Chapter V
Listed Wildlife Species

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LISTED WILDLIFE SPECIES

One species, the Gray wolf (*Canis lupus*), listed as "endangered" under the Endangered Species Act (ESA) of 1973, as amended, has habitat within the Project Area. The Umatilla and Wallowa-Whitman National Forests both contain habitat for the gray wolf, and, over the last year, numerous confirmed sightings have occurred including a recovered carcass that was discovered. No den or rendezvous sites have been found, although one pack was confirmed in the spring of 2008.

Gray Wolf

LIFE HISTORY AND HABITAT DESCRIPTION

Habitat preference for the gray wolf appears to be more prey dependent than cover dependent. The wolf is more of a habitat generalist inhabiting a variety of plant communities, typically containing a mix of forested and open areas with a variety of topographic features (NatureServe 2006, Verts and Carraway 1998, and Witmer et al. 1998). Historically, they occupied a broad spectrum of habitats including grasslands, sagebrush steppe, and coniferous, mixed, and alpine forests. Wolves prefer fairly large tracts of roadless country; generally avoiding areas with an open road density greater than one mile per square mile (Witmer et al. 1998). Gray wolves have extensive home ranges and specific habitat requirements for denning, rearing young, and foraging. Dens are usually located on moderately steep slopes with southerly aspects within close proximity to surface water. Rendezvous sites, used for resting and gathering, are complexes of meadows that have adjacent hillside timber with nearby surface water (Kaminski and Hansen 1984). Both dens and rendezvous sites are often characterized by having nearby forested cover, remote from human disturbance (NatureServe Explorer 2006). Wolves seem to require areas with low human population, low potential for human interactions, high prey densities, and secluded denning and rendezvous sites (NatureServe Explorer 2006 and Witmer et al. 1998). Wolves are strongly territorial; defending an area of 75-150 square miles, and home range size and location is determined primarily by abundance of prey. Wolves are limited by prey availability and are threatened by negative interactions with humans. Wolves generally den between April and June, then move pups to a series of rendezvous sites for the remainder of the summer. Gray wolves have been documented to abandon den sites if disturbed by humans (Mech et al. 1991).

Wolves prey primarily on large ungulates such as elk and deer (NatureServe Explorer 2006, Verts and Carraway 1998, and Witmer et al. 1998). Their alternate prey base typically consists of smaller mammals and birds, such as, beaver, ground squirrels, rabbits, and grouse (NatureServe Explorer 2006 and Witmer et al. 1998). It is not uncommon to observe wolves "mousing" in grassy meadows much like coyotes and red fox. Individuals may take livestock as secondary prey when ungulates are less vulnerable or available (Witmer et al. 1998).

Wolves were extirpated from the region by the early 1900's and are currently listed as an endangered species in Oregon. Recent successful reintroduction programs in Idaho and Montana have increased wolf populations in the northern Rocky Mountains. Individual gray wolves have dispersed from Idaho into the Blue Mountains and currently one pack is known to have formed in this area. The Idaho wolf population has been increasing steadily, and dispersion will likely continue into the Blue Mountains. Recovery regulations require consideration of potential effects to known denning habitat or rendezvous sites (USDI 2003).

Due to the ability of gray wolves to thrive under a variety of land uses, the U.S. Fish and Wildlife Service concluded that successful wolf recovery in the northern Rocky Mountains does not depend on land-use restrictions, with the possible exception of temporary restrictions around active den sites on federally managed lands (USDI 2003). The most important criteria for gray wolf management and recovery is reducing the mortality of wolves by humans and managing for an abundant prey base.

Historically wolves were fairly common in most parts of the state with big game herds. The basic social unit in wolf populations is the pack. A pack can consist of 2 to 20 wolves (average of 10).

Pack members have a strong social bond to each other, and they establish and defend territories. Territories range in size from 80 square miles in Minnesota to over 600 square miles in Alberta. Home ranges for Central Idaho packs range from 360 square miles to 2000 square miles over the last several years.

PROJECT AREA INFORMATION

During the winter of 2007-2008, numerous wolf sightings, some confirmed, have occurred in the Northern Blue Mountains. The significant increase may indicate more than just transient individuals. Investigations of wolf sightings are on-going. There are also camera bait stations located on National Forest Lands and State Lands. There are currently no known denning or rendezvous sites on or near the Umatilla and Wallowa-Whitman National Forests, but a pack was discovered in the spring of 2008.

THREATS

The primary threat to wolves is mortality from shooting and vehicle collisions (Quigley and Arbelbide 1997, Wisdom et al. 2000). Primary management concerns for the Forest Service are (1) disturbance to denning wolves or rendezvous sites when pack numbers are low and (2) providing adequate habitat for populations of prey species such as elk.

Wolves initially experienced population declines due mainly to conflicts with humans. This included human settlement, direct conflict with livestock, and lack of understanding of wolf ecology and habits and the subsequent eradication programs (USDI 1987). Today human conflict still exists most notably over livestock depredations and the associated economic losses. Concern over wolf depredation on big game also exists.

Wolves may use den sites from year to year and certain areas may contain several den sites that are used in different years by wolves (USDI 1987). Wolf packs appear sensitive to human disturbance near den sites and may abandon the site (Mack 2005, pers. comm.). Subsequently, most den sites are located away from trails and backcountry campsites.

Rendezvous sites refer to specific resting and gathering areas used by wolves during the summer and early fall. Several rendezvous sites are used with the first site generally located between one and six miles from the natal den. Rendezvous sites are used by a pack until the pups are mature enough to travel with the adults, generally early autumn. Wolves appear to be most sensitive to human disturbance at the first rendezvous site and become less sensitive at later sites (USDI 1987). However, wolf response to human disturbance is due to a variety of factors including specific setting, individuality of wolves, and whether the population is exploited or protected (Mech et al. 1989).

Wolves primarily prey on ungulates (USDI 1987). During May and June, wolves selectively prey upon newborn and young bison, moose, elk, and deer in calving/fawning areas. During the summer and fall, ungulates constitute the highest percentage of biomass; in winter wolves prey almost exclusively on deer, elk, and moose. Because they are an important prey item, factors (e.g. habitat and access management, winter range productivity) that affect ungulate distribution and abundance also affect wolves.

The presence of roads on the landscape does not directly impact wolves. Rather, it is the potential mortality associated with vehicle accidents and increased potential for illegal shooting that roads facilitate (Theil 1985, Mech 1989, Mech et al. 1988, Boyd and Pletscher 1999).

Invasive plant species have not been identified as a threat to wolves. However, if infestations were to become large enough to negatively impact habitat of their prey species they would be indirectly impacted.

SPECIES PROTECTION MEASURES

- Limit human accesses to large tracts of land were wolves are managed (Witmer et al. 1998). Manage human and road density in these areas
- Maintain adequate ungulate prey populations in areas managed for wolves (Witmer et al. 1998)
- Protect denning and rendezvous sites from disturbance (Witmer et al. 1998)

PDF FOR GRAY WOLF

The Umatilla and Wallowa National Forests currently have one confirmed wolf pack, but have not identified a den or rendezvous site at the current time.

In accordance with the Federal Register, Vol. 68, No. 62/April 1, 2003 4(d), invasive plant treatments in areas within 1 mile of active wolf dens would be timed to occur outside the season of occupancy (April 1 through June 30). Treatments within 0.50 mile or .50 mile line of sight occupied rendezvous sites would be timed to occur outside the season of occupancy unless treatment activity is within acceptable ambient noise levels and human presence in the area would not cause wolves to abandon the site (as determined by a local specialist). The restriction in the vicinity of active rendezvous sites is not backed up by scientific data but is intended to reduce impacts to wolves. Occupancy of both denning and rendezvous sites (i.e. whether it is active or not) will be determined each year prior to treatments. Consultation with FWS would be reinitiated (unless determined otherwise by FWS) if wolves are discovered in the vicinity of treatment sites.

EFFECTS ANALYSIS AND METHODOLOGY

Excerpts from the Invasive Plants FEIS (USDA Forest Service, 2005a) are used throughout this discussion. The effects analysis of individual herbicides and surfactants are used here. Facts, figures, herbicides, and species analysis are modified to reflect the site-specific analysis effort on the Forest.

The following terminology and introduction from the Invasive Plants FEIS (USDA Forest Service, 2005a) are repeated here for easy reference, and are pertinent to discussion of effects on wildlife on the Forest (Pages 4-42 to 4-44).

- NOAEL (No observed adverse effect level): An exposure level at which there is no statistically or biologically significant increases in the frequency or severity of adverse effects between the exposed population and its appropriate control. Some effects may be produced at this level, but they are not considered as adverse, or as precursors to adverse effects. In an experiment with several NOAELs, the regulatory focus is primarily on the highest one, leading to the common usage of the term NOAEL as the highest exposure without adverse effects.
- LOAEL (Lowest Observed Adverse Effect Level): The lowest dose associated with an adverse effect.
- Toxicity index: The benchmark dose used in analysis to determine a potential adverse effect when it is exceeded. Usually a NOAEL, but when data are lacking other values may be used.

When considering the effects of herbicides on wildlife species, it is important to remember these herbicides are designed to affect plants at relatively low rates, while much higher rates would be required to kill animals. Plants have metabolic systems that do not exist in animals. It is these metabolic systems at which the herbicides are targeted. Michael (2002) explained it well when he said, "All chemicals, natural or man-made, are toxic at some level of exposure. The difference between acute and chronic toxicity versus the no observed effect level (NOEL) is primarily a function of the amount of exposure in a unit of time and the mode of action of the chemical. For example, vitamin D is essential to good health and mammals consume it on a daily basis. However, it could be very toxic, in fact more toxic than most of the herbicides used in forest management" (Michael 2002).

Results of numerous field studies indicate the likelihood for direct adverse effects to wildlife from herbicide use is low (e.g., Marshall & Vandruff, 2002; Dabbert et. al. 1997; Fagerstone et. al., 1977; Rice et. al., 1997; Sullivan et. al. 1998,, Cole et. al., 1997; Cole et. al. 1998, Johnson and Hansen 1969, Nolte and Fulbright 1997, McMurray et. al. 1993a, McMurray et. al., 1993b). The use of herbicides to treat invasive plants, however, does have the potential to harm free-ranging wildlife. Certain herbicides have the potential, for example, to affect the vital organs of some wildlife species, change body weight, reduce the number of healthy offspring, increase susceptibility to predation, or cause direct mortality. Individual birds and mammals may ingest vegetation or insects that have been sprayed with some herbicides and potentially experience these types of effects.

Herbicides may also cause some malformations or mortality to amphibians that have been exposed to herbicides or surfactants in water (Relyea 2005). In addition, herbicides contain impurities and additives, and produce metabolites that could be toxic to wildlife. A metabolite of triclopyr, 3, 56-trichloro-2-pyridinol (TCP), is toxic to aquatic animals. The impurity hexachlorobenzene, found in picloram and clopyralid, is carcinogenic. Surfactants added to herbicides could substantially increase toxicity to aquatic species, like amphibians. These substances were evaluated in the relevant risk assessments and, with the exception of surfactants, were found not to contribute substantially to toxic exposures or increase cancer risk (SERA, 2003a, 2003b, 2003c, 2004b).

The results of the herbicide analysis indicate that birds or mammals that eat grass or insects are most susceptible to harm from herbicides. Birds or mammals that eat vegetation (primarily grass) that has been sprayed with herbicide have relatively greater risk for adverse effects because herbicide residue is higher on grass than it is on other herbaceous vegetation or seeds (Kenaga

1973, Fletcher et. al. 1994, Pfleeger et. al. 1996). Because of their small size and relatively larger surface area, herbicide residues on insects may also be higher (Kenaga 1973). Some birds and mammals that eat grass include elk, rabbits and hares, chukar, California quail, and geese. Some bird species (like quail) are primarily herbivorous as adults but require insects as a primary food source as chicks. Insect-eating mammals include bats and shrews. Insect-eating birds include a huge number of species, such as bluebirds, flycatchers, swallows, wrens, and others.

Surfactants (NPE) added to herbicides also have the potential to result in harmful doses to birds and mammals that eat vegetation or insects that have been sprayed. For the purpose of analysis, it is assumed that the number of plausible exposure scenarios that exceed the toxicity indices is the same for surfactant as it is for the herbicides. No estimate of acres treated using NPE surfactants is made because surfactants may not be used, or other additives may be used instead, so there is no direct correlation between acres treated with herbicide and acres treated with NPE.

ANALYTICAL METHODS

The analytical methods used in determining toxicity of herbicides and surfactants on wildlife species including PETS, management indicator species and landbirds can be found in Appendix C of this document.

The number of acres of wildlife habitat benefited by removal of invasive species to restore native vegetation and rate of treatment is determined by the acres treated and the rate of treatment determined by the effectiveness of the treatment method.

The special status species potentially exposed to herbicides following implementation of the PDF is determined by Geographic Information System (GIS) analysis of the number of acres of herbicide treatment that dissect or traverse habitat that is potentially suitable. These acres are discussed in the wildlife effects section.

The number of special status species potentially impacted by manual or mechanical treatments following implementation of the PDF is determined by Geographic Information System (GIS) analysis of the number of acres of non-herbicide treatment that dissect or traverse habitat that is potentially suitable. These acres are discussed in the wildlife effects section.

GENERAL EFFECTS OF INVASIVE PLANT TREATMENTS

Effects of invasive plant treatment methods to wildlife were evaluated and discussed in detail in the Region Six Invasive Plant Program FEIS (USDA Forest Service 2005a), the corresponding Biological Assessment (USDA Forest Service 2005b), project files, and FS/SERA risk assessments (SERA 2001, 2003a-d, 2004a-e). These documents indicate that the most plausible adverse effect to wildlife from invasive plant treatments is from disturbance caused by manual and mechanical treatments.

Wildlife species may be adversely affected by invasive plant treatment methods. All treatment methods have the potential to disturb, temporarily displace, or directly harm various wildlife species. Successful control of invasive plant infestations provides long-term benefits by restoring native habitat. Treatment of larger infestations may create more disturbances for longer periods than small infestations, but the specific amount and duration is largely dependant upon specific treatment methods. Several techniques can create bare ground, which may reduce cover and expose certain species to increased predation. Large tracts of bare ground can alter migration and dispersal of some species (Semlitsch 2000). The likelihood of these effects depends on the size and distribution of bare ground created.

The effects of the invasive plant treatment are also relative to the size and locations of existing and future invasive plant infestations. Treatments of infestations along disturbed roadsides are not likely to substantially affect terrestrial wildlife populations, since this vegetation type does not provide essential habitat for native wildlife species, and it consists of long, narrow areas spread over large distances. Adverse effects to individuals using the roadside vegetation at the time of treatment could occur.

Treatments of moderate infestations could pose the greatest risk to native wildlife in some areas. In moderately infested areas, enough native habitats may remain to support some native wildlife, and the infestation may be large enough to require more intensive and extensive treatment techniques. Very large infestations and monocultures of invasive plants do not support native wildlife populations and the presence of native wildlife in these areas is greatly reduced in comparison to native habitat (see Duncan and Clark 2005).

There are two primary effects likely for most species from invasive plant treatments; disturbance and trampling from machinery or people treating invasive plants, and risk from herbicide contact for species in which data is not sufficient to allow quantitative estimates of risk. There is no risk to species' habitat because invasive plant treatments do not remove suitable habitat for any species, and the majority of the treatments will occur along highly disturbed roadsides which do not provide suitable habitat in most cases. Some species in the Project Area may have suitable habitat along roads, although in small amounts relative to the amount of suitable habitat that is not within a road corridor.

Invasive Plant Treatment Methods Effects to Wildlife

MANUAL

Manual treatments can result in trampling of non-target plants (habitat) and animals and create bare ground. The degree of threat and effect from manual treatments depends on the number of workers present and the size of the area being treated. Because manual techniques are slower than mechanical or chemical methods, the duration of disturbance, caused by the presence of people, may be longer in the treatment area. The slower pace of work allows animals in the area to leave and reduces the risk of direct harm from trampling. Bare ground is likely to be patchy in distribution with this method and less likely to interfere with animal movement or dispersal.

MECHANICAL

Some mechanical treatments may crush small mammals, reptiles, amphibians, or eggs of ground-nesting birds. Hand-held mechanical equipment, like chainsaws and string trimmers, can be used very selectively on target plants and may be less likely than larger equipment to directly harm wildlife. Use of vehicle-mounted mechanical equipment (mowers, tractors with disks or hammer flails, bull dozers with brush rakes, etc.) is much less selective and more likely to directly harm small wildlife species. Vehicle-mounted equipment is most often applied to monocultures of invasive plants on gentle slopes or road verges, and even though those areas do not provide preferred or suitable habitat for most native wildlife, adverse effects from disturbance or crushing are still possible. Mechanical treatments may produce more bare ground, reducing cover, exposing more soil to erosion, potentially disrupting dispersal or foraging patterns of small animals, and possibly exposing some to increased predation as a result of decreased cover. Mechanical methods generate more noise than other treatments, except for aerial applications, and have a higher likelihood of disturbing species that are secretive or sensitive to noise.

For several species loud and sudden noises above background or ambient levels (those above 92 dB) can cause disturbance that might flush a bird off the nest or abort a feeding attempt. Based on interviews with State and County weed control operators, the vehicles used to spray roadside vegetation with herbicides do not make noise as loud as logging trucks or large delivery trucks and are therefore within the background noise level for open roads. Other mechanical devises proposed for use on invasive plants include brushing machines, mowers, chainsaws, and string trimmers. These tools have the potential to create noise above background levels that may disturb certain wildlife species. Bald eagles could be disturbed by these same tools, as well as human presence, however eagles are quite variable in their responses to activity and noise in the vicinity of their nests or roosts.

Small species that lack rapid mobility (e.g. turtles and toads) are vulnerable to crushing or injury from people or equipment.

BIOLOGICAL

Biological control methods will not directly affect native wildlife species; however, recent studies have found that native rodents may take advantage of the food source provided by biological control agents (Pearson et al. 2000). Biological control methods that reduce invasive plant populations, increase native plant populations, and provide a supplemental food source are indirectly beneficial to wildlife. Any biological control agents that could affect native plant species could adversely affect wildlife, however these would not be used as per standard 18.

SITE RESTORATION/REVEGETATION

Reseeding or revegetation to increase competition with invasive plants can cause short-term disturbance to wildlife similar to manual or mechanical treatments, depending on specific methods used. If native or non-native, non-invasive forage species are used in restoration or competitive plantings, increased food and native habitat could benefit wildlife. Restoration activities have the potential to restore important wildlife habitat faster than natural or passive revegetation.

HERBICIDE

The herbicides proposed for use in this document were determined to have minimal impacts to wildlife species in the analysis conducted for the Region Six Invasive Plant Program FEIS (USDA Forest Service 2005a). Risk from herbicide exposure was determined using data and methods outlined in the SERA risk assessments (2001, 2003, 204). Tables 5 and 6 in Appendix P of the 2005 FEIS and the Wildlife Biological Assessment (USDA 2005c pp. 24 – 27) list the toxicity indices used as the thresholds for potential adverse effects to mammals and birds (respectively) from each herbicide. A quantitative estimate of dose using a “worst case” scenario was compared to these toxicity indices. If a dose exceeded a toxicity index, then it was determined to have a potential for adverse effect.

Under “worst case” scenarios, mammals and birds that eat insects or grass that have been contaminated by herbicides are at most risk of adverse effects for some herbicides and NPE surfactants. Amphibians also appear to be at higher risk of adverse effects due to their permeable skin and aquatic or semi-aquatic life history. In most cases, there is insufficient data available on toxicity thresholds to allow a quantitative estimate of risk to an amphibian using a “worst case” scenario.

For this proposed action, no aerial, broadcast, or spot application will exceed the typical application rate, so highest application rate scenarios are not discussed here. For typical application rates and exposures to birds and mammals, only triclopyr and NPE surfactants produced doses that exceeded toxicity indices. Results of triclopyr exposures do not take into account the strict limitations on use required by a Forest Plan Standard, which makes the exposure scenarios implausible. NPE surfactant exceeded the toxicity index for direct spray of a small mammal, large mammal and large bird that consumed contaminated vegetation (acute), and a small mammal and small bird that consume contaminated insects. There is insufficient data to assess risk of chronic exposures for a large grass-eating bird or insect-eating birds and mammals.

The exposure scenarios do not account for factors such as timing and method of application, animal behavior and feeding strategies, seasonal presence or absence within a treatment area, or implementation of Project Design Features and therefore exaggerate risk when compared to actual applications proposed in this BA.

Early Detection Rapid Response (EDRR)

EDRR is designed to be aggressive in the control of invasive plants. This is necessary to ensure success in managing and controlling the spread of these highly competitive and easily established plants. Allowing the treatment of newly found sites adds additional risk factors to wildlife just by adding additional exposure areas. This also expands the treatment into areas that may not have been originally anticipated; however, the new sites could likely be in the same vicinity of current treatment areas as the current invasive plants spread. The decision tree would be used with each new infestation site. The risk factors do not change and the PDFs would still reduce the effects to little or no impacts to wildlife species.

Incomplete and Unavailable Information

The data available for mammals are derived from numerous studies conducted to meet registration requirements, and primarily on laboratory animals that serve as surrogates. Data for mammals are available for more types of toxicity tests and often on a wider variety of species than are available for birds.

Availability of information on the direct toxicological effects of the 10 herbicides approved for use in Region 6 on wild mammals varies by herbicide. Glyphosate has been widely studied, including field applications. Little or no data on wildlife may exist for other herbicides because they have been tested on only a limited number of species under conditions that may not well represent populations of free-ranging animals (SERA 2001b, 2003a, 2003b, 2003c, 2004a, 2004b, 2004c, 2004d, 2004e, 2004f).

Toxicity data available for birds are derived from studies conducted to meet registration requirements, and primarily on domestic birds that serve as surrogates. There are typically fewer types of toxicity studies conducted on birds using a more restricted variety of species than are conducted for mammals. Almost all laboratory data is collected on mallards and northern bobwhite. How the sensitivities of different bird species to herbicides may vary from that reported for mallard and bobwhite is not known.

The treatment of invasive plants has short-term impacts by reducing cover, but restoring native vegetation would have long-term benefits by providing food and cover. Birds or mammals that eat vegetation (primarily grass) that has been sprayed with herbicide have relatively greater risk for adverse effects because herbicide residue is higher on grass than it is on other herbaceous vegetation or seeds (Kenaga, 1973; Fletcher et. al., 1994; Pfleeger et. al., 1996). Broadcast treatments would impact larger areas than spot treatments, however; disturbance would occur once a year and normally would last for less than a few hours. Species such as turkeys, grouse, quail, and waterfowl all consume grass as part of their diet. Other birds would eat grass seeds especially. The end result of all of the alternatives is some degree of improvement in the quality of habitat, while having a short-term negative effect on individual birds. One example from this project would be the treatment of knapweed. Knapweed seed is not consumed by birds and provides very poor nest cover. By reducing the presence of knapweed and allowing native grasses and forbs that do provide food and cover there is a positive effect from the treatment.

The effects of herbicides, from all methods of intake and to all species on the landscape, are limited. The studies that were analyzed for the Regional EIS indicated that there was a low toxicity of herbicides to birds, but because of the large gaps in data it must be stated that some effects to birds from herbicides are unknown. The data that is available would indicate that the risk is low.

The overall likelihood of adverse effects from invasive plant treatments is low. Sensitive species like terrestrial amphibians are often underground or other insulating structures during the dry summer months when most invasive plant treatments would occur. They would therefore not be susceptible to trampling or herbicide exposure. PDFs reduce, but do not eliminate, risk to terrestrial amphibians. This low level of potential effect makes it difficult to compare effects between alternatives in meaningful ways. The distinction between alternatives could be compared to the difference between low potential for adverse effect and very low potential for adverse effect. Also, because reducing herbicide use often means increasing manual or mechanical methods, the risk from herbicide exposure is traded for the risk from trampling or disturbance.

General Overview of Herbicide Analysis by Species

The analysis is based on exposure scenario results from the SERA risk assessments for mammals, birds, and honeybees using the typical application rate. The effects analysis is those effects that could be expected to exceed toxicity index based on the information outlined in Appendix P of the Invasive Plant FEIS (USDA Forest Service, 2005a). The anticipated effects are extrapolated results based on the scenarios used for particular taxonomic groups and may be different from actual toxicity of a particular species. Worst-case for both acute and chronic exposures are combined if it is anticipated that both scenarios would apply to the species analyzed. For species that are mobile and have large home ranges only the acute scenarios are applied, because these species would not be in an area long enough to receive chronic exposure to the herbicides.

Effects to Gray Wolf

TREATMENT AND RESTORATION

Methods used to treat invasive plants or restore habitat though not likely, may affect the gray wolf. The general effects of each non-herbicidal method to wildlife are discussed previously in this chapter. The potential effects from herbicides are also summarized previously in this chapter, and discussed in detail in Appendix B and in the R6 Invasive Plants Program FEIS (USDA Forest Service 2005b, Appendix P). All treatment methods that result in improved habitat for elk, deer or other prey species will provide a long-term benefit to wolves.

MANUAL AND MECHANICAL METHODS

Direct effects from invasive plant treatment include disturbance caused by noise, aircraft, people and vehicles, which are activities common to manual and mechanical methods. These activities could potentially disturb gray wolves. However, invasive plant projects involve very short-term disturbance with few people and might only be repeated once in the same growing season. Currently, wolves may occur within the Project Area but are unlikely to encounter any individual project. Although wolves will travel over large distances, they are most likely to occur in wilderness and roadless areas, away from human disturbance. These areas have minimal invasive plant infestations so the likelihood of disturbance would likely be nominal. The life history traits of the species, current literature, existing guidelines, and expert opinion of biologists familiar with the species (A. Kuehl personal communication with W. Gaines and R. Naney, 2007) indicate that the level of disturbance expected from any invasive plant project is not likely to adversely disturb the gray wolf. In addition the PDF that addresses activities in close proximity to known denning or rendezvous sites will limit disturbance.

BIOLOGICAL CONTROL

There is no indication that any biological controls adversely affect the forage of elk or other prey items for the gray wolf. Biological controls cannot affect gray wolves directly, because they only act on invasive plants.

HERBICIDES

Exposure scenarios used to analyze potential effects from herbicides are discussed in “Summary of Herbicide Effects to Wildlife” Appendix C, and in the R6 Invasive Plants Program FEIS (USDA Forest Service 2005b, Appendix P). The potential effects are not likely to occur under actual field conditions because the worst-case scenarios do not account for plausibility of exposure, differences in application methods and timing, seasonal presence, species behavior, current protection measures in place, the current distribution of the species, or the standards included in the Regional FEIS. In addition, although wolves will travel over large distances, they are most likely to occur in wilderness and roadless areas, away from human disturbance. These areas have minimal invasive plant infestations so the likelihood of herbicide use where they exist would likely be greatly reduced.

Gray wolves prey upon large mammals and will also eat carrion. It is extremely unlikely that a gray wolf would enter into an invasive plant treatment area, because they tend to be transient and generally avoid areas where there has been recent human activity. Wolves are even more unlikely to be exposed to herbicide because any appreciable exposure would require wolves to feed upon the exact individual of prey that had been feeding exclusively within the treatment area, or had been directly sprayed. Even if an elk or deer had foraged in the treatment area, or been directly sprayed, a single wolf would have to consume the entire deer or elk before the herbicide was eliminated from the herbivore’s body. Again, an extremely unlikely scenario, since most of any herbicide dose for the herbicides contained in the Proposed Action is eliminated within 24-48 hours.

Small mammals are not the typical prey item for wolves. Nonetheless, the scenario in which a medium-sized canid eats small mammals that have been directly sprayed was used to evaluate a general risk to carnivores from herbicide use. This scenario, while not very plausible, would constitute the worst-case scenario of herbicide exposure for a gray wolf.

The following interpretations of the exposure scenario results are made with the reservation that toxicity data was generated from laboratory animals that may not accurately represent potential effects to free-ranging wildlife.

At typical and highest application rates, the estimated doses from the exposure scenario are all less than the reported NOAELs for all herbicides except chronic doses of triclopyr. There is no data available to estimate an actual chronic dose in this scenario, so the chronic estimate is obtained by comparing the acute dose to the chronic toxicity index. This comparison will over-estimate the dose and risk to the carnivore. At the typical application rate, the estimated acute dose to a carnivore consuming contaminated small mammals is 2.1 mg/kg (project file worksheets). The chronic NOAEL for effects to kidneys in dogs is 0.5 mg/kg/day.

For triclopyr, the worst-case analysis uses a very conservative toxicity value. Toxicity of triclopyr acid and triclopyr BEE does not differ for mammals. The EPA has used two different values for a reference dose on the effects of triclopyr to mammals. The FS/SERA risk assessment (2003 Triclopyr) relies on a chronic toxicity index (NOEL of 5 mg/kg/day) from a rat reproduction study. In this analysis, a lower value from a 1-year feeding study of dogs is used (chronic NOEL of 0.5 mg/kg/day; Quast et al., 1976, cited in SERA, 2003 Triclopyr). Dogs were not considered by EPA to be a good model for human health effects, because they do not excrete weak acids as well as other animals (see Timchalk and Nolan 1997; Timchalk et al. 1997). Canids are, however, relevant for concerns about effects to wildlife in general and gray wolves specifically. It may be argued that the use of the 0.5 mg/kg/day value for the toxicity index in this analysis is overly cautious, because it represents competition for excretion rather than a toxic effect (Timchalk et al., 1997). However, it meets the criteria for providing a worst-case analysis based on available toxicity data for potential effects to wildlife, and is therefore consistent with the criteria for choice of other indices used in this analysis.

The use of triclopyr for invasive plant treatment is restricted in the Proposed Action by Standard #16, which states, "The use of triclopyr is limited to selective application techniques only (e.g. spot spraying, wiping, basal bark, cut stump injection)." The above exposure scenarios calculate doses based on a broadcast spray-type application that would directly spray and entire day's diet of small mammals. The direct spray of many small mammals could not occur with triclopyr applied to non-desirable vegetation in a selective manner. Therefore, with Standard 16 in place, adverse effects to gray wolves from the use of triclopyr will not occur.

It is unlikely a wolf would be in areas with invasive plants, since invasive plants are not generally utilized by their prey species and are usually in more open or populated areas. It is unlikely a wolf would be directly sprayed through aerial application since the wolf would run from a low flying plane or at least hide under some type of cover. As discussed before, even if a wolf were to be sprayed with herbicide the effects would not be measurable.

EARLY DETECTION AND RAPID RESPONSE

If new invasive plant treatment sites are discovered in close proximity to a wolf den or rendezvous site the PDF is in place to limit impacts to the wolf and its habitat.

SUMMARY OF HERBICIDE EFFECTS TO GRAY WOLF

Indirect effects to gray wolf would consist of changes to the habitat of their prey. Invasive plant treatments will not remove or degrade prey habitat since invasive plants do not provide adequate forage for elk and other prey, although certain invasive species may be utilized during some parts of the year. Successful control of invasive plant infestations provides long-term benefits to gray wolf by restoring native habitat and forage for their prey and preventing future degradation of habitat. Indirect effects of herbicide are not likely because the herbicides in the proposed action do not bioaccumulate and any exposure for gray wolf is highly unlikely. In addition, a PDF would be in place to limit disturbance to denning and rendezvous sites (See Chapter II of this document).

DETERMINATION OF EFFECTS TO GRAY WOLF

At this time gray wolves are known to exist on the Forests, and a pack has been confirmed. Invasive plant treatments **may effect**, and is **not likely to adversely affect** the gray wolf. This determination is based on:

- The Region 6 Invasive Plants FEIS prevention standards will help to protect foraging habitat of their prey from invasive plants
- Distribution of gray wolves within the infested areas would likely be very limited, so the opportunity for wolves to be in or near treatment areas is also very limited
- Disturbance from projects could occur, but is unlikely. In addition, the PDF for wolves would further limit possible disturbance
- Disturbance from invasive plant treatment projects is low level, short duration, and infrequent
- Doses of any herbicides in the proposed action that would cause potential adverse effects are not plausible

CUMULATIVE EFFECTS

Cumulative effects for the purposes of consultation under ESA are defined as, “the effects of future State, tribal, local, or private actions that are reasonably certain to occur in the action area…” (50 CFR, Part 402).

As wolves move into Oregon and Washington, they will be subject to the same pressures and conflicts with humans that occur in Idaho, Wyoming and Montana. The projected increases in population for Oregon and Washington will likely increase recreation on the National Forests where wolves may occur. This could increase human disturbance and potential sources of mortality, to wolves in the area.

There would be negligible direct or indirect effects to wolves, if any, so there are no effects to accumulate. Activities of man and natural processes have led to the introduction, establishment and spread of invasive plants across the Umatilla and Wallowa National Forests. Only the land and roads within the National Forest System would be treated in the proposed action. The Forest, however, is intermingled with other federal, state, county, and private ownerships. Management activities and actions on neighboring lands may contribute to spread or containment of invasive plants on National Forest System lands, and vice versa. The effectiveness of the proposed invasive plant treatments project would be increased if coordination with adjacent landowners treats invasive infestation across land ownerships. The cumulative effects analysis assumes that this cooperative, coordinated effort continues for the life of this project.

Herbicides are commonly applied on lands other than National Forest system lands for a variety of agricultural, landscaping and invasive plant management purposes. Herbicide use occurs on tribal lands, state and county lands, private forestry lands, rangelands, utility corridors, road rights-of-way, and private property. No requirement or central reporting system exists to compile invasive plant management information on or off National Forests in Oregon or Washington. So, accurate accounting of the total acreage of invasive plant treatment for all land ownerships is unavailable.

The proposed use of herbicides on and off National Forest system lands could result in additive doses of herbicides to wildlife species. For additive doses to occur, the two exposures would have to occur closely together in time, since the herbicides proposed for use are rapidly eliminated from wildlife and do not significantly bioaccumulate (USDA 2005). The application rates and extent considered in this BA are unlikely to result in additive doses beyond those evaluated for chronic and acute exposures in the USDA Forest Service risk assessments, which formed the basis for the effects analysis in the Invasive Plant FEIS (2005). The Invasive Plant FEIS (2005), in return, served as the basis for the site-specific effects analysis discussed in this BA.

The risk of adverse effects of invasive plant treatments in the proposed action have been minimized by the Project Design Features (PDFs). These limit, but do not exclude, the possibility of cumulative adverse effects caused by treatment. The use of herbicides within the scope of this project is unlikely to contribute to cumulative effects beyond those described in the Invasive Plant FEIS (2005). Herbicide persistence is managed through PDFs to avoid chemical loading in the soil over time at any one site. Buffers minimize risk of herbicide concentrations of concern near water.

Early Detection Rapid Response is considered in the direct, indirect and cumulative effects analysis. Effects of treatments each year under early detection-rapid response, by definition, would not exceed those predicted for the most ambitious conceivable treatment scenario. This is because the Project Design Features reduce the risks of adverse effects.