Western Washington Gray Wolf Distinct Population Segment

By Certified Mail

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U. S. FISH AND WILDLIFE SERVICE
UNITED STATES DEPARTMENT OF THE INTERIOR

Defenders of Wildlife	)	
1101 14th St. NW, Suite 1400	)	
Washington, D.C. 20005	)	Petition to list a distinct population segment of
Tel: (202) 682-9400	)	gray wolves (16 U.S.C. § 1533 and 5
		U.S.C. § 553) generally recognized as
and		Western Washington
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I. INTRODUCTION

Defenders of Wildlife and the Northwest Ecosystem Alliance hereby petition the U. S. Fish and Wildlife Service to list a distinct population segment of gray wolves as endangered under the Endangered Species Act (ESA) (16 U.S.C. § 1533) and the Administrative Procedure Act (5 U.S.C. § 553). The DPS is defined in Section III but generally represents western Washington State.

The gray wolf in Washington State is currently classified as "endangered" under the ESA. The FWS, however has proposed to downlist the species to "threatened" and to forgo an affirmative recovery effort in this region, 65 Fed. Reg. 43450 - 43496 (July 13, 2000).

In this petition we will present documentation of vast areas of suitable habitat and favorable conditions for the establishment of viable populations of wolves in western Washington. We present several factors that establish the significance and discreteness of this population to the conservation of gray wolves in the lower 48 states. Feasibility studies indicate that the Blue Mountains of eastern Washington, the northern Cascades in central Washington and the Olympic peninsula on the western edge of Washington could all support wolf populations. Wolves restored to the Blue Mountain area along eastern Washington could be considered contiguous with the recuperating wolf population in central Idaho and as such would not be considered a distinct population.

In western Washington however, there is sufficient distance combined with anthropogenic barriers, namely a wide expanse of intensive farmlands, to preclude the reasonable expectation of natural recolonization. It is to these areas that we wish to see active wolf recovery initiated by the U. S. Fish and Wildlife Service. Even Canadian wolf populations in the north are so reduced that the chances of southward migrating wolves naturally repopulating the north Cascades are remote. The absence of a gray wolf population in the western Washington region of the Pacific Northwest constitutes a "significant gap within the historical range"of the gray wolf. This area includes over 9 million acres of federally controlled lands with substantial amounts of potential wolf habitat available. Finally we will show that a wolf population located in western Washington would qualify as an "endangered" species under the ESA. We believe that the FWS is legally obligated to establish this new DPS and expeditiously complete and implement a recovery plan that addresses the entire geographic area encompassed by the proposed DPS.

A. The Petitioners

Defenders of Wildlife (Defenders) is a non-profit, science-based, conservation organization with over 430,000 members and an extensive involvement in wolf restoration and protection in North America. For more than 30 years Defenders has been directly involved in making gray wolf recovery a reality in the lower 48 states. Our activities in this arena include:

- Lobbying Congress and various administrations for wolf recovery actions and funding;
- Litigating on behalf of wolves as well as intervening on behalf of the government to protect the Yellowstone and Mexican gray wolf recovery efforts;
- Operating a privately funded wolf compensation trust in the northern Rockies and

elsewhere since 1987;

- Offering and paying rewards for information leading to the conviction of illegal wolf killers;
- Working with current and potential cooperating tribes often providing technical training and funding for equipment or personnel;
- Funding and training field staff to manage and protect wolves in recovery areas;
- Sponsoring educational symposia and activities such as the annual North American Interagency Wolf Conference and Wolf Awareness Week to educate and organize wolf supporters and others;
- Financing and participating in numerous scientific studies to gauge habitat suitability and public support for wolf recovery, documenting wolf-related ecological phenomenon, and testing the efficacy of many management approaches and techniques;
- Providing emergency funding and staff during the government shutdown of 1996 to complete the second Yellowstone reintroduction; and
- Providing support for captive breeding facilities.

Northwest Ecosystem Alliance (NWEA) protects and restores wildlands and wildlife in the Pacific Northwest and supports such efforts in British Columbia. NWEA bridges science and advocacy, working with activists, policy makers and the general public to conserve our natural heritage. We envision a Northwest that includes natural areas healthy, wild and large enough to sustain viable populations of all native species, including large carnivores such as grizzly bears and wolves. Since 1988, NWEA has fought relentlessly to protect the Northwest's wildlands and wildlife. Our strength lies in mobilizing people to demonstrate support for science-based solutions you, our members, are our partners in the truest sense of the word. Along with protecting countless acres of forestland, we have worked diligently to protect threatened species such as the lynx, gray wolf and salmon.

NWEA has remained at the forefront of regional conservation issues and sought new solutions to old problems. In 1999, we led the successful campaign to protect 25,000 acres in the Loomis State Forest, the best lynx habitat in the lower 48. Raising nearly $17 million in a little more than one year for this effort inspired new momentum for conservation in the Northwest. We are proud to be in coalition efforts such as The Cascades Conservation Partnership and Northwest Old-Growth Campaign along with our on-going dynamic program work.

In December 1999 Defenders of Wildlife published *Places for Wolves: A Blueprint for Restoration and Long-term Recovery in the Lower 48 States* (Ferris et al. 1999) as our formal and detailed response to early drafts of the FWS reclassification proposal. This document, which was recently recognized as the Natural Resource Council of America's 1999 conservation publication of the year, lays out our science-based vision for what federally-led wolf recovery should entail.

That publication identifies several areas that offer great opportunities for wolf recovery, and among these is the western Washington region. To help enable wolf recovery in this area, Defenders of Wildlife has agreed to extend our wolf compensation trust to cover this region until wolves no longer require federal protection. We've launched a public education and outreach program that includes traveling education booths, a wolf curriculum and a bi-annual international predator conference.

B. Current and Proposed Legal Status

Under provisions of the Endangered Species Act (43 Fed. Reg. 9607-9615 March 9, 1978), all gray wolves south of the United States - Canada border (including Mexico) are currently listed as Endangered except in Minnesota where they are listed as threatened and in the three non-essential and experimental areas of Yellowstone, Central Idaho, and Arizona. Since its initial listing, the gray wolf has made progress in parts of its historical range. The FWS has proposed a reclassification of gray wolves under the ESA that would establish 4 distinct population segments (DPS) covering all or parts of 19 states and Mexico. These proposed DPS's are: Western Gray Wolf DPS (threatened status, WA, OR, ID, MT, WY, UT, CO, northern NM and northern AZ); Southwestern (Mexican) Gray Wolf DPS: (endangered status, southern AZ, southern NM, west TX, Mexico); Western Great Lakes Gray Wolf DPS (threatened status, ND, SD, MN, WI, MI); and Northeastern Gray Wolf DPS. The proposed rule specifies that when arbitrary population requirements for each DPS are met and maintained over a predetermined period of time, gray wolves will be either downlisted to Threatened or delisted entirely from the ESA.

Gray wolves would lose all ESA protection in 29 states, where they historically occurred if this rule were promulgated as proposed. Furthermore, gray wolves within the boundaries of the four DPS's would become delisted if recovery goals were attained for the small, discrete areas with active recovery plans. When these arbitrary recovery goals are attained, which is expected to occur in as few as 3- 5 years, gray wolves in *all states* will be delisted. In effect, when populations are reestablished in no more than 12 of the 48 conterminous United States, the gray wolf in this country will lose all Federal protection. Additionally, gray wolves could be delisted (with no or non-viable populations) in Oregon, Washington, Utah, Colorado, northern Arizona, and northern New Mexico once delisting recovery goals established in the Northern Rocky Mountain Wolf Recovery Plan (USFWS 1987) are met. Recovery goals for the proposed Western DPS are expected to be attained soon and a delisting proposal for that area is expected within 3-5 years. Under the proposed rule gray wolves could lose ESA protections when populations are reestablished in portions of no more than 12 of the 48 conterminous states..

C. DPS and ESA Criteria

Under the FWS DPS policy, 61 Fed. Reg. 4722-25 (Feb. 7, 1996), three elements are considered in a decision whether to list a DPS as threatened or endangered under the ESA. First the population must be discrete based on one of the following criteria: (1) the population is markedly separated from other populations of the same taxon, or (2) it is delimited by international governmental boundaries. Second, a population's significance can be established, for example based the following factors: (1) persistence of the DPS in an ecological setting unusual or unique for the taxon, (2) evidence that loss of the DPS would result in a significant gap in the range of the taxon, (3) evidence that the DPS represents the only surviving natural occurrence of a taxon within its historic range, or (4) evidence that the discrete population segment differs markedly from other populations of the species in its genetic characteristics. Lastly, if a population is determined to be both discrete and significant and therefore a "species" under the ESA, its status as endangered or threatened is then evaluated. The standard for listing species under the ESA is fairly straight forward, 16 U.S.C. § 1533 (a)(1); 50 C.F.R. § 424.11. The ESA requires the Secretary to determine, "solely on the basis of the best scientific and commercial data available..." whether a species is endangered or threatened based on any one or a combination of five factors: 1- the present or threatened destruction, modification, or curtailment of its habitat or range; 2 - overutilization for commercial, recreational, scientific, or educational purposes; 3 - disease or predation; 4 - the inadequacy of existing regulatory mechanisms; and 5 - other natural or manmade factors affecting its continued existence.

D. Overview, Current Issues and the Flaws of the Proposed Rule

Although the goal of Endangered Species protection is to ultimately remove species from endangered status, adjusting management tactics while wolf populations are not fully recovered may be detrimental to populations in the Northern Rockies. The criteria that determined ESA listing of the gray wolves in 1978 must be satisfied prior to reducing or eliminating federal protection. The United States Fish and Wildlife Service's proposal to remove and reduce federal protections from the gray wolf will increase probability for extinction for many existing small populations due primarily to the wolf's dispersal behavior. Regardless of the protection a wolf population has within the boundaries of a recovery zone, nature reserve, or park, wolves will disperse to new territory beyond reserve boundaries in search of prey and mates (Mladenoff et. al. 1995, Gese and Mech 1991).

While wildlife biologists and the conservation community applaud the successes of the gray wolf in the northern Rocky Mountain and Great Lakes recovery areas, population sizes are far below levels pre-twentieth century, and currently utilized habitats are isolated by distance and anthropogenic barriers. The Fish and Wildlife Service's proposed Western DPS includes all or parts of nine states, but for most of this land area no recovery plans have been developed. Only three states within this DPS are included in a recovery plan.

Once gray wolves are reestablished in parts of these three states, Federal protection will be adjusted for all states within the proposed DPS although wolf recovery throughout these nine states will continue to be threatened by curtailment of its range, human attitudes, and environmental stochastity. Because metapopulations of the gray wolf are less likely to become extinct and thus need protection under the ESA when there are more local populations established (McLaughlin, pers. comm.), the FWS must promote recovery over a larger geographic area and strive to protect individuals dispersing between local populations. This is why we propose to create a Western Washington Gray Wolf DPS.

We cannot support the downlisting of the entire Western DPS as described in the FWS proposed rule. The proposed Western DPS includes regions for which no recovery plans have been developed even though significant amounts of potential wolf habitat is available, and more importantly it includes areas where no notable progress to recovery has been made. One such region is western Washington which includes about half of Washington State west of the Okanagan and Columbia Rivers (see Section IV).

The FWS's proposed Western DPS adds six additional states to the current northern Rocky Mountain recovery zone – to include a total of nine states – without expanding recovery goals that were initially set for only three states. Thus, when the current northern Rockies populations reach their recovery goal of ten pairs in each population, breeding successfully for three years, the FWS plans to delist throughout the entire Western DPS including western Washington. This could happen as early as 2003, at which time all federal protection would be lost for gray wolves in the western U.S., (except those located in the Southwestern DPS), and without a viable wolf population anywhere in the Pacific Northwest. The proposed rule essentially writes off wolves and wolf recovery in the Pacific Northwest.

Delisting of the Western DPS would leave an area about 200 by 200 miles empty (from the Cascade Mountains to the Olympic Peninsula, and from the Canadian to the Oregon borders) that historically supported healthy, viable wolf populations. Gray wolves are unlikely to recolonize the western Washington region on their own because of the distance (about 100 miles) and anthropogenic barriers (highways, farmland, development) between this area and wolf populations in the northern Rockies (Singleton and Gaines, 2002). The northern boundary of this area is legally isolated along the international border with British Columbia, Canada. Moreover, the wolf population in the Cascades of Canada is thought to be extremely low (possibly only occasional migrants) and would not provide a source population for natural recolonization.

Delisting will remove federal protection for gray wolves and give responsibility for their continued protection to Washington State. Washington State Fish and Wildlife Commission, composed of nine members appointed by the governor, primarily establishes policy and direction for fish and wildlife species and their habitats in Washington and monitors the Department's implementation of the goals, policies and objectives established by the Commission. The Washington Department of Fish and Wildlife currently manages 55 animal species that are hunted and 34 wildlife species that are listed as threatened or endangered on state or federal Endangered Species lists. The gray wolf is listed as “Endangered” by Washington State. It will be up to the governor-appointed game commission to determine the level of "management" given to wolf populations in that state. If Washington follows the lead of South Dakota, which recently repealed hunting restrictions on wolves (S.D. Laws 1999, ch. 209, sec.1), protection could be non-existent. Many of the western states have also shown an inability or an unwillingness to recover or protect wolves within their boundaries. Other states retain legal bounties on gray wolves. In Colorado, for example, a state law offering a $2 bounty for each wolf killed remains on the books, despite threats of a lawsuit over the law (Co. Rev. Stat. sec. 35-40-107). Most states have failed to demonstrate either their willingness or capability to protect wolves and it remains to be seen what direction Washington State is willing to take.

Little can be done to significantly increase the amount of suitable habitat available for wolf recovery. Consequently, the best that can be done for the wolf is to make the most use of what habitat remains. The only way to maximize the species’ chances of long-term survival is to utilize remaining habitat to restore populations that can provide adequate representation, resiliency, and redundancy (Shaffer and Stein 2000). Representation refers to establishing populations across the full array of appropriate potential habitats. Resiliency refers to maintaining populations in each habitat at levels large enough to survive any negative consequences of demographic stochasticity and inbreeding. Redundancy refers to providing several populations in each habitat type as a hedge against extreme environmental events (Shaffer and Stein 2000). Wolf populations should be established in remaining habitat based on these principles in order to maximize the long-term viability of the gray wolf in the lower 48 states. In practice, the above would call for a minimum of two (preferably three or more) populations of not less than several hundred wolves in each ecologically or environmentally distinct area of it's former range.

With these conditions in mind we feel that the only solution for recovery of a viable long-term population of gray wolves is through continued federal oversight and the establishment of a Western Washington Gray Wolf DPS. The FWS should develop a comprehensive recovery plan for this region and follow it up with whatever steps are deemed necessary to encourage the restoration of this species. Defenders and NWEA will support the FWS in this process and Defenders will continue its long tradition of wolf education and outreach as well as payment of livestock depredation claims arising from wolf predation.

II. NATURAL HISTORY

A. Description of the Species

Physical description.– Gray wolves (*Canis lupus*) are the largest member of the dog family *Canidae* (Mech 1970). Female average weight ranges from 80 - 85 lbs. and males average from 95 - 100 lbs. (Mech 1970), though considerable clinal variation in size and pelt color exists from the Arctic to central Mexico (Young and Goldman 1944). The heaviest recorded wolf was a 175 pound male from east-central Alaska, though males seldom exceed 120 lbs. and females are seldom over 100 lbs. (Mech 1970).
Wolves' acute hearing and exceptional sense of smell - up to 100 times more sensitive than that of humans - make them well-adapted to their surroundings and to finding food (Mech 1970). Some researchers estimate that a wolf can run as fast as 40 miles an hour. Wolves have been known to travel 120 miles in a day, but they usually travel an average of 10 to 15 miles a day (Mech 1970).

Pack Behavior.– Wolves live, travel, and hunt in packs averaging four to seven animals, consisting of an alpha, or dominant pair, their pups, and several other subordinate or young animals. The alpha female and male are the pack leaders, tracking and hunting prey, choosing den sites, and establishing the pack's territory (Mech 1970). Wolves prey mainly on ungulates, such as deer, elk, moose, caribou, bison, bighorn sheep and muskoxen. They also eat smaller prey such as snowshoe hare, beaver, rabbits, opossums and rodents. Wolves also prey on livestock, although wild prey are their preferred food (Mech 1970).

Wolf pups romp and play fight with each other from a very young age. Scientists think that even these early encounters establish hierarchies that will help determine which members of the litter will grow up to be pack leaders. All adults share parental responsibilities for the pups. They feed the pups by regurgitating food for them from the time the pups are about four weeks old until they learn to hunt with the pack. Pups remain with their parents for at least their first year, while they learn to hunt. During their second year of life, when the parents are raising a new set of pups, young wolves can remain with the pack, or spend periods of time on their own. Frequently, they return in autumn to spend their second winter with the pack (Mech 1970).

By the time wolves are two years old, however, they leave the pack permanently to find mates and territories of their own. Not all the pups in a litter live to the age of dispersal, of course. Biologists have determined that only one or two of every five pups born live to the age of 10 months, and only about half of those remaining survive to the time when they would leave the pack and find their own mates. Adult wolves, on the other hand, have fairly high rates of survival. A seven year old wolf is considered to be pretty old, and a maximum lifespan is about 16 years (Young and Goldman 1944).

Reproduction.– The alpha pair mate in January or February and give birth in spring, after a gestation period of about 65 days. Litters can contain from one to nine pups, but usually consist of around six. Pups have blue eyes at birth and weigh about one pound. Their eyes open when they are about two weeks old, and a week later begin to walk and explore the area around the den. Wolf pups grow rapidly, reaching 20 pounds at two months. A wolf pup is the same size as an adult by the time he or she is about a year old, and reaches reproductive maturity by about two years of age (Mech 1970).

Communication.– Wolves communicate through facial expressions and body postures, scent-marking, growls, barks, whimpers and howls. Howling can mean many things: a greeting, a rallying cry to gather the pack together or to get ready for a hunt, an advertisement of their presence to warn other wolves away from their territory, spontaneous play or bonding. Pups begin to howl at one month old. The howl of the wolf can be heard for up to six miles. When wolves in a pack communicate with each other, they use their entire bodies: expressions of the eyes and mouth, set of the ears, tail, head, and hackles, and general body posture combine to express excitement, anxiety, aggression, or acquiescence.
Wolves wrestle, rub cheeks and noses, nip, nuzzle, and lick each other. They also leave "messages" for themselves and each other by urinating, defecating, or scratching the ground to leave scent marks. These marks can set the boundaries of territories, record trails, warn off other wolves, or help lone wolves find unoccupied territory. No one knows how wolves get all this information from smelling scent marks, but it is likely that wolves are very good at distinguishing between many similar odors.

B. Taxonomy

According to Young and Goldman (1944) and Hall (1981) western Washington was historically occupied by *Canus lupus fuscus*, which Goldman referred to as the "Cascade Mountains Wolf." Nowak (1995) presented a significant revision to gray wolf taxonomy which reduced the 24 formerly recognized subspecies in North America to 5 currently recognized subspecies. According to Nowak's (1995) revised classification, the gray wolf subspecies that formerly occupied the western Washington region was *C. l. nubilus*. This subspecies currently exists in the wild in northern Minnesota, northern Michigan, and northern Wisconsin (USA) and Ontario, northeastern Manitoba, and northern Quebec (Canada). Other extant subspecies near the western Washington region are *C. l. occidentalis* in northwestern Montana (naturally occurring), central Idaho (reintroduced from Canada), and northwestern Wyoming (re-introduced from Canada).

Confusion and disagreement exists over North American gray wolf taxonomy (Brewster and Fritts 1995). However, most gray wolf taxonomists agree that the boundaries between ranges of adjacent gray wolf subspecies were zones of intergradation where genetic mixing between subspecies occurred, rather than distinct lines on a map (Young and Goldman 1944; Mech 1970; Brewster and Fritts 1995). The width of these zones relate to the ability of wolves to disperse. Wolves are capable of dispersing hundreds of kilometers, with the longest known dispersal exceeding 550 miles (Fritts 1983). Gese and Mech (1991) found that the mean dispersal distance for 316 dispersing gray wolves was 47.8 miles, with a range of 5-220 miles. Thus for gray wolves, zones of intergradation were likely hundreds of kilometers wide. The narrow zone where the gray wolf population genome was represented by approximately equal contributions from adjacent subspecies (the putative subspecies boundary) would be impossible to delineate without very large samples of DNA material, which no longer exist.

Because of the fluid nature of gray wolf taxonomy and its desire to afford protection to all gray wolves south of the U.S.-Canada border, the FWS listed all gray wolves as threatened (Minnesota) or endangered (remaining 47 contiguous states and Mexico) at the species (*Canis lupus*) level in 1978, 43 Fed. Reg. 9607-9615 (March 9, 1978). In its most recent proposal to reclassify gray wolves by distinct population segments, the FWS states: "We recognize that gray wolf taxonomy at the subspecies level is subject to conflicting opinions and continuing modification. For this reason, we will not base our gray wolf recovery efforts on any particular portrayal of gray wolf subspeciation. Instead we have identified geographic areas where wolf recovery is occurring or is feasible, and we will focus recovery efforts on those geographic entities, regardless of the subspecific affiliation of current or historical gray wolves in those areas," 65 Fed. Reg. 43451-43452 (July 13, 2000).

C. Historical Distribution in the Western Washington Eco-Region

The so-called "Cascade Mountains wolf" occupied the forested regions from the Cascade Range to the Pacific coast (Young and Goldman 1944). A National Park Service Fact sheet (1998) reports that although exact estimates are unavailable early settlers described the wolf as 'common' and speculate that one or more wolf packs may have occurred in all major river drainages. The first recorded western description of wolves came from the Lewis and Clark expedition in 1806 though native peoples have a long and rich cultural relationship to the wolves going back thousands of years (Burroughs 1961, Linton 1998). With the arrival of western settlers came the animosity towards the wolf, government-sponsored bounty payments and, eventually, extirpation of all the large predators (Linton 1998). Since 1973 there have been 19 observations that have been judged for reliability and found to be probable (Laufer and Jenkins 1989) and all but two were found to be sightings of single wolves. These were most likely transients from the southernmost populations still found about 100 miles north of the Washington border in British Columbia, Canada.

III. WOLF ECOLOGY

A. The Role of the Wolf as a Top Carnivore

Energy transfer between trophic levels.– As a top carnivore, the gray wolf along with other predators such as the bear, cougar, and coyote, controls prey populations so that a landscape may support multiple trophic levels of a healthy ecosystem. When the populations of large herbivores are kept in check by predators, the amount of primary production available to smaller animals increases, allowing for increased biodiversity. A basic principle of ecology states that only ten percent of the vegetable or prey's biomass is retained in the biomass of the grazer or predator, respectively. For example, only one tenth of the vegetation consumed by an ungulate in a year will be assimilated into the molecular building blocks of the ungulate itself. The other ninety percent is converted into energy used for metabolic processes and is eventually lost to the environment. Large browsing herbivores such as deer and elk require a great quantity of woody stems, herbaceous plants and lichens to fuel their metabolisms and to reproduce. Left uncontrolled, large herbivores that require such a large amount of primary productivity to survive will deplete a landscape of its primary productivity. When this overpopulation of ungulates occurs, the diversity of smaller herbivores and their predators is reduced. Without predators to regulate the number of ungulates, ecosystems are simplified. Ungulate population explosions simplify the food web and ultimately reduce biodiversity. (Terbough et al. 1999).

Mesopredator release.– Another deleterious effect of removing wolves from an ecosystem is that it leaves a niche available for meso-predators such as the coyote. Meso-predators, when they are occupying the highest trophic level, can be responsible for decreased biodiversity because they tend to prey on a wide variety of smaller animals. Coyotes and other meso predators are generalists and can survive after they deplete a preferred food source. Normally, when wolves are present, coyote populations are suppressed by territorial aggression and by predation (Crabtree and Sheldon 1999), releasing small mammals and birds from the risk of coyote predation (Fischer 1998, Wilkenson 1997). Additionally, when wolves are present they increase the amount of available carrion in an ecosystem with potentially positive effects for scavenger species such as bear, foxes, weasels, and raptors. Availability of carrion may increase biodiversity as it provides an alternate food source for generalist meso-predators (Crabtree and Sheldon 1999).

Regulation of prey genetic health.– In addition to the role carnivores play in increasing biodiversity, they also improve the gene pool of their prey species through time by culling genetically inferior individuals. The gray wolf in particular exerts this positive force on the prey gene pool, as it often chases after a herd of ungulates until a slower animal is left behind. This "coursing" technique may more effectively reduce the chance of a genetically weak animal from reproducing than other hunting strategies (Mech 1970). A cougar, for example, will usually hide in a hunting bed until its prey comes within springing distance. The prey in this case is almost as likely to be healthy as it is to be weak. Because all carnivores occupy a distinct niche in an ecosystem and employ different hunting strategies, they all play a unique role in the management of the lower trophic levels. The wolf, however, may have a more direct effect on prey gene flow than other carnivores.

Wolf behavior and population dynamics.– Wolves hunt, live, and travel in packs averaging four to seven animals consisting of an alpha, or dominant pair, their pups, and several other subordinate or young animals. The alpha male and female are the pack leaders, whose role it is to track and hunt prey, choose den sites and to establish the pack's territory (Mech 1970). Wolves prey primarily on ungulates such as deer, elk, moose, caribou, bison, bighorn sheep, and muskoxen depending on the distribution of these prey species. They also eat smaller prey such as lagomorphs, beaver, opossums, and rodents. Wolves will take livestock, though wild prey is their preferred food (Mech 1970). Pups will remain with their parents for at least their first year while they learn to hunt. During the second year when parents may be raising a new set of pups, young wolves can remain with the pack or spend time on their own, frequently returning in autumn to spend their second winter with the pack. Biologists have determined that only one or two of every five pups born live to the age of ten months, and only about half of those survive to the age of dispersal (Young and Goldman 1944).

By the time wolves are two years old, young wolves leave the pack permanently to find mates and territories of their own. Because dispersal is an important stage in wolf development, overall wolf populations can be viewed as a dynamic mosaic of populations or a metapopulation (65 Fed. Reg). Metapopulations are simply a group of smaller populations linked by immigration and emigration (Levins 1970), and the basic structure of wolf populations both on a small scale and on a large scale allows wolves to be described in this way. On a small scale, wolves travel in family units, but depend on dispersal to find mates and new territories. On a large scale, especially in the Northern Rocky Mountain recovery areas, wolves disperse from one population center to another, and wildlife officials expect individuals will interbreed with members of populations in distant areas (65 Fed Reg).

B. Ecological Importance of Dispersal and Management Considerations

Gray wolf dispersal.– Dispersal is a fundamental aspect of wolf ecology that should be addressed when designing wildlife reserves or planning for wolf management. Pups remain with their parents for at least their first year while they are learning to hunt and then both sexes disperse with the same frequency (Gese and Mech 1991). During the second year when parents may be raising a new litter of pups, young wolves can remain with the pack or spend time on their own making predispersal forays (Gese and Mech 1991), frequently returning in autumn to spend their second winter with the pack. Adults disperse as well as yearlings and pups, but not with the same frequency. When they do disperse, they are often more successful than younger wolves in finding vacant territory within a shorter distance of their natal territory (Gese and Mech 1991). Wolf dispersal rate (and overall wolf abundance) is negatively correlated to prey abundance (Fuller 1989, Gese and Mech 1991, Messier 1985, Ballard et al. 1987, Peterson and Page 1988, Hayes and Harestad 2000). The number of wolves within a region can be estimated by finding the number of prey in the area, according to the prey biomass: wolf index developed by Fuller (1989) and tested by other studies (Hayes and Harestad 2000).

Movements and population fluctuations of prey are the major causes of wolf dispersal and the determining factors determining dispersal distance. Even when prey density is adequate, however, most wolves disperse from their natal pack territories as pups or yearlings (Gese and Mech 1991). Factors other than prey density that can influence dispersal are social strife within a pack and the unavailability of genetically unrelated mates. The search for mates may be one of the most important reasons for dispersal because wolves avoid inbreeding to the point where they will not breed if they cannot locate a mate from a sufficiently distant pack. For this reason the number of packs occupying an area partially determines dispersal distance and dispersal success. If there are very few packs in an area, a dispersing wolf might not be able to locate a mate that is genetically unrelated, and therefore may have to disperse long distances to find a suitable mate.

Landscape characteristics of dispersal paths.– Because of this close relationship between wolves and their prey, designing wildlife reserves for wolves is difficult. Ungulates, the most common prey species for wolves (Mladenoff et al. 1995), are often more dense at the edges of wilderness areas than they are within the boundaries of preserves because disturbed areas usually provide more browse. Although they may have habitat preferences when prey density is high and they are able to select certain habitat characteristics over others, wolves are not specific to any one particular habitat type and are able to survive in almost any type of landscape as long as there is adequate prey and contact with humans is minimal.

Dispersal mortality.– Because wolves will stray beyond the boundaries of protected habitat if their prey moves to other areas, and because prey species such as deer and elk often move across the landscape seasonally, wolves can be expected to travel seasonally as well. As wolves follow their prey into disturbed areas where deer and elk are able to find more browse and cover from winter conditions, they may be moving toward human population centers (Haight et al. 1998). This behavior poses a severe threat to individual wolves and to overall population numbers within protected areas. Dispersal mortality greatly affects overall population size and probability of local extinction (Fritts and Carbyn 1995). If wolves within protected areas must stray into agricultural or semi-rural regions in order to find prey, they may not survive long enough to return when prey moves once again into protected wolf habitat.

If human threats to wolves were limited by federal protection, dispersal patterns of wolves would not be such a danger to overall populations. However, wolves are often extremely vulnerable to human caused mortality because they are able to adapt to almost any type of environment, including areas with relatively high human populations. A dispersing wolf may encounter many dangers it had not been exposed to while living within a protected habitat. One of the biggest threats to a dispersing wolf may be human-caused mortality in the form of illegal taking and government sponsored depredation control measures (Mladenoff et al. 1995, Mech 1970, Fuller 1989).

Because wolves are able to adapt to almost any type of environment, including areas with relatively high human populations, wolves dispersing out of protected reserves will likely encounter humans if they do not quickly settle. Mortality caused by humans includes accidental killing by motor vehicles, legal depredation control measures, and illegal takings. Dispersal mortality greatly affects overall population stability, especially if there are few immigrants into the population and if the initial population size is small (Haight et al. 1998). Furthermore, dispersal has been found to be a key factor limiting population growth (Hayes and Harestad 2000).

As wolves recover within the protected boundaries of Yellowstone National Park, individual wolves dispersing into agricultural areas are exposed to increased threats posed by humans. Increased wolf mortality during and after wolf recovery programs illustrates that the greatest number of human-caused mortalities occurs at or near the boundaries of protected reserves where wolves disperse into more fragmented habitat (Hayes 2001, Mladenoff et al. 1995). One reason for this trend is that the present reserves in the Midwest and in the northern Rockies are in close proximity to, if not completely surrounded by, agricultural land. Human attitudes of those surrounding the protected wolf habitat can determine whether or not wolves will successfully disperse (Fritts and Carbyn 1995). Whereas the reserve boundary areas adjacent to agricultural land might actually represent some of the most favorable habitat for wolves due to the presence of foraging ungulates at field edges, it also introduces wolves to another, more dangerous type of prey: domestic livestock. Cattle ranching puts pressure on wolf populations, especially if there are mosaics of forest interlaced with ranching lands because wolves are enticed to explore further away from their natal territories when dispersing (Fritts and Carbyn 1995).

Human actions account for approximately 80-90% of all wolf mortalities (Weaver 2001). Between 1995 and July of 2002, 64 of the 118 known wolf mortalities within the Yellowstone wolf population were confirmed to be human-caused, 3 were unknown and the remainder were natural deaths. Illegal shooting or poisoning was responsible for 10 deaths, legal control claimed 37 wolves, road kills caused another 12 deaths and 5 of the remaining losses were human-related (Maughan 2002). Similarly, when wolf populations increased in Minnesota between the years of 1988 and 1993, the number of wolves killed through government-sponsored programs for depredation control increased by 223% (Mech 1995).

Dispersal distance.– The risk of mortality during dispersal increases when as dispersal distance increases. There is much variability in wolf dispersal distances. While some wolves travel very short distances before settling, most wolves seem to travel several hundred kilometers before finding suitable vacant territory (Gese and Mech 1991, Wabakken et al. 2001). Occasional long distance dispersers have been found to travel as much as 886 km before settling (Fritts 1983). Dispersal distance is important to the survival probability of a wolf population because individual wolves have a greater chance of survival if their dispersal distance is short (Weaver 2001). Long dispersal distances increase the risk of mortality due to conflicts with humans or starvation and reduce the chance that a disperser will settle and find a mate.

The factors that initiate dispersal are the same that ultimately determine the distance a wolf will disperse: social interactions between wolves, availability of mates, spatial distribution of available territories, and prey density (Gese and Mech 1991, Hayes and Harestad 2000, Fuller 1989). If conditions are favorable, a dispersing wolf may only need to travel to nearby areas to successfully establish a new territory. However, if a wolf travels through areas with low prey abundance and few potential mates, it will search much longer before locating food and a mate, becoming increasingly vulnerable to human-caused or natural mortality (Gese and Mech 1991, Fritts and Carbyn 1995, Mladenoff et al. 1995 Mech 1995, Fuller 1989).

C. Minimum Viable Population Size

Although there is some debate over what the minimum viable population size is for gray wolves and how much gene flow through immigration is required to maintain genetic diversity, most wildlife ecologists agree that the probability of population extinction is high when the number of individuals is low (Franklin 1980, Thomas 1990, Wabakken et al. 2001). Minimum viable population is defined as the number of individuals necessary to insure the population's survival and genetic diversity over a specified time period, regardless of harsh environmental conditions, fluctuating prey base, succession of forest plant species, and dispersal (Fritts and Carbyn 1995).

If a population of wolves is isolated without frequent genetic exchange with immigrating wolves, an ideal population size should be anywhere from several hundred to two thousand individuals (Franklin 1980, Wabakken et al. 2001, Lande and Barrowclough 1987, Soule 1980, Thomas 1990). Five to six hundred individuals, or approximately 100 breeding pairs, may be sufficient to maintain genetic diversity within a population closed to immigration (Wabakken et al. 2001, Soule 1980, Fritts and Carbyn 1995), but dispersal and environmental stochastity may strain a population of this small size (Franklin 1980, Thomas 1990).

For a relatively small population of 280 to 300 wolves in Italy, which is approximately the same size of that in the northern Rockies, population viability analysis showed that populations of this size are vulnerable to extinction if there are any dramatic changes in percent adult mortality. If adult mortality increased beyond 10%, the model showed that the population would likely become extinct within 60 to 100 years (Ciucci and Boitani 1991). Small populations that barely meet the minimum viable population requirements such as the Italian population and that of the northern Rockies are more vulnerable to extinction when the mortality rate increases even by a small amount (Wabakken et al. 2001). Also, these small populations may experience inbreeding pressure, as there is probably a significant decline in genetic variability over time (Wabakken et al. 2001).

IV. WESTERN WASHINGTON GRAY WOLF DPS PETITION PROPOSAL

A. Distinct Population Segments under the Endangered Species Act

<u>Discreteness and significance</u>.–Individual populations of a species should be managed separately if there is sufficient reason to believe that there are factors threatening their persistence, according to the FWS DPS policy (61 Fed. Reg. 4722-25 Feb. 7 1996). To be designated as a DPS,

a population must be discrete based on the fact that the population is markedly separated from other populations of the same taxon, or it is delimited by international or governmental boundaries. If determined to be discrete, then the population must meet one or any combination of the following factors to prove that it is significant to the overall taxon: 1) the species is persisting in an ecological setting that is unusual or unique for its taxon, 2) there is evidence that loss of the particular population would result in a significant gap in the range of the taxon, 3) there is evidence that the population represents the only surviving natural occurrence of a taxon within its historic range, and 4) there is evidence that the population differs markedly from other populations of its species in its genetic characteristics.

Determination of federal protections.– If a population is determined to be discreet and significant based on these criteria, the Secretary will then determine the level of Federal protections given to the Distinct Population Segment. Congress then can give a mandate to the FWS to develop recovery plans where appropriate and where chance of success is high. Recovery efforts should give priority to areas with adequate resources. The Endangered Species Act requires the Secretary of the Interior to determine if a species should be listed as endangered or threatened according to whether they meet one or any combination of the following five criteria (16 U.S.C.§1533 (a) (1); 50 C.F.R. § 424.11): 1)there is present or threatened destruction, modification, or curtailment of its habitat or range, 2) the species is over-utilized for commercial, recreational, scientific, or educational purposes, 3) the species is greatly threatened by disease or predation, 4) existing regulatory mechanisms are inadequate, and 5) other natural or manmade factors are affecting its continued existence.

B. DPS Boundaries and Habitat Description

To build a landscape scale metapopulation it is necessary to manage each distinct subpopulation separately because of the differences in regional landscape attributes such as local climate, geology, and prey base. Therefore, western Washington and the few wolves that may inhabit its vast favorable habitat should be designated as a distinct population segment under the Endangered Species Act. The region that should be defined by the Western Washington Gray Wolf DPS includes all land west of the Okanagan River north of its confluence with the Columbia River, and west of the Columbia River where it forms the border between Oregon and Washington. The southern border would be the Columbia River, the western border is the Pacific Ocean and Puget Sound, and the northern border would be the U.S. Canadian border. A core habitat with few roads and little human population density is centered within the proposed DPS. Gaines et al. (2000) described this region of core habitat as the North Cascades Ecosystem (NCE).

The northern part of the ecosystem included in the DPS is very rugged and is divided by the Cascade crest into a densely forested habitat on one side and a dry sagebrush steppe habitat on the other side. Elevations range from 150 meters to 3300 meters at the summit of Mount Baker on the west side of the Cascade crest. On the east side of the crest, elevations range from 710 to 3300 meters. About 62% of the land area contained in the NCE is coniferous forest and 22% is non-forested, including alpine meadows and dry meadows on the east side of the Cascade Crest. The remaining 16% of the land area is composed of rock and ice. In the southern part of the DPS habitat, three volcanoes (Rainier, Adams and St. Helens) form a triangle inside which is a Douglas fir-hemlock forest currently being considered for National Monument status. Although much of this area is used for industrial purposes such as logging, human population and livestock population is sparse, making this ideal wolf habitat.

Different tree and plant associations characterize the two haves of the region supporting the DPS. The region west of the Cascade crest, which is influenced by westerly moving storms and heavy rainfall (170-300 cm annually), is covered with forests composed of Douglas fir, hemlock, silver fir, subalpine fir, grand fir and cedar. Understory density is high. On the east side of the Cascade crest which receives much less precipitation annually (25-50 cm) and most of its winter precipitation in the form of snow, vegetation communities include subalpine fir, Engleman spruce, and lodgepole pine in the higher elevations. As the elevation decreases, these tree species give way to sagebrush and other vegetation types associated with xeric environments (Gaines et al. 2000).

C. Suitability of Western Washington for Gray Wolf Restoration

Land availability.– Studies demonstrating the existence of potentially significant areas of suitable gray wolf habitat have been completed for large portions of the Pacific Northwest (Laufer and Jenkins 1989, Dietz 1993, Church 1996, Hosack 1997, Jenkins et al. 1999, Ratti et al. 1999). Connectivity between areas of suitable habitat is high throughout the area. The area includes 1.8 million acres of National Parks and Monuments of which 95% are designated Wilderness and 7.5 million acres of National Forests of which 2.3 million acres are designated wilderness. The amount of federally controlled land totals nine million acres, of which 4 million is designated wilderness. The immensity of the available habitat and its inaccessibility to humans is ideal because even though wolves utilize various types of landscapes, core habitat areas are often are sites for dens and pack rendezvous (Mladenoff et al. 1995).

Road density.– Another benefit of this region as favorable wolf habitat is that roads are sparse over most of the terrain. About 68% of the region defined by the core region of the DPS (the North Cascades Ecosystem) has no open road access. Of the 32% of the core region that does have open road access, 10% has a road density of .1-1 km/km2, 18% has a road density of 1-3 km/km^2, and 4% has a road density greater than 3 km/km^2. A total of almost 78% of the DPS core habitat has a lower road density than prescribed by wolf habitat models (Mladenoff et al. 1995).

Prey base.– Deer populations in Washington State fluctuate between 250,000 and 500,000, depending on harvest levels, predation, birth rate, and mortality due to environmental stochastity. Elk populations in the state are fairly stable between 50,000 and 55,000. Ungulate populations in states that currently support gray wolves are similar to those in Washington State (Washington State Office of Financial Management website). White tailed deer are more numerous on the east side of the Okanagan River, whereas mule deer are more numerous on the west side of the Okanagan River. Likewise, blacktailed deer populations are greater in the Cascade Range and in the lowlands along Puget Sound (Washington Department of Fish and Wildlife website).

The northern portion of the Western Washington DPS includes an area already designated as the "North Cascades Grizzly Bear Recovery Area" by the FWS. This management zone roughly follows the boundaries of the 3 northernmost National Forests (Wenatchee, Okanagan, and Mt. Baker - Snoqualmie) until reaching the I-90 corridor. It clearly fits the FWS intention for a "distinct population" from the Northern Continental Divide Ecosystem Grizzly Bear DPS (an area concomitant with the northern Rocky Mountain gray wolf DPS), and consequently represents a valid and reasonable model for the proposed Western Washington gray wolf DPS.

The Western Washington gray wolf DPS would continue south of I-90 (which presents significant barriers to ungulate and carnivore migration, though not completely impassible) to the Columbia River. Here the Cascades become less rugged and mostly forested with ridges up to 6,000 foot elevation and valleys of 2-3,000 foot elevation and a bit higher on the eastern side. Three major volcanoes punctuate this gentler expanse - Mt Rainier, Mt Adams and Mt St. Helens. The three volcanoes form nearly an equilateral triangle with Rainier the northern point and Adams and St. Helens on an east-west line about 60 miles long and about 30 miles north of the Columbia River Gorge.

Much of the area between Adams and St. Helens is potential wilderness and is also being advocated for Monument status (The Dark Divide). Very little livestock grazing occurs in this area, mostly logging in the Gifford-Pinchot NF. This would be very good wolf territory and verified wolf sightings have occurred nearly to the Columbia River (Almack and Fitkin 1998).

Eventually, if wolves recolonize the Cascades and are restored to the Olympics, they could possibly connect through the southern side of the Chehalis River system (about 90 miles south of Seattle) where forested hills link the Cascades into the Black Hills and Willapa Hills southwest of Olympia. An initial feasibility study of wolves in the Olympic Peninsula (Dratch *et al.* 1975) estimated that the area could support at least 40 - 60 wolves in a dynamic equilibrium with neighboring natural systems. They also modeled the projected impacts of wolves upon their ungulate prey base and predicted that wolves would not become the controlling factor for ungulate mortality. Indeed, the model showed that wolf numbers would increase very slowly and would stabilize naturally. A similar investigation of the Olympic Peninsula by Ratti et al. (1999) estimated similar numbers 56-64 and Dietz (1993) estimated about 200 as a maximum in the northern Cascade range.

Human Attitudes.–A review of public opinion polls by Buckley (2000) clearly shows a national trend of growing support for restoration of viable wolf populations. Specific to Washington State, Kellert (1985) found that 52% of respondents had a favorable attitude while 30% had a negative attitude towards wolves. Another poll conducted by the Evans/McDonough Co. showed that 62% favored wolf reintroduction in Olympic National Park against 27% that were opposed (Don McDonough and Kathleen Drew; Evans/McDonough Company Inc., 1633 Belleville Ave., Suite A, Seattle, WA 98122; Telephone survey conducted October 23-28 1998).

<u>Ecosystem Impacts</u>.– The impacts of wolves in ecosystems have never been comprehensively studied, due to the difficulty of establishing controls and replication (Smith et al. 1999). It has been noted, however, that removal of large predators releases herbivores and mesopredators, causing overgrazing, vegetation recruitment failure, decreases in ground-nesting birds, and in general, ecosystem simplification, extinctions, and decreased biodiversity. (Terbough et al. 1999). Wolf effects on their herbivore prey species, as well as the resultant vegetation response, have been investigated. In three-level trophic systems, wolves are responsible for maintaining vegetation levels; for instance, on Isle Royale in Lake Superior, predation by wolves releases balsam fir *(Abies balsamea*) from browsing by moose (McLaren and Peterson 1994). There has been speculation that the interruption of these trophic cascade interactions have caused the decline of Aspen (*Populus*) trees in Yellowstone National Park following wolf extirpation in the 1920s. However, it is too soon to determine if there has been a vegetation recruitment response in Yellowstone Park since wolf reintroduction (Ripple and Larsen 2000).

Estimates based on population size indicated that wolf presence in Yellowstone Park would triple available carrion (Garton et al. 1990), with potentially positive effects for a wide range of scavenging species, including foxes, bears, weasels and raptors (Crabtree & Sheldon 1999). Wolves have killed at least 24 coyotes in Yellowstone and altered their behavior and home ranges (Crabtree and Sheldon 1999). Once the ecosystem is released from extreme coyote and ungulate pressure it has been speculated to have a positive impact on numbers of ground squirrels, pocket gophers, hawks, owls, eagles, pronghorn, beaver, wetlands, moose, aspen, willows, and songbirds (Fischer 1998, Wilkinson 1997).

D. Qualifications of the Western Washington Wolf Population as a DPS

<u>Discreteness</u>.–Western Washington State populations of gray wolves should be designated as a DPS based on the criteria determined by the FWS (61 Fed. Reg. 4722-25 Feb. 7 1996). The gray wolf population in Western Washington State is discrete according to the language of the FWS policy because it is markedly separated from natural and reintroduced populations in the northern Rocky Mountains due to distance separating the populations by 150-200 miles. The distance separating the Rocky Mountain recovery areas and the easternmost part of the proposed Western Washington Gray Wolf DPS is three - four times the average dispersal distance for a gray wolf (Gese and Mech 1991). While occasional wolves may disperse across this distance, recolonization of western Washington State is very unlikely within the foreseeable future due to livestock density in eastern Washington. Where wolves encounter livestock there are likely to be increased depredation control measured preventing the natural expansion of wolf range to the Cascades.

Gray wolves currently inhabiting Washington may be dispersers from Canada. Wolves in Canada, however, are subject to less protective wildlife management plans and indeed, are still managed as vermin in many areas of British Columbia with very liberal hunting regulations. Moreover, the ESA recognizes population discreteness based on international borders, if it is isolated from other populations of its taxon by international boundaries. In the past thirty to forty years, the occurrence of gray wolves dispersing from Canada into the state has attested to the presence of adequate habitat. However, because these dispersing wolves have not formed packs over the course of the past few decades, there is little reason to believe that they will do so in the future.

Significance.– The gray wolf population of Washington State also meets the "significance" requirement of DPS designation as described by the FWS policy because it is persisting in an ecological setting unusual and unique for its taxon. Although gray wolves are very scarce in Washington State today, early settlers described the wolf as common, and officials of the North Cascades National Park estimate that they may have occurred in all major river drainages (National Park Service Fact Sheet 1998). Since 1973 there have been nineteen reliable gray wolf detections in the state (Laufer and Jenkins 1989), though most appeared to be single wolves rather than packs.

Western Washington State is a unique habitat for the gray wolf when compared to the other regions grouped into the proposed Western DPS. The climate is markedly different from that of the Northern Rocky Mountain recovery zones in that it has several distinct climates, potentially within one wolf pack's territory. The typical winter weather pattern for the Pacific Northwest is that warm wet air is carried from tropical areas over the southern Pacific Ocean towards the northwestern United States. Whereas other areas of the United States at similar latitudes experience severely low temperatures and snow, the westernmost part of the Pacific Northwest is relatively warm and wet. Along the lowland coastal regions this maritime influence results in densely forested valleys and slopes and a heavy understory rich in mosses and ferns. As the warm moist air is pushed towards the western flanks of the Cascade Mountains it is forced to rise to elevations where it quickly cools and the water vapor it contains condenses into precipitation. For this reason, western Washington has high annual precipitation that affects the forest structure and the species diversity within it.

Higher elevations in the cascades are more affected by latitude than by the marine influence, and are characterized by alpine meadows, snowfields and glaciers. Deep east-west ranging river valleys transect the North-South ranging mountains in Washington. Through these valleys, the warm marine air travels eastward into the mountains, where it affects vegetation and forest structure deep into the heart of the North Cascades. Further east, however, the marine air is almost completely blocked by the Cascade Crest. On the East Side of the Cascade Crest, plant life changes suddenly and dramatically. Conifer forests are restricted to higher elevations and shrub-steppe vegetation such as grasses, sagebrush, and other shrubs cover the valleys. Washington State, due to its latitude, elevational extremes, and influences from both marine air and continental weather systems is a richly diverse region that supports densely forested mountains, dry rangelands, and coastal plains all within relatively small geographic area. The ecosystem of western Washington State, therefore, is distinctly different from that of other areas where wolves occur naturally or where they have been reintroduced to the conterminous United States. The wolves that have been detected within this area, therefore, are persisting in a unique setting that qualifies western Washington to be designated as a DPS according to the language of FWS policy.

Genetics.– Confusion and disagreement exists over North American gray wolf taxonomy (Brewster and Fritts 1995). Nowak (1995) presented a significant revision of gray wolf taxonomy that reduced the 24 formally recognized subspecies in North America to 5 currently recognized subspecies. Although most gray wolf taxonomists agree that the boundaries between ranges of adjacent gray wolf subspecies are blurred, and hybrids occur in wide geographic regions between areas of more homogeneous subspecies, there has not been enough data collected to conclude that wolf populations are not genetically distinct. The width of these zones of genetic intergradation corresponded roughly to the dispersal distance of the wolves of each subspecies and of the hybrids themselves as dispersers traveled from their home range in search of mates (Young and Goldman 1944, Mech 1970, Brewster and Fritts 1995). Yet natural barriers such as water bodies and mountain ranges discouraging dispersal may have resulted in speciation in the overall gray wolf population.

Current studies reveal that wolf DNA from coastal regions of British Columbia may have distinct DNA (Paquet, P. 2001 pers. comm.). Previous research on wolf genetics used DNA found in wolf scat to determine a wolf's subspecies. This technique resulted in the reduction of the number of subspecies in North America. However, new techniques in the development stage using mitochondrial DNA are showing wolf biologists that there may be more subspecies than once believed. DNA fingerprinting of wolves along the B.C. coast shows that they may have significant genetic differences from wolves in the midwestern United States. If these tests are conclusive, wolves that once inhabited western Washington may also be genetically distinct.

E. Western Washington Gray Wolf DPS Qualifications for ESA Listing

Because the gray wolf populations meet the requirements of discreteness and significance to its taxon, it should be designated as the Western Washington Distinct Population Segment with its own recovery plan. To increase the probability that gray wolf populations will be successful in this region, the Western Washington Gray Wolf DPS must retain Endangered status under the ESA. The threats to gray wolves are more significant as they disperse through eastern Washington and as they recover within core regions of the Western Washington Gray Wolf DPS than they were when wolves were first listed under the ESA. The ESA requirements for listing a Distinct Population Segment as threatened or endangered include manmade factors that affect its continued existence and the inadequacy of existing regulatory mechanisms to sufficiently protect the species. If the proposed Fish and Wildlife rule to reduce ESA protections for wolves in Washington is promulgated, then the regulatory mechanisms will not be adequate to maintain large enough wolf populations to protect them from environmental stochastity and the greatest threat to wolf populations: human-caused mortality.

Conservation Status.-- If a population is determined to be discrete and significant (i.e., a Distinct Population Segment), the FWS must then determine whether it meets the definition of an endangered or threatened species under the ESA. That determination must be based solely on an evaluation of the best available scientific information and the ESA's five listing factors. Gray wolves in Washington are currently listed as endangered. Before the FWS can legally downgrade the gray wolf in this area, it must demonstrate that progress has been made toward its recovery, and that threats to its continued existence have been reduced or removed. While there have been sporadic observations of individual wolves appearing in the north Cascades (probably transients from Canada), there is little evidence of reproducing pairs or any pack formations despite vast areas of suitable habitat and several feasibility studies that indicate the potential for successful restoration. An analysis of the ESA's five listing factors and the best available scientific evidence support retaining an endangered classification for the Western Washington DPS.

1. The present or threatened destruction, modification, or curtailment of its habitat or range.

Western Washington represents an expanse of suitable habitat that may provide an excellent opportunity to restore significant wolf numbers and range. However the availability and utilization of that existing range is jeopardized by a number of factors. As in most regions, increasing urbanization and human populations are reducing the amount of suitable wolf habitat. Washington's population has grown by 25% over the last twenty years, from about four million in 1980 to over 5.6 million people in 2000. That population is expected to double by 2030. Experts estimate that we are losing up to 70,000 acres of wildlife habitat a year to conversion to human use. In addition, recreational development in and around federal forest lands severely diminishes the value of these lands for wolf recovery. There are also geographical and legal barriers that prevent wolf recolonization from adjacent areas. The end result is that these available habitats are not being utilized, which constitutes a significant curtailment of range.

2. Overutilization for commercial, recreational, scientific, or educational purposes

Commercial take of wolves is currently illegal, though should wolves lose their ESA protection it could become a significant factor in preventing the reestablishment of wolves within this region. The amount of poaching for commercial purposes is unknown but will be totally dependant upon the regulatory status of the gray wolf (i.e. protected or not). For example, bounties still exist on the books in some states that could make harvesting wolves profitable. Recreational take is also dependant upon the regulatory status of the wolf. Currently, hunting is restricted but without federal protections some states have already signified their intention to hunt wolves. We would expect a few research-related mortalities (capture and handling mortality) though it is unlikely that these will present any significant impact on the population. All these issues indicate the need for continued federal protection under the ESA until wolves are clearly established, and the need for implementing a recovery plan that can monitor and regulate the take from the above factors and make management adjustments accordingly.

3. Disease or predation

Many diseases and parasites are found among the canids and some of these can create significant problems in wolf recovery, and require monitoring and appropriate treatment to ensure that they do not spread and impact the entire population. While some individuals may die from diseases, disease is generally not considered a significant problem for wolf recovery in western Washington. Most wolves in North America have had regular exposure to many of the canine diseases over the years and survive. Of course, any gray wolves that become reestablished in the Western Washington DPS should be monitored for disease or parasite problems and treated as necessary. Were wolves to be reintroduced they would be vaccinated or treated for canine diseases and parasites.

Natural predation from other wolves, bears, mountain lions, and mortality from the defensive tactics of prey species is relatively rare and would not be expected to significantly affect gray wolf recovery. However, the risk of human-caused predation can be substantial even while under federal management and protection (64% - 96% of all mortality among the reestablished wolves in the Western US, 65 Fed. Reg. 43467). Wolf populations in the Pacific Northwest were extirpated largely due to human-caused mortality and there continues to be a high level of malevolence towards the wolf from relatively small elements in the private and state government sectors. Some states currently offer bounties for wolf kills and agricultural interests are advocating against wolf recovery. Clearly the threat of human predation has not been reduced or eliminated in any substantive way, therefore we must have the continued presence of federal management and ESA protection until wolves have achieved some recovery goal as defined by a Western Washington recovery plan.

4. The inadequacy of existing regulatory mechanisms

The proposed Western Washington DPS contains over 9 million acres of federal lands whose management agencies have not yet addressed wolf management issues adequately. There is no recovery plan in place for gray wolves, nor does FWS intend to develop one. Instead, the FWS proposes to downlist gray wolves in this area based on the attainment of goals under the Northern Rockies Gray Wolf Recovery Plan (USFWS 1987). Gray wolf recovery in Western Washington is not addressed in that plan even though the region is geographically and ecologically discrete. Any move to downlist gray wolves in this area in the absence of a scientifically credible recovery plan for that area and demonstrable progress toward the attainment of recovery goals established under such a plan, is scientifically indefensible and illegal. The proposed Western DPS will do nothing to encourage recovery in western Washington, as its regulatory influence will stop as soon as the wolf populations in the northern Rockies have recovered sufficiently to delist (possibly within one to two years). Without a coordinated recovery plan that involves all the lands controlled by the Forest Service and Park Service, it appears highly unlikely that management plans for the National Forests, National Parks, and National Recreation Areas will adequately address wolf conservation. The above is indicative of the need for continued federal management in this area with a specific recovery plan and continued protection under the ESA.

5. Other natural or manmade factors affecting its continued existence

Within the Western Washington DPS there is a large livestock industry that has historically dealt with increased predation through extirpation of the predator. Government-sponsored trapping and hunting of wolves was instrumental in driving the gray wolf towards extinction and the chief reason that the gray wolf was listed as an endangered species. Obviously such depredation control actions can severely affect the population, dependant upon the current conservation status of that population. With good federal control and a responsive management plan, these impacts can be reduced or eliminated. .Without adequate federal controls and protection, the individual states and agricultural interests appear ready and willing to again extirpate the wolf. The threat from unrestricted, livestock depredation control clearly represents a present and ongoing threat to the recovery of the gray wolf and requires continued federal management in western Washington with a specific recovery plan and continued protection under the ESA.

Gray wolves in Washington are currently listed as endangered, and before the FWS can legally downgrade the gray wolf in this area it must demonstrate that progress has been made towards its recovery and that threats to its continued existence have been reduced or removed (50 CFR 424.11 (d)). While there have been wolf detections in Washington, there is little evidence of reproducing pairs or pack formation despite vast areas of suitable habitat (Laufer and Jenkins 1989, and there are substantial threats against wolves preventing its recolonization. The most important threats against wolf success in this region are environmental stochastity and negative human attitudes.

<u>*Environmental Stochastity*</u>.– Natural wolf populations in Montana that were being monitored before the northern Rockies reintroduction were in decline, and it was found that extreme weather in the winter of 1996-1997 killed an unusually large percentage of the ungulate populations, leaving the gray wolf with scarce food supplies. The food shortage that began in that winter resulted in a steep decline in wolf populations, partly due to increased wolf depredation on livestock. Nearly 50% of all confirmed wolf depredations and lethal control actions in the period from 1987 to 1999 were documented during this one harsh winter. In the years since wolves were reintroduced in Yellowstone and central Idaho their populations have been growing steadily, but there has not been a winter as severe as that of 1996-1997, so we do not yet know the effects of a harsh winter on these populations. When the FWS developed recovery plans for the gray wolf and set goals that would determine when level of protections could be reduced, no realistic cycle of environmental stochastity was considered. All successful wolf recovery zones are in areas where winter conditions are harsh enough to kill natural wolf prey, and were there are alternate food sources of livestock available.

The strong dependence of wolves on prey density also causes instability in wolf populations because ungulate populations are sensitive to environmental stochastity (McRoberts et al. 1995). In the simplest predator-prey models, predator populations cycle with prey populations, reacting to and causing the prey population's increases and decreases. This model cannot describe wolf-prey relationships because ungulate populations are much more dependent on climate than on pressure from predators (McRoberts et al. 1995). However, as described earlier, wolf populations are greatly affected by shifts in their prey's populations. Therefore, when ungulate populations are reduced dramatically by a harsh winter as they were in the winter of 1996-1997 wolf populations can be expected to decline in response due to starvation and by increased contact with humans while foraging through agricultural land (Fed Reg. 65). In the winter of 1996-1997 there was a decline in wolf numbers in the natural Montana population, and it has been speculated that low prey density due to harsh winter conditions was the cause.

<u>*Negative Human Attitudes*</u>.– The Western Washington Gray Wolf DPS still qualifies for federal listing as an endangered species because it meets criteria established by the language of the ESA. The most important factor threatening gray wolf persistence in Washington State is negative human attitudes about wolves. Negative human attitudes, which result in unnecessary legal and illegal killing of wolves, are the primary factor limiting the growth of new populations (Wabakken et al. 2001) primarily in rural areas where wolves may come into contact with livestock (65 Fed. Reg.). The illegal taking of wolves can result in the depletion of an entire population (Young and Goldman 1944). This threat against wolves meets the fifth criteria for protecting a species under the ESA as a manmade factor affecting its continued existence.

Success of wolf programs depends highly on the attitudes of the humans the wolves may encounter while dispersing. Wolves symbolize many different things for people across the North America, and whether these symbols are positive or negative depends on highly varied individual concepts of wildness. For centuries, fairy tales and legends have perpetuated superstitions about the menacing nature of wolves and have spread the fear throughout human settlements that wolves prey on human children. But because there has never been a documented case of a human being killed by a wild wolf in the United States, establishment of such widespread negative attitudes about wolves through the middle of the twentieth century was more likely due to the relationship between the rancher and the wolf. Ranchers were determined to eliminate the threat of wolf depredation on their livestock and were eventually successful, as wolf populations were extirpated from almost all of the conterminous forty-eight states except Montana, Minnesota and Washington State by the 1930s. Currently, ESA endangered status notwithstanding, human-caused mortality is the primary cause of death (80-90%) for gray wolves within and beyond the boundaries of recovery zones (Weaver 2001).

In 1985, an opinion poll on attitudes about wolf reintroduction showed that 30% of Washington State's population was against wolf recovery projects. Furthermore, 27% of Washington residents were against wolf reintroduction on the Olympic Peninsula. Negative human attitudes about the wolf were to blame for their disappearance a century ago and continue to be the primary cause of adult wolf mortality today. If humans with negative attitudes about predators are concentrated in dispersal paths for wolves, they can thwart recovery efforts even if they represent a minority of the overall Washington State population (65 Fed. Reg.).

To illustrate that wolves are often maligned without justification, Forest Service records show that depredation control activities against wolves may not always be warranted. After wolves began recovering in Idaho after reintroduction programs, ranchers applied for permits to harass or kill wolves that had allegedly killed livestock. Thirty-six incidents of wolf depredation on livestock were reported, but the Forest Service determined that wolves were to blame for only eleven of these incidents. Ranchers claimed that wolves preyed on their livestock, yet when livestock carcasses are partially consumed or if carcasses are not found until they are partially decomposed, it is difficult to determine the cause of death. It is postulated that as humans become more aware of wolf presence due to media coverage of wolf recovery projects, more livestock depredation incidents are wrongfully blamed on wolves (US Forest Service website). Another added incentive for misidentifying wolves as the cause of death arises because ranchers only receive compensation for their livestock that are killed by wolves (and grizzly bears).

Dispersal is an important factor to consider when forming wolf management plans because it defines wolf population structure. Because almost all wolves disperse from their family units after their second year, the probability is high that they will encounter humans in rural areas where negative opinion of wolves is most concentrated (65 Fed Reg.). As populations grow and it becomes more difficult for individual wolves to find unoccupied territory, dispersal distances increase. Wolves will travel over almost any type of terrain, and studies show that only human persecution and low prey densities limit their distribution (Mech 1995). Because wolves are not specific to certain habitats, the possibility of encountering humans is high because they do not necessarily avoid human population centers (Mladenoff et al. 1995). To date, some five or six gray wolves have attempted dispersal into eastern Washington and Oregon, but these attempts have not been successful.

Wolves that disperse through rural areas of eastern Washington, as they likely will when gray wolf population density increases in Idaho, must travel through the region where the use of depredation control measures for another predator, the cougar is very liberal. Although cougars are distributed throughout the state and in fact are closer to human population centers in the westernmost counties, over 60% of all cougar exterminations occurred in northeastern Washington (Washington Department of Fish and Wildlife website). In 1999 and 2000 Kititas, Chelan and Okanagan counties took accounted for 19% of the cougars, while Ferry, Stevens, Pend de Oreille, and the north half of Spokane County took 41% of the 2-year total. The high percentage of cougar deaths in this area of the state demonstrates that travel through eastern Washington is highly dangerous for dispersing carnivores.

Development and human population growth.--In the decades since gray wolf extirpation, the human population in Washington has increased dramatically. Thirteen counties across the state have grown more than 24% on average in the last ten years (1000 Friends of Washington website). This increase in development and human population growth will prevent the expansion of a recovering population of gray wolves because risk of mortality increases with proximity to human population centers (Mladenoff et al. 1995). Without sufficient regulations protecting wolves that disperse into semi-rural and agricultural land, the extermination of wolves by landowners could affect the survival probability of the entire wolf population (Haight et al. 1998, Hayes and Harestad 2000).

IV. SUMMARY AND CONCLUSIONS

The ongoing restoration of gray wolves in the lower 48 states is one of the most important conservation success stories during the last quarter century under the protections of the Endangered Species Act. While much progress has been made, there still remain significant gaps in the historical distribution of gray wolves. The job of wolf recovery is not complete and much work is yet to be done. While some of these areas are lost forever to development and degradation, others still contain vast tracts of land that contain suitable wolf habitat. Western Washington, with areas of relatively low human population density, large areas of federal lands and abundant prey populations, is one area where tremendous potential exists to restore this important ecological actor.

The gray wolf must be managed on a landscape scale within the conterminous United States scale to avoid local population extinction due to environmental stochastity and human caused mortality. A survey revealed that wildlife scientists were not unanimously in favor of the Northern Rockies recovery plan for wolves because it managed for a relatively low numbers of individuals and breeding pairs when compared to recommendations of most wolf biologists. Also, many felt that the generations following the founding breeding pairs were too genetically related, compromising the health of the gene pool. (Fritts and Carbyn 1995). The chances of success regarding the maintenance of wolf populations anywhere within the conterminous forty-eight states will be increased if we maintain several populations over their historical range because we must make management decisions on a small scale to conserve wolf populations at a larger landscape scale (McLaughlin 2001 pers. comm., Haight et al. 1998). Small "insignificant" populations should be protected even if they do not substantially contribute towards the goal of a minimum viable population because they can provide dispersers to other populations that may be stressed. (Fritts and Carbyn 1995).

In this document and others cited in this text, Defenders of Wildlife and Northwest Ecosystem Alliance have presented evidence that wolves can be returned to western Washington. In addition, we have provided materials that indicate that wolves will benefit ecosystems in this region, that they have provided economic benefit in other areas, and that well-managed wolf recovery is supported by a majority of the region's citizens. All these arguments indicate that wolves should be restored to western Washington.

We also demonstrated that the western Washington wolf population meets the definition of a DPS under the ESA. We have clearly shown that this eco-region and it's wolves are discrete from both the northern Rockies and Southwest recovery areas. We have also demonstrated that this discrete region constitutes a significant portion of the species' range. The FWS recognizes the validity for restoring grizzly bears to the northern Cascade range and can surely recognize the ecological similarities between these two top carnivores.

Western Washington State is an ideal region to manage for a gray wolf subpopulation because of its proximity to the northern Rockies subpopulation and for its favorable gray wolf habitat. Washington State, with its nine million acres of federally controlled land and vast areas with low road density, could support a subpopulation of gray wolves that would benefit the landscape-scale metapopulation. This subpopulation, however, will not likely recover within Washington without increased federal protection for wolves within western Washington and for wolves dispersing between neighboring subpopulations of the landscape scale metapopulation. Wolves in western Washington may require different management strategies than wolves in the northern Rockies due to differences in prey base, geography, and environmental disturbance regimes. For this reason, recovering gray wolves in western Washington must be designated as a Distinct Population Segment with a separate recovery plan.

Lastly and perhaps most importantly, we've demonstrated that no measure of wolf recovery will occur in this region without federal leadership. The current proposed reclassification rule would inevitably end federal involvement in western Washington. That will leave the few naturally recolonizing wolves with no recovery plan and little chance of survival. Moreover, these wolves would be wandering into an area where the federal government has done little or nothing to alleviate threats to the animals or to encourage their recovery.

For all of the above reasons, the western Washington gray wolf must be designated as a distinct population segment whereby the FWS, in consultation with a recovery team, draws up a recovery plan and takes the steps necessary to restore this animal to its important ecological role in this region.

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Appendix I. Areal coverage of federally managed lands that fall within the proposed Western Washington Gray Wolf Distinct Population Segment. All of the land areas listed will not necessarily provide wolf habitat**.**

Western Washington DPS

National Forests	**Acres**
Mt Baker - Snoqualmie NF	1 700 000
Wenatchee NF	2 100 000
Gifford Pinchot NF	1 372 000
Okanogan NF	1 706 000
Olympic NF	632 000
Mt. St. Helens NM	

National Parks/ Monuments/Rec. Area	**Acres**
North Cascades NP	504 781
Ross Lake NRA	117 574
Lake Chelan NRA	61 887
Mt. Rainier NP	235 625
Olympic NP	922 651

DPS TOTAL	9 194 242