General

Roads can form a significant barrier to fish, small mammals, amphibians, and reptiles. Many species of wildlife have been impacted by development to the point where they have been listed as threatened or endangered. Other species that are more adaptable to urban environments have expanded their ranges and their populations. For example, some species such as red-tailed hawks have adapted very successfully to the altered habitats available on the roadside rights of way.

Wildlife requires special consideration during the planning, design, construction, and maintenance phases of highways. Of particular concern are:

- Locations of roads in relation to wildlife migration corridors and critical habitat areas.
- Noise generating activities.
- Alteration of habitat.
- Creation of an impenetrable barrier to wildlife movement.
- Regulations pertaining to threatened and endangered species.

References

Endangered Species Act of 1973:
http://www fhwa dot gov/environment/env_sum htm#AN

*Environmental Manual* M 31-11, WSDOT. The manual can be found on the internet at:

Resources

EAO Wildlife Biologist/Biology Projects Coordinator
Region’s Biologist
Region’s Environmental Coordinator
**Definitions**

*anadromous*  Born in fresh water, migrating to and living in salt water, and then returning to freshwater to reproduce.¹

*critical habitat*  Specific areas that possess physical or biological features that are essential to the conservation of a listed species. These might require special management considerations or protection.²

*endangered species*  Any species that is in danger of extinction throughout all or a significant portion of its range.³

*habitat*  The environment occupied by individuals of a particular species, population, or community.

*listed species*  Any species listed by a state or federal agency as threatened or endangered under the Endangered Species Act of 1973.

*migration corridor*  An area that is usually used by migrating wildlife to move between suitable habitat.

*native*  Applied to a species that occurs naturally in an area and, therefore, one that has not been introduced by humans either accidentally or intentionally.⁴

*old growth forest*  A late successional or climax stage in forest development. In western Washington, ancient or old growth forests have a canopy of very large living conifers, shade-tolerant trees beneath the canopy, and abundant large snags and logs.⁵

*riparian*  The interface of aquatic and terrestrial systems in flood plains, rivers, and streams. Riparian systems are valued for diverse functions such as flood reduction, groundwater supply, streambank stabilization, habitat and migration corridors for wildlife, erosion control, and preservation of water habitats.⁶

*species*  Includes any subspecies of fish, wildlife, or plants; any distinct population segment of any species of vertebrate fish or wildlife that interbreeds when mature.⁷

*threatened species*  Any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.⁸

¹ Johnson and Stipula. 1993. p. G1  
² Endangered Species Act of 1973  
³ ibid.  
⁶ TRB, 1996. p. 76.  
⁷ Endangered Species Act, 1973
**wildlife** Any undomesticated animals, including vertebrates and invertebrates.

**Planning**

Identify all important wildlife habitat, such as nest and roost sites, and habitat used by threatened and endangered species during the project-planning phase.

In addition to the federal Endangered Species Act, which protects threatened and endangered species, some kinds of wildlife habitat are protected and regulated by local jurisdictions. Examples of habitats that might be regulated by a local jurisdiction include: oak savannas, native outwash prairies, talus slopes, cliffs, riparian corridors, old growth forests, streams, and wetlands.

The following sources of information can be used to help identify these areas:

- Local jurisdiction's fish and wildlife habitat regulation and inventory maps. These maps identify what types of habitat the jurisdiction regulates, indicate where all the inventoried habitat areas are, and identify the regulations relating to the management and development of these areas.
- National Wetland Inventory Maps. These maps provide the location of wetlands on a large scale.
- Department of Natural Resources (DNR) stream typing maps. These maps indicate stream location and type.
- DNR Natural Heritage Program provides the location of high quality native plant communities.
- Washington Department of Fish and Wildlife (WDFW) Priority Habitat and Species provides information on the location of priority species and habitats.
- United States Fish & Wildlife Service Threatened and Endangered Species Section provides information on the location of threatened and endangered species and critical habitat.
- WSDOT deer kill database provides information on which state highways experience large numbers of deer-and-vehicle collisions.
- Biological assessment by regional or EAO Biologist – usually required to identify uninventoryed habitat features, identify wildlife migration corridors, and to verify wildlife use.

Identification of some habitat features or seasonal use by a

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8 Ibid.
threatened or endangered species can be time dependent. For example, concentrations of wintering bald eagles can only be observed during the winter.

Design

When mitigation for wildlife impacts is recommended for a project, coordination between offices is necessary. The designer works closely with the regional Environmental Office. Address all wildlife concerns during the design phase. Examples are:

- Planning for large mammal overcrossing or undercrossing when a highway crosses a migratory route for deer or elk.
- Providing wildlife fencing where accident statistics indicate the need.

![Figure 450.1 Elk Fencing on SR 90](image)

- Planning for small animal migration across the highway. Consider barrier and culvert designs that allow passage.
- Flagging or survey markers to assist in locating and protecting large Douglas fir trees in critical spotted owl habitat.
- Habitat improvements for streams including in-stream placement of logs and root wads. Do not trim vegetation along the shores of creeks. If no vegetation is present, revegetate the streambank with desirable native riparian vegetation.

Either the regional or HQ Environmental Office prepares a biological assessment for projects having federal funds, actions, or permits to meet Section 7 of the Threatened and Endangered Species Act as amended in 1973. The assessment assists in identifying wildlife concerns associated with the project and assessing the potential impacts.

Primary Considerations

Potential concerns involving transportation projects include:
• Loss of critical habitat for threatened and endangered species.
• Creation of uncrossable barriers for small mammals, reptiles, amphibians, insects, and fish.
• Disruption of migratory routes for larger mammals such as deer, elk, and bear.
• Disruption of migratory routes for anadromous fish.
• Increased human access and disturbance within the extensive home ranges of threatened and endangered species such as wolves and grizzly bears.
• Maintenance activities, practices, and policies that conflict with Best Management Practices for habitat management.
• Increased vehicle-and-animal collisions.
• Noise disruption during the breeding season of threatened, endangered, or sensitive species.
• Noise disruption during critical periods, for example wintering periods or migratory periods.
• Elimination of food resources.
• Impacts to water quality that would affect any species.

Minimize impacts to wildlife and wildlife habitat, and mitigate for the unavoidable impacts with the design.

Mitigation can involve:
• Vertical and horizontal road alignment shifts and modifications.
• Installing oversized culverts as wildlife underpasses.
• Installing wildlife overpasses.
• Including fish baffles in culverts.
• Reducing clearing limits to save significant trees.
• Wildlife reflectors. See Design Manual for placement.

Design sustainable mitigation systems by considering long-term maintenance needs.

Construction

Timing restrictions might be imposed on the project due to the presence of nesting, migrating, or wintering threatened or endangered species. Restrictions are dependent upon the distance from the species' activity center, the type of activity proposed, and the time of year the activity is proposed. Pile driving, blasting, and other noise
generating activities are of the greatest concern. Timing restrictions might also be placed on projects involving construction in or over water, such as culvert or bridge installation or pile driving.

**Primary Considerations**

During construction, clearly flag or place construction fencing around all habitat areas and features that are to be saved or avoided in the field, and include those locations in the plans of the project. This will minimize confusion and will help avoid impacting these areas and/or features.

Projects near stream or wetland habitat areas must have their erosion control measures carefully implemented and maintained during construction to avoid impacting aquatic species.

**Maintenance**

Maintenance activities impact wildlife habitat. The following maintenance activities will enhance wildlife habitat:

- Regional maintenance managers coordinate their planned maintenance activities with the regional Environmental Office.
- Field maintenance personnel are trained to ensure that adverse impacts do not occur. Commitment and cooperation of Maintenance and Environmental Office staff to bettering efforts to protect wildlife habitat will enhance both the work and the environmental interests of WSDOT.
- Do not clear vegetation in areas designated and preserved as critical habitat areas.
- A Memorandum of Understanding with the WDFW requires that WSDOT avoid mowing during the upland bird and migratory fowl nesting season in Eastern Washington. In those affected areas, delay highway roadside mowing until after July first.
- The Integrated Vegetation Management Plan includes provisions to allow and encourage native vegetation growth where possible and indicates how best to do so. It is appropriate to designate and provide areas such as this for habitat improvement within maintained highway right of way.
- Highway maintenance plans do not provide for construction of wildlife habitat or enhancement areas. However, prudent use of maintenance resources in combination with routine activities can effectively enhance wildlife habitat in many ways. Control of exotic species such as Himalaya blackberry and Scotch broom offer habitat benefits to native animals in addition to cleaning up...
a sight distance problem or signing installation site. Brush piles created from clearing debris and logs offer habitat benefit if they are not obtrusive to other highway use considerations.

- Though not a maintenance function, projects undertaken by state forces might include features such as bird boxes, nesting platforms, and perches for raptors. In-stream placement of large woody debris such as logs and root wads can improve stream habitat, sometimes as on-site mitigation for needed maintenance work in HPA regulated projects.

Resolving Conflicting Requirements

Certain conflicts might arise during design, construction, and maintenance of the roadways. All parties are working together to provide the best possible product.

The regional biologist or the EAO Wildlife Biologist can complete coordination on wildlife habitat regulations and other environmental regulations. Mediators and facilitators are available to resolve conflicts.