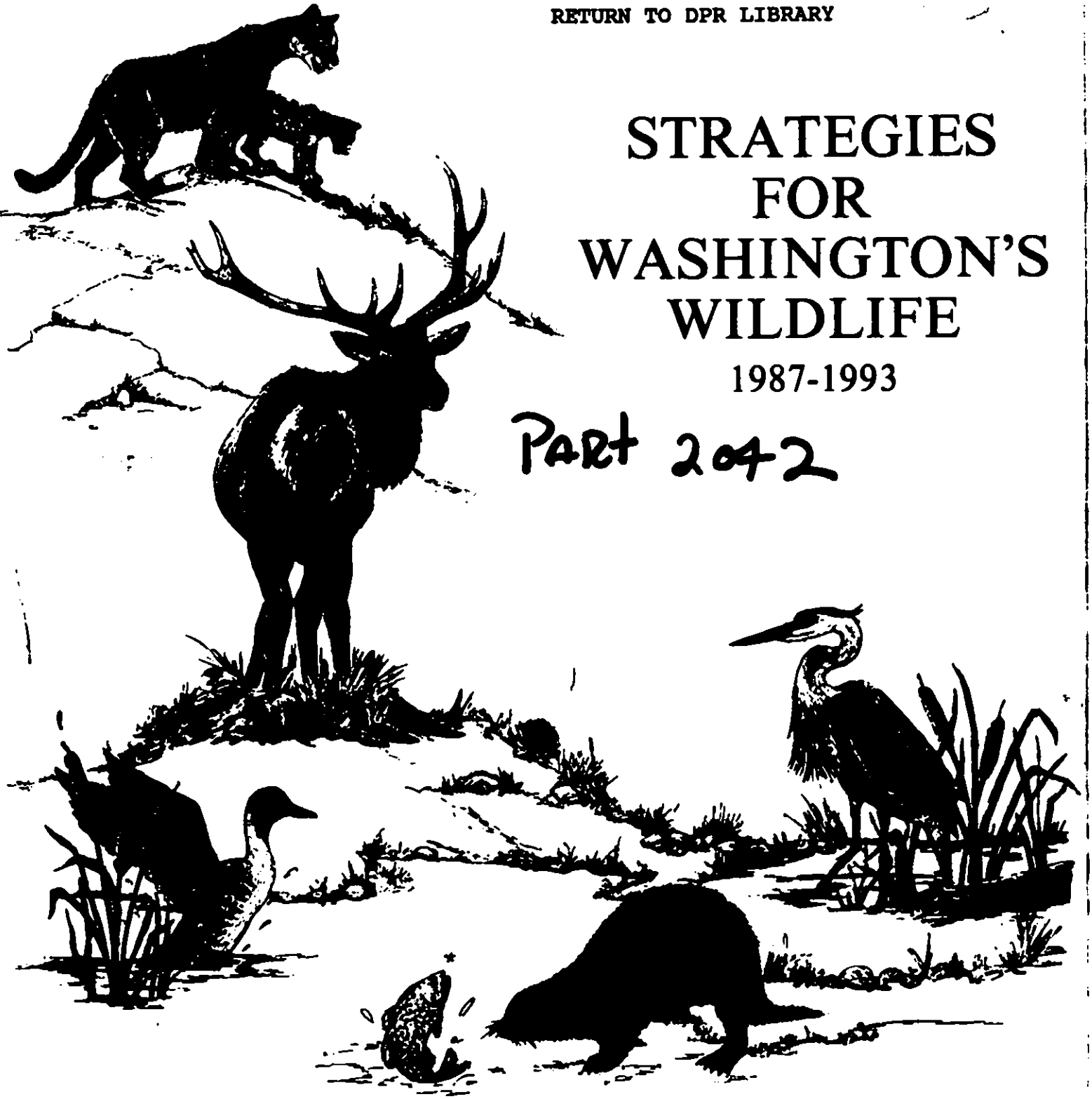
Comprehensive Plan

WA-42



STRATEGIES FOR WASHINGTON'S WILDLIFE

1987-1993

Part 2 of 2

Washington Department of Game

Serving Washington's wildlife and people- now and in the future

A Draft Strategic Plan
from the
Department of Game
May 1987

COLUMBIA RIVER SPIRE SNAIL

The Columbia River spire snail is one of few freshwater snails restricted to large rivers in the western United States. This species is found on granite boulders on the edges of the river in moderate current. It has been collected from many localities along the mainstem Columbia River as well as the Snake and Payette Rivers in Idaho. The previously known Idaho populations are now gone. In Washington, the spire snail is believed to occur only in the Hanford Reach. All other previously documented localities are now reservoirs behind dams. The Snake River in Washington may support still undiscovered populations.

GOAL

Identify all remaining populations and secure habitat protection to ensure persistence of the species as a component of Washington's wildlife heritage.

Objective

Ensure long term protection for all Columbia River spire snail habitat in Washington and establish populations in at least 3 distinct localities.

Problem

A variety of purposed events, including construction of the Ben Franklin dam in the Hanford Reach threaten Washington's only known population.

Strategy

Work to ensure protection for the last free-flowing stretch of the Columbia River. Cooperate with Idaho and Oregon in attempts to reestablish populations in these states. More widely distributed populations will render the species less vulnerable to extinction.

Problem

The distribution and size of existing populations are poorly known, making protection plans and monitoring programs impossible to develop.

Strategy

Conduct surveys to determine location and relative abundance of snails.

Problem

The biology, population dynamics, and ecological role of this species

are too poorly known to allow for an effective program to monitor population status.

Strategy

Conduct research aimed at developing a plan for monitoring the population's health and trends.

CHINQUAPIN HAIRSTREAK

The chinquapin hairstreak is a small golden brown butterfly. Its range extends north from Nevada and Arizona to southwest Idaho and southern Washington. In Washington this species is restricted in its distribution to stands of golden chinquapin, a large woody shrub. The golden chinquapin is known from several localities on the Gifford Pinchot National Forest and one locality near Hood Canal. However, the chinquapin hairstreak butterfly is only known to occur at one site in the Gifford Pinchot National Forest.

The Gifford Pinchot National Forest has recognized golden chinquapin as a sensitive species requiring special consideration in the management of the Forest. However, the small isolated population of butterflies is vulnerable to extermination resulting from any of a variety of conceivable natural or human-caused events.

GOAL

Increase the distribution of the chinquapin hairstreak to include all known suitable habitats. Secure protective management strategies for all populations.

Objective

Increase chinquapin hairstreak distribution to at least four distinct sites and establish long term management strategies for the protection of the populations.

Problem

The factors that limit the distribution of this species are not well known. In some areas where golden chinquapin is present, such as Hood Canal, other factors (not yet identified) may prevent the survival of the butterfly.

Strategies

a) Examine the characteristics at the established colony and compare with those of other potential habitats.

b) Consider the feasibility of enhancing potential habitats, if necessary.

c) Introduce butterflies to habitats deemed suitable.

Problem

Golden chinquapin, the host shrub, though currently managed as

sensitive due its rarity, is known to compete with economically valuable species.

Strategy

The chinquapin hairstreak may always be known from no more than a few localities in Washington. Work cooperatively with the U.S. Forest Service to ensure proper management of chinquapin habitats.

OREGON SILVERSPOT BUTTERFLY

The Oregon silverspot butterfly once inhabited scattered salt-spray meadow areas along the coasts of Washington and Oregon. Only two Oregon populations remain viable. In Washington, this butterfly formerly inhabited coastal meadows from Westport south to the Columbia river. In this area, all viable populations have been eliminated. Intensive searches have revealed but a handful of adult butterflies on the Long Beach Peninsula during late summer. This population is considered weak and nonviable.

The Oregon silverspot butterfly is linked closely to the occurrence of its larval food plant, the western blue violet (Viola adunca). Adult females deposit their eggs near these violets during late summer. During spring, larvae end diapause and begin to feed on the violets. After a two-month larval stage, the larvae move to well hidden shelter sites where they pupate. Two or more weeks later, the adult butterfly emerges and leaves the windy, cool meadow for sheltering areas and nectar sources.

Habitat destruction is clearly the cause of the Oregon silverspot's decline. Seaside meadow sites have been used for residential and business establishments, public parkland development, and parking areas or lawns. Excessive use of salt-spray meadows by grazing animals and off-road vehicles has also destroyed habitat.

GOAL

Increase the distribution of populations and overall numbers to ensure the persistence of the species as a component of Washington's wildlife heritage.

Objective

Establish at least one viable population in Washington.

Problem

The meadow habitat in the vicinity of the Long Beach Peninsula butterflies is privately-owned, development property that is degrading due to natural accumulation of mulch.

Strategy

Acquire meadow habitat and manage mulch build-up with fire to maintain

and improve meadow conditions for Viola adunca .

Problem

Adult nectaring and sheltering habitats are poorly known and may be vulnerable to alteration or in need of enhancement.

Strategy

Locate adult nectaring and sheltering habitats and evaluate protective and management needs.

Problem

Eisting weak population may not be recoverable.

Strategy

Investigate feasibility and necessity for reintroductions to enhanced habitats.

SENSITIVE SPECIES

(OFFICIAL AND PROPOSED)

SHREW SPECIES

MERRIAM'S SHREW

Merriam's shrew is found in Washington, Idaho, Montana, Wyoming, and northern Nevada. In Washington it is known only from shrub/steppe areas of the Columbia Basin and Snake River. This species inhabits much drier areas than do most shrews. However, its preferred habitat is being rapidly converted to agricultural use. As few specimens of this shrew have been found, little is known about the habits or population status of this small mammal.

PYGMY SHREW

The pygmy shrew is known from British Columbia, northeastern Washington, and the Rocky Mountains of Idaho and Montana. This species is only known in Washington from 13 specimens all collected within 15 miles of Loon Lake in Spokane and Stevens Counties. Pygmy shrews are found in habitats ranging from dry pine to riparian.

GOAL

Ensure that these species persist as components of Washington's wildlife heritage.

Objective

Establish Merriam's shrew populations at 100 distinct locations, establish pygmy shrew populations at 15 distinct locations.

Problem

Current information is inadequate to assess the population dynamics, status, or distribution of these species in the state.

Strategy

Determine an adequate method to assess the population status of these shrews.

Problem

The habitats where these shrews have been found are being converted to agricultural use.

Strategies

a) Work with county planners to provide habitat for these species.

b) Require suitable land to be left undeveloped as mitigation for

Irrigation projects being planned by federal agencies.

WESTERN GRAY SQUIRREL

Western gray squirrels are found from Central Washington south to northern Baja, Mexico. In Washington these squirrels occur in the Puget Trough from Pierce County south, and in scattered localities east of the Cascades from Lake Chelan to Klickitat County.

These squirrels avoid human habitation and are closely allied with oak, ponderosa pine, and other mast producing trees in open woodlands. Urban encroachment, fire suppression, and forest management activities have all taken their toll on the habitat of these animals. The introduced, more aggressive eastern gray squirrel has adapted to urban conditions and its range now comes very close to that of the western gray squirrel in several areas. As fragmentation of the oak and other mast producing lands occurs, the ranges of these two species will interface. The more aggressive eastern gray squirrel is expected to displace the more shy western species. Although the population of the western gray squirrel has declined, no estimate of its current numbers is available.

GOAL

Reverse the decline of the population of the western gray squirrel to ensure its perpetuation as a viable component of Washington's wildlife heritage.

Objective

Establish western gray squirrel populations at 50 distinct locations and ensure long term habitat protection at these sites.

Problem

Urbanization is encroaching on habitat on which the species is dependent.

Strategies

a) Work with county planners to discourage expansion into critical western gray squirrel habitat (sites containing mast producing trees).

b) Acquire suitable habitats near existing populations or in historic population areas.

Problem

Fragmentation of remaining western gray squirrel habitat impacts much

larger areas than that actually used by the housing development.

Strategies

a) Encourage planning which utilizes areas immediately adjacent to existing developments, rather than allowing expansion into areas potentially of value to western gray squirrels.

b) Encourage municipalities to control dogs and cats.

Problem

Fire suppression activities have allowed encroachment of conifers into oak and other mast producing areas.

Strategies

a) Work with landowners to remove conifers and replant with oak and other suitable trees.

b) Allow limited burns in areas where mast producing trees would be encouraged by fire.

c) Plant mast producing trees in appropriate locales.

WESTERN POCKET GOPHER

The western pocket gopher occurs in the western parts of Washington and Oregon, and from northwestern California, where it occurs in open prairies and similar areas with fine soil. The species ranges from sea level to over 5,000 feet in elevation. Subspecies of particular interest in Washington occur in remnant glacial outwash prairies of the Puget Sound Basin, in meadows of the Olympic National Park, and in a small area in the vicinity of an old burn in Wahkiakum county.

Gophers feed primarily on the roots and stems of forbs and grasses, which are pulled underground from tunnel systems. Occasionally shrub and tree roots are also eaten. Dirt is pushed from side tunnels of underground burrow systems and is fanned out around the entrance, which is then plugged.

Of the 8 subspecies originally described in Washington, 1 is now presumed extinct and 4 have been designated as sensitive due to their very limited distributions. The other 3 subspecies are known from more than one locality within their respective ranges and are thought to be secure.

GOAL

Ensure the persistence of viable populations of each subspecies in the state.

Objective

Establish 3 populations at distinct localities for each subspecies.

Problem

All of the subspecies of this gopher are isolated and the genetic affinities between them poorly understood.

Strategy

Determine the genetic affinities which exist between the subspecies in Washington.

Problem

The extremely limited range of each subspecies makes them vulnerable to alterations in their habitat.

Strategies

a) Determine the current distribution and locate unoccupied areas

with suitable soil types.

b) Assure that each subspecies occupies enough different sites within its range to ensure its viability by clearing/plowing suitable areas and transplanting individuals to these sites.

c) Support land use regulations favoring development compatible with each subspecies continued existence.

d) Work with landowners to encourage plowing small areas within the range of each subspecies to stimulate growth of preferred foods.

NORTHERN POCKET GOPHER

The northern pocket gopher ranges from the southern part of British Columbia to the southern part of the U.S. and from the Great Lakes west to the Cascade mountains. This gopher is found throughout all of eastern Washington, in a few areas on the western slopes of the Cascades, and as a disjunct population in Clark county. This population designated as Douglas pocket gopher, is found only near Brush Prairie, near Vancouver, where it inhabits open to semi-open meadows and prairies with soft soils suitable for burrowing.

Gophers feed on roots and stems of grasses and forbs and occasionally feed on roots of smaller shrubs and trees. Dirt is pushed from side tunnels of underground burrow systems and is fanned out around the entrance, which is then plugged.

Urban development has continued to encroach on the very limited habitat this gopher is dependent upon. Since the activities associated with urbanization are often in conflict with the habits of gophers, these limited populations are in jeopardy.

GOAL

Increase the population and distribution of this subspecies to ensure its existence as a viable component of Washington's wildlife heritage.

Objective

Maintain populations at 3 distinct localities in Clark County.

Problem

The Clark County population is disjunct from the majority of the species and the genetic relationships are unknown.

Strategy

Determine the genetic relationships which exist between this population and the majority of the species.

Problem

The limited distribution and increasing urbanization make this gopher vulnerable to extinction.

Strategies

a) Determine the current distribution and obtain an estimate of the population size.

b) Search for unoccupied, suitable areas in which to establish new populations.

c) Work with county planners and landowners in an effort to retain areas where these gophers can be secure.

d) Acquire critical habitat.

FISHER

Fishers are a member of the weasel family found throughout Canada, northeastern United States, along the Cascade and Olympic Mountains south through western Oregon to central California; and along the northern half of the Rocky Mountains. Throughout the United States, fisher populations declined in the early 1900's. The species was extirpated from Wisconsin and Michigan by the 1920's and virtually eliminated from New England by the 1930's. The drastic nationwide decline has been attributed to largescale and unregulated logging and burning of forests.

Fishers feed upon grouse, squirrels, hares, porcupines, mice, shrews, insects, fruits, fish, frogs, and small birds. Fishers require mature to old-growth forests with dense canopy covers at low to middle elevations.

The fisher is now scarce in Washington despite complete protection from trapping since 1933. It appears to be absent from the southern and eastern areas of the state. Since 1970 fishers have been reported from the Olympic Peninsula and Pacific county and from counties along both flanks of the Cascades.

GOAL

Increase the size and distribution of populations to ensure the persistence of the species as a component of Washington's wildlife heritage.

Objective

No measurable objective established.

Problem

Inadequate data exist to accurately assess current population levels.

Strategy

a) Support research contracts throughout state or key regions to run trapline capture/recapture surveys.

b) Solicit fisher sighting data from field personnel of land management agencies and trappers.

c) Hire a trapper to live trap for status assessment.

Problem

Current and past timber harvest patterns have greatly diminished suitable low elevation mature forest stands and remaining stands are often fragmented or isolated to such a degree that fisher movement patterns are curtailed.

Strategy

Work with timber harvest planners to maintain travel corridors of suitable habitat.

Problem

Low reproductive potential of this species makes incidental, non-natural mortality potentially significant.

Strategy

Continue to enforce protected status of this species.

Problem

Low reproductive potential of this species will not allow rapid recovery.

Strategies:

a) Acquire fisher from adjacent states to supplement stocks in cooperation with land management agencies.

b) Transplant fishers to suitable areas to establish new populations.

HARBOR PORPOISE

The harbor porpoise is the smallest of several species of cetaceans which can be found regularly in Washington's marine waters. Historically, harbor porpoise were present year-round as resident breeders and distributed widely throughout all inland and coastal marine regions.

In recent years numbers have declined, particularly in Puget Sound waters where this species is now seldom sighted. Because little is known about the natural history of the harbor porpoise in Washington, causes for declining numbers remain unclear. Potential causes which have been suggested include 1) loss of critical marine habitats through development and human activity, 2) increasing mortality rates due to gillnet entanglement, and 3) environmental pollution affecting reproductive capabilities.

GOAL

Maintain and restore, if possible, harbor porpoise population levels and distribution in Washington waters, particularly Puget Sound.

Objective

No measurable objective established.

Problem

Minimal information exists regarding abundance and distribution patterns in Washington waters.

Strategy

Conduct aerial, ground, and boat surveys to identify seasonal distribution, abundance and habitat use patterns.

Problem

Little is known about harbor porpoise population reproduction and mortality rates.

Strategies

a) Monitor productivity and reproductive parameters to establish population trends.

b) Identify human related mortality causes (including gillnet entanglement) and develop methods to reduce human related mortality.

Problem

Harbor porpoise are sensitive to human activities and disturbance.

Strategy

a) Educate public to reduce harassment.

b) Increase enforcement emphasis.

Problem

Harbor porpoises may be susceptible to environmental pollutants which may affect reproduction rates.

Strategy

Monitor contaminant levels from stranded or incidentally taken harbor porpoise to identify and eliminate sources of pollution.

BRANDT'S CORMORANT

Brandt's cormorants are found primarily on the northeastern Pacific Coast, scattered and uncommon from southern British Columbia to Baja California. This cormorant nests on rocky islands off the coast and feeds on fish in open water, channels, reefs, estuaries, and entrances to major channels.

In Washington Brandt's cormorant is a fairly common resident along the coast. Historically they nested in the San Juan Islands and other portions of Puget Sound, but they have now been extirpated from the Sound as a breeding species. This is the least common of the three cormorant species nesting on the Washington coast. Brandt's cormorants may be particularly susceptible to human disturbance since all San Juan historical breeding locations are heavily used by recreationists during the summer. In 1980 there were an estimated 269 breeding pairs of Brandt's cormorants in Washington.

GOAL

Maintain the size and distribution of the breeding population to ensure the persistence of this species as a component of Washington's wildlife heritage.

Objective

Maintain nesting distribution along Pacific Coast and establish nesting colonies at 3 localities in the San Juan Islands.

Problem

Nesting cormorants are vulnerable to human disturbance and nesting sites may have been lost as a result.

Strategies

a) Work to protect cormorant nesting sites through signing and enforce protective laws to reduce harassment at or near breeding sites.

b) Develop an information and education program and public relations program to educate the public about cormormants and seabirds in general.

c) Establish an "Adopt-a-Refuge" program where citizens can act as colony stewards.

d) Rehabilitate and/or acquire previously used nest sites to

encourage renesting.

Problem

The relationship between population size and distribution and human disturbance is not well understood.

Strategies

a) Continue monitoring population trends.

b) Conduct research on the basic effects of human disturbance on seabirds.

NORTHERN GOSHAWK

The distribution of the northern goshawk is circumpolar in the northern hemisphere. In western North America it occurs from Alaska south through the Rocky Mountains to New Mexico, and in the forests of Washington, Oregon, and California. It is migratory and winters south to northern Mexico.

The goshawk is a rare resident and breeder in dense coniferous forests of Washington. It typically breeds in mature or old-growth stands of conifer forest. Deciduous and second-growth coniferous stands are uncommonly used for nesting.

GOAL

Maintain goshawk populations at current levels.

Objective

Identify and ensure long term protection of at least 200 nesting pairs, at least 25 should be in the Olympic Peninsula.

Problem

The size of the current goshawk population in Washington is unknown, and the density of nesting within the different habitats in Washington has never been measured.

Strategies

a) Census population to determine breeding status.

b) Survey different nesting habitats to estimate nesting densities.

Problem

Nesting pairs return to the same nesting area year after year, and the northern goshawk is especially sensitve to timber harvest in the vicinty of their nest, and require a minimum size stand of suitable timber.

Strategy

Protect all nest sites leaving a minimum of 50 ha of undisturbed timber around nest.

Problem

The preferred breeding habitat of northern goshawks is multi-layered mature stands of timber. These stands are rapidly being replaced by short rotations of young timber stands, which will reduce the available suitable habitat.

Strategies

a) Encourage retention of stands of old-growth forest in areas where goshawks occur.

b) Determine the silvicultural methods which could produce suitable habitat within commercial forest management practices, (such as extended rotations).

c) Provide financial incentives to retain goshawk habitat.

SWAINSON'S HAWK

The Swainson's hawk breeds from Alaska south to the Mexican plateau, and winters mainly in Argentina. In Washington it summers regularly in the arid open country east of the Cascade Mountains and irregularly west of the Cascades.

This species is associated with the drier steppe region, and commonly nests in black locust, hawthorn, box elder, Russian olive, cottonwood, willow, and juniper. It forages over cultivated and uncultivated land, with low density plant cover areas usually selected. The availability of nesting trees has declined due to clearing, and natural mortality of trees without replacement. Also its productivity has declined in predominately cultivated habitat.

GOAL

Maintain a healthy Swainson's hawk population in Washington.

Objective

Maintain a breeding population of at least 400 pairs in Washington.

Problem

The number of trees for nesting is currently on the decline and current farming practices are not producing replacements.

Strategy

Encourage changes in farming practices which retain, replace, and protect nesting trees. Plant trees in suitable habitat

Problem

Swainson's hawk nesting productivity is lower in areas of largely cultivated land. Increasing proportions of land under intensive cultivation will potentially affect the population.

Strategies

a) Determine causes of decline in productivity in cultivated habitat.

b) Reduce human disturbance around nest sites.

c) Survey population periodically for status and trends.

d) Provide incentives through CRP program to plant and retain nesting habitat.

GOLDEN EAGLE

The golden eagle inhabits mountains and rangelands of western North America from Alaska to Mexico. It is also found in the northeastern states, but is rare. The northern populations are migratory.

Washington may be near the edge of the golden eagle's breeding range. Although its numbers are low, they were probably never very common in this state. Although it breeds at scattered locations in western Washington, it is usually found in the arid interior of eastern Washington.

The golden eagle utilizes open country throughout the state from subalpine forest to ocean beaches, and is probably most numerous in grain fields, and sagebrush areas of the arid interior. For nesting they primarily utilize cliffs in eastern Washington, and large trees adjacent to open areas in western Washington.

In western Washington, 10 of 17 nest sites were occupied in 1985. Statewide, only 79 of 182 territories surveyed were occupied.
It is considered a "species of special emphasis" by the U.S. Fish and Wildlife Service.

GOAL

Prevent population decline of the golden eagle in Washington.

Objective

Maintain at least 100 breeding pairs of golden eagles in Washington.

Problem

Habitat development is encroaching upon many nesting sites and nest site foraging areas, and contributing to loss of productivity.

Strategy

Protect nest sites.

Problem

The size of the golden eagle population is not certain, and it is not known whether the numbers are declining.

Strategy

Census population annually for population size and trends statewide.

Problem

The factors contributing to the vacancy of nesting territories and reduced population size are not known.

Strategies

a) Conduct pesticide analysis on preferred prey items to determine contaminant loads.

b) Assay golden eagle carcasses for contaminants.

c) Determine impact of chemicals in prey associated with predator control.

d) Examine habitat changes around successful and unsuccessful nesting territories using LANDSAT and other methods.

e) Determine foraging area and habitat components at successful and unsuccessful nesting territories, using radiotelemetry and other methods.

f) Identify prey utilization at successful nests and unsuccessful nesting territories.

Problem

Illegal shooting and other human disturbances potentially threaten the long-term survival of this species.

Strategies

a) Enforce regulations prohibiting the taking of protected species.

b) Work with landowners to reduce disturbance of known nesting sites, feeding areas, etc.

MARBLED MURRELET

The marbled murrelet breeds along the Pacific Coast from southeastern Alaska to northwestern California. They are found on marine waters of the open coast and bays and harbors along the entire coast and tend to frequent inner coastal waters more than most other members of the family Alcidae. The murrelets feed on fish such as sandlance and seaperch, as well as shrimp and other small crustaceans.

The nesting habits of marbled murrelets are poorly known. Preliminary evidence however, shows them to use both coastal and interior old-growth and mature forest stands, nesting either on a limb or in a cavity. One ground nest was located on Barren Island in Alaska. Evidence also shows the birds fly as far as 40 miles inland to nest.

Marbled murrelets are abundant in the coastal waters of Washington and Puget Sound during the summer months. Although no actual nests have been found, nest areas have been identified through the recovery of young in Pacific, Grays Harbor, Pierce, and King counties in recent years.

GOAL

Maintain population size and distribution to ensure persistence of this species as a component of Washington's wildlife heritage.

Objective

Collect sufficient information to develop a measurable objective.

Problem

The number of nesting pairs of marbled murrelets in the state is not known.

Strategy

Conduct radio-telemetry studies and censuses to identify nesting habitat and document numbers of breeding pairs.

Problem

Evidence suggests that marbled murrelets nest in mature (80-200 yrs) and old-growth (200-400 yrs) timber stands, habitat that is rapidly declining in availability in the Northwest, especially near the coast.

Strategy

Work with other natural resource management agencies to develop

management plans that will preserve some old-growth mosaic.

Problem

Preliminary evidence from Oregon and Washington indicates that marbled murrelets will nest in small old-growth stands up to 50 km inland as well as stands near the shoreline.

Strategies

a) Work with other management agencies to preserve small, dense continuous patches of old-growth along or near shorelines, as well as interior stands.

   1) Work to ensure through these plans that the stands left are permanent and protected from loss through wind damage.

   2) Develop mitigation plans in the event stands are lost or degraded.

b) Work with other agencies to prohibit variances or waivers for extensive cutting in old-growth strands.

Problem

Hundreds of marbled murrelets, as well as other seabirds, are killed each year by gill nets and other fisheries interactions.

Strategies

a) Educate the gill netting industry and the general public about marbled murrelets and work to develop means to avoid large losses of these seabirds.

b) Strictly enforce laws protecting the murrelets.

FLAMMULATED OWL

The flammulated owl is found from the interior forests of British Columbia through the Rocky Mountains and in the Pacific states from the Cascade Mountains to the mountains of the Mexican plateau. In Washington it is presumed to be a resident and breeder in the eastern Cascade Mountains, the Blue Mountains and in northeastern Washington. It uses mixed coniferous forests of Ponderosa pine, grand fir, and Douglas fir, with multiple canopy layers. The uppermost layer, usually old-growth, is chosen for nesting sites.

Snags are important to this species, since it needs cavities for nest sites. The preferred tree species is Ponderosa pine. This species is rare to uncommon from mid-March to August, as an uncommon breeder in dry coniferous forest. It is very rare or absent at other times of the year. It is considered a rare resident in eastern Washington. Existing data suggest prevalent timber management and harvest methods will cause further declines of this species' breeding habitat.

GOAL

Maintain the current population of flammulated owls in Washington and prevent it from becoming threatened.

Objective

Collect sufficient data to develop a measurable objective.

Problem

The population size of the flammulated owl in Washington is unknown.

Strategy

Survey selected habitat to determine occurrence of nesting flammulated owl.

Problem

The habitat requirements for the flammulated owl in Washington are unknown.

Strategies

a) Determine habitat relationships, nesting requirements, and food habits.

b) Determine how current forest practices affect the flammulated owl in Washington.

BURROWING OWL

The burrowing owl can be found throughout the west from southwest Canada to Central and South America. It is also found as a disjunct population in Florida. In Washington it occurs primarily in the open arid interior of eastern Washington. Although colonies did occur west of the Cascade Mountains historically (Moon Island, Grays Harbor) they are now extirpated from the westside. In eastern Washington they are mostly limited to the shrub/steppe habitat.

It is an uncommon breeder in Washington. It is found in much reduced numbers in central Washington because of reclamation projects. With agricultural development of the plains and prairies, it is much less common than formerly in interior Washington. Loss of habitat is a major concern, along with prey availability. Low vegetation, and soils capable of supporting burrows are essential, and these are becoming less common with increases in agriculture.

GOAL

Maintain the current nesting population of burrowing owls in Washington.

Objective

Locate and maintain at least 300 active nesting sites.

Problem

Agricultural practices are modifying burrowing owl nesting habitat and in many cases causing the loss of nesting pairs.

Strategies

a) Perform baseline status surveys to determine population size, and populaton trends.

b) Identify areas where habitat protection is needed to preserve burrowing owl nesting habitat.

c) Acquire habitat through purchase, lease, easement, etc.

VAUX'S SWIFT

The Vaux's swift ranges from the southern tip of the Alaskan panhandle to central California but is largely confined to the coastal ranges. It is also found in Central and South America.

This species nests primarily in tall, hollow snags but with the decline of mature and old-growth forest stands this species has been known to occasionally nest in chimneys. This species is most abundant in old-growth forests where it forages in airways above stream corridors, bodies of water, forest openings, and just above the forest canopy. During its fall migration it forms large flocks and roosts communally in chimneys or natural cavities. Migratory roosts have been observed containing over 1500 individuals.

In western Washington this species has been reported in all but 2 counties - San Juan and Wahkiakum. East of the Cascade Crest it has been reported from Chelan, Columbia, Okanogan, Pend Oreille, Spokane, Stevens, Walla Walla, and Yakima counties. Although sightings of this species are widely distributed throughout forested areas of Washington, it is seldom observed nesting. To date, we know very little about actual nesting areas or their characteristics. This species' apparent preference for old-growth is cause for concern as these stands become increasingly scarce.

GOAL

Maintain viable populations of this species in forested regions of Washington to ensure its persistence as a part of Washington's wildlife heritage.

Objective

Locate and maintain 100 natural nesting sites, and ensure preservation of snags with cavities in these areas.

Problem

This species is an inconspicuous nester. Few sites are currently known.

Strategy

Coordinate surveys of old-growth riparian habitats during this

species' breeding period. Investigate all snags where swifts are seen entering and exiting cavities.

Problem

This species depends upon large, mature or old-growth snags for natural nest sites. With the decline of such stands from timber harvesting and the demand for fire wood, large snags are becoming increasingly scarce.

Strategy

Promote the retention of mature and old-growth stands as buffers to stream corridors and bodies or water. Protect individual nesting snags with signs and increased public awareness.

WOODPECKER SPECIES

WHITE-HEADED WOODPECKER

The White-headed woodpecker ranges from southern British Columbia and Idaho to southern California. In Washington this species is primarily found in Ponderosa pine forests east of the Cascade Mountains. It prefers hard shelled, but internally decayed, trees for nesting and foraging. Excess cavities produced by this species are used by other forest cavity dwelling animals. The primary food of this species is ponderosa pine seeds.

PILEATED WOODPECKER

The pileated woodpecker breeds across the continent in the Canadian taiga; and in the coastal forests, south to Oregon and California. It is found throughout the forested regions of Washington. Optimum conditions for foraging and nesting for this species are found in old-growth Douglas fir and western hemlock ecosystems. The population of Pileated woodpeckers has declined as these ecosystems, characterized by large snags and fallen trees, have declined. They feed on a wide variety of insects which can affect growing trees.

Excess cavities produced by this woodpecker are used by a wide variety of other species which cannot excavate their own nesting sites, thus assisting in maintaining the species diversity in the forest environment.

LEWIS' WOODPECKER

The Lewis' woodpecker inhabits dry areas of the West from southern British Columbia, south to northern Arizona and south-central Oregon. In Washington, this species is primarily found east of the Cascade mountains. Historically this woodpecker was more abundant as a summer resident and breeder on the westside of the cascades than now.

Lewis' woodpeckers are found in open or broken coniferous forests, particularly in dry foothills country and in semi-forested mountains. Recent burns have been identified as being important in attracting the species and maintaining its presence. Oak groves have also been identified as being important for the species. Because the species is a weak excavator, it is dependent on excess cavities produced by other species or the presence of soft snags.

Changing forest practices leave fewer potential trees capable of supporting these woodpeckers, and the other species which are dependent on them for cavities. As a consequence these species are declining in this state.

GOAL

Ensure the perpetuation of these species as viable components of Washington's wildlife heritage.

Objective

Collect suffient information on these species to develop measurable objectives.

Problem

The current populations and distribution of these species are largely unknown.

Strategy

Design and implement methods for determining population sizes and distributions of these species.

Problem

Old-growth forests are being logged and replaced with forests which are unsuitable for pileated and white-headed woodpeckers.

Strategies

a) Protect patches of old-growth timber, well distributed over the landscape to provide for genetic exchange between populations.

b) Work with federal and state land managers to include provisions for retaining snags, future snags, and downed material in their forest planning process.

c) Encourage private landowners to retain snags during the review

of forest practices applications.

d) After natural fires, work with landowners to encourage the retention of snags and stumps for woodpecker use during the process of forest regeneration.

e) Encourage a limited let burn policy in wilderness areas and National Parks and retain remaining snags, stumps, and downed material for woodpecker use.

Problem

Shorter timber rotation cycles limit the size and life expectancy of snags, snags are often viewed as valueless "danger" trees and are often cut for safety or firewood.

Strategies

a) Inform landowners of the role woodpeckers play in controlling detrimental insects.

b) Encourage landowners to retain snags and allow some trees to be saved for future snags.

Problem

Introduced species of birds compete with the Lewis' woodpecker for cavities and may limit populations of this woodpecker.

Strategies

a) Where feasible, encourage control of introduced species.

b) Encourage landowners to incorporate the needs of this woodpecker in their management plans.

PURPLE MARTIN

The purple martin ranges from southern Canada to northern Mexico but is scarce in the West. Preferring wooded habitats, it is not found in the Central Plateau and its mountain chain borders. Throughout much of the West this species is becoming increasingly sparse, probably due to competition with house sparrows and starlings for nesting cavities.

Purple martins require nest cavities in trees, snags, or buildings usually near large, open bodies of water. This species also readily uses artificial nest sites if constructed to the appropriate dimensions and situated in suitable shoreline habitats.

In Washington the purple martin is an irregular, local breeder predominately west of the Cascades. In the early 1900's, purple martins became more widespread and abundant with the development of cities. Early authors reported martins inhabiting the business districts of cities from Bellingham south to Olympia. The decline of these populations is attributed to the influx of starlings and house sparrows.

GOAL

Increase the size and distribution of populations to ensure the persistence of this species as a component of Washington's wildlife heritage.

Objective

Establish breeding colonies of 5 or more breeding pairs at 30 distinct localities.

Problem

Few natural martin colonies are known. This may be an artifact of limited search effort or poor reporting of known sites.

Strategies

a) Emphasize to the amateur birding community and to field biologists the importance of reporting all observed natural and artificial nesting colonies.

b) Implement volunteer surveys of shoreline habitats.

Problem

Martin numbers may be so low and colonies so sparsely distributed that

existing habitats are under utilized.

Strategies

a) Collect, organize, and distribute plans for martin nest boxes.

b) Encourage birding clubs, scout troops, and service organizations to erect and maintain martin boxes in suitable habitats.

c) Contact marina owners throughout Puget Sound and persuade them to permit erection of martin boxes.

Problem

There may be insufficient natural nesting cavities to allow martins to increase their distribution to natural sites.

Strategies

a) Encourage timber land managers and harvesters to retain snags in riparian and shoreline habitats.

b) Develop and implement snag creation and retention policies with DNR and USFS pertinent to shoreline habitats.

WESTERN BLUEBIRD

The western bluebird ranges from southwestern Canada through the western U.S. to Mexico. This species inhabits coniferous or deciduous forests, oak woodlands, mixed forest types with low percent canopy coverage, and throughout much of the West is becoming increasingly scarse, probably due to competition with house sparrows and starlings for nesting cavities.

Western bluebirds require trees or snags with cavities for nesting in open timbered terrain, but also readily use artificial nest sites if constructed to the proper dimensions and situated in appropriate habitats.

In Washington, the western bluebird is widely distributed in the dry coniferous forests east of the Cascade Crest. In western Washington it has become an uncommon, local breeder, although historically, western bluebirds were abundant and widespread in western Washington. The decline of these populations is attributed to a loss of snags for nesting and competition for nesting cavities from starlings and house sparrows.

GOAL

Increase the size and distribution of populations to ensure the persistence of this species as a component of Washington's wildlife heritage.

Objective

Establish bluebird nesting at 50 distinct localities in western Washington, distributed over at least 8 counties.

Problem

Few natural westside nest sites are known, which may be due to limited search effort or poor reporting of known sites.

Strategies

a) Emphasize to the amateur birding community and to field biologists the importance of reporting all observed natural and artificial nesting sites.

b) Implement volunteer surveys of appropriate habitats.

Problem

Bluebird numbers may be so low in western Washington that existing habitats are underutilized.

Strategies

a) Collect, organize, and distribute plans for bluebird nest boxes.

b) Encourage birding clubs, scout troops, etc. to erect and maintain boxes in appropriate habitats.

SHRUB/STEPPE PASSERINES

SAGE THRASHER

The sage thrasher is a bird of the arid sagebrush regions of the west. It nests from southern British Columbia and Southeastern Saskatchewan south to northern Arizona and winters from southern California to southern Texas and northern Mexico.

Sage thrashers are confined to areas with sagebrush cover and are found in expanses of sage/shrub habitat remaining in eastern Washington. Becuase of the erosion of sage/shrub habitat, this species is uncommon and localized in distribution.

Sage thrashers feed heavily on grasshoppers, beetles, and other insects in the spring and on fruit in the summer.

LOGGERHEAD SHRIKE

The loggerhead shrike is found throughout the continental United States, from southern Canada to southern Mexico. In Washington, it occurs as a winter straggler both east and west of the Cascades. In summer, it occurs mostly in eastern Washington, where it is considered a resident species. This species is found in open, arid country, often in sagebrush and juniper habitats. It frequently inhabits cultivated areas in summer, where it uses densely foliated trees and shrubs for nesting. Numerous perching sites are thought to be an important component of its habitat.

It feeds primarily upon large insects, but will take mice and small birds when insects are not abundant. Breeding bird surveys document declines of the species in all parts of its breeding range.

GREEN-TAILED TOWHEE

Green-tailed towhees breed from central Oregon south through mountainous terrain to southern California and west Texas. They

winter in the more southerly parts of California, Arizona, and Texas and into Mexico.

The green-tailed towhee is a bird of dense brush, open pine or sage habitats, on mountain sides or high plateaus. Washington is on the periphery of the species' breeding range and the status of the green-tailed towhee here is largely unknown. The only confirmed historical breeding records for the state come from the Blue Mountains in the southeastern portion of Washington.

SAGE SPARROW

The sage sparrow breeds from southeastern Washington west to northwestern Colorado, south to Baja California and other parts of the arid Southwest. It winters from the southwestern states south to northern Mexico.

Sage sparrows are associated with arid sagebrush habitats, and areas of bunchgrass. This type of habitat is especially critical as nesting habitat. The birds are mostly insectivorous during the spring and summer.

This species is a summer resident of the more arid portions of eastern Washington, primarily the Columbia Basin. Historically common throughout the sagebrush and bunchgrass habitats of eastern Washington, it is now considered uncommon due to the erosion of shrub/steppe habitat through land conversion.

GOAL

Maintain the breeding population size and distribution to ensure persistence of these species as components of Washington's wildlife heritage.

Objective

Collect sufficient information on these species to develop measurable objectives.

Problem

There are few data available on these species populations.

Strategy

Conduct surveys to document distribution and densities of these species in eastern Washington.

Problem

These passerines are dependent upon shrub/steppe habitats for nesting. Washington's shrub/steppe habitat is rapidly being lost through conversion to other uses.

Strategies

a) Identify the distribution remaining high quality shrub/steppe habitat in eastern Washington.
   1) Maintain patches of high quality shrub/steppe of at least 10 acres in size, large enough for an entire breeding territory.
   2) Confine unavoidable brush removal to irregular strips or patches less than 100 m wide.

b) Work with landowners to develop management plans to prevent further habitat loss or degradation.

c) Acquire critical habitat if possible.

d) Encourage retention and rehabilitation of shrub/steppe habitats through CRP program.

Problem

The spraying of biocides reduces insect populations and shrub cover and is detrimental to sage thrasher populations.

Strategy

Work with landowners and management agencies to avoid unnecessary herbicide and pesticide application.

CALIFORNIA MOUNTAIN KINGSNAKE

The California mountain kingsnake is one of the most attractive snakes found in the Northwest, having a bright pattern of red, white, and black bands. The Washington population is restricted to the vicinity of the Columbia River gorge. It is not poisonous.

The habitat requirements of the kingsnake are poorly known, though it is usually found inside rotting logs or under rocks. Concern for this species is based solely on its restricted range and apparent low population level. These factors render the species vulnerable to extirpation from land use changes that impact critical habitat features.

GOAL

Ensure that the California mountain kingsnake persists as a component of Washington's wildlife heritage.

Objective

Maintain 15 populations at distinct localities.

Problem

The life history and habitat requirements of this species in Washington are too poorly known to allow development of strategies for the protection of current population.

Strategy

Conduct research to answer management questions. Use research results to develop habitat protection plan.

Problem

Because of the inherent rarity of the species, surveys to monitor the population are likely to be an inefficient use of available resources.

Strategy

Development informational materials and present educational programs to the community which emphasize the need to report sightings to the Department of Game.

STRIPED WHIPSNAKE

The striped whipsnake is found throughout much of the arid interior regions of the western United States. It inhabits grasslands, sagebrush flats, and dry rocky canyons. Originally, this snake was distributed over much of the dry Columbia Basin region. Today, agricultural uses of these lands have displaced the striped whipsnake. Only Ginkgo State Park and the Hanford Reservation are known to support sustainable populations.

GOAL

Ensure persistence of the striped whipsnake as a component of Washington's wildlife heritage.

Objective

Establish 10 protected striped whipsnake populations in the Columbia Basin.

Problem

Much potential striped whipsnake habitat remains as fragmented pieces of native plant communities. However, it is not known how many of these habitats currently support this snake or whether any of them are capable of supportion populations in the future.

Strategy

Survey potential habitats to determine the current distribution of this species. Conduct basic ecological studies to determine habitat needs and population support requirements.

Problem

Too much habitat may have already be lost to allow for establishment of new populations.

Strategy

Some agricultural lands could be purchased and restored to conditions suitable for this species. Priority would be given to areas adjacent to already suitable habitats and agricultural lands already marginal in terms of productivity. Whipsnakes could be introduced to new appropriate habitats.

DUNN'S SALAMANDER

Dunn's salamander is one of the largest woodland salamanders in the Pacific northwest. It is associated with rocks, along streams, waterfalls, or in talus. It is widely distributed over western Oregon, but is thought to be restricted to a small area in the extreme southwest portion of Washington, which is privately owned land and much of it managed for timber production. The effects of clear-cutting, herbicide applications, and other land use practices on this species are not well known.

GOAL

Maintain Dunn's salamander populations at levels that ensure its persistence as a component of Washington's wildlife heritage.

Objective

Maintain and protect populations in at least 10 distinct localities distributed over Wahkiakum, Pacific, and west Lewis counties.

Problem

Many areas where Dunn's salamanders once occurred have not been recently surveyed for the presence of the species and condition of the habitat.

Strategy

Survey historic collection localities for presence of Dunn's salamanders and condition of the habitat.

Problem

Knowledge of the species' ecology is not sufficient to allow formulation of a valid species preservation plan on a site by site basis.

Strategy

Conduct research into this species' microhabitat and general habitat requirements. Describe local land uses and their effects on Dunn's salamander.

Problem

Most Dunn's salamander habitat is privately owned. Landowners may have objectives incompatible with the protection needs of the salamander.

Strategy

After thorough evaluation of the species' overall range and protection

needs in Washington, consider purchase of higher quality habitats where necessary to achieve objective.

VAN DYKE'S SALAMANDER

Van Dyke's salamanders are known from just two areas in North America, the Idaho Panhandle/western Montana vicinity and western Washington. They inhabit streamsides and wet talus slopes. Although widely distributed in western Washington, populations are small. Scientists have been unable to locate this species in several areas where it previously occurred.

GOAL

Manage for sufficient number and distribution of populations to ensure persistence of the species as a component of Washington's wildlife heritage.

Objective

Protect the 17 known populations and establish at least 10 new populations in appropriately managed habitats distributed through the south Cascade mountains, the Olympic peninsula, and southwest Washington.

Problem

Suspected disappearance of this species from several former habitats needs to be confirmed and the causes investigated to better understand the status of the species and its management needs.

Strategy

Survey and describe current conditions at each locality where the species historically occurred. Determine habitat and environmental conditions most suitable to the presence of this salamander.

Problem

Hypothetically suitable habitats do not now support Van Dyke's salamander populations.

Strategy

Transfer gravid females or egg masses and brooding adult from healthy population to new suitable habitats. Monitor success of transplants.

SPOTTED FROG

The spotted frog is a medium-sized, highly aquatic frog found along marshy margins of lakes, ponds, and streams. The species is widely distributed in western Canada and the western United States. It was once widespread in forested regions of Washington, but appears to have been extirpated from western Washington. The key cause of the spotted frog's disappearance is thought to the introduction of bull frogs, which are capable predators, feeding on many small vertebrates.

GOAL

Establish spotted frog populations in former habitats of western Washington and eliminate threats to ensure the persistence of the species as component of Washington's wildlife heritage.

Objective

Establish at least 15 populations at distinct and widely distributed localities in western Washington and eliminate threats to these populations.

Problem

Bullfrogs, the apparent cause of the spotted frog's decline, are now well established in western Washington.

Strategy

Spotted frogs may be able to tolerate the presence of a few bullfrogs, but some level of bullfrog control is probably necessary for the survival of spotted frogs. It may be possible to find landowners with good habitat who are also willing to help in controlling bullfrog populations. Such sites could be used in early reintroduction experiments.

OLYMPIC MUDMINNOW

The Olympic mudminnow is a small primitive fish that lives in quiet freshwater marshes, swamps, oxbows, and backwaters. It occurs in western Washington and nowhere else. Although many wetlands that once supported populations are now gone, this species is still abundant where it is found. In addition, the mudminnow cannot survive the presence of introduced predatory fishes such as bass, crappie, sunfish, and catfish. Recently, aquarists in Europe have discovered the Olympic mudminnow as an interesting and attractive aquarium fish and commercial interests have developed which may impact wild stocks.

GOAL

Maintain populations at current levels to ensure persistence of the Olympic mudminnow as a component of Washington's wildlife heritage.

Objective

Protect 80 known mudminnow sites, and maintain distribution of populations over Grays Harbor, Jefferson, Thurston, Lewis, and Clallam counties.

Problem

Mudminnows are eliminated where non-native piscivorous species are introduced into mudminnow habitat.

Strategy

Prohibit introduction of new species into drainages supporting mudminnow populations.

Problem

Commercial exploitation of wild stocks could potentially decimate local populations.

Strategy

Manage harvest. Monitor populations in areas where harvest occurs.

Problem

Wetland drainage, pollution, filling, and other relatively common practices degrade wetland environments and destroy habitat for the Olympic mudminnow.

Strategy

Cooperate with local authorities in developing and enforcing regulations that maintain healthy wetland communities.

INSECT SPECIES

BELLER'S GROUND BEETLE

The Beller's ground beetle is known from only 7 bogs in the Pacific Northwest. It occurs nowhere else in the world. It is believed extirpated from at least one of its former habitats and two others are threatened by inundation behind a dam.

HATCH'S CLICK BEETLE

The Hatch's click beetle in known from two bogs in Washington and nowhere else. It is believed extirpated from one of these former habitats.

LONG-HORNED LEAF BEETLE

The long-horned leaf beetle inhabits sphagnum bogs. It once occurred in Chase Lake bog in Snohomish County. It is known from nowhere else in the world. Chase Lake bog has been significantly altered since the time that this beetle was known to survive here. Further investigations are needed to determine whether or not this species is extinct.

GOAL

Secure protection of these species' habitats to ensure persistence of these species as components of Washington's wildlife heritage.

Objective

Maintain habitat in at least 10 bogs where these species are found.

Problem

Currently, only a few populations are known in Washington.

Strategy

Survey lowland bogs for the presence of these species.

Problem

Lowland bogs are believed to be declining due to drainage, peat mining, and bog development practices.

Strategies

a) Cooperate with local governments in the development and enforcement of wetland protection regulations.

b) Acquire critical habitats.

MONITOR SPECIES

There are 116 species proposed as monitor species, 49 of which are invertebrates. These species have been identified as requiring special management emphasis due to their unresolved taxonomic or population status problems, their function as indicators of environmental quality, or their requirements for limited habitats. In recognition of their special needs, marine mammals and seabirds not classified as endangered, threatened, or sensitive have their own species group management plan in addition to the general monitor species plan. All monitor species share the same basic goals and strategies as follows.

Goals

Maintain populations at self-sustaining levels.

Preserve key limiting habitats as needed to maintain self-sustaining levels.

Increase public education and enjoyment of these species where it will not be detrimental to meeting population objectives.

PROBLEMS AND STRATEGIES

1. Problem

   Little is known about the numbers, distribution, habitat requirements, natural history, and ecology of most nongame species. Many have never been studied. Many others have received only preliminary examination. Without this knowledge, management of these species is impossible.

   Strategies

   a. Conduct and support research that will provide information needed for managing these species.

   b. Design and implement surveys for monitoring these species and their habitats.

2. Problem

   Habitat needed to support these species has been destroyed, is still being lost or is being managed for uses incompatible with maintenance of self-sustaining populations. Habitat loss is the major reason why populations of many of these species have declined to a level of concern.

   Strategies

a. Identify and acquire critical habitat and manage it for increased production of these species.

b. Work with other agencies and private landowners through cooperative agreements, interagency planning, environmental review, and other administrative activities to retain or improve nongame habitats.

3. Problem

There is a large demand but insufficient opportunity for public education and enjoyment of monitor species.

Strategies

a. Develop and implement plans for appreciative use of these species while minimizing negative impacts on the species themselves.

MARINE MAMMALS

The marine environment in Washington supports a wide variety of marine mammals with a total of 29 species expected to occur in coastal or inland waters. Each species is unique in its habits and natural history characteristics. All are currently classified as nongame wildlife species and are protected as such by state law. Five species of marine mammals--Harbor Seal, California Sea Lion, Northern Sea Lion, Killer Whale, and Dall's Porpoise--are listed under this State Monitor classification. All are protected under provisions of the federal Marine Mammal Protection Act and each may be managed under existing federal regulations. All are high profile species which generate intense public interest. Management goals and strategies listed below are applicable to all of these species. Three species of marine mammals--California Gray Whale, Sea Otter, and Harbor Porpoise --are presented in the Endangered, Threatened or Sensitive Program.

Most of the marine mammal species occurring in the coastal waters of Washington are generally considered pelagic or oceanic in their distribution and occurrence, entering Washington waters only as accidental, rare, or casual migratory visitors. This group includes the larger whales (Sperm, Blue, Fin, Sei, Minke, Humpback, and Right), numerous smaller cetaceans (Pygmy Sperm Whale, Bering Sea Beaked Whale, Hubb's Beaked Whale, Cuvier's Beaked Whale, Giant Bottlenosed Whale, Pilot Whale, False Killer Whale, Common Dolphin, Northern Right Whale Dolphin, Striped Dolphin, and Pacific White-sided Dolphin), and two migratory pinnipeds (Northern Fur Seal and Northern Elephant Seal).

In addition to the current state classification as nongame, all marine mammals receive protection under various regulations and provisions of several federal laws including the Fur Seal Act, Marine Mammal Protection Act and Endangered Species Act. For these species, no additional protective legislation or management actions will likely be needed in the future.

Current problems and involvement with the above species generally only develop as a result of disease, fishery entanglements, or strandings.

These problems are usually local and require little enforcement, research, rehabilitation, or carcass disposal efforts.

Goals

Maintain each species in the Optimal Sustainable Population (OSP) range as defined by federal regulations.

Protect critical habitats including haulout sites, rookeries, and feeding locations.

Reduce marine mammal-fishery interaction levels including damage to gear/catch, incidental entanglements, and impacts on escapements.

Strategies

Develop and implement cooperative management efforts with appropriate state and federal resource agencies. Continue research efforts to identify and characterize critical habitat areas such as haulout sites, rookeries and feeding locations.

Assess population status and trends for each selected species.

Identify and document fishery interaction problems and develop mitigation techniques.

Increase public information and education efforts to help better

SEABIRDS

Seabirds form a diverse group of species which spend significant portions of their life cycle in the marine environment for breeding, feeding, rearing young, and maturation.

Seabirds are represented in the family groupings of loons, grebes, albatrosses, shearwaters and fulmars, storm petrels, pelicans, cormorants, oystercatchers, shorebirds, phalaropes, jaegers and skuas, gulls and terns, and auks. Seabird species in Washington of special interest include rhinocerous auklets, common murres, cormorants, puffins, storm petrels, and marbled murrelets. Two of the seven major rhinoceros auklet colonies in the world are located in Washington on Destruction and Protection Islands. Marine bird species occur in inshore, offshore, and pelagic waters and include resident, migrant, wintering and occasional uncommon visitors.

Seabirds use landforms such as islands, sea stacks, rocky shorelines, beaches, and some even use old growth forests, when they are not on marine waters. These terrestrial habitats are characterized by their proximity to feeding areas, minimal human disturbance, and availability of nesting sites. As a group, seabirds are generally long-lived, have low reproductive rates, and display high site fidelity to their roosting and nesting colonies. Most species are colonial nesters with very specific nest site requirements which results in a reliance on limited habitats. As higher trophic level feeders, seabirds such as rhinoceros auklets are excellent indicator species for marine ecosystems.

In Washington, seabirds are classified as nongame species and are protected by state and federal laws. Most of the seabird nesting colonies in Washington are in public ownership, and receive varying levels of habitat protection depending on landowner policies. Colonies are located within the Washington Islands, San Juan, and Protection Island National Wildlife Refuges (USFSW); Zella Schultz Seabird Sanctuary - Protection Island (WDG); Goose Island, Sand Island, and Gunpowder Island Natural Area Preserves (DNR), state parks, Indian reservations, Bureau of Land Management rocks, and a few privately

owned sites.

Goals

Maintain seabird species at self-sustaining levels.

Protect critical nesting, roosting, feeding, and wintering habitats to maintain self-sustaining levels.

Increase public awareness, appreciation of this little known species group, and education concerning seabirds and their protection needs.

Problems

Oil spills threaten both seabird populations and their habitats. The offshore marine environment is impacted by oceanic pollution from biological contaminants such as chlorinated hydrocarbons that have been found in some seabirds.

Evidence exists that the Puget Sound and Strait of Juan de Fuca marine environment is impacted by regional point and non-point sources of pollution such as polychlorinated biphenols and heavy metals.

Depletion of some seabird prey has occurred with unknown effects on seabirds. Puget Sound herring stocks have substantially decreased and a subsequent shift in seabird diet has occurred. Very little is known about the movements and the biology of this forage species and its sensitivity to environmental impacts. seabirds may result in large Commercial gill net fisheries may result in large scale mortalities especially with gill net entanglement.

Human disturbance of seabird sites and permanent alteration by residential, recreational, and commercial developments have reduced the quality and quantity of limited seabird habitat.

The effects of increased human population in Washington has resulted in increased populations of certain gull species which have in term caused deleterious interspecific problems on other seabird species.

Strategies

Conduct and support research that will provide information needed for managing these species such as investigations on impacts of human disturbance, long term effects of oil spills and biocontamination, effects of shifts of forage fish population, and interspecific relations.

Design and implement cooperative surveys with the US Fish and Wildlife Service for monitoring seabird species and their habitats with the emphasis on long term monitoring to assess population trends and

status for selected species.
Identify and inventory critical habitats such as feeding areas, wintering areas, and new nesting colonies.
Protect suitable nesting colonies.
Identify and document fishery interaction problems and develop techniques to reduce seabird mortalities and impacts on forage fish stocks.
Work with other agencies and landowners through cooperative agreements, interagency planning, environmental review, and other management activities to improve seabird habitats, especially in reducing effects of human disturbance on critical sites.
Participate in oil spill management activities and marine bird damage assessment.
Increase public information and education efforts to help better understand these unique species.

Species classified as monitor by the nongame program.

Newcomb's littorine snail	- *Algamorda newcombiana*
Clodius parnassian	- *Parnassius clodius shepardi*
Oregon swallowtail	- *Papilio oregonius*
Short-tailed black swallowtail	- *Papilio indra*
Eastern tiger swallowtail	- *Papilio glaucus*
Pink-edged sulphur	- *Colias interior*
Labrador sulphur	- *Colias nastes*
Coral hairstreak	- *Harkenclenus titus*
Sylvan hairstreak	- *Satyrium sylvinus*
Hoary elfin	- *Incisalia polios*
Thicket hairstreak	- *Mitoura spinetorum*
Dwarf mistletoe hairstreak	- *Mitoura johnsoni*
Juniper hairstreak	- *Mitoura siva*
Immaculate green hairstreak	- *Callophrys affinis*
Lustrous copper	- *Lycaena cupreus*
Edith's copper	- *Lycaena editha*
High mountain blue	- *Plebejus aquilo*
Viceroy	- *Limenitis archippus*
California sisters	- *Adelpha bredowii*
American painted lady	- *Cynthia virginiensis*
Compton tortoiseshell	- *Nymphalis vau-album*
Oreas anglewing	- *Polygonia oreas*
Pallid crescent spot	- *Phyciodes pallida*
Silver-bordered fritillary	- *Boloria selene*
Meadow fritillary	- *Boloria bellona*
Freya's fritillary	- *Boloria freija*
Astarte fritillary	- *Boloria astarte*
Egleis fritillary	- *Speyeria egleis*
Atlantis fritillary	- *Speyeria atlantis*
Leto fritillary	- *Speyeria leto pugetensis*
Chryxus arctic	- *Oeneis chryxus valerata*
Chryxus arctic	- *Oeneis chryxus chryxus*
Melissa arctic	- *Oeneis melissa*
Northwest alpine	- *Erebia vidleri*
Dun skipper	- *Euphyes vestris*
Mardon skipper	- *Polites mardon*
Long-dash skipper	- *Polites mystic*
Sonora skipper	- *Polites sonora*
Tawny-edged skipper	- *Polites themistocles*
Nevada skipper	- *Hesperia nevada*
Garita skipperling	- *Oarisma garita*
Alpine checkered skipper	- *Pyrgus centaureae*
Pacuvius dusky wing	- *Erynnis pacuvius*
Edith's checkerspot	- *Euphydryas editha taylori*
Pygmy whitefish	- *Prosopium coulteri*
Lake chub	- *Couesius plumbeus*
Longnose sucker	- *Catostomus catostomus*
Mountain sucker	- *Catostomus platyrhynchus*
Sand roller	- *Percopsis transmontana*
Piute sculpin	- *Cottus beldingi*
Slimy sculpin	- *Cottus cognatus*

Riffle sculpin	- *Cottus gulosus*
Margined sculpin	- *Cottus marginatus*
Reticulate sculpin	- *Cottus perplexus*
Tiger salamander	- *Ambystoma tigrinum*
Cope's giant salamander	- *Dicamptodon copei*
Woodhouse's toad	- *Bufo woodhousei*
Southern alligator lizard	- *Elgaria multicarinata*
Sagebrush lizard	- *Sceloporus graciosus*
Sharp-tailed snake	- *Contia tenuis*
Ring-necked snake	- *Diadophis punctatus*
Night snake	- *Hypsiglena torquata*
Pacific gopher snake	- *Pituophis melanoleucus catenifer*
Horned grebe	- *Podiceps auritus*
Red-necked grebe	- *Podiceps grisegena*
Western grebe	- *Aechmophorus occidentalis*
Great blue heron	- *Ardea herodias*
Great egret	- *Casmerodius albus*
Green-backed heron	- *Butorides striatus*
Black-crowned night-heron	- *Nycticorax nycticorax*
Turkey vulture	- *Cathartes aura*
Osprey	- *Pandion haliaetus*
Merlin	- *Falco columbarius*
Gyrfalcon	- *Falco rusticolus*
Prairie falcon	- *Falco mexicanus*
Black-necked stilt	- *Himantopus mexicanus*
Long-billed curlew	- *Numenius americanus*
Caspian tern	- *Sterna caspia*
Arctic tern	- *Sterna paradisea*
Forster's tern	- *Sterna forsteri*
Black tern	- *Chlidonias niger*
Snowy owl	- *Nyctea scandiaca*
Barred owl	- *Strix varia*
Great gray owl	- *Strix nebulosa*
Black swift	- *Cypseloides niger*
Three-toed woodpecker	- *Picoides tridactylus*
Black-backed woodpecker	- *Picoides arcticus*
Gray flycatcher	- *Empidonax wrightii*
Ash-throated flycatcher	- *Myiarchus cinerascens*
Streaked horned lark	- *Eremophila alpestris strigata*
Boreal chickadee	- *Parus hudsonicus*
Oregon vesper sparrow	- *Pooecetes gramineus affinis*
Grasshopper sparrow	- *Ammodramus savannarum*
Lesser goldfinch	- *Carduelis psaltria*
Preble's shrew	- *Sorex preblei*
Pacific water shrew	- *Sorex bendirii*
Yuma myotis	- *Myotis yumanensis*
Keen's myotis	- *Myotis keenii*
Long-eared myotis	- *Myotis evotis*
Fringed myotis	- *Myotis thysanodes*
Long-legged myotis	- *Myotis volans*
Small-footed myotis	- *Myotis leibii*
Western pipistrelle	- *Pipistrellus hesperus*
Red bat	- *Lasiurus borealis*
Pallid bat	- *Antrozous pallidus*

Red-tailed chipmunk	- *Tamias ruficaudus*
Washington ground squirrel	- *Spermophilus washingtoni*
White Salmon pocket gopher	- *Thomomys talpoides limosus*
Ord's kangaroo rat	- *Dipodomys ordii*
Northern grasshopper mouse	- *Onychomys leucogaster*
Kincaid's meadow vole	- *Microtus pennsylvanicus kincaidi*
Gray-tailed vole	- *Microtus canicaudus*
Sagebrush vole	- *Lagurus curtatus*
Northern bog lemming	- *Synaptomys borealis*
Wolverine	- *Gulo gulo*
Northern sea lion	- *Eumetopius jubatus*
California sea lion	- *Zalophus californianus*
Harbor seal	- *Phoca vitulina*
Killer whale	- *Orcinus orca*
Dall's porpoise	- *Phocoenoides dalli*

ALL OTHER NONGAME

There are 406 vertebrate species which are the nongame program's responsibility to manage. Of these 406, 115 are classified or proposed as monitor, sensitive, threatened, or endangered. The remaining 291 species include all vertebrate wildlife not classified as game or furbearing species, inland fish, and nonwildlife species not classified as food fish by the Department of Fisheries. A total list of nongame vertebrate species is included in the appendix.

Invertebrate wildlife species are also the nongame program's responsibility but are too numerous to list in the context of this document. All other nongame species not previously discussed as monitor, sensitive, threatened, or endangered share the following goals and strategies.

Goals

Maintain populations at self-sustaining levels.
Increase public education and enjoyment of these species.

Strategies

Design and implement surveys for monitoring these species.
Develop and implement projects for appreciative use of these species.

URBAN WILDLIFE PROGRAM

Most Washington residents live in cities, and the proportion of our population residing in urban areas will continue to increase into the next century. It has been estimated that by the year 2000 some 75%-90% of all Americans will live and work in cities. The growth of urban centers has reduced the opportunities of urban residents for viewing wildlife and decreased their direct experiences with the realities of nature. As a result, their perceptions of animals and wildlife habitat are based less on direct observations in natural surroundings and more on indirect encounters through television or newspapers and artificial experiences with pet animals.

The implications of these changes for the Department of Game, which deals with animals in increasingly remote natural environments and which bases its programs on principles of ecology that are not understood by urban residents, are readily apparent. These changes are likely to result in a decline in the proportion of Washington residents who identify with the programs of the Department and who believe that the agency represents their interests. This can have serious consequences if the Department must rely on the decisions these urban residents make regarding support for legislative or financial proposals that affect the agency.

Despite the increasing isolation of urban residents from natural environments, these people still show strong interests in wildlife. A number of surveys that have been taken across this country to ascertain the knowledge and attitudes of Americans regarding wildlife and wildlife agencies have shown that:

1. Very large numbers of people participate in appreciative wildlife activities such as birdwatching or nature photography.

2. The overwhelming percentage of these activities occur within the vicinity of the home of the wildlife enthusiast.

3. Most urban residents have no opinion regarding wildlife management activities because they have little identification with the wildlife agency.

The Department of Game is mandated with the management of all animal species for all the residents of the state. The growing awareness and concern for nongame species of wildlife, together with the movement of Washington residents to large metropolitan areas, suggest that the traditional role of the Department in provisioning game animals for hunters should continue to be broadened to include provisioning wildlife for people for a variety of uses. The agency must meet the needs of the large majority of Washington residents who enjoy and value wildlife in many appreciative ways, often within their immediate household surroundings, and who desire greater opportunities to have this kind of wildlife interaction. The needs and demands of people regarding wildlife are changing in this state and across the country, and new priorities and ways of dealing with the public are needed if the Department is to remain responsive and relevant to wildlife problems and viable as a public-supported organization.

An urban program that focuses on the needs and desires of these citizens is a primary means to accomplish this task. Urban wildlife becomes the "common ground" which identifies the Department as representative of the interests of urban residents and worthy of their support. Citizens who can appreciate the value of the land and resources in their own backyards are likely to support Department programs that benefit the wildlife resource on a larger scale. An increased public identification with the goals and activities of the Department resulting from an urban wildlife program will broaden both the financial and political base of the agency.

GOAL

Maintain native wildlife in urban areas at self-sustaining population levels in harmony with the ecological, social, and economic values of the community, thereby perpetuating the diversity of wildlife in the state and fostering opportunities for continued human-wildlife interactions.

OBJECTIVES

1. Maintain self-sustaining urban animal populations that approximate the faunal community in surrounding non-urban environments.

2. Increase public education and enjoyment of urban wildlife so

that private actions will complement the policies, objectives, and activities of the Department.

PROBLEMS AND STRATEGIES

1. Problem

Urbanization is adversely affecting wildlife and wildlife habitat.

Strategies

a. Investigate, evaluate, and recommend for preservation urban open space that is appropriate and valuable for urban wildlife.
b. Coordinate and participate with the Habitat Management Division in EIS reviews, land use planning, mitigation projects, and cooperative agreements with city/county governments and other resource agencies.
c. Represent the Department on technical committees, serve as expert witness or negotiator before commissions or review boards.
d. Identify research needs and develop research plans regarding urban wildlife and habitat.
e. Conduct the Urban Wild Acres Program.

2. Problem

The urban-suburban environment is where most people interact with and learn about wildlife and nature, and it is here that the public image of the Department and support for its activities may be enhanced among the majority of Washington citizens.

Strategies

a. Survey public attitudes, perceptions, preferences, and values regarding wildlife and habitat.
b. Increase public awareness and understanding or urban wildlife issues.
c. Conduct permit reviews for salvaged wildlife and wildlife rehabilitation; provide coordination with Control Agents; serve as Department liaison with rehabilitation groups.
d. Develop and distribute educational activities that utilize urban wildlife resources.
e. Coordinate with Project WILD and I & E specialists to integrate urban wildlife activities into their programs wherever appropriate.
f. Determine and disseminate methods of reducing damage and preventing hazards to people from urban wildlife.
g. Conduct the Backyard Wildlife Sanctuary Program to encourage and recognize private conservation efforts.

h. Participate in the activities of public educational and conservation groups.

i. Write articles, develop slide presentations, conduct radio-television programs, and develop other informational materials on urban wildlife topics.

j. Maintain liaison with conservation/environmental organizations and coordinate agency programs with those groups.

k. Present programs to education/social/scientific/conservation groups.

l. Organize public workshops or conferences dealing with urban wildlife and habitat.

m. Recognize individuals, groups, developers, or agencies for their efforts towards achieving the goals of the urban wildlife program.

n. Coordinate with Department personnel to develop and integrate urban wildlife activities into other programs wherever appropriate.

3. Problem

Information regarding urban wildlife and wildlife habitat is not sufficient nor available in a format that can be used by agencies with jurisdiction.

Strategies

a. Develop lists and data files of birds, mammals, fish reptiles, amphibians, and some invertebrates found in urban/urbanizing areas. Obtain information on their habitat requirements and urban population trends.

b. Identify and map major habitat types in and around urban areas. Within each major habitat type, assess populations of state endangered, threatened, sensitive, monitor, or species of special concern. Convey this information to appropriate city/county officials, agencies, and public groups.

c. Determine the effectiveness of existing management techniques that influence urban wildlife populations. Develop management guidelines for urban species.

d. Encourage local legislative ordinances and procedures to protect wildlife and habitat. Integrate wildlife concerns into urban development projects.

e. Communicate the socio-economic values and interests concerning urban wildlife to urban planners, developers, and the public.

f. Provide advisory services to city/county/state/federal agencies, individuals, private developers, civic groups, sportsmen's groups

professional groups, and interest groups regarding urban wildlife and habitat.

FISHERIES PROGRAMS

OVERVIEW

Washington State is drained by five major drainages* and is endowed with some eight thousand lakes, fifty thousand miles of streams, and nearly three thousand miles of saltwater shoreline. In 1968, the estimated area of inland fishing water in the state was 1,158,000 acres. This nearly matches the area of saltwater, which is estimated at 1,743,000 acres. The inland waters of Washington provide habitat for at least seventy-six species of resident and anadromous fish,** including thirty that are classified as game fish under the management authority of the Game Department. The only game fish (see Appendix) native to Washington are rainbow trout (including steelhead), cutthroat trout, Dolly Varden, kokanee, burbot and mountain and lake whitefish. All other species of trout and warmwater game fish have been introduced into the state.

The Washington Game Department provides angling opportunities for hundreds of thousands of resident and nonresident anglers each year -- over 500,000 resident fishing licenses were sold in 1985 -- and the demand for sport angling continues to climb each year. To meet angler demand for game fish, the Department operates a statewide system of hatcheries, which not only augment wild populations of fish but provide angling opportunities in lakes, reservoirs, and other waters where wild populations do not occur. A number of lakes are rehabilitated each year with organic rotenone to remove undesirable fish which compete with trout and other game fish. To guarantee public access to lakes and streams, the Department also operates a system of about 600 developed and undeveloped access areas around the state.

* Upper Columbia River, Lower Columbia River, coastal, Strait of Juan de Fuca, and Puget Sound.

** Quoted loosely from Inland Fishes of Washington, Richard S. Wydoski and Richard R. Whitney, University of Washington Press, 1979.

Although demand for trout in lowland lakes and for steelhead is strong, angler demand for warmwater fish and for additional "blue ribbon" fisheries

is also growing, and the Department will attempt to provide a diversity of angling opportunities in the future, particularly in areas accessible to the state's population centers.

The management of game fish has become very complex in recent years. Public demand for sport angling is growing and changing each year; aquatic habitat and public access is being continually depleted by new streambank and lakeshore development; competition with salmon for spawning and rearing habitat and competition for water becomes more intense each year. Management of steelhead has become extremely complicated by the 1974 federal court decision which guarantees an opportunity for treaty Indian tribes to take up to 50 percent of the harvestable salmon and steelhead in all of Puget Sound and most coastal drainages of western Washington. The 1974 decision was upheld by the U.S. Supreme Court in 1979. All of the above factors are facts of life, and the Washington Game Department will continue to strive to protect and perpetuate the basic fishery resource while providing fishing for all user groups.

ORGANIZATION

The fisheries section of the Strategic Plan is broken into six separate programs, defined by harvest area or fishery type. Each program includes a general background narrative, a goal statement for the next 12-15 years, a listing of major problems identified to meeting the stated goals, and alternative strategies to overcoming the problems.

The goal statements establish a general management philosophy or direction for each program and a sense of relative priority between the protection and perpetuation of native or wild stocks and the providing of recreational angling opportunities. The goals do not specifically address levels of population, harvest, or participation as with the wildlife programs, mainly because of differences in available data between the wildlife and fisheries programs. More specific goals and measurable objectives for individual streams and lakes or stream and lake systems will be developed at the regional level.

As with the wildlife programs, nonconsumptive or appreciative uses of fisheries resources will be seriously considered in managing fisheries programs.

STEELHEAD

Steelhead populations can be divided into two major groups: winter runs, which return to streams from November through May to spawn, and summer runs, which return to streams from May through October but spawn the following winter and spring. With some diversity within these major strains, steelhead angling in streams is available almost year around.

Washington streams supporting steelhead are distributed throughout the Puget Sound region, the Columbia River drainage, and coastal areas draining directly to the Pacific Ocean. A relatively small percentage of the total steelhead harvest occurs in marine areas. Some notable exceptions are the commercial harvest in Marine Area 8-A by the Tulalip Tribe and the sport fishery on the west coast of Whidbey Island.

Management of steelhead has been complicated by a number of factors, including the 1979 U.S. Supreme Court decision providing for allocation of up to 50% of harvestable numbers of steelhead and salmon to Treaty Indian Tribes; possible physical and biological competition with salmon species; and continuous reduction of adequate stream-flows and natural spawning and rearing habitat.

SUPPLY AND DEMAND

Steelhead punchcard data back to 1970 show that sport angling for steelhead fluctuated from year to year within a narrow but fairly high range until 1976. In that year the punchcard price increased and the full impact of the Federal Court (Boldt) decision on salmon and steelhead allocation was realized. Punchcard sales dropped about 35%. Sales increased again by 26% in 1977 and have continued to grow slowly but steadily at a rate of 1 to 5 percent through 1980. The punchcard fee went up to $5 (from $3) in 1982 and there was a 24% decline in sales the following year. However, the price of the punchcard is only one factor affecting sales. Another major factor is probably steelhead run size for a particular year. This is borne out by the fact that punchcard sales surged strongly upward for the 1984-85 season despite the fact that free cards for juveniles and oldsters were eliminated that year. The 1984-85 season was one of the best on record and anglers responded by buying punchcards. The most recent development of the

most recent development of the punchcard (now called permit card) is the elimination of the "punches" (anglers simply write in river code), the provision for designating each fish as "hatchery" or "wild" (based on adipose fin clips for all hatchery fish) and an increase in price from $5 to $15 with a $5 rebate for any card turned in to a license dealer before June 1 following expiration of the card. The rebate is intended to encourage even greater numbers of anglers to return their permit cards in a timely fashion so they can be used to develop harvest estimates.

Goal

Maintain, or increase where feasible, wild populations of steelhead while increasing fishing opportunities through selective stocking of hatchery origin fish.

Population Objectives

Meet wild steelhead spawning escapement goals on all rivers with sustainable wild populations by protection of the weakest natural stock in mixed stock areas and by controlling in-river harvest to maximize sustained natural production in each river.

Harvest Objectives

1. Increase steelhead sport fishing recreation opportunity to 1.2 million angler days per year.

2. Provide a statewide catch rate of about 0.025 fish per hour to sports anglers fishing specifically for steelhead.

3. Work cooperatively with treaty Indian tribes to achieve the court-ordered allocation of the annual harvestable surplus on individual stocks in the Washington (Boldt) Conservation Area.

4. For the Columbia River Conservation Area, work cooperatively with the negotiating parties to develop a management plan which protects wild steelhead stocks while providing for an equitable sharing of the annual harvestable surplus.

PROBLEMS AND STRATEGIES

a. Problem

Spawning and rearing habitat for wild and hatchery stocks is being depleted by streambed disturbance and development activities affecting stream habitat.

Strategies

a. Acquire and analyze back-up information needed to adequately protect and restore aquatic habitat or mitigate fish losses. This will include inventorying aquatic habitat, measuring losses, determining economic values, and developing and evaluating new methods for improving and restoring habitat to replace losses.
b. Attempt to protect, enhance, and mitigate fish habitat losses by continued active involvement in federal, state, and local environmental review and permit processes.
c. Establish and maintain statewide programs for such activities as gold dredging, instream flows, and small hydro developments to deal effectively with projects that cumulatively have significant effects on aquatic habitat.
d. Maintain effective investigation, coordination, disposition and enforcement of Hydraulic Project Approvals (HPA).
e. Keep a high level of involvement in local, state and federal agency planning that affects anadromous streams.
f. Develop and maintain education and information programs to raise public awareness about the value of spawning and rearing habitat to steelhead and cutthroat.
g. Reclaim or improve spawning and rearing habitat, using proven enhancement techniques.
h. Maintain an active role in securing regulations and legislation to provide habitat protection and opposing legislation and activities detrimental to habitat.

2. Problem

Upstream and downstream migration of anadromous fish is blocked by dams and other instream structures.

Strategies

a. Require adequate passage facilities for adult fish and smolts on new and existing dams.
b. Continue to seek adequate mitigation for fish and wildlife

losses from construction, or during relicensing of hydroelectric dams and federally-funded projects.

c. Seek state legislation to require mitigation for state or locally funded dams and diversion structures that impact anadromous fish migration.

d. Emphasize selection in hatchery stocks for increased migration survival in streams with artificial passage facilities.

e. Supplement wild fish production with quality hatchery-origin fish to offset migration losses.

f. Increase access to unused spawning and rearing areas by removing barriers or constructing fishways in areas where resident fish would not be harmed.

g. Seek flow maintenance agreements that reduce the possibility of stranding of adults or juveniles.

3. Problem

There is severe competition for water between out-of-stream water development interests and fisheries resources.

Strategies

a. Insist that adequate instream flows are established and maintained in anadromous trout streams by Department of Ecology and other appropriate agencies. Develop a program to determine amounts of water needed for adequate flows.

b. Take other legal measures, including formal adjudication of water rights in some cases, to require adequate flows for fish.

4. Problem

There is a shortage of available harvest, escapement, and recruitment data for predicting runs or for basing and evaluating management objectives for anadromous trout.

Strategies

a. Designate index streams in Puget Sound, Columbia/Snake system, and coastal drainages, collect baseline harvest, escapement, and recruitment data for steelhead.

b. Fund steelhead data and management program to collect and apply harvest, escapement and recruitment data.

c. Develop improved methods for determining escapement goals.

d. Conduct population assessments needed to properly manage wild steelhead populations. Specific areas of emphasis include creel

census, spawning escapement surveys and expanded research and development at research stations.

6. Problem

Harvest of hatchery fish at the maximum rate usually results in excessive harvest of wild stocks in mixed stock streams.

Strategies

a. Categorize streams according to their potential for wild-only trout management; develop, implement, and enforce specific management programs and harvest regulations for wild-only, hatchery-only, and mixed-stock streams.
b. Mark hatchery-stock fish to enable the public to distinguish them from wild fish. This has been standard procedure statewide since 1984.
c. Discontinue planting legal-sized trout in anadromous streams, except where required by mitigation agreements.
d. Institute limited entry fisheries in streams managed for wild stocks.
e. Work with treaty Indian tribes to manage commercial fisheries to achieve appropriate harvest rates of wild stocks.

7. Problem

There is a shortage of public streambank access due to increased recreational pressure and private streambank development.

Strategies

a. Acquire or promote more public access and easements on selected streams where demand justifies more access.
b. Ensure that already-acquired access areas and easements are open and available for public use and maintained properly.
c. Evaluate those accesses (primarily saltwater) where the main use appears to be salmon anglers or shellfish diggers for potential assignment to the Department of Fisheries.

8. Problem

There is a shortage of angler use and preference information for program planning and management.

Strategies

a. Continue and refine a recently instituted periodic statewide angler use and preference survey.

9. Problem

Salmon and game fish may compete for spawning and rearing habitat.

Strategies

a. Maintain close management coordination with Department of Fisheries and other commercial fish management agencies and Indian tribes.

b. Conduct studies to determine the degree of competition in various streams.

10. Problem

Inadequate coordination takes place among agencies and colleges and universities doing research on steelhead and other anadromous species.

Strategies

a. Continue to expand and improve research exchange services through University of Washington and other appropriate fisheries management/research entities.

b. Encourage and participate in symposia with other anadromous fish research entities.

11. Problem

Complex regulations to ensure adequate resource protection and maximum recreational opportunity confuse anglers creating compliance problems.

Strategies

a. Improve angler understanding of and participation in the regulation development process.

b. Make fishing season pamphlets easier to understand.

c. Increase angler comprehension of regulations through media and by posting regulation information.

12. Problem

Emergency conservation or allocation closures are often misunderstood. There is a lack of compliance with these actions.

Strategies

a. Better anticipation of emergency actions.

b. Increase media information regarding emergency actions.

c. Increase patrol capability to ensure compliance.

13 Problem

Steelhead harvest information is not consistently documented and reported in an accurate and timely manner.

Strategies

a. Develop Wildlife Agent's capability to inspect fish and document commercial enterprises dealing in steelhead.

b. Evaluate present system to increase the return of steelhead punchcards between May 1 and June 1.

c. Increase patrol of commercial and sport fisheries.

d. Publicize need for accurate documentation of catch.

14. Problem

Commercial fishing for steelhead has the potential for overharvesting runs, reduces sport angling opportunity and catch, and places an expensive, complicated management burden on the agency.

Strategies

a. Work with sport and commercial fisheries to minimize adverse effects on wild steelhead runs.

b. Determine level of interception of steelhead in existing commercial salmon fisheries.

c. Manage sport and commercial fisheries with harvest strategies that minimize conflicts between them.

d. Expand enforcement effort on the commerical fishery on steelhead. Emphasize a reduction in the number of undocumented fish.

15. Problem

The anadromous fish hatchery program is facing funding cuts but demand for fish is increasing.

Strategies

a. Reduce need for hatchery fish by increasing wild fish runs where feasible.

b. De-emphasize amount of hatchery production (pounds and numbers of fish) and emphasize quality of product (genetic diversity, size of fish, condition factor, return rate) to optimize adult returns.

c. Conduct research to determine optimum rearing densities in all types of rearing facilities to improve adult return rate.

16. Problem

There is a need to improve the efficiency and effectiveness of existing hatchery facilities.

Strategies

a. Develop a research station(s) and pathology lab(s) to conduct studies on fish diseases, nutrition, time and size of release, brood stock development and related work. Conversion of an existing hatchery(s) would be the most cost effective method and could be done without significant loss of current production.

Related off-station projects will be required.

b. Renovate existing hat cheries to meet long-standing maintenance and repair needs and to improve production efficiency.

c. Construct new artificial production facilities.

CUTTHROAT AND DOLLY VARDEN

Besides steelhead the other species of anadromous trout found in Washington include the sea-run cutthroat and Dolly Varden. Both species are found in Puget Sound, Hood Canal, the Straits of Juan de Fuca, the coast and lower Columbia River. Of the two species sea-run cutthroat are the most widely distributed and more is known of their life history. In Puget Sound and Hood Canal there are two races of sea-run cutthroat; early-entry stocks, which begin entering coastal streams as early as July; and late entry stocks which do not enter coastal streams until October or later. The later entry fish are found in smaller streams. Both races spawn about the same time, in January and February. The sea-run cutthroat found on the Washington coast, in the Straits of Juan de Fuca and the lower Columbia are the early-entry race. In reality, sea-run cutthroat exhibit a more complicated life history than this, with fish moving in and out of the freshwater during much of the year and mature fish (at least in Puget Sound and Hood Canal)overwintering in streams other than their native stream.

Little is known of the life history and distribution of sea-run Dolly Varden in western Washington.

The hatchery program for sea-run cutthroat is small. Most previous fish cultural efforts centered on stocking of sea-run cutthroat from the Beaver Creek hatchery in southwest Washington. Beaver Creek stocks have not been shown to contribute to the saltwater fishery. Alternative enhancement techniques involving endemic broodstocks, saltwater broodstock development, and extended rearing hold some promise. To date, such stocks have been developed for coastal, Hood Canal (early) and Cowlitz river. There is no hatchery program for sea-run Dolly Varden.

SUPPLY AND DEMAND

Populations and harvest opportunities for sea-run cutthroat have declined in recent years due to habitat alteration, incidental harvest in commercial salmon fisheries, competition from salmon (principally coho), and even possible overharvest by sport fishermen. Demand for sea-run cutthroat and Dolly Varden is not expected to increase sharply but will grow steadily as the general population grows and as more angling opportunities are provided. Sea-run cutthroat are especially susceptible to environmental

disturbances, and satisfaction of future angler demand will depend on habitat protection and probably some level of hatchery enhancement. The main focus of hatchery enhancement will be to rebuild or re-establish runs in streams where they are below carrying capacity.

GOAL

Maintain, or increase where feasible, sustainable wild populations of trout while increasing fishing opportunities through selective stocking of hatchery origin fish.

OBJECTIVES

1. Control harvest to provide spawning escapement that will maximize sustained natural production.
2. Determine current annual catch and angler-days recreation on anadromous cutthroat/Dolly Varden stocks statewide.
3. Establish a catch rate which provides a satisfactory angling experience. (This should average about .25 fish per hour for searun cutthroat fishing.)

PROBLEMS AND STRATEGIES

1. Problem

   Data on sport harvest and impact of sport harvest of anadromous cutthroat and Dolly Varden is lacking.

   Strategies

   a. Develop a punch card system for all anadromous game fish to yield information on harvest trends.

2. Problem

   There is a shortage of angler use and preference information for program planning and management.

   Strategies

   a. Continue and refine a recently instituted periodic statewide angler use and preference survey.
   b. Collect the basic data needed to manage harvest and use. This would include expansion of the sampling program and other efforts to obtain angler catch, and effort and biological data, evaluation of angler satisfaction and demographics, and collection of other data needed to evaluate regulation.

3. Problem

   Spawning and rearing habitat for wild and hatchery stocks is being depleted by streambed disturbance and development activities affecting stream habitat.

Strategies

a. Acquire and analyze back-up information needed to adequately protect and restore aquatic habitat or mitigate fish losses. This will include inventorying aquatic habitat, measuring losses, determining economic values, and developing and evaluating new methods for improving and restoring habitat to replace losses.

b. Attempt to protect, enhance, and mitigate fish habitat losses by continued active involvement in federal, state, and local environmental review and permit processes.

c. Establish and maintain statewide programs for such activities as gold dredging, instream flows, and small hydro developments to deal effectively with projects that cumulatively have significant effects on aquatic habitat.

d. Maintain effective investigation, coordination, disposition and enforcement of Hydraulic Project Approvals (HPA).

e. Keep a high level of involvement in local, state and federal agency planning that affects anadromous streams.

f. Develop and maintain education and information programs to raise public awareness about the value of spawning and rearing habitat to steelhead and cutthroat.

g. Reclaim or improve spawning and rearing habitat, using proven enhancement techniques.

h. Maintain an active role in securing regulations and legislation to provide habitat protection and opposing legislation and activities detrimental to habitat.

4. Problem

Basic life history information is lacking for anadromous Dolly Varden.

Strategies

a. Inventory waters containing anadromous Dolly Varden.

b. Develop projects to collect basic life history information on anadromous Dolly Varden.

c. Conduct literature review of work done in Alaska, B.C., and Oregon.

5. Problem

Salmon and anadromous trout compete for spawning and rearing habitat.

Strategies

a. Maintain close management coordination with Department of Fisheries and other commercial fish management agencies and Indian

tribes.

b. Conduct studies to determine the degree of competition.

6. Problem

Information on the impact of commercial fishing on anadromous game fish in saltwater is largely lacking.

Strategies

a. Establish monitoring programs to collect information on the effect of commercial harvest on anadromous game fish.

b. Establish monitoring program to ensure treaty Indian harvest data is reported in an accurate and timely manner.

7. Problem

There is a lack of proper stream-specific brookstock of sea-run cutthroat trout.

Strategies

a. Develop truly anadromous stocks of hatchery-reared cutthroat trout that will return in reasonable numbers to the streams where they are stocked.

b. Develop hatchery and saltwater rearing facilities to produce proper stream-specific stocks of sea-run cutthroat.

c. Improve survival of hatchery releases by reducing hauling stress, improving stream inprinting and releasing at the optimum time and size.

LOWLAND LAKES TROUT PROGRAM

The Lowland lakes trout management program includes about 4800 lakes below 2500 feet evelation -- 2500 feet in eastern Washington and 2300 feet in western Washington -- plus all trout managed lakes above 2500 feet with road access, and the state's 12 reservoirs larger than 1000 acres.

Lowland trout lakes are stocked primarily with rainbow trout, and management of trout-only waters relies heavily on the lake rehabilitation program -- treatment of selected lakes with organic rotenone -- to reduce competition with fish other than trout. Due to a number of factors, including disease, parasites, winter and summer kill, and shortage of spawning areas, most lowland lakes do not support self- sustaining populations of trout.

SUPPLY AND DEMAND The lowland lakes trout program is very popular with anglers. Most angler pressure is experienced early in the season, particularly on opening day and during the first two weeks of the season. Demand is expected to grow at a rate greater than general population growth, especially in areas close to metropolitan centers. Given the larger number of lakes available for intensive trout management, our capability to meet this growing demand is constrained only by public access, hatchery production capacity, and funding for expanded intensive lowland lake trout management.

Goal

Increase angling opportunity and diversity in lowland lakes.

Harvest Objectives

1. Increase the total number of waters available in this category by 30 waters statewide.
2. Provide a season long satisfactory angling experience for hatchery trout averaging 8" - 11" in length. (A catch rate of about 0.75 fish per hour average for the season should provide such an experience).

PROBLEMS AND STRATEGIES

1. Problem

   Competition from undesirable or competing fish species reduces the

survival and growth of trout in lakes managed for trout.

Strategies

a. Rehabilitation of lowland lakes with chemicals, principally rotenone.

b. Explore other acceptable techniques for reducing competition.

c. Develop biological alternatives to rotenone which would allow the Department of Game to produce comparable fisheries without the use of chemicals.

2. Problem

There is a shortage of public access to lakes suitable for trout management.

Strategies

a. Promote construction or improvement of lowland lakes on public lands.

b. Assure that already-acquired access areas and easements are open and available for public use.

c. Provide or promote more public access to lakes which are not on public lands but suitable for trout management.

d. Attempt to meet public demand by intensifying management of suitable trout lakes with existing public access.

e. Acquire and develop new access areas on lakes without current public access through purchase, land use agreement or easements. Redevelop existing areas to accommodate more use.

f. Increase access for bank fishing.

3. Problem

Harvest of trout during the first month of the season is rapid and excessive; extreme pressure is experienced on opening day.

Strategies

a. Design and implement management schemes to spread out the angling pressure on lowland lakes; i.e., year-around seasons, staggering of legal plants throughout the summer, reduction in catch and possession limits, limited-entry fisheries.

4. Problem

Trout mortality from natural causes is excessive in some lowland lakes.

Strategies

a. Emphasize, where possible, naturally producing populations of game fish that are resistant to natural mortality factors.

b. Increase pre-winter harvest of hatchery-origin fish to circumvent winter kills.

c. Investigate and implement techniques such as aeration to prevent summer and winter kill.

d. Collect the basic data needed to manage each lake in the program. This would include expansion of the current sampling program and other efforts to obtain catch, success and biological data; evaluation of angler satisfaction and characteristics; and collection of data needed to evaluate regulations. Improve our management plans based on results of this work.

e. Develop a research station(s) and pathology lab(s) to conduct studies on fish disease, nutrition, timing and size of release, brood stock development and related work. Conversion of existing hatchery(s) would be the most cost effective method and could be done without loss of current production. Related off-station projects may be required.

5. Problem

Hatchery production is inadequate to meet current and projected demand.

Strategies

a. Increase production at existing hatcheries by expanding facilities and increasing water supplies.

b. Explore development of new hatchery sites with adequate water supplies in areas where demand for trout angling is or will be greatest.

c. Reduce dependence on hatchery production to meet demand.

d. Renovate existing hatcheries to meet long standing maintenance and repair needs and to improve production efficiency.

e. Expand hatchery system to meet program needs with a special emphasis on kokanee production.

6. Problem

Trout mortality in hatcheries is excessive.

Strategies

a. Investigate and implement acceptable ways of discouraging or preventing hatchery predation, primarily from birds.

b. Seek hatchery water supplies that are of adequate volume and free of bacterial infection and parasite vectors.

c. Treat hatchery water supplies to prevent infection.

d. Construct or expand hatchery facilities adequate to prevent crowding.

e. Develop a research station(s) and pathology lab(s) to conduct studies on fish disease, nutrition, timing and size of release, brood stock development and related work. Conversion of existing hatchery(s) would be the most cost effective method and could be done without loss of current production. Related off-station projects may be required.

7. Problem

There is a shortage of angler use and preference information for program planning and management.

Strategies

a. Continue and refine a recently instituted periodic statewide angler use and preference survey.

b. Collect the basic data needed to manage each lake in the program. This would include expansion of the current sampling program and other efforts to obtain catch, success and biological data; evaluation of angler satisfaction and characteristics; and collection of data needed to evaluate regulations. Improve our management plans based on results on this work.

8. Problem

There is a lack of compliance with possession limits and gear restrictions.

Strategies

a. Improve angler understanding of regulations through media information, posting of regulations and simplified pamphlets.

b. Provide public and angler information on the management reasons for specific seasons and regulations.

c. Increase citizen participation in Poaching Hotline. (1-800-582-5626)

9. Problem

Water oriented recreational activity conflicts with fishery management and angler use.

Strategies

a. Develop fishery management plans in cooperation with other water related recreationists.

b. Manage public access areas to control recreational activity which is inconsistent with fishery management objectives.

10. Problem

Acid rain, domestic sewage and other water quality problems may limit fish production and fishing opportunity in some lowland lakes.

Strategies

a. Determine nature and extent of the problem.
b. Determine means to improve water quality.
c. Work with Department of Ecology, other public agencies and landowners to improve water quality.

11 Problem

Operational priorities of reservoir management agencies often conflict with the management of game fish.

Strategies

a. Work closely with reservoir management agencies to minimize fish losses from large or rapid water level fluctuations.
b. Develop cooperative fishery management programs which are compatible with reservoir operations.
c. Seek legislative or court relief to get more authority for protecting game fish resources in reservoirs.

12. Problem

There is a shortage of kokanee salmon and other species particularly suitable to reservoir operations.

Strategies

a. Improve spawning areas on reservoir tributary streams.
b. Increase hatchery production of kokanee and other suitable pelagic species.
c. Investigate introduction of other species such as lake trout which might be suitable for certain reservoir fisheries.
d. Research development of non-migratory stocks of rainbow trout more suited to reservoir conditions.
e. Consider trapping and egg taking on streams with strong kokanee runs not currently used for egg taking.

ALPINE LAKES PROGRAM

There are about 3,100 lakes in Washington above 2,500 feet in elevation that are not accessible by road. These lakes are distributed throughout the Olympic and Cascade mountains, with the majority being in the Cascades. Most alpine lakes are located on public lands open for both public enjoyment and active fishery management, although most lakes located in National Parks are not presently available for intensive trout management by the state.

More alpine lakes are managed as quality or "blue ribbon" fisheries than are lowland lakes or reservoirs. The season is usually quite short (July to September) due to ice and, because these lakes are not accessible by road, angling is usually done as part of an overall hiking or camping experience rather than an independent endeavor.

Hatchery production is geared to species and strains of trout such as Mt. Whitney rainbow, Twin Lakes cutthroat, and the Owhi strain of eastern brook which are all particularly suited to survival in alpine lakes. The Department is also experimenting with golden trout, Atlantic salmon, and Arctic grayling. Alpine lakes are stocked with fry using fixed-wing airplanes, helicopters, and volunteers with backpacking equipment.

SUPPLY AND DEMAND

Demand for alpine lake fishing is expected to increase at a modest rate, reflecting general population growth and increasing interest in non-motorized backcountry recreation. The number of alpine lakes is certainly not a limiting factor in meeting demand. Access is limited in most cases by remote locations. Demand for fish will continue to be met by stocking of hatchery-reared fry, and by improving broodstocks to develop self-sustaining trout populations.

GOAL

The goal for alpine lakes is to increase the diversity and quality of angling opportunity. Emphasis will be on improving those qualitative aspects of diversity that make alpine angling a special outdoor experience.

OBJECTIVES

1. To maintain at least the present number of fisheries (planted and wild) but increase angling diversity.
   a. Provide trophy fish (14" or larger) in 10 lakes statewide by reducing planting rates.
   b. Increase the number of lakes containing golden trout by 4 statewide.
   c. Increase the number of lakes containing arctic grayling by 4 statewide.
   d. Increase the number of lakes containing atlantic salmon by 4 statewide.
   e. In 10 lakes statewide, introduce brown trout and/or lake trout to control stunted poopulations of brook or cutthroat trout and provide a trophy fishery.
2. Provide a satisfactory angling experience in lakes receiving significant use. (Current estimate indicated about 0.75 fish per hour should be sufficient.) Remaining lakes should be managed for quality aspects (size and diversity) and catch rate is of secondary significance.

PROBLEMS AND STRATEGIES

1. Problem

   Conflicts exist between fishery management goals of the Game Department and policies of federal and state land management agencies.

   Strategies

   a. Coordinate development of Game Department policies, plans, and management activities with the U.S. Forest Service and other land management agencies that own or control alpine lakes.
   b. work to change state and federal policies and regulations which generally preclude or restrict recreational use of alpine lakes on public lands.

2. Problem

   There is a shortage of biological and harvest data for management of alpine lakes.

   Strategies

   a. Complete initial and follow-up statewide surveys of alpine lakes to develop lake management programs.
   b. Intensify collection of biological/ecological data and use

information provided by use of backcountry rangers and organized recreationists as well as public employees.

c. Increase the level of data collection on alpine lakes to provide the basic data needed to adequately manage the resource. Emphasis should be placed on angler use and catch; and fish survival and growth rates.

d. Develop a more efficient means of sampling and planting alpine lakes.

3. Problem

There is a lack of diversity and availability of broodstock suitable for stocking in alpine lakes.

Strategies

a. Expand research and development of suitable broodstock for alpine lakes.

b. Upgrade the quality of hatchery broodstock and develop strains of golden trout, arctic grayling, cutthroat trout, atlantic salmon and brown trout appropriate for Washington's alpine lakes.

c. Renovate existing hatcheries to meet long standing maintenance and repair needs and to improve production efficiency.

4. Problem

Uniform harvest regulations presently impede specific alpine lakes management effort.

Strategies

a. Develop harvest regulations tailored to alpine lakes management on a regional, area, and eventually lake-by-lake level.

5. Problem

There is a shortage of angler use and preference information for program planning and management.

Strategies

a. Continue and refine a recently instituted periodic statewide angler use and preference survey.

6. Problem

Reproduction is too low or nonexistent in some alpine lakes.

Strategies

a. Manipulate or create spawning habitat to promote more natural production.

b. Stock hatchery-reared fish in lakes with low productivity; emphasize species with good natural productive capabilities.

7. Problem

Reproduction is too high in some alpine lakes, resulting in stunted fish populations.

Strategies

a. Manipulate spawning habitat to prevent or reduce successful spawning.
b. Experiment with stocking alternative species best suited to alpine lakes.
c. Rehabilitate selected lakes with rotenone or other toxicants.
d. Introduce predators such as brown trout or lake trout where appropriate.

8. Problem

Acid rain may affect alpine lake fish populations.

Strategies

a. Determine extent of the problem.
b. Determine the effects on fish populations.
c. Develop means to reduce lake acidity.

WARMWATER FISHERIES

Warmwater, or spiny ray, game fish are not native to Washington but have been stocked in lowland lakes, reservoirs, and streams of the state since the late 1800's. Warmwater fisheries are distributed widely at lower elevations in both eastern and western Washington. Game fish available to the angler include crappie, bluegill, walleye, perch, bass, catfish, northern pike, and several species of sunfish.

SUPPLY AND DEMAND

Angler demand for warmwater angling is growing rapidly and is expected to continue. Because of the high reproductive potential of warmwater species and their ability to compete successfully with trout for food and space, much angler demand is met even without intensive management. Warmwater species are available in about 4500 out of 4800 lakes below 2500 feet in elevation, but intensive management is precluded by public access problems in all but about 70 of these lakes at this time.

GOAL

The statewide goal of the warmwater fisheries program is to increase opportunities for warmwater angling, and to increase diversity in waters selected for warmwater or mixed species management.

OBJECTIVES

1. Increase the number of actively managed warmwater or mixed species lakes by an average of 10 per region (60 statewide.)

PROBLEMS AND STRATEGIES

1. Problem

   There is a shortage of angler use and preference information for program planning and management.

   Strategies

   a. Continue and refine a recently instituted periodic statewide angler use and preference survey.

2. Problem

   Most warmwater fisheries are underused.

Strategies

a. Develop material to inform and educate the public on the desirability of warmwater species, the location of underutilized warmwater fisheries, and angling techniques for warmwater species.

b. Improve growth rates and size of warmwater fish in existing fisheries through various habitat management techniques.

c. Manipulate seasons and catch limits for specific waters to increase angler use.

3. Problem

Department fisheries managers needs education in refined management techniques and practical experience in managing warmwater game fish species in Washington.

Strategies

a. Initiate warmwater fisheries management programs in all six regions to increase local management experience and evaluate the management potential of warmwater species in Washington. This program could include habitat manipulation and artificial production, rearing, and stocking of warmwater species.

b. Investigate and develop the proper warmwater fish management procedures. This would include development of population indices and regulatory options; and evaluation of weed control activities.

4. Problem

There is a shortage of inventory data on lakes, streams, and reservoirs, which are particularly suitable for warmwater species management.

Strategies

a. Inventory streams, lakes, and reservoirs statewide to determine which are particularly suitable for managing warmwater species.

b. Collect the basic data needed to manage harvest and use. This would include upgrading the current sampling program and other efforts to obtain catch, success and biological data; evaluation of angler satisfaction and characteristics; and collection of data needed to evaluate regulations.

5. Problem

There is a statewide shortage of public access to lakes and streams available for warmwater species management.

Strategies

a. Acquire or promote more public access and easements on selected streams and lakes which are not on public lands but suitable for warmwater species management.

b. Promote construction of reservoirs for warmwater species management on public lands.

c. Ensure that already-acquired access areas and easements are open and available for public use.

d. Develop more bank fishing facilities at access areas.

e. Acquire, develop, and redevelop access areas on lakes without current public access.

6. Problem

Hatchery production is unreliable.

Strategies

a. Accommodate warmwater fish production in existing production facilities.

b. Build new facilities for warmwater fish production.

c. Construct and operate a new warmwater fish hatchery, including satellite programs at existing facilities.

d. Purchase warmwater fish for hatchery and stocking needs from outside sources. This would include purchase of fingerlings, fry and broodstock.

7. Problem

Some lakes have not responded to traditional management techniques or introduction of species already existing in Washington.

Strategies

a. Evaluate species not currently used in Washington for their potential to provide a successful fishery here.

8. Problem

Operational priorities of reservoir management agencies often conflict with the management of game fish.

Strategies

a. Work closely with reservoir management agencies to minimize fish losses from large or rapid water level fluctuations.

b. Develop cooperative fishery management programs which are compatible with reservoir operations.

c. Seek legislative or court relief to get more authority for protecting game fish resources in reservoirs.

RESIDENT STREAMS AND BEAVER PONDS

Under a concept of stream system management, resident streams and beaver ponds are considered together as one management program. There are at least 12,000 miles of streams in Washington containing populations of resident trout. Game species found in resident streams and beaver ponds include rainbow trout, cutthroat trout, eastern brook trout, brown trout, bull trout and mountain whitefish.

SUPPLY AND DEMAND

Angling pressure on resident streams and beaver ponds is expected to increase commensurate with overall human population growth and a general increase in outdoor recreation demand. With adequate public access, and natural production stream angler demand can be met in the foreseeable future. Intensive management of selected beaver ponds for game fish will be needed to satisfy that demand in the future.

Goal

Maintain, or increase where feasible, sustainable wild populations of trout while increasing angling opportunities through selective stocking of hatchery origin fish.

Objectives

1. Manage streams which are not planted with hatchery fish for wild trout. Streams with healthy populations (multiple age class structure and normal mortality rates) will be maintained at current levels. Depressed populations will be increased and barren areas will be repopulated. Therefore, the overall effect will be significantly increased populations of wild trout. Exceptions would be streams where catchable rainbows have already been committed for mitigation, where warmwater species would be more appropriate or where habitat will not support enough natural production to provide a reasonable recreational fishery.
2. Maintain a satisfactory angling experience in beaver ponds. (Current estimates indicate a catch rate of about 0.75 fish per hour should be sufficient.)
3. Maintain the existing number of beaver pond fishing opportunities.

PROBLEMS AND STRATEGIES

1. Problem

Habitat is being deteriorated by streambed disturbance and various development and logging activities which affect stream and beaver pond habitat.

Strategies

a. Acquire and analyze information needed to adequately protect and aquatic habitat or mitigate fish losses. This will include inventorying aquatic habitat, measuring losses, determining economic values, and developing and evaluating new methods for improving or restoring habitat to replace losses.

b. Attempt to protect, enhance, and mitigate fish habitat losses by continued active involvement in federal, state, and local environmental review and permit processes.

c. Establish and maintain statewide programs for such activities as gold dredging, instream flows, and small hydro developments to deal effectively with projects that cumulatively have significant effects on aquatic habitat.

d. Maintain effective investigation, coordination, disposition, and enforcement of Hydraulic Project Approvals (HPA).

e. Keep a high level of organized involvement in local, state, and federal agency planning that affects resident streams and beaver ponds.

f. Maintain an active role in securing regulations and legislation provide habitat protection and opposing legislation and activities detrimental to habitat.

g. Continue to seek mitigation for stream habitat losses from construction or during relicensing of hydroelectric dams and other publically-funded projects - to include new state legislation if necessary.

h. Increase efforts to protect rearing habitat, which is the primary limiting factor. Emphasis should be placed on riparian corridor protection, reduced stranding, retention of adequate instream flow, diversion screening, and water quality.

2. Problem

There is severe competition for water between irrigation and other out-of-stream water development interests and fisheries resources.

Strategies

a. Develop a program to determine amount of water needed for adequate flows.

b. Take other legal measures, including formal adjudication of water rights on some streams, to require adequate flows for fish.

c. Work with Department of Ecology and other agencies to ensure that adequate flows are established and maintained in resident strams.

3. Problem

Inadequate biological and harvest data is collected for management of beaver ponds and resident streams.

Strategies

a. Expand the systematic collection of biological and harvest data for resident streams and beaver ponds.

b. Conduct field research on a representative sample of streams to test the effects of alternative management strategies and develop management techniques appropriate for Washington streams.

4. Problem

There is a shortage of angler use and preference information for program planning and management.

Strategies

a. Continue and refine a recently initiated periodic statewide angler use and preference survey.

5. Problem

Excessive harvest of wild stocks occurs in mixed wild- and hatchery-stock streams due to uniform stream harvest regulations and the inability of anglers to distinguish between wild and hatchery fish.

Strategies

a. Categorize streams according to their potential for wild-only trout management; develop, implement, and enforce specific management programs and harvest regulations for wild-only, hatchery-only, and mixed-stock streams.

b. mark hatchery-stock fish to enable the public to distinguish them from wild fish.

6. Problem

Beaver control programs often conflict with management of beaver ponds for sport fishing.

Strategies

a. Close management coordination with wildlife control and furbearer management programs (to be addressed within the Game Department).

7. Problem

Increased recreational pressure and private streambank development are resulting in a shortage of public streambank access.

Strategies

a. Acquire or promote more public access and easements on selected streams.

b. Ensure that already-acquired access areas and easements are open and available for public use.

c. Acquire and develop new access areas in streams without current public access through purchase, land use agreement or easements. Redevelop existing areas to accommodate more use.

8. Problem

Compliance rates for fishing regulations on streams managed for wild fish are low.

Strategies

a. Increase compliance with signs and provide better information on the reasons behind rules and regulations to protect wildl fish.

b. Bolster enforcement efforts related to management regulations, HPA provisions, instream flow regulation, and other actions related to resource protection.

9. Problem

No stream-dwelling strain of broodstock exists in Washington.

Strategies

a. Develop broodstocks from strains appropriate for management in Washington streams.

b. Renovate existing hatcheries to meet long standing maintenance and repair needs and to improve production efficiency.

FISH AND WILDLIFE - GENERAL

Program Improvements

1. Complete a remote sensing-based resource inventory on Washington Department of Game lands.

2. Conduct a study to determine the actual extent of damage to private property caused by wildlife.

3. Provide for a staff veterinarian and laboratory facilities to investigate and control wildlife diseases.

4. Provide for adequate facility maintenance and repair.

5. Develop a comprehensive program to protect wetlands.

6. Develop the capability to monitor and respond to environmental contaminants.

7. Create an emergency response/crisis management team to respond to emergencies such as toxic spills and volcanic eruption.

8. Expand the mitigation banking and habitat evaluation procedures program.

9. Provide the capability to participate in an interagency, statewide geographic information system.

10. Provide the computer capability needed to implement many of the strategies in this plan.

11. Provide increased administrative services such as payroll, personnel and purchasing needed to support the additional projects in this plan.

HATCHERIES

Improved hatchery production has been identified as a need in each of the fisheries harvest area plans. For convenience, hatchery improvement needs are summarized here:

1. Renovate many existing facilities to provide more efficient production. Replace obsolete hatcheries with new ones.
2. Improve the water supply at some hatcheries which will allow increased production with existing facilities.
3. Expand existing facilities where present water supply is more than adequate.
4. Provide research and development capability at existing facilities which will help increase production efficiency.
5. Build new facilities, especially for Kokanee and warmwater fish.

FISHING ACCESS

Improved fishing access was identified as a need in most of the fisheries harvest area plans. For convenience, these needs are summarized here.

1. New boating access on lakes without current public access (First Priority).
2. Additional bank fishing access on streams and lakes (Second Priority).
3. Adequate maintenance on existing sites.
4. Redevelopment of existing sites where inadequate size or deteriorated facilities limit use.

ENFORCEMENT

Program Improvements

Enforcement program improvements were identified in many of the wildlife species and fisheries harvest area plans. For convenience, the following information is provided to summarize and focus attention on the most significant enforcement needs. In the planning process, thirteen programs were identified as having the most serious enforcement problems. These programs and the additional enforcement effort they need are as follows:

1-7. Black-tailed Deer, Westside Elk, Mule Deer, White-tailed Deer, Eastside Elk, Bighorn Sheep, Cougar

a. Conduct research to determine the magnitude of the poaching problem and its effect on big game populations. Evaluate effectiveness of enforcement efforts. Make program improvements based on results of study. Focus first on deer and elk.

b. Increase enforcement effort on road closures and road management areas to increase effectiveness and allow for expansion of the program.

8. Pheasants

a. Prevent unlawful or abusive use of Department of Game land, especially trespass farming and grazing, burning and other habitat destruction in prime pheasant areas.

b. Fulfill contractual obligations for regulated hunting areas on private land.

c. Increase enforcement effort on western Washington pheasant permit regulations.

9. Waterfowl

a. Increase enforcement of reserve area regulations.

b. Fulfill contractual obligations for regulated hunting areas on private lands.

10. Nongame

    a. Provide additional enforcement to protect selected species as identified by the Nongame program.

11-13. Steelhead, Searun Cutthroat and Dolly Varden trout, Resident Streams and Beaver Ponds.

    a. Increase enforcement of rules designed to protect wild fish.
    b. Increase enforcement of rules to protect stream habitat.
    c. Increase enforcement effort on Treaty Indian fisheries.

14. Additional General Enforcement Needs.

    a. Provide more agent-at-large investigators.
    b. Create a covert investigations team.
    c. Upgrade the agents' training program.
    d. Obtain forensics evaluation capability.
    e. Upgrade the Help Stop Poaching program.
    f. Target additional effort on commercialization of wildlife, especially for bighorn sheep, mountain goat, bear, raptors and Threatened, Endangered and, Sensitive nongame species.

Program Improvements

Habitat program improvements were identified in most if not all of the wildlife species and fisheries harvest area plans. For convenience, the following information is provided to summarize and focus attention on the most significant habitat needs. In the planning process, eleven programs were identified as having the most serious habitat problems. These problems, their major habitat problems, and possible solutions are as follows:

1. Black-tailed Deer

   a. Problem: Land use and forest practices on forest lands in western Washington result in a forage/cover ratio unsuitable for good black-tailed deer production.

      Possible Solutions:

      1) Participate in land use and interagency planning efforts to incorporate deer habitat needs into forest management plans.
      2) Work for legislation which provides improved forest practices.
      3) Provide financial incentives to landowners who implement land use/forest practices more beneficial to black-tailed deer.
      4) Conduct habitat enhancement projects on forest lands.

   b. Problem: Some black-tailed deer populations are below carrying capacity due to excessive human disturbance from too much road access in critical habitat.

      Possible Solutions:

      1) Participate in land use and interagency planning efforts to minimize the impact of roads.
      2) Expand the cooperative road management program.

2. Westside Elk

   a&b Problem: Westside elk have the same two problems and the same recommended solutions as the two problems shown for Black-tailed deer.

   c. Problem: Critical winter range is being lost to urban and agricultural expansion.

Possible Solutions:

1) Purchase critical winter range and manage it for increased elk expansion.
2) Develop cooperative habitat enhancement projects with public and private land owners.

3. Mule Deer

a. Problem: Critical winter range is being lost to houses agriculture and recreation developments.

Possible Solutions:

1) Purchase critical winter range and manage it for increased deer production.
2) Provide financial incentives to landowners to retain land as winter range.
3) Develop cooperative winter range enhancement projects on public and private lands.
4) Conduct winter range enhancement projects on Department of Game lands to increase deer carrying capacity.

4. Eastside Elk

a. Problem: Same as problem a for Mule Deer.

b. Problem: There has been a loss of cover in transition range.

Possible Solutions:

1) Participate in interagency resource planning; help develop resource management plans which provide for needed cover in transition range.

c. Problem: Some elk populations are below carrying capacity due to excessive human disturbance from too much road access in critical habitat.

Possible Solutions:

1) Participate in land use and interagency planning to reduce the impact of roads.
2) Expand the cooperative road management program.

5. Sage/Sharp-tailed Grouse

a. Problem: There has been a major loss of critical habitat (shrub/steppe and riparian habitat types) due to a variety of human developments.

Possible Solutions:

1) Work with the agricultural extension services at Washington State University, the Soil Conservation Service and others to promote retention or improvement of critical habitat.
2) Develop cooperative habitat enhancement projects on public and private lands.
3) Provide financial incentives to private land owners to retain habitat.
4) Purchase critical habitat and manage it for increased grouse production.

6. Waterfowl

Eastern Washington

a. Problem: There has been a continuing loss of both production and wintering habitat.

Possible Solutions:

1) Protect wetlands on private land through fee-title purchase, long term easement, or other financial compensation.
2) Provide compensation to land owners for crops produced for waterfowl food on private land.
3) Improve habitat and food crop production on Department of Game Wildlife Areas. Provide diking and water control to retain wetlands for resting and feeding.

Western Washington

a. Problem: There has been a continuing loss of wintering areas due to encroachment of human developments.

Possible Solutions:

1) Protect wetland, especially estuaries, by fee-title purchase, long term easement or other landowner compensation.
2) Maximize waterfowl food production on Department of Game Wildlife Areas. (Will require water level management in some areas.)
3) Compensate for losses where legally required by a mitigation program.

7. Pheasant

a. Problem: There has been a continuing loss of critical habitat particularly for food and cover, in prime pheasant production

areas.

Possible Solutions:

1) Acquire small plots (2-15 acres) of critical habitat in prime pheasant production areas through purchase, long-term easement on other means.
2) Provide financial incentives to landowners to retain permanent cover and provide food crops.

8-10. Steelhead, Searun Cutthroat and Dolly Varden Trout, and Resident Stream and Beaver Ponds (the problems and possible solutions are the same for all three programs.)

a. Problem: The primary limiting factor for all stream programs is rearing capacity. A variety of impacts have reduced rearing capacity in most streams.

Possible Solutions:

1) Retain adequate instream flows through participation in state in stream flow and water rights review programs.
2) Provide financial incentives to land owners to protect stream corridors.
3) Seek new legislation which provides for protection of stream corridors.
4) Make improvements to our HPA program to make it more efficient and effective.
5) Participate in interagency and land use planning to assure stream protection in resource management plans.
6) Develop a stream inventory to monitor resource changes.

11.a Nongame Species of concern grouped by special habitats

A. Shrub Steppe (ferruginous hawk (ST), pygmy rabbit (ST), burrowing owl (SS), golden eagle (SS), gyrfalcon (SS), loggerhead shrike (SS), sage sparrow (SS), sage thrasher (SS), Swainson's hawk (SS), W. bluebird (SS), Merriam's shrew (SS), pallid bat (SS)

a. Problem: Habitat is being reduced

Possible Solutions:

1) Land use planning (interagency)
2) Other agency extension service and WDG extension service
3) Cooperative enhancement
4) Manage, enhance WDG lands

5) Landowner compensation
6) Purchase

B. Old Growth (spotted owl (ST), fisher (SS), grizzly bear (F&SE), long-eared myotis (SS), N. goshawk (SS), pileated wood-pecker (SS), Larch Mt. salamander (SS), Dunn's salamander (SS).

a. Problem: Habitat is being reduced due to conversion to second growth.

Possible Solutions:

1) Land use planning (interagency)
2) Environmental review
3) Manage WDG lands
4) Legislation/rule changes

C. Riparian (bald eagles (F&ST), common loon (PT), horned grebe (SS), long-eared myotis (SS), purple martin (PT), w. pond turtles (ST), wolverine (SS), Columbia white-tailed deer (F&SE), peregrine falcon (F&SE), northern bog lemming (SS).

a. Problem: Mature riparian habitat is being lost and early successional stages are being maintained.

Possible Solutions:

1) Legislation/rule changes
2) Land use interagency planning
3) WDG permits
4) Environmental review
5) Mitigation/compensation
6) Extension service (both WDG and other agency)
7) Landowner compensation
8) Public education
9) Oil/toxic spills

D. Bogs and other small wetlands (sandhill crane (SE), Western pond turtle (SE), Beller's ground beetle (SS), black necked stilt (SS), N. bog lemming (SS), Hatche's click beetle (SS), silver bordered fritillary (SS).

a. Problem: Habitat is disappearing due to conversion to other uses.

Possible Solutions:

1) WDG permits

2) Mitigation/compensation
3) Legislation/rule changes
4) Land use planning/interagency
5) Extension service programs (both WDG and other)
6) Manage, enhance WDG lands
7) Landowner compensation
8) Purchase/less than fee purchase
9) Oil/toxic spills

E. Snags (black-bakced woodpecker (SS), fisher (SS), long eared myotis (SS), pileated woodpecker (SS), purple martin (PT), three-toed woodpecker (SS), western bluebird (SS), white headed woodpecker (SS).

a. Problem: There is major loss in both numbers and sizes of snags due to timer harvest anf fuel wood cutging.

Possible Solutions:

1) Other agency extension and WDG extension service
2) Public education
3) Legislation/rule changes
4) Environmental review
5) Manage WDG lands

F. Oak Woodlands (w. grey squirrel (SS), golden eagle (SS), loggerhead shrike (SS), pallid bat (SS), western bluebird (SS).

a. Problem: There is loss of habitat due to conversion to other uses.

Possible Solutions:

1) Land use planning/interagency
2) Landowner compensation
3) Less than fee purchase
4) Purchase
5) Manage/enhance WDG lands (fire)
6) Environmental review

G. Meadow/prairies (Oregon fritillary (F&SE), Mardon skipper (SS), silver bordered fritillary (SS), grizzly bear (SE, FT), loggerhead shrike (SS), long-eared myotis (S), northern bog lemming (SS), pallid bat (SS), sandhill crane (SE), Townsend's big eared bat (PT).

a. Problem: There is habitat loss due to conversion to other uses.

Possible Solutions:

1) land use/interagency planning
2) Environmental review
3) Landowner compensation
4) Purchase/less than fee purchase
5) Extension services (both WDG and other agency)

H. Sandspits (bald eagle (F&ST), merlin (SS), peregrine falcon (F&SE), snowy plover (SE).

a. Problem: There is degradation or loss of habitat through development.

Possible Solutions:

1) Land use/interagency planning
2) Mitigation/compensation
3) Environmental review
4) Purchase/less than fee purchase
5) Oil/toxic spills

I. Juniper Forest (sage sparrow (SS), ferruginous hawk (ST), Swainson's hawk (SS), loggerhead shrike (SS), sage thrasher (SS), western bluebird (SS), golden eagle (SS), burrowing owl (SS).

a. Problem: Habitat is extremely limited in extent in state. There are conflicts with recreation.

Possible Solutions:

1) Land use/interagency planning (BLM)
2) Public education
3) Environmental review

J. Dunes (Oregon silverspot butterfly (F&ST), Snowy plover (SE).

a. Problem: There is degradation of vegetation and disturbance of wildlife.

Possible Solutions:

1) Land use/interagency planning
2) Environmental review
3) Education

K. Caves (pallid bat (SS), Townsend's big eared bat (PT).

a. Problem: There is disburbance by cave explorers.

Possible Solutions:

1) Interagency/land use planning
2) Public education
3) Purchase

L. Marine Marine mammals (Sea Otter (SE), Harbor Seal, California Sea Lion, Northern Sea Lion, Killer Whale, Harbor Porpoise (SS), Dall's Porpoise, Minke Whale, California Gray Whale (FE), plus others), marine birds (Pelagic Cormorant, Brandt's Cormorant, Double Crested Cormorants, Rhinoceros Auklets, Marbled Murrelets, Common Murre, Tufted Puffin plus others) and all unclassified marine invertebrates and fish.

a. Problem:

1) Population declines due to habitat loss.
2) Susceptibility to environmental pollution.
3) Fishery interactions and incidental mortality.
4) Human disturbance.
5) Oil spill vulnerability

Possible Solutions:

1) Species status monitoring
2) Identification and protection of critical habitats, nesting colonies and haulout sites.
3) Contaminant monitoring for pollution levels/effects.
4) Develop comprehensive oil spill response plan for marine species.
5) Fishery interaction documentation and mitigation.

11b. Nongame species of concern of other or multiple habitats

A. Grizzly Bear (F&SE)

a. Problem: Disturbance occurs during critical spring period.

Possible Solutions:

1) Interagency/land use planning
2) Environmental review
3) Public education

B. Caribou (F&SE)

a. Problem: Some habitat is threatened by roads and logging in

winter and spring range.

Possible Solutions:

1) Interagency/land use planning
2) Environmental review

C. Columbia White Tailed Deer (F&SE)

a. Problem: Habitat is being converted to agriculture.

Possible Solutions:

1) Landowner compensation
2) Purchase

D. Bald Eagle (F&ST)

a. Problem: Nesting habitat is threatened with development-primarily residental or timber cutting.

Possible Solutions:

1) Land use planning (interagency)
2) Land owner compensation
3) Purchase
4) Public education

b. Problem: Winter roosting habitat is being lost.

Possible Solutions:

1) Rule making
2) Land use planning (interagency)
3) Landowner compensation
4) Purchase

c. Problem: Winter feeding habitat is threatened by recreational disturbance.

Possible Solutions:

1) Manage WDG lands
2) Land use planning (interagency)
3) Rules changes (fishing)
4) Public education

E. Peregrine Falcon (F&SE)

a. Problem: Pesticide build-up in system resulting in poor reproduction.

Possible Solutions:

1) Environmental review

2) Extension service (other agencies)

3) Public education

b. Problem: Nesting sites are threatened by development.

Possible Solutions:

1) Land use planning (interagency)

2) Environmental review

3) Purchase

F. Brown Pelican (F&SE)

a. Problem: This species is susceptible to oil spills.

Possible Solutions:

1) Oil spill control

G. White Pelican (SE)

a. Problem: Breeding habitat is being lost through land reclamation, irrigation, and disturbance.

Possible Solutions:

1) Manage and enhance WDG lands (control disturbance on Pothole Reservoir)

2) Public education

H. Wolf (F&SE)

a. Problem: There is a low transient population due to disturbance and harassment.

Possible Solutions:

1) Public education

2) Land use (interagency planning), road management

3) Environmental review

I. Sea Otter (SE)

a. Problem: Limited range is susceptible to oil spills.

Possible Solutions:

1) Pollution control/oil spills

2) Mitigation compensation

3) Environmental review

4) Legislation/rule changes

J. Sandhill Crane (SE)

a. Problem: Nesting habitat is being lost due to recreational disturbance, swamp drainage, and prairie cultivation.

Possible Solutions

1) Manage, enhance WDG lands
2) Land use/interagency planning
3) Environmental review
4) Extension services (WDG and other agency)
5) Landowner compensation
6) Purchase/less than fee purchase

Habitat Acquisition Priorities

Habitat acquisition was identified as a Program improvement in all of the following programs. Habitat will be acquired for all of these programs either by purchase or less-than-fee-title on a willing seller basis as opportunities arise. However, based on the urgency of need, unprotected habitat should be purchased according to the following priorities:

1. State Endangered Species
   a. Peregrine Falcon - nesting sites
   b. Upland Sandpiper - nesting and brooding sites in meadow/pasture. (Conservation easement or cooperative land use agreement will be used also if feasible.)

2. State Threatened Species
   The highest quality habitat on the most threatened sites where large concentrations of these species occur should be purchased first. Cooperative management agreements and conservation easements can be used also where they can provide adequate protection.
   a. Bald Eagle - nesting and roosting sites
   b. Common Loon - alpine lakes with known nesting sites
   c. Townsend's Big-eared Bat - nesting and hibernation caves
   d. Western Pond Turtle - occupied palustrine ponds in western Washington
   e. Larch Mountain Salamander - occupied talus slopes in the Columbia Basin
   f. Oregon Silver Spot Butterfly - occupied coastal meadows and adjacent dunes

3. Mule Deer - winter range

4. Shrub - Steppe Dependent Species
   Purchase is the primary option for protecting shrub-steppe habitat type occupied by the following species. Emphasis should be placed first on threatened sites of high quality habitat where these animals are concentrated or where several of these species occur on the same site. Conservation easements or cooperative agreements can be used if a site

can be adequately protected. Species to be protected include:

a. Sage and sharp-tailed grouse - sites which include leks, dancing grounds, winter habitat and key riparian areas
b. Pygmy Rabbit - Columbia basin sites with deep, soft soils and abundant forbs
c. Ferruginous Hawk - nesting sites
d. Merriams Shrew - occupied sites
e. Swainsons Hawk - nesting sites
f. Golden Eagle - nesting sites
g. Burrowing Owl - occupied sites
h. Sage Thrasher - nesting and heavily used sites
i. Loggerhead Shrike - nesting and heavily used sites
j. Sage Sparrow - nesting and heavily used sites

5. Eastside Elk - key winter range

6. Band-tailed Pigeons - mineral springs

7. Waterfowl - wetlands

8. Pheasant/Quail - nesting and winter habitat

9. Bighorn Sheep - winter range

10. Westside Elk - winter range

11. State Sensitive Species

Habitat may be purchased for these species where high quality sites are threatened with destruction if no other means of protection is possible.

a. *Pallid Bat - cave and roost sites in river canyons of eastern Washington*
b. Western Gray Squirrel - occupied sites of oak-fir-pine woodlands in southern Puget Sound Region
c. Western Pocket Gopher (4 subspecies) - occupied prairies in southern Puget Sound Region
d. Northern Pocket Gopher - occupied meadows in Columbia Gorge
e. Gray-tailed Vole - occupied meadows in the Vancouver area

f. Marbled Murrelet - nest sites in old-growth and mature forest

g. Dunn's Salamander - wet talus slopes in south west Washington

h. Olympia Mudminnow - quiet, heavily vegetated waters over mud bottom

i. Beller's Ground Beetle - occupied sphagnum bogs

j. Hatch's Click Beetle - occupied sphagnum bogs

INFORMATION AND EDUCATION

While the department has never overlooked the needs of the public, in the past we have concentrated our efforts on wildlife's needs. Hindsight proves this decision to be prudent; but our crystal ball shows the public needs becoming larger and more demanding. As the human population increases, more people will be demanding our services; more habitat will be lost for wildlife; more conflicts will arise between competitive users; and the harder it will be for the fish and wildlife program managers to achieve their goals. Not only is our population increasing, it is changing. We are becoming more urbanized, and are losing our ties to the land. Our understanding of wildlife is coming less from actual field experience and more from books and television sets. The proportion of us who hunt and fish is decreasing, while the needs and demands of all our publics are increasing. To achieve agency objectives, we will need to reach and serve more and different people.

Not only does the public have needs from the department, the department has many different needs and expectations of the public. The central purpose of the Information and Education Division is to facilitate this identification and exchange of department and public needs and services.

To be most effective, we will take an approach very similar to species management. The first step is consultation with the different program managers to determine their public-related obstacles to achieving their objectives. Secondly, we must assess the public mood and perceived needs, to establish a goal for that program. Thirdly, we must chosse from the various techniques we have available to move toward the objectives. Finally, we must evaluate our effectiveness, and adjust accordingly.

The most critical needs have been identified by the management divisions, they are:

Wildlife Management

1. A program to generate public understanding of wildlife management principles, techniques and the Department's management program especially for issues involving big game management: population dynamics principles, carrying capacity, annual recruitment/annual

surplus.

2. An information program on trapping.
3. A program to develop public acceptance of the need to protect habitat for threatened and endangered species; the methods and the benefits anc costs of each technique.
4. A program to help hunters understand various regulations; branched-antler restrictions, resource allocation-either/or requirements, etc.

Habitat Management

1. A program to explain to the public how the mitigation and landowner relations programs protect habitat.
2. A program to explain our policies on permits and how they protect habitat.
3. Programs to help certain groups understand what we do and why we do For example:
   a. The agricultural community-Cattlemen, Grange, Farm Bureau, etc.
   b. Washington Public Port Association
   c. Individual Industrial Forest owners
4. A program to help the public understand why landowner compensation is a legitimate wildlife management techniques.
5. A program to explain Game Department habitat improvement projects.

Fisheries Management

1. A program to better inform anglers about regulations on specific water, especially streams.
2. A program to generate public understanding of fisheries management principles, techniques and the department's management programs, especially for:
   a. The lake rehabilitation program
   b. Wild fish management
   c. Catch and release program
   d. Warmwater fish management

Law Enforcement

1. A program to obtain voluntary compliance with rules and regulations.
2. A program to obtain awareness of and cooperation with the Help Stop Poaching Program.

Personnel

1. Career Day Program targeted for affirmative action recruitment in Junior High and Senior High.
2. Recruitment program for college orientation.
3. New employees handbook.
4. Sexual harassment information program for internal use.

Administrative Services

1. A program to educate agency personnel on the license system.
2. A program to educate license dealers on licensing procedures.
3. A program to explain how and where the Department spends it's money.
4. An internal program to explain what Management Services Division does.

APPENDIX

FISH AND WILDLIFE OF WASHINGTON

Listed below are the common and scientific names of fish and wildlife species that occur in Washington.

GAME FISH	
Arctic grayling	- *Thymallus arcticus*
Atlantic salmon	- *Salmo salar*
Black bullhead	- *Ictalurus melas*
Black crappie	- *Pomoxis nigromaculatus*
Blue catfish	- *Ictalurus furcatus*
Bluegill	- *Lepomis macrochirus*
Brown bullhead	- *Ictalurus nebulosus*
Brown trout	- *Salmo trutta*
Burbot or Freshwater Ling	- *Lota lota*
Channel catfish	- *Ictalurus punctatus*
Cutthroat trout eastern Washington	- *Salmo clarki lewisi*
Cutthroat trout (sea-run)	- *Salmo clarki clarki*
Dolly Varden	- *Salvelinus malma*
Eastern Brook trout	- *Salvelinus fontinalis*
Golden trout	- *Salmo aguabonita*
Green sunfish	- *Lepomis cyanellus*
Kokanee or Silver trout	- *Oncorhynchus nerka kennerlyi*
Lahontan Cutthroat trout	- *Salmo clarki henshawi*
Lake trout	- *Salvelinus namaycush*
Lake whitefish	- *Coregonus clupeaformis*
Largemouth bass	- *Micropterus salmoides*
Mountain whitefish	- *Prosopium williamsoni*
Northern pike	- *Esox lucius*
Pumpkinseed sunfish	- *Lepomis gibbosus*
Rainbow trout	- *Salmo gairdneri*
Rock bass	- *Ambloplites rupestris*
Smallmouth bass	- *Micropterus dolomieui*
Steelhead trout	- *Salmo gairdneri*
Walleye	- *Stizostedion vitreum*
Warmouth bass	- *Chaenobryttus gulosus*
White crappie	- *Pomoxis annularis*
Yellow bullhead	- *Ictalurus natalis*
Yellow perch	- *Perca flavescens*
BIG GAME	
Antelope, Pronghorn	- *Antilocapra americana*
Bear, Black	- *Ursus americanus*
Mountain sheep	- *Ovis canadensis*
Cougar	- *Felis concolor*
Deer, Black-tailed	- *Odocoileus hemionus columbianus*
Deer, Columbian White-tailed	- *Odocoileus virginianus leucurus*
Deer, Mule	- *Odocoileus hemionus hemionus*
Deer, White-tailed	- *Odocoileus virginianus ochrourus*
Elk, Rocky Mountain	- *Cervus elaphus nelsoni*
Elk, Roosevelt	- *Cervus elaphus roosevelti*
Moose	- *Alces alces*

Mountain goat	- *Oreamnos americanus*
UPLAND GAME	
Blue grouse	- *Dendragapus obscurus*
Spruce grouse	- *Canachites canadensis*
Ruffed grouse	- *Bonasa umbellus*
Sage grouse	- *Centrocercus urophasianus*
Sharp-tailed grouse	- *Pedioecetes phasianellus*
White-tailed Ptarmigan	- *Lagopus leucurus*
Mourning Dove	- *Zenaidura macroura*
Band-tailed pigeon	- *Columba fasciata*
Chukar partridge	- *Alectoris graeca*
Hungarian partridge	- *Perdix perdix*
Ring-necked pheasant	- *Phasianus colchicus*
Wild turkey	- *Meleagris gallopavo*
Valley quail	- *Lophortyx californicus*
Bobwhite quail	- *Colinus virginianus*
Scaled quail	- *Callipepla squamata*
Mountain quail	- *Oreortyx pictus*
Common snipe	- *Capella gallinago*
Eastern cottontail rabbit	- *Sylvilagus floridanus*
Nuttall's cottontail rabbit	- *Sylvilagus nuttallii*
Snowshoe hare	- *Lepus americanus*
Black-tailed jackrabbit	- *Lepus californicus*
White-tailed jackrabbit	- *Lepus townsendii*
FURBEARERS	
Badger	- *Taxidea taxus*
Beaver	- *Castor canadensis*
Bobcat	- *Lynx rufus*
Coyote	- *Canis latrans*
Fisher	- *Martes pennanti*
Fox, Cascade Red	- *Vulpes fulva cascadensis*
Fox, Lowland Red	- *Vulpes fulva fulva*
Lynx	- *Lynx canadensis*
Marten	- *Martes americana*
Mink	- *Mustela vison*
Muskrat	- *Ondatra zibethica*
Nutria	- *Myocastor coypus*
Opossum	- *Didelphis virginiana*
Otter, River	- *Lutra canadensis*
Otter, Sea	- *Enhydra lutris*
Raccoon	- *Procyon lotor*
Seal, Fur	- *Callorhinus ursinus*
Skunk, Spotted	- *Spilogale gracilis*
Skunk, Striped	- *Mephitis mephitis*
Weasel, Longtailed	- *Mustela frenata*
Weasel, Shorttailed	- *Mustela erminea*
Wolf	- *Canis lupus*
Wolverine	- *Gulo gulo*
WATERFOWL	
Whistling swan	- *Olor columbianus*

Trumpeter swan	- *Olor buccinator*
Great basin Canada goose	- *Branta canadensis moffitti*
Lesser Canada goose	- *Branta canadensis parvipes*
Western dusky Canada goose	- *Branta canadensis occidentalis*
Taverner's Canada goose	- *Branta canadensis taverneri*
Vancouver Canada goose	- *Branta canadensis fulva*
*Aleutian Canada goose	- *Branta canadensis leucopareia*
Cackling Canada goose	- *Branta canadensis minima*
Pacific (black) brant	- *Branta bernicla nigricans*
Atlantic brant	- *Branta bernicla hrota*
*Emperor goose	- *Anser canagicus*
Pacific white-fronted goose	- *Anser albifrons frontalis*
Lesser snow goose	- *Anser caerulescens caerulescens*
*Ross goose	- *Anser rossii*
*Fulvous whistling duck	- *Dendrocygna bicolor*
Mallard	- *Anas platyrhynchos*
Gadwall	- *Anas strepera*
Pintail	- *Anas acuta*
Green-winged teal	- *Anas crecca*
Blue-winged teal	- *Anas discors*
Cinnamon teal	- *Anas cyanoptera*
European wigeon	- *Anas penelope*
American wigeon	- *Anas americana*
Shoveler	- *Anas clypeata*
Wood duck	- *Aix sponsa*
Redhead	- *Aythya americana*
Ring-necked duck	- *Aythya collaris*
Canvasback	- *Aythya valisineria*
Greater scaup	- *Aythya marila*
Lesser scaup	- *Aythya affinis*
Tufted duck	- *Aythya fuligula*
Common goldeneye	- *Bucephala clangula*
Barrow's goldeneye	- *Bucephala islandica*
Bufflehead	- *Bucephala albeola*
Oldsquaw	- *Clangula hyemalis*
Harlequin duck	- *Histrionicus histrionicus*
*King elder	- *Somateria spectabilis*
*Pacific elder	- *Somateria mollissima*
White-winged scoter	- *Melanitta fusca*
Surf scoter	- *Melanitta perspicillata*
Black scoter	- *Melanitta nigra*
Ruddy duck	- *Oxyura jamaicensis rubida*
Hooded merganser	- *Mergus cucullatus*
Common merganser	- *Mergus merganser*
Red-breasted merganser	- *Mergus serrator*
Coot	- *Fulica americana*

*Irregular, casual, or accidental

Vertebrate Species Managed by the Nongame Program
(Excluding primarily pelagic or accidental visitors)

Pacific lamprey	- *Entosphenus tridentatus*
River lamprey	- *Lampetra ayresi*
Western brook lamprey	- *Lampetra richardsoni*
Pygmy whitefish	- *Prosopium coulteri*
Olympic mudminnow	- *Novumbra hubbsi*
Chiselmouth	- *Acrocheilus alutaceus*
Lake chub	- *Couesius plumbeus*
Tui chub	- *Gila bicolor*
Peamouth	- *Mylocheilus caurinus*
Northern squawfish	- *Ptychocheilus oregonensis*
Longnose dace	- *Rhinichthys cataractae*
Leopard dace	- *Rhinichthys falcatus*
Speckled dace	- *Rhinichthys osculus*
Redside shiner	- *Richardsonius balteatus*
Longnose sucker	- *Catostomus catostomus*
Bridgelip sucker	- *Catostomus columbianus*
Largescale sucker	- *Catostomus macrocheilus*
Mountain sucker	- *Catostomus platyrhynchus*
Sand roller	- *Percopsis transmontana*
Three-spine stickleback	- *Gasterosteus aculeatus*
Coastrange sculpin	- *Cottus aleuticus*
Prickly sculpin	- *Cottus asper*
Mottled sculpin	- *Cottus bairdi*
Plute sculpin	- *Cottus beldingi*
Slimy sculpin	- *Cottus cognatus*
Shorthead sculpin	- *Cottus confusus*
Riffle sculpin	- *Cottus gulosus*
Margined sculpin	- *Cottus marginatus*
Reticulate sculpin	- *Cottus perplexus*
Torrent sculpin	- *Cottus rhotheus*
Northwestern salamander	- *Ambystoma gracile*
Long-toed salamander	- *Ambystoma macrodactylum*
Tiger salamander	- *Ambystoma tigrinum*
Cope's giant salamander	- *Dicamptodon copei*
Pacific giant salamander	- *Dicamptodon ensatus*
Olympic salamander	- *Rhyacotriton olympicus*
Ensatina	- *Ensatina eschscholtzi*
Dunn's salamander	- *Plethodon dunni*
Larch Mountain salamander	- *Plethodon larselli*
Van Dyke's salamander	- *Plethodon vandykei*
Western red-backed salamander	- *Plethodon vehiculum*
Roughskin newt	- *Taricha granulosa*
Western toad	- *Bufo boreas*
Woodhouse's toad	- *Bufo woodhousei*
Pacific treefrog	- *Hyla regilla*
Tailed frog	- *Ascaphus truei*
Great Basin spadefoot	- *Spea intermontana*
Red-legged frog	- *Rana aurora*
Cascades frog	- *Rana cascadae*
Northern leopard frog	- *Rana pipiens*

Spotted frog	- *Rana pretiosa*
Wood frog	- *Rana sylvatica*
Western pond turtle	- *Clemmys marmorata*
Painted turtle	- *Chrysemys picta*
Northern alligator lizard	- *Elgaria coerulea*
Southern alligator lizard	- *Elgaria multicarinata*
Short-horned lizard	- *Phrynosoma douglassi*
Sagebrush lizard	- *Sceloporus graciosus*
Western fence lizard	- *Sceloporus occidentalis*
Side-blotched lizard	- *Uta stansburiana*
Western skink	- *Eumeces skiltonianus*
Rubber boa	- *Charina bottae*
Racer	- *Coluber constrictor*
Sharp-tailed snake	- *Contia tenuis*
Ring-necked snake	- *Diadophis punctatus*
Night snake	- *Hypsiglena torquata*
California mountain kingsnake	- *Lampropeltis zonata*
Striped whipsnake	- *Masticophis taeniatus*
Gopher snake	- *Pituophis catenifer*
Western terrestial garter snake	- *Thamnophis elegans*
Northwestern garter snake	- *Thamnophis ordinoides*
Common garter snake	- *Thamnophis sirtalis*
Western rattlesnake	- *Crotalus viridis*
Red-throated loon	- *Gavia stellata*
Arctic loon	- *Gavia arctica*
Common loon	- *Gavia immer*
Yellow-billed loon	- *Gavia adamsii*
Pied-billed grebe	- *Podilymbus podiceps*
Horned grebe	- *Podiceps auritus*
Red-necked grebe	- *Podiceps grisegena*
Eared grebe	- *Podiceps nigricollis*
Western grebe	- *Aechmophorus occidentalis*
American white pelican	- *Pelecanus erythrorhynchos*
Brown pelican	- *Pelecanus occidentalis*
Double-crested cormorant	- *Phalacrocorax auritus*
Brandt's cormorant	- *Phalacrocorax penicillatus*
Pelagic cormorant	- *Phalacrocorax pelagicus*
American bittern	- *Botaurus lentiginosus*
Great blue heron	- *Ardea herodias*
Great egret	- *Casmerodius albus*
Green-backed heron	- *Butorides striatus*
Black-crowned night-heron	- *Nycticorax nycticorax*
Turkey vulture	- *Cathartes aura*
Osprey	- *Pandion haliaetus*
Black-shouldered kite	- *Elanus caeruleus*
Bald eagle	- *Haliaeetus leucocephalus*
Northern harrier	- *Circus cyaneus*
Sharp-shinned hawk	- *Accipiter striatus*
Cooper's hawk	- *Accipiter cooperii*
Northern goshawk	- *Accipiter gentilis*
Swainson's hawk	- *Buteo swainsoni*
Red-tailed hawk	- *Buteo jamaicensis*
Ferruginous hawk	- *Buteo regalis*

Rough-legged hawk	- *Buteo lagopus*
Golden eagle	- *Aquila chrysaetos*
American kestrel	- *Falco sparverius*
Merlin	- *Falco columbarius*
Peregrine falcon	- *Falco peregrinus*
Gyrfalcon	- *Falco rusticolus*
Prairie falcon	- *Falco mexicanus*
Sandhill crane	- *Grus canadensis*
Black-bellied plover	- *Pluvialis squatarola*
Snowy plover	- *Charadrius alexandrinus*
Semipalmated plover	- *Charadrius semipalmatus*
Killdeer	- *Charadrius vociferus*
Black oystercatcher	- *Haematopus bachmani*
Black-necked stilt	- *Himantopus mexicanus*
American avocet	- *Recurvirostra americana*
Greater yellowlegs	- *Tringa melanoleuca*
Lesser yellowlegs	- *Tringa flavipes*
Solitary sandpiper	- *Tringa solitaria*
Willet	- *Catoptrophorus semipalmatus*
Wandering tattler	- *Heteroscelus incanus*
Spotted sandpiper	- *Actitis macularia*
Upland sandpiper	- *Bartramia longicauda*
Whimbrel	- *Numenius phaeopus*
Long-billed curlew	- *Numenius americanus*
Marbled godwit	- *Limosa fedoa*
Ruddy turnstone	- *Arenaria interpres*
Black turnstone	- *Arenaria melanocephala*
Surfbird	- *Aphriza virgata*
Red knot	- *Calidris canutus*
Sanderling	- *Calidris alba*
Semipalmated sandpiper	- *Calidris pusilla*
Western sandpiper	- *Calidris mauri*
Least sandpiper	- *Calidris minutilla*
Baird's sandpiper	- *Calidris bairdii*
Pectoral sandpiper	- *Calidris melanotos*
Sharp-tailed sandpiper	- *Calidris acuminata*
Rock sandpiper	- *Calidris ptilocnemis*
Dunlin	- *Calidris alpina*
Stilt sandpiper	- *Calidris himantopus*
Buff-breasted sandpiper	- *Tryngites subruficollis*
Short-billed dowitcher	- *Limnodromus griseus*
Long-billed dowitcher	- *Limnodromus scolopaceus*
Wilson's phalarope	- *Phalaropus tricolor*
Red-necked phalarope	- *Phalaropus lobatus*
Red phalarope	- *Phalaropus fulicaria*
Bonarparte's gull	- *Larus philadelphia*
Heermann's gull	- *Larus heermanni*
Mew gull	- *Larus canus*
Ring-billed gull	- *Larus delawarensis*
California gull	- *Larus californicus*
Herring gull	- *Larus argentatus*
Thayer's gull	- *Larus thayeri*
Western gull	- *Larus occidentalis*

Glaucous-winged gull	- *Larus glaucescens*
Sabine's gull	- *Xema sabini*
Caspian tern	- *Sterna caspia*
Common tern	- *Sterna hirundo*
Arctic tern	- *Sterna paradisea*
Forster's tern	- *Sterna forsteri*
Black tern	- *Chlidonias niger*
Common murre	- *Uria aalge*
Pigeon guillemot	- *Cepphus columba*
Marbled murrelet	- *Brachyramphus marmoratus*
Ancient murrelet	- *Synthliboramphus antiquus*
Rhinoceros auklet	- *Cerorhinca monocerata*
Tufted puffin	- *Fratercula cirrhata*
Yellow-billed cuckoo	- *Coccyzus americanus*
Common barn-owl	- *Tyto alba*
Flammulated owl	- *Otus flammeolus*
Western screech-owl	- *Otus kennicottii*
Great horned owl	- *Bubo virginianus*
Snowy owl	- *Nyctea scandiaca*
Northern pygmy-owl	- *Glaucidium gnoma*
Burrowing owl	- *Athene cunicularia*
Spotted owl	- *Strix occidentalis*
Barred owl	- *Strix varia*
Great gray owl	- *Strix nebulosa*
Long-eared owl	- *Asio otus*
Short-eared owl	- *Asio flammeus*
Northern saw-whet owl	- *Aegolius acadicus*
Common nighthawk	- *Chordeiles minor*
Common poorwill	- *Phalaenoptilus nuttallii*
Black swift	- *Cypseloides niger*
Vaux's swift	- *Chaetura vauxi*
White-throated swift	- *Aeronautes saxatalis*
Black-chinned hummingbird	- *Archilochus alexandri*
Anna's hummingbird	- *Calypte anna*
Calliope hummingbird	- *Stellula calliope*
Rufous hummingbird	- *Selasphorus rufus*
Belted kingfisher	- *Ceryle alcyon*
Lewis' woodpecker	- *Melanerpes lewis*
Red-breasted sapsucker	- *Sphyrapicus ruber*
Williamson's sapsucker	- *Sphyrapicus thyroideus*
Downy woodpecker	- *Picoides pubescens*
Hairy woodpecker	- *Picoides villosus*
White-headed woodpecker	- *Picoides albolarvatus*
Three-toed woodpecker	- *Picoides tridactylus*
Black-backed woodpecker	- *Picoides arcticus*
Northern flicker	- *Colaptes auratus*
Pileated woodpecker	- *Dryocopus pileatus*
Olive-sided flycatcher	- *Contopus borealis*
Western wood-pewee	- *Contopus sordidulus*
Willow flycatcher	- *Empidonax traillii*
Hammond's flycatcher	- *Empidonax hammondii*
Dusky flycatcher	- *Empidonax oberholseri*
Gray flycatcher	- *Empidonax wrightii*

Western flycatcher	- *Empidonax difficilis*
Say's phoebe	- *Sayornis saya*
Ash-throated flycatcher	- *Myiarchus cinerascens*
Western kingbird	- *Tyrannus verticalis*
Eastern kingbird	- *Tyrannus tyrannus*
Horned lark	- *Eremophila alpestris*
Purple martin	- *Progne subis*
Tree swallow	- *Tachycineta bicolor*
Violet-green swallow	- *Tachycineta thalassina*
Northern rough-winged swallow	- *Stelgidopteryx serripennis*
Bank swallow	- *Riparia riparia*
Cliff swallow	- *Hirundo pyrrhonota*
Barn swallow	- *Hirundo rustica*
Gray jay	- *Perisoreus canadensis*
Steller's jay	- *Cyanocitta stelleri*
Scrub jay	- *Aphelocoma coerulescens*
Clark's nutcracker	- *Nucifraga columbiana*
Common raven	- *Corvus corax*
Black-capped chickadee	- *Parus atricapillus*
Mountain chickadee	- *Parus gambeli*
Boreal chickadee	- *Parus hudsonicus*
Chestnut-backed chickadee	- *Parus rufescens*
Bushtit	- *Psaltriparus minimus*
Red-breasted nuthatch	- *Sitta canadensis*
White-breasted nuthatch	- *Sitta carolinensis*
Pygmy nuthatch	- *Sitta pygmaea*
Brown creeper	- *Certhia americana*
Rock wren	- *Salpinctes obsoletus*
Canyon wren	- *Catherpes mexicanus*
Bewick's wren	- *Thryomanes bewickii*
House wren	- *Troglodytes aedon*
Winter wren	- *Troglodytes troglodytes*
Marsh wren	- *Cistothorus palustris*
American dipper	- *Cinclus mexicanus*
Golden-crowned kinglet	- *Regulus satrapa*
Ruby-crowned kinglet	- *Regulus calendula*
Western bluebird	- *Sialia mexicana*
Mountain bluebird	- *Sialia currucoides*
Townsend's solitaire	- *Myadestes townsendi*
Veery	- *Catharus fuscescens*
Swainson's thrush	- *Catharus ustulatus*
Hermit thrush	- *Catharus guttatus*
American robin	- *Turdus migratorius*
Varied thrush	- *Ixoreus naevius*
Gray catbird	- *Dumetella carolinensis*
Sage thrasher	- *Oreoscoptes montanus*
Water pipit	- *Anthus spinoletta*
Bohemian waxwing	- *Bombycilla garrulus*
Cedar waxwing	- *Bombycilla cedrorum*
Northern shrike	- *Lanius excubitor*
Loggerhead shrike	- *Lanius ludovicianus*
Solitary vireo	- *Vireo solitarius*
Hutton's vireo	- *Vireo huttoni*

Warbling vireo	- *Vireo gilvus*
Red-eyed vireo	- *Vireo olivaceus*
Orange-crowned warbler	- *Vermivora celata*
Nashville warbler	- *Vermivora ruficapilla*
Yellow warbler	- *Dendroica petechia*
Yellow-rumped warbler	- *Dendroica coronata*
Black-throated gray warbler	- *Dendroica nigrescens*
Townsend's warbler	- *Dendroica townsendi*
Hermit warbler	- *Dendroica occidentalis*
Palm warbler	- *Dendroica palmarum*
American redstart	- *Setophaga ruticilla*
Northern waterthrush	- *Seiurus noveboracensis*
Macgillivray's warbler	- *Oporornis tolmiei*
Common yellowthroat	- *Geothlypis trichas*
Wilson's warbler	- *Wilsonia pusilla*
Yellow-breasted chat	- *Icteria virens*
Western tanager	- *Piranga ludoviciana*
Black-headed grosbeak	- *Pheucticus melanocephalus*
Lazuli bunting	- *Passerina amoena*
Green-tailed towhee	- *Pipilo chlorurus*
Rufous-sided towhee	- *Pipilo erythrophthalmus*
American tree sparrow	- *Spizella arborea*
Chipping sparrow	- *Spizella passerina*
Brewer's sparrow	- *Spizella breweri*
Vesper sparrow	- *Pooecetes gramineus*
Lark sparrow	- *Chondestes grammacus*
Sage sparrow	- *Amphispiza belli*
Savannah sparrow	- *Passerculus sandwichensis*
Grasshopper sparrow	- *Ammodramus savannarum*
Fox sparrow	- *Passerella iliaca*
Song sparrow	- *Melospiza Melodia*
Lincoln's sparrow	- *Melospiza lincolnii*
White-throated sparrow	- *Zonotrichia albicollis*
Golden-crowned sparrow	- *Zonotrichia atricapilla*
White-crowned sparrow	- *Zonotrichia leucophrys*
Dark-eyed junco	- *Junco hyemalis*
Lapland longspur	- *Calcarius lapponicus*
Snow bunting	- *Plectrophenax nivalis*
Bobolink	- *Dolichonyx oryzivorus*
Red-winged blackbird	- *Agelaius phoeniceus*
Western meadowlark	- *Sturnella neglecta*
Yellow-headed blackbird	- *Xanthocephalus xanthocephalus*
Brewer's blackbird	- *Euphagus cyanocephalus*
Brown-headed cowbird	- *Molothrus ater*
Northern oriole	- *Icterus galbula*
Rosy finch	- *Leucosticte arctoa*
Pine grosbeak	- *Pinicola enucleator*
Purple finch	- *Carpodacus purpureus*
Cassin's finch	- *Carpodacus cassinii*
House finch	- *Carpodacus mexicanus*
Red crossbill	- *Loxia curvirostra*
White-winged crossbill	- *Loxia leucoptera*
Common redpoll	- *Carduelis flammea*

Pine siskin	- *Carduelis pinus*
Lesser goldfinch	- *Carduelis psaltria*
American goldfinch	- *Carduelis tristis*
Evening grosbeak	- *Coccothraustes vespertinus*
Masked shrew	- *Sorex cinereus*
Preble's shrew	- *Sorex preblei*
Vagrant shrew	- *Sorex vagrans*
Dusky shrew	- *Sorex monticolus*
Pacific shrew	- *Sorex pacificus*
Water shrew	- *Sorex palustris*
Pacific water shrew	- *Sorex bendirii*
Trowbridge's shrew	- *Sorex trowbridgii*
Merriam's shrew	- *Sorex merriami*
Pygmy shrew	- *Sorex hoyi*
Shrew-mole	- *Neurotrichus gibbsii*
Townsend's mole	- *Scapanus townsendii*
Coast mole	- *Scapanus orarius*
Broad-footed mole	- *Scapanus latimanus*
Little brown myotis	- *Myotis lucifugus*
Yuma myotis	- *Myotis yumanensis*
Keen's myotis	- *Myotis keenii*
Long-eared myotis	- *Myotis evotis*
Fringed myotis	- *Myotis thysanodes*
Long-legged myotis	- *Myotis volans*
California myotis	- *Myotis californicus*
Small-footed myotis	- *Myotis leibii*
Silver-haired bat	- *Lasionycteris noctivagans*
Western pipistrelle	- *Pipistrellus hesperus*
Big brown bat	- *Eptesicus fuscus*
Red bat	- *Lasiurus borealis*
Hoary bat	- *Lasiurus cinereus*
Townsend's big-eared bat	- *Plecotus townsendii*
Pallid bat	- *Antrozous pallidus*
Pika	- *Ochotona princeps*
Pygmy rabbit	- *Sylvilagus idahoensis*
Mountain beaver	- *Aplodontia rufa*
Least chipmunk	- *Tamias minimus*
Yellow-pine chipmunk	- *Tamias amoenus*
Townsend's chipmunk	- *Tamias townsendii*
Red-tailed chipmunk	- *Tamias ruficaudus*
Yellow-bellied marmot	- *Marmota flaviventris*
Hoary marmot	- *Marmota caligata*
Olympic marmot	- *Marmota olympus*
Townsend's ground squirrel	- *Spermophilus townsendii*
Washington ground squirrel	- *Spermophilus washingtoni*
California ground squirrel	- *Spermophilus beecheyi*
Golden-mantled ground squirrel	- *Spermophilus lateralis*
Cascade golden-mantled ground	- *Spermophilus saturatus*
Western gray squirrel	- *Sciurus griseus*
Red squirrel	- *Tamiasciurus hudsonicus*
Douglas' squirrel	- *Tamiasciurus douglasii*
Northern flying squirrel	- *Glaucomys sabrinus*
Northern pocket gopher	- *Thomomys talpoides*

Western pocket gopher	- *Thomomys mazama*
Great Basin pocket mouse	- *Perognathus parvus*
Ord's kangaroo rat	- *Dipodomys ordii*
Western harvest mouse	- *Reithrodontomys megalotis*
Deer mouse	- *Peromyscus maniculatus*
Northern grasshopper mouse	- *Onychomys leucogaster*
Dusky-footed woodrat	- *Neotoma fuscipes*
Bushy-tailed woodrat	- *Neotoma cinerea*
Southern red-backed vole	- *Clethrionomys gapperi*
Western red-backed vole	- *Clethrionomys californicus*
Heather vole	- *Phenacomys intermedius*
Meadow vole	- *Microtus pennsylvanicus*
Montane vole	- *Microtus montanus*
Gray-tailed vole	- *Microtus canicaudus*
Townsend's vole	- *Microtus townsendii*
Long-tailed vole	- *Microtus longicaudus*
Creeping vole	- *Microtus oregoni*
Water vole	- *Microtus richardsoni*
Sagebrush vole	- *Lagurus curtatus*
Northern bog lemming	- *Synaptomys borealis*
Western jumping mouse	- *Zapus princeps*
Pacific jumping mouse	- *Zapus trinotatus*
Porcupine	- *Erethizon dorsatum*
Coyote	- *Canis latrans*
Gray wolf	- *Canis lupus*
Grizzly bear	- *Ursus arctos*
Northern sea lion	- *Eumetopius jubatus*
California sea lion	- *Zalophus californianus*
Fisher	- *Martes pennanti*
Wolverine	- *Gulo gulo*
Spotted skunk	- *Spilogale gracilis*
Striped skunk	- *Mephitis mephitis*
Sea otter	- *Enhydra lutris*
Harbor seal	- *Phoca vitulina*
Gray whale	- *Eschrichtius robustus*
Killer whale	- *Orcinus orca*
Pacific harbor porpoise	- *Phocoena phocoena*
Dall's porpoise	- *Phocoenoides dalli*
Woodland caribou	- *Rangifer tarandus*