels of the Colorado River system, in swift water, and also in Nevada, along the main channel of the Colorado River and lower part of the Virgin River. Several historical accounts describe bonytail throughout the Colorado River system more than 100 years ago.

The basic biology of bonytail was not studied in detail until the late 1960's. Even then, early studies focused on the abundance, life history, and distribution, and little was determined about its ecology. During this period, bonytail numbers were greatly reduced. Thus, the ecological requirements of the bonytail remain poorly understood. The last known concentration of bonytail were captured in Split Mountain Canyon of the Green River through Dinosaur National Monument, Utah. In 1993, a suspected adult bonytail was captured in the Colorado River about 4 miles upstream from its confluence with the Green River. Utah Division of Wildlife Resources captured two potential bonytail in 1996 in the Colorado River in Cataract Canyon and in Desolation Canyon.

The bonytail represents environmental selection of those traits in the species which are of paramount importance to living in swift water. These traits include greater streamlining, powerful fins for more efficient propulsion, and head dorsum concavity to aid in steadying against the strong currents on the river bottom.

Photo courtesy of Utah Division of Widlife Resources.

Life History

Bonytail spawn in the spring usually when water temperatures exceed 64 degrees F. Females produce between 1,000 and 17,000 eggs which are deposited at random over gravel bars. The eggs adhere to rocks or settle in depressions. No parental care is given to the eggs once they are deposited. Eggs begin hatching about 9 hours after fertilization, and swim-up occurs generally 48-120 hours later. Survival rate of juveniles is 17-38%. Bonytails mature at 2-3 years of age.

Threats and Reasons for Decline

Bonytails evolved in a harsh and unusual environment. As the environment changed, they rapidly went from being one of the most common to the rarest fish species in the Colorado River system. The primary reasons for the decline of the bonytail are changes in stream flow and water temperature, direct loss of habitat due to inundation by reservoirs, blockage of migration routes, and the introduction of non-native fish.

Recovery Efforts

Bonytails were listed by the U.S. Fish and Wildlife Service as an endangered species in 1980. The Colorado River System Endangered Fish Recovery Program agreement, signed in January

1988, includes five basic steps to aid in the recovery of the bonytail:

1. Provision of instream flows
2. Habitat development and maintenance
3. Native fish stocking
4. Management of non-native species and sport-fishing
5. Research, monitoring and data management

The goal of this program is to maintain and protect self-sustaining populations and sufficient natural habitat to sustain these populations. This program will likely be beneficial to other endangered species sharing this habitat, including the humpback chub, razorback sucker, and the Colorado squawfish. There is currently a population of bonytails being maintained at the Dexter National Fish Hatcheries in Dexter, New Mexico.

Bonytail distribution.

References

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Razorback sucker

(*Xyrauchen texanus*)—Endangered

Description

Adult razorback suckers may reach lengths of over 2 feet and weigh up to 10 pounds. This fish has a large head somewhat compressed. The head constitutes up to one fourth of the total length. Its eyes are small and longitudinally oval. It has a large mouth, and distinctive hump on its back. The dorsal (back) fin is long and low, and it has a large, powerful caudal (tail) fin. The fish's upper surface is a dull slate color, its belly is white, and its throat is yellow.

Distribution and Habitat

The razorback sucker was once widely distributed throughout the large river portions of the Colorado River and its tributaries. In the upper basin it was present in the Green River to Green River, Wyoming, in the Colorado River to below Rifle, Colorado, and in the lower reaches of the major tributaries such as the Yampa and Gunnison Rivers.

Present distribution in the upper basin is much the same as it was in the past, except that it is generally absent from Flaming Gorge Reservoir and the cold tailwaters below the dam down to the mouth of the Yampa River. Habitats which are still important for the razorback sucker include the following river segments:

Green River—confluence with Yampa to confluence with Colorado River.

Yampa River—Lily, Colorado, to confluence with Green River.

White River—immediate vicinity of the confluence with the Green River.

Colorado River—Rifle, Colorado, to Lake Powell.

Gunnison River—Delta, Colorado, to confluence with Colorado River.

Razorback suckers are generally found in backwater areas or areas of very slow current. They have been collected in faster water, and some have considered them inhabitants of the main channels. Young are seldom collected, but probably seek out eddies, pools, and other slow water near shore. In the upper Colorado River basin, the razorback is restricted to the lower zone and the lower portions of the intermediate zone. They are seldom found in larger tributaries and have never been reported from smaller streams. For example, they are found only in the lower Yampa River, well below the upstream limit of Colorado squawfish. The razorback sucker appears to grow well in warm reservoirs, but though spawning has been observed, no successful reproduction is known from reservoirs.

Photo courtesy of Utah Division of Wildlife Resources.

Life History

Spawning has been observed several times in the lower basin reservoirs along shorelines where wave action causes currents. Spawning occurred in March at water temperatures of 60-68 degrees F. During spawning male breeding coloration is black to a point about 1 inch below the lateral line, with a brilliant orange extending ventrally from this point.

In its natural habitat, the razorback is a bottom feeder, sucking up plant and animal material along with mud. In reservoirs and perhaps at times in riverine situations, plankton (especially crustaceans) are consumed. It appears that the razorback can feed on the bottom and in the open water. The diet of larval suckers is not known. However, larval fish fed a diet of strained beef liver, baby food, and zooplankton under artificial propagation conditions at Willow Beach National Fish Hatchery exhibited good growth.

Threats and Reasons for Decline

Razorback suckers were abundant during the late 1800's and early 1900's and were harvested as a

commercial species in large quantities. These harvests contributed to long-term population declines. However, beginning in the early part of the 20th century, a more precipitous decline appears to have begun. Changes in stream flow and water temperatures, direct loss of habitat due to inundation by reservoirs, blockage of migration routes and the introduction of non-native fish species are primarily responsible for the decline of the razorback sucker. Today the razorback sucker is rare in collections in all but a very few locations. Evidence of reproduction is lacking in some areas where it was previously common.

Recovery Efforts

The razorback sucker was listed as an endangered species by the U.S. Fish and Wildlife Service in 1991. The Colorado River System Endangered Fish Recovery Program agreement, signed in January 1988, includes five basic steps to aid in the recovery of this and other Colorado River system fish species. These steps include:

1. Provision of instream flows
2. Habitat development and maintenance
3. Native fish stocking
4. Management of non-native fish species and sport fishing
5. Research, monitoring, and data management

The goal of this program is to maintain and protect self-sustaining populations and sufficient natural habitat to sustain these populations. This program should be beneficial to other endangered fish species sharing this habitat, including bonytail chub, Colorado squawfish, and humpback chub.

Razorback Sucker distribution.

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June Sucker

(*Chasmistes liorus*)—Endangered

Description

The coloration of the June sucker is black or brown above, fading to a flat white on the belly. The most distinguishing characteristics of adult fish are weakly developed lips, with widely separated lower lobes and an oblique subterminal mouth. The body is robust and the head is large. Scales are very large, numbering 55 to 62 in the lateral series. There are 10 to 12 rays in the dorsal fin and 7 rays in the anal fin. Breeding males may have a red lateral stripe. June suckers are typically slow growing and long lived. Historically, adults reach lengths of approximately 2 feet and may weigh up to 6 pounds. Current age and growth data for June sucker are not available.

Distribution and Habitat

June suckers occur only in Utah Lake and its major tributary, the Provo River. Utah Valley settlers provided valuable insight into characteristics of the lake's June sucker population. Early accounts indicated that Utah Lake was a pristine lake that supported an enormous population of these fish. In the 1850s, June sucker were caught during their spawning runs and were widely utilized as fertilizer and food. Native Americans and white settlers, captured and dried spawning fish for food.

Except during spawning, adult June sucker remain in Utah Lake at depths of 12 to 14 feet. Historically, June sucker probably inhabited the entire lake and were found throughout the water column. Current populations, especially young, are much reduced and inhabit more restricted areas of the lake.

Life History

June suckers primarily spawn in one section of the Provo River below the Tanner Race diversion. This diversion creates a permanent upstream barrier. Peak spawning activity is over a brief period of time between June 1 and June 29 when water temperatures exceed 55 degrees F.

Photo courtesy of Utah Division of Wildlife Resources.

Spawning activity is greatest during midday from approximately 11 a.m. to 2 p.m.

June suckers have been observed resting in the deeper pools of the lower Provo River and moving into shallow riffles to spawn. Spawning occurs by small groups of three to six individuals, generally a female accompanied by several males. The females release eggs and males fertilize them. Water depths at spawning sites range from 1 to 2.5 feet, with a mean depth of 1.7 feet. Substrate in spawning areas is a mixture of coarse gravel and cobble-sized stones. June sucker do not spawn in sand, silt, or calm backwater areas. During spawning, mean daily water temperatures range from 53 degrees to 55 degrees F. Eggs of June sucker are pale yellow, with a mean diameter of 0.02 inches. At a mean temperature of 70 degrees F, they hatch in 4 days. Newly hatched larvae, averaging 0.3 inches in length, remain on the bottom and enter the water column approximately 10 days after hatching. Larval and juvenile June sucker remain near the mouth of the Provo River during June and July. Areas frequented are shallow, calm backwaters with depths of 3 to 8 inches. Larvae form large schools of several hundred to several thousand. They begin to range into swifter, deeper water after changing to adult forms.

Data on the food habits of the June sucker are lacking. It is probably an opportunistic omnivore, feeding on zooplankton, aquatic insects, and algae.

Threats and Reasons for Decline

The first major reductions in the number of June sucker were noted in association with the

development of Utah Valley. In the late 1800's, an estimated 1,500 metric tons of spawning suckers were killed when about 2.1 miles of the Provo River was dewatered. Hundreds of tons of suckers were also lost when Utah Lake was nearly drained dry during a 1932-35 drought. After the drought, sucker populations gradually increased. Due to the combined impacts of drought, over exploitation, and habitat destruction, the population has never returned to its historical level.

The species was federally listed as an endangered species with critical habitat in 1986. Included as critical habitat was the lower 4.9 miles of the main channel of the Provo River, from the Tanner Race diversion downstream to Utah Lake. The species had a documented wild population of fewer than 1,000 individuals at the time of listing. The current population is estimated at approximately 300 individuals.

The June sucker was federally listed as endangered due to: a) their localized distribution; b) failure to recruit new adult fish; and c) threats to their continued survival. Decline in abundance of June suckers can be attributed to habitat alteration through dewatering stream channels and degrading water quality, competition and predation by nonnative species, commercial fishing, and killing of adults during the spawning run.

June Sucker distribution.

Recovery Efforts

The June sucker was listed by the U.S. Fish and Wildlife Service as an endangered species in 1986. The U.S. Fish and Wildlife Service has given the species a high recovery priority. This species has a high threat of extinction, a low recovery potential, and the presence of conflict. Water development and sportfish management are the primary impediment to June sucker recovery.

The recovery of these fishes and the ecosystem they depend upon will require the input and cooperation of numerous federal, state, county, city, as well as local organizations and individuals who own or manage land and water resources. Implementation of this Recovery Plan may improve sportfishing management and opportunities within Utah Lake, enhance aquatic resources, including trout populations, in the Provo River, and benefit wetland, riparian, and other water-related resources in the Utah Lake area.

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Virgin River Chub

(*Gila seminuda*)—Endangered

Description

Adult Virgin River chub rarely exceed 10 inches in length. Although this species lacks the prominent hump of the bonytail and humpback chub, they are stoutly built. The front and bottom of their bodies are swollen in appearance tapering suddenly from the dorsal (top) to the caudal (tail) fin. This tear-drop shape is most likely an adaptation to the swift, turbid waters in which it lives. Its body coloration is silvery to grayish brown above and lighter beneath.

The largest of this species feed on other smaller fish species, but most eat terrestrial and aquatic insects, and plant matter. They are opportunistic and will feed on insects, snails, crustaceans, and algae.

Distribution and Habitat

These chub are found in runs and pools over substrates of sand and sediment in physically and chemically unmodified areas of the Virgin River drainage.

Life History

These fish spawn in June and July when the water temperatures have warmed to about 66 degrees F. At this time they avoid turbid waters, staying in low, clear flows so that eggs are not carried away by the current. Spawning females are accompanied by several males. Females randomly drop their eggs over gravel beds in deeper water. The adhesive eggs attach to anything available. Once the eggs are deposited no additional parental care is provided.

Threats and Reasons for Decline

The population of Virgin River chub has declined over the last 100 years due to increased agricultural and urban water use, decreased water quality, and the introduction of exotic fishes. Decreased water flow leads to overcrowding of fish, resulting in increased predation and spread of disease.

Recovery Efforts

The Virgin River chub was listed as an endangered species by the U.S. Fish and Wildlife Service in 1989. A recovery plan has been developed which calls for restoring permanent water flows in the Virgin River to provide habitat for this fish. There is a population currently being maintained at the Dexter National Fish Hatcheries in Dexter, New Mexico.

Photo courtesy of Utah Division of Wildlife Resources.

Virgin River Chub distribution.

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Colorado Squawfish

(*Ptychocheitus lucius*)—Endangered

Description

Adult Colorado squawfish may reach lengths of 5 feet and weigh more than 80 pounds. This fish has a compressed body, and its head constitutes nearly one fourth of its entire length. The dorsal (top) and ventral (bottom) fins are set well back. The caudal (tail) fin is strong, and deeply forked. Squawfish range in color from bluish-gray coloring above to silvery gold below, and the young have a black spot in the middle of the caudal base. It has two weak lateral zones, an upper, dark one and a lower, pale line.

The young feed on aquatic insect larvae and crustaceans, turning to fish as they grow larger. Large adults feed primarily on fish but are opportunistic and have been known to take carcasses of small animals and birds.

Distribution and Habitat

Colorado squawfish was originally found in the Colorado River basin from Wyoming to Mexico. Its current range is restricted to the upper Colorado River drainage. Populations can now be found in the portions of the Green River, Gunnison, White, and San Juan Rivers. Squawfish prefer large rivers with strong to moderate current, deep pools, eddies, riffles, swift runs and quiet backwaters. Prior to dams, squawfish moved upstream in "spawning runs" sometimes up to 100 miles.

Life History

Colorado squawfish may migrate 100 miles or more to spawning sites. Spawning sites are of two types. The first consists of deep pools or eddies where the fish rest and feed between spawning bouts, or where males gather around the females until they are ready to deposit eggs. The second area is located at riffles or shallow runs, and it is here that mating takes place. Spawning occurs when water temperatures reach 70° F. Spawning females may deposit over 100,000 adhesive eggs at random in riffle areas that consist of cobblestones. After the eggs are deposited no additional parental care is given.

Photo courtesy of Utah Division of Wildlife Resources.

Male squawfish mature at lengths of about 17 inches. At this time they are about 6 years of age. Females tend to mature a year later.

Threats and Reasons for Decline

Changes in stream flow and water temperature, direct loss of habitat due to inundation by reservoirs, blockage of migration routes and the introduction of non-native fish are primarily responsible for the decline of the Colorado squawfish. Flaming Gorge Lake was once prime squawfish habitat. Before creation of the reservoir, the Green River in this area was a warm, turbulent river that exhibited violent fluctuations in flow. Once the reservoir was built, the river in this area became a deep, cold lake.

Recovery Efforts

Colorado squawfish were originally listed as an endangered species by the U.S. Fish and Wildlife Service in 1967. This fish is currently protected under the federal Endangered Species Act of 1973. The Colorado River System Endangered Fish Recovery Program agreement, signed in January 1988, includes five basic steps to aid in the recovery of the Colorado squawfish:

1. Provision of instream flows
2. Habitat development and maintenance
3. Native fish stocking
4. Management of non-native fish species and sportfishing
5. Research, monitoring and data management

The goal of this program is to maintain and protect self-sustaining fish populations and sufficient

natural habitat to sustain these populations. The program should be beneficial also to other endangered fish species sharing this habitat, including the razorback sucker, humpback chub, and the bonytail chub. There is currently a population of Colorado squawfish being maintained at Dexter National Fish Hatcheries in Dexter, New Mexico.

Colorado Squawfish distribution.

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Woundfin

(*Plagopterus argentissimus*)—Endangered

Description

The woundfin is a small fish approximately 2.5 inches in length. It has a slender body and rather broad head. The snout overhangs the small, horizontal mouth. Its lips are thin, with barbels present at the corners. The woundfin has no scales. The pelvic fins are joined to the abdomen along the inner edges. The caudal (tail) fin is large, and deeply forked. Woundfins have a silvery-colored body with the color darkening along the back.

Woundfin are opportunitistic feeders that will feed on both plant and animal material (omnivorous). Their diet includes aquatic insects and algae.

Distribution and Habitat

The woundfin was once found throughout the Virgin and Gila River drainages. In Utah it is currently restricted to a small portion of the Virgin River near La Verkin.

Adult woundfin use areas in the river that exhibit relatively strong current and shifting sand bottoms. Young woundfin stay in slow, shallow areas closer to shore. Water temperatures in excess of 95° F are lethal.

Life History

Females produce about 200 eggs, most spawn the second spring after hatching. Woundfin spawn in April when water temperatures reach 58 degrees F. During the spawning period, females congregate in pools then move to flowing water where the males are waiting. Spawning areas may be less than 2 feet wide and no more than 1 inch deep. Eggs are deposited randomly and no parental care is provided to them or the young. Most woundfin survive two reproductive seasons.

Threats and Reason for Declines

Although woundfin are better adapted to environmental extremes, high temperatures that result from reduced flows or lack of stream side vegetation can prove fatal to eggs, young, and the adults. Increased competition for food and the introduction of exotic fish species into the Virgin River has resulted in increased predation on woundfin young and brought disease. Reduced water flows and degraded water quality in the river have destroyed woundfin habitat and threatened the species.

Recovery Efforts

The woundfin was listed as an endangered species by the U.S. Fish and Wildlife Service in 1973. Currently, there is a population of woundfin currently being maintained at Dexter National Fish Hatcheries in Dexter, New Mexico. This population will provide the stock for any future reintroductions that are made in areas where habitat conditions have been improved.

Photo courtesy of Utah Division of Wildlife Resources.

Woundfin distribution.

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Desert Tortoise

(*Gopherus agassizii)*—Threatened

Description

The desert tortoise has a domed shaped shell. Shells of adult tortoises may be up to 15 inches long. The upper shell (carapace) is oblong and is brown in color with the center scutes often being yellowish. The lower shell (plastron) is yellowish, with brown along the scutes margins (outer edges of the shell). For the male tortoise, the plastron is concave. The female tortoise has a flat plastron. The adult throat scutes project beyond the carapace, for protection from predators.

The shell has several main purposes. One is protection from both predators and the sun. The shell enables the tortoise to reduce water loss. This is a great asset when water is scarce.

Photo courtesy of Utah Division of Wildlife Resources

The front and back feet and legs are of about equal size. The hind legs are round, stumpy, and elephantine like. The front limbs are flattened and heavily scaled for digging burrows and ground pockets for nests. The reddish tan head is small, and rounded in front. The iris is a greenish-yellow color.

Tortoises may live 80 or more years, with average life spans being well over 50 years. They can weigh between 14 and 20 pounds, with some individuals weighing even more.

Distribution and Habitat

The desert tortoise species can be separated into three distinct groups. There is the "California type" found in California and southwestern Nevada; the "Sonoran type" which lives in Arizona south of the Grand Canyon; and the "Beaver Dam Slope type" living at Beaver Dam in the extreme southwestern corner of Utah.

Tortoises thrive in sparsely vegetated deserts and semi-arid grasslands, canyon bottoms, and on rocky hillsides at elevations between 500 to 2700 feet. They construct burrows by digging into dry, gravelly soil under bushes, in arroyo banks or at the base of cliffs. Tortoise survival rates depends on the habitat in which they live. Dens are usually made in gravels that form portions of the banks of stream channels. The interior is usually widened to a width greater than that of a tortoise. Turns in the den are common and many times there is more than one chamber in each burrow.

The desert tortoise is a herbivorous reptile with forage consisting of native winter and summer annuals, perennial grasses, cacti, a few half-shrubs, and some exotic introduced species. The desert tortoise forages from March to November, and must have a varied diet in order to supply nutrients needed for reproduction, growth, and maintenance. On the Beaver Dam slope their diets consist mainly of red brome and brush muhly. They eat about 64% grasses, 27% forbs, and 6% shrubs. They also mine and consume soils high in calcium content.

Because of their diet, the desert tortoise will eat less than one-tenth of the percent of available plant material. This means that when less food is available the tortoise will likely increase its home range size so it can find the food it needs. Due to the seasonality of vegetation, tortoises tend to eat very heavily in early spring in order to tank up for the dry, relatively barren summer and fall seasons. The home range of the desert tortoise in Utah ranges from 5-91 acres.

Although tortoises are slow moving, in many cases they wander far outside their normal areas of activity in search of minerals, mates, and food sources. They may also travel these distances in response to seasonal fluctuations in resources and in temperatures, and may travel up to 1 mile per week.

Life History

The desert tortoise is a polygynous species having several females to one male with females being subordinate to the males. Males may gather harems of up to four females, with the largest female receiving the most visits from the male. Some relationships between a male and female are maintained for several years.

Males find females by trailing the scent left by the female. Once the male has found a female, he will go to the female's burrow and

entice her out for courtship and mating. Once the female emerges the male will circle, bunt, ram, or bite the female until the female is ready to mate.

Females usually nest at the mouth of the burrow or under a large shrub, and may return to the same nest site year after year. On the Beaver Dam slope they will often take advantage of the washes and nest in a caliche grottoe. Eggs are lain from May to July, and hatch between August and October, with the incubation period being 90-120 days. Clutches may range from 2-14 eggs, with the size of the clutch depending on the size of the female, and 1-3 clutches may be laid annually. Eggs don't develop synchronously and some eggs may not hatch until the next spring, depending on environmental conditions. It is also thought that juvenile sex may be determined by the temperature of the eggs during incubation; thus, nest site selection is very important.

Young tortoises look like miniature adults. The only real difference is that the shells of young tortoises stay soft for the first 5 to 6 years; as such they are more vulnerable to predation. Juvenile desert tortoises have a very high mortality rate with only 5% or less reaching sexual maturity, which is between 17 and 20 years of age. Females will defend the nest and the hatched young because other tortoises will often antagonize or even kill the offspring of another.

Threats and Reasons for Decline

The foremost threat to the desert tortoise is the loss of habitat. Expanding human settlement and development of arid regions has greatly reduced the number of individuals surviving today. Other factors suggested that have led to the decline of the desert tortoise include livestock grazing practices, military activities, and off road vehicles. Livestock using the areas that tortoises inhabit may compete for forage. Military activities and ORV use threaten the habitat that the desert tortoise needs.

Recovery Efforts

The desert tortoise was listed as a threatened species by the U.S. Fish and Wildlife Service in 1980. The U.S. Fish and Wildlife Service in cooperation with the State of Utah and Washington County have developed a Habitat Conservation Plan to protect this species and its habitat. This plan established a preserve west of St. George, Utah, that was set aside specifically to conserve this species and its habitat.

Desert Tortoise distribution.

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Kanab Ambersnail

(*Oxyloma haydeni kanabensis*)—Endangered

Description

The Kanab ambersnail was named for the locality where it is found. It only occurs in deep impoundments located 6 miles north of Kanab, Utah. The Kanab ambersnail is a moderate-sized snail. Adults are approximately one inch in length, having a mottled brown, spired, dextral shell. Young ambersnails are a scant tenth of an inch long.

Habitat and Distribution

The Kanab ambersnail is considered a land snail, but lives at the edge of water on damp substrates. It is often found on stems of semiaquatic plants, in particular cattail (*Typha*), monkey flower (*Mimulus*), and watercress (*Nasturtium officinale*), but is also found on bedrock that is supporting algae.

A subspecies, the Niobrara Amersnail, is known from only three locations, two in southern Utah and one in Grand Canyon, Arizona. One Utah population appears to have been extirpated recently. In Arizona, surveys of 81 springs near Vaseys Paradise failed to find any Kanab ambersnails. However, in 1995 a small population of the nominate subspecies was found at Grand Canyon National Park's Indian Gardens Campground.

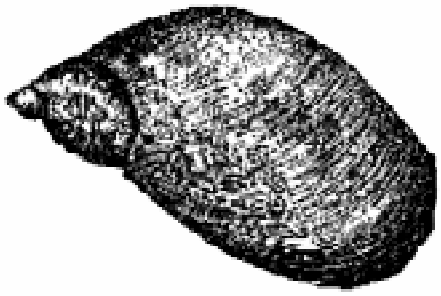
Life History

As you might expect for such a rare, small, and isolated animal, very little is known of the life habits and ecological requirements of the Kanab ambersnail. In an ongoing study in the Grand Canyon, Kanab ambersnails have been found to overwinter in the stems of host plants, and to emerge from winter dormancy in March. Maturation occurs after overwintering. Large snails are uncommon until early summer, and reproduction occurs in mid-summer (July-August).

The Kanab ambersnail breathes air directly, rather than extracting oxygen from water. Food is obtained by scraping material, probably algae, bacteria, and dead organic matter, from the substrate using a longitudinal, toothed structure, the radula, which occupies a position analogous to that of the human tongue.

Threats and Reasons for Decline

The primary management concern for the Kanab ambersnail is loss of habitat to human development. The extremely small number of populations remaining in existence causes great concern for the future of the snail. This precarious position is further complicated by the small amount of knowledge concerning ecological requirements of the snail, since recovery activities should be founded upon this knowledge.



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Utah Valvata

(*Valvata utahensis*)—Endangered

Description

The Utah Valvata is a small aquatic snail and is believed to have a maximum longevity of 2 years, although a majority only survive a single year.

Distribution and Habitat

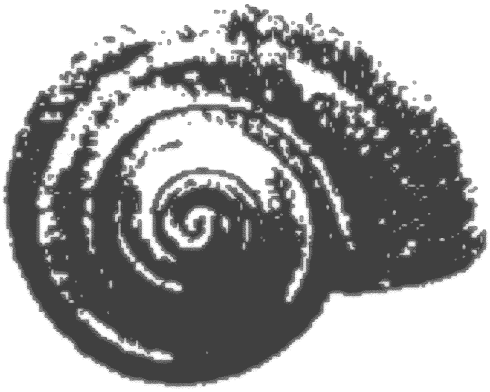
Currently, in the Snake River in Idaho, the Utah Valvata lives in deep pools near rapids or in flowing waters associated with large springs. The species avoids areas with a swift current. It prefers well-oxygenated areas of mud or mud-sand bottoms among beds of submerged aquatic vegetation. Here, the Utah Valvata feeds on plant debris or on microorganisms such as diatoms.

Threats and Reasons for Decline

The free-flowing, cold-water environments where this species live have been impacted by, and are vulnerable to, continued adverse habitat modification and deteriorating water quality from hydroelectric development and operations, water withdrawal and diversions, water pollution, and inadequate regulatory mechanisms. Some cold-water spring habitats in the Hagerman area of Idaho are also threatened by water diversions and pollution.

Recovery Efforts

The Utah Valvata was listed by the U.S. Fish and Wildlife Service on December 14, 1992. A record of the Utah Valvata in Utah comes from a shell fragment found on the shore of Bear Lake.



Reference

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The Utah Sensitive Species List

The purpose of the State Sensitive Species list is to identify those species in the state that are most vulnerable to population or habitat loss. The list also provides land managers, wildlife managers and concerned citizens with a brief overview of the conservation status of state listed species.

The list is intended to stimulate management actions for sensitive species, e.g., development and implementation of a conservation strategy, before they reach the point where they require federal listing as Endangered or Threatened. By taking proactive actions to conserve these species, management can be done more effectively, at a lower cost, and with greater likelihood of success.

While the state list includes species that are federally listed, it differs from the federal list of Threatened and Endangered Species. The federal list requires that strict protective measures be taken for listed species; the state list does not require protection, but suggests which species would benefit from proactive management actions. By developing and implementing timely and sufficient conservation measures for Utah Species of Special Concern, federal listing of these species under the Endangered Species Act may be precluded.

The Utah Sensitive Species List is compiled and published by the Utah Division of Wildlife Resources annually. The best available and most current information pertaining to conservation status, distribution and abundance of animals in Utah is used to compile this list.

The following pages include an abbreviated version of the 1998 Utah Sensitive Species list. It includes only category definitions and the species listed (**Note: this list is updated annually**). A complete, current version of the list (definitions, species listed, status description, comparison of various state and federal rankings, and literature references) is available through the Utah Division of Wildlife Resources Salt Lake Office.

Utah Sensitive Species List

(February 1998)

Definitions

A. **Wildlife:** the purposes of this list, includes all vertebrate animals; crustaceans, including brine shrimp and crayfish; and mollusks in Utah that are living in nature, except feral animals.

B. **Extinct Species:** any wildlife species that has disappeared in the world.

C. **Extirpated Species:** any wildlife species that has disappeared from Utah since 1800.

D. **State Endangered Species:** any wildlife species or subspecies which is threatened with extirpation from Utah or extiction resulting from very low or declining numbers, alteration and/or reduction of habitat, detrimental environmental changes, or any combination of the above. Continued long-term survival is unlikely without implementation of special measures. A management program is needed for these species if a Recovery Plan has not been developed.

E. **State Threatened Species:** any wildlife species or subspecies which is likely to become an endangered species within the foreseeable future throughout all or a significant part of its range in Utah or the world. A management program is needed for these species if a Recovery Plan has not been developed.

F. **Species of Special Concern:** any wildlife species or subspecies that: has experienced a substantial decrease in population, distribution and/or habitat availability **(SP)**, or occurs in limited areas and/or numbers due to a restricted or specialized habitat **(SD)**, or has both a declining population and a limited range **(SP/SD)**. A management program, including protection or enhancement, is needed for these species.

G. **Conservation Species:** any wildlife species or subspecies, except those species currently listed under the Endangered Species Act as Threatened or Endangered, that meets the state criteria of Endangered, Threatened or of Special Concern, but is currently receiving sufficient special management under a Conservation Agreement developed and/or implemented by the state to preclude its listing above. In the event that the conservation agreement is not implemented, the species will be elevated to the appropriate category.

Sensitive Bird Species of Utah

Extinct Species

Passenger Pigeon (*Ectopistes migratorius*)

State Endangered Species

American Peregrine Falcon (*Falco peregrinus anatum*)[1]
Southwestern Willow Flycatcher (*Empidonax traillii extimus*)[1]

State Threatened Species

Bald Eagle (*Haliaeetus leucocephalus*)[2]
Ferruginous Hawk (*Buteo regalis*)
Yellow-billed Cuckoo (*Coccyzus americanus occidentalis*)
Mexican Spotted Owl (*Strix occidentalis lucida*)[2]

Species of Special Concern

(SP: Due to declining populations)
Northern Goshawk (*Accipiter gentilis*)
Swainson's Hawk (*Buteo swainsoni*)
Caspian Tern (*Sterna caspia*)
Black Tern (*Chlidonias niger*)
Burrowing Owl (*Athene cunicularia*)
Common Yellowthroat (*Geothlypis trichas*)
Short-eared Owl (*Asio flammeus*)

(SD: Due to limited distribution)
American White Pelican (*Pelecanus erythrorhynchos*)
California Condor (*Gymnogyps californianus*)
Osprey (*Pandion haliaetus*)
Sharp-tailed Grouse (*Tympanuchus phasianellus columbianus*)
Williamson's Sapsucker (*Sphyrapicus thyroideus*)
Three-toed Woodpecker (*Picoides tridactylus*)

(SP/SD: Due to declining populations and limited distribution)
Sage Grouse (*Centrocerus urophasianus*)
Mountain Plover (*Charadrius montanus*)[3]
Long-billed Curlew (*Numenius americanus*)
Black Swift (*Cypseloides niger*)
Lewis' Woodpecker (*Melanerpes lewis*)
Crissal Thrasher (*Toxostoma crissale*)
Bell's Vireo (*Vireo bellii*)
Grasshopper Sparrow (*Ammodramus savannarum*)
Blue Grosbeak *(Guiraca caerulea)*
Bobolink *(Dolichonyx oryzivorus)*

[1] Species is federally listed as Endangered
[2] Species is federally listed as Threatened
[3] Species is federally listed as Candidate

Sensitive Mammal Species of Utah

Extirpated

Grizzly Bear (*Ursus arctos*)
Fisher (*Martes pennanti*)
Gray Wolf (*Canis lupus*)

State Endangered Species

Black-footed Ferret (*Mustela nigripes*)[1]

State Threatened Species

Utah Prairie Dog (*Cynomys parvidens*)[2]
Wolverine (*Gulo gulo*)

Species of Special Concern

(SP: Due to declining populations)
Spotted Bat (*Euderma maculatum*)

(SD: Due to limited distribution)
Allen's Big-eared Bat (*Idionycteris phyllotis*)
Fringed Myotis (*Myotis thysanodes*)
Dwarf Shrew (*Sorex nanus*)
Desert Shrew (*Notiosorex crawfordi*)
Abert's Squirrel (*Sciurus aberti navajo*)
Belding Ground Squirrel (*Spermophilus beldingi*)
Thirteen-lined Ground Squirrel (*Spermophilus tridecemlineatus*)
Spotted Ground Squirrel (*Spermophilus spilosoma*)
Wyoming Ground Squirrel (*Spermophilus elegans*)
Yellow Pine Chipmunk (*Tamias amoenus*)
Rock Pocket Mouse (*Chaetodipus intermedius*)
Olive-backed Pocket Mouse (*Perognathus fasciatus*)
Merriam's Kangaroo Rat (*Dipodomys merriami*)
Chisel-toothed Kangaroo Rat (*Dipodomys microps celsus*)
Cactus Mouse (*Peromyscus eremicus*)
Southern Grasshopper Mouse (*Onychomys torridus*)
Marten (*Martes americana*)
Pika (*Ochotona princeps*)
Ringtail (*Bassariscus astutus*)
Northern Flying Squirrel (*Glaucomys sabrinus*)

(SP/SD: Due to declining populations and limited distribution)
Western Red Bat (*Lasiurus blossevillii*)
Big Free-tailed Bat (*Nyctinomops macrotis*)
Brazilian Free-tailed Bat (*Tadarida brasiliensis mexicana*)
Townsend's Big-eared Bat (*Plecotus townsendii*)
Desert Kangaroo Rat (*Dipodomys deserti*)
Northern Rock Mouse (*Peromyscus nasutus*)
Stephen's Woodrat (*Neotoma stephensi*)
Virgin River Montane Vole (*Microtus montanus rivularis*)
Mexican vole (*Microtus mexicanus*)
Northern River Otter (*Lutra canadensis*)
North American Lynx (*Felis lynx canadensis*)

[1] Species is federally listed as Endangered
[2] Species is federally listed as Threatened

Sensitive Amphibian Species of Utah

Extinct Species

Relict Leopard Frog (*Rana onca*)

Species of Special Concern

(SP: Due to declining populations)
Boreal Toad (*Bufo boreas boreas*)[3]
Arizona Toad (*Bufo microscaphus microscaphus*)
Lowland Leopard Frog (*Rana yavapaiensis*)

(SD: Due to limited distribution)
Pacific Chorus Frog (*Pseudacris regilla*)

Conservation Species

Spotted Frog[3] (*Rana pretiosa*)

[3] Species is federally listed as Candidate

Sensitive Reptile Species of Utah

State Endangered Species

Banded Gila Monster (*Heloderma suspectus cinctum*)
Desert Tortoise (*Gopherus agassizii*)[2]

Species of Special Concern

(SP: Due to declining populations)
Utah Mountain Kingsnake (*Lampropeltis pyromelana infralabialis*)
Utah Milk Snake (*Lampropeltis triangulum taylori*)

(SD: Due to limited distribution)
Desert Iguana (*Dipsosaurus dorsalis*)
Utah Banded Gecko (*Coleonyx variegatus utahensis*)
Utah Night Lizard (*Xantusia vigilis utahensis*)
Desert Night Lizard (*Xantusia vigilis vigilis*)
Mojave Zebra-tailed Lizard (*Callisaurus draconoides rhodostictus*)
California Kingsnake (*Lampropeltis getula californiae*)
Southwestern Black-headed Snake (*Tantilla hobartsmithi*)
Desert Glossy Snake (*Arizona elegans eburnata*)
Painted Desert Glossy Snake (*Arizona elegans philipi*)
Sonora Lyre Snake (*Trimorphodon biscutatus lambda*)
Utah Blind Snake (*Leptotyphlops humilis utahensis*)
Mojave Patch-nosed Snake (*Salvadora hexalepis mojavensis*)
Southwestern Speckled Rattlesnake (*Crotalus mitchellii pyrrhus*)
Mojave Rattlesnake (*Crotalus scutulatus scutulatus*)
Mojave Desert Sidewinder (*Crotalus cerastes cerastes*)

(SP/SD: Due to declining populations and limited distribution)
Western Chuckwalla (*Sauromalus obesus obesus*)
Glen Canyon Chuckwalla (*Sauromalus obesus multiforaminatus*)
Many-lined Skink (*Eumeces multivirgatus gaigeae*)
Plateau Striped Whiptail (*Cnemidopherus velox*)
Great Plains Rat Snake (*Elaphe guttata emoryi*)
Smooth Green Snake (*Opheodrys vernalis*)

[2] Species is federally listed as Threatened

Sensitive Fish Species of Utah

Extinct

Utah Lake Sculpin (*Cottus echinatus*)

State Endangered Species

Bonytail (*Gila elegans*)[1]
Colorado Squawfish (*Ptychocheilus lucius*)[1]
Humpback Chub (*Gila cypha*)[1]
Razorback Sucker (*Xyrauchen texanus*)[1]
Woundfin (*Plagopterus argentissimus*)[1]
Virgin River Chub (*Gila seminuda*)[1]
June Sucker (*Chasmistes liorus*)[1]

State Threatened Species

Lahontan Cutthroat Trout (*Oncorhynchus clarki henshawi*)[2]
Roundtail Chub (*Gila robusta*)

Species of Special Concern

(SP: Due to declining populations)
Leatherside Chub (*Gila copei*)
Flannelmouth Sucker (*Catostomus latipinnis*)
Bluehead Sucker (*Catostomus discobolus*)

(SD: Due to limited distribution)
Bonneville Cisco (*Prosopium gemmiferum*)
Bonneville Whitefish (*Prosopium spilonotus*)
Bear Lake Whitefish (*Prosopium abyssicola*)
Bear Lake Sculpin (*Cottus extensus*)
Desert Sucker (*Catostomus clarki*)

Conservation Species

Colorado River Cutthroat Trout (*Oncorhynchus clarki pleuriticus*)
Bonneville Cutthroat Trout (*Oncorhynchus clarki utah*)
Virgin Spinedace (*Lepidomeda mollispinis mollispinis*)
Least Chub (*Iotichthys phlegethontis*)[3]

[1] Species is federally listed as Endangered
[2] Species is federally listed as Threatened
[3] Species is federally listed as Candidate

Sensitive Mollusk Species of Utah

State Endangered Species

Kanab Ambersnail (*Oxyloma haydeni kanabensis*)[1]
Fish Springs Pond Snail (*Stagnicola pilsbryi)*
Utah Valvata (*Valvata utahensis*)[1]

State Threatened Species

California Floater (*Anodota californiensis*)
Thickshell Pondsnail [Utah Band Snail] (*Stagnicola utahensis*)

Species of Special Concern

(SP: Due to declining population)
Round Mouth Valvata (*Valvata humeralis*)

(SD: Due to limited distribution)
Clinton Cave Snail (*Pristiloma subrupicola*)
Eureka Mountainsnail (*Oreohelix eurekensis eurekensis*)
Lyrate Mountainsnail (*Oreohelix haydeni haydeni*)
Ogden Rocky Mountainsnail (*Oreohelix peripherica wasatchensis*)[3]
Wet-rock Physa [Zion Canyon Snail] (*Physella zionis*)
Yavapai Mountainsnail (*Oreohelix yavapai*)

(SP/SD: Due to declining populations and limited distribution)
Brian Head Mountainsnail (*Oreohelix parowanensis*)
Fat-whorled Pondsnail (*Stagnicola bonnevillensis*)[3]
Utah Physa [Utah Bubble Snail] (*Physella utahensis*)
Uinta Mountainsnail (*Oreohelix eurekensis uinta*)
Desert Spring Snail (*Pyrgulopsis deserta*)
Fish Lake Physa Snail (*Physella microstriata*)

[1] Species is federally listed as Endangered
[3] Species is federally listed as Candidate

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