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To: Chief, Division of Conservation Planning, U.S. Fish and Wildlife Regional Office, Portland, Oregon (ATTN: Rick Amidon)

From: State Supervisor/Deputy State Supervisor, Oregon Fish and Wildlife Office, U.S. Fish and Wildlife Service, Portland, Oregon

Subject: Formal Conference on the Issuance of the Four Enhancement of Survival Permits Associated with the Threemile Canyon Farms Multi-Species Candidate Conservation Agreement with Assurances

Our conference opinion for the Threemile Canyon Farms Multi-Species Candidate Conservation Agreement with Assurances (Agreement) is attached. Thank you for you diligence and cooperation in completing this project and ensuring the protection of important sagebrush-steppe habitats. Please provide us a copy of the Agreement upon completion.

We appreciate the opportunity to work closely with you in attaining our mutual goals. If you have any further questions regarding this consultation, please contact Mikki Collins or Laura Todd at (503) 231-6179.

Attachment

cc:

OFWO-NFLC (Rich Szlemp)
OFWO, LaGrande FO (Jodie Delavan)
The Nature Conservancy (Cathy Macdonald)
David Evans and Associates (Jennifer Miller, Dan Heagerty)
Threemile Canyon Farm (Marty Myers)
Portland General Electric Company (Greg Concannon)
Oregon Department of Fish and Wildlife (Russ Morgan)

Conference Opinion
on the Issuance of the
Four Enhancement of Survival Permits
for the
Threemile Canyon Farms
Multi-Species Candidate Conservation Agreement with Assurances

Oregon Fish and Wildlife Office
2600 SE 98th, Suite 100
Portland, Oregon 97266

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Conference Opinion on the Issuance of the Four Enhancement of Survival Permits Associated with the Threemile Canyon Farms Multi-Species Candidate Conservation Agreement with Assurances

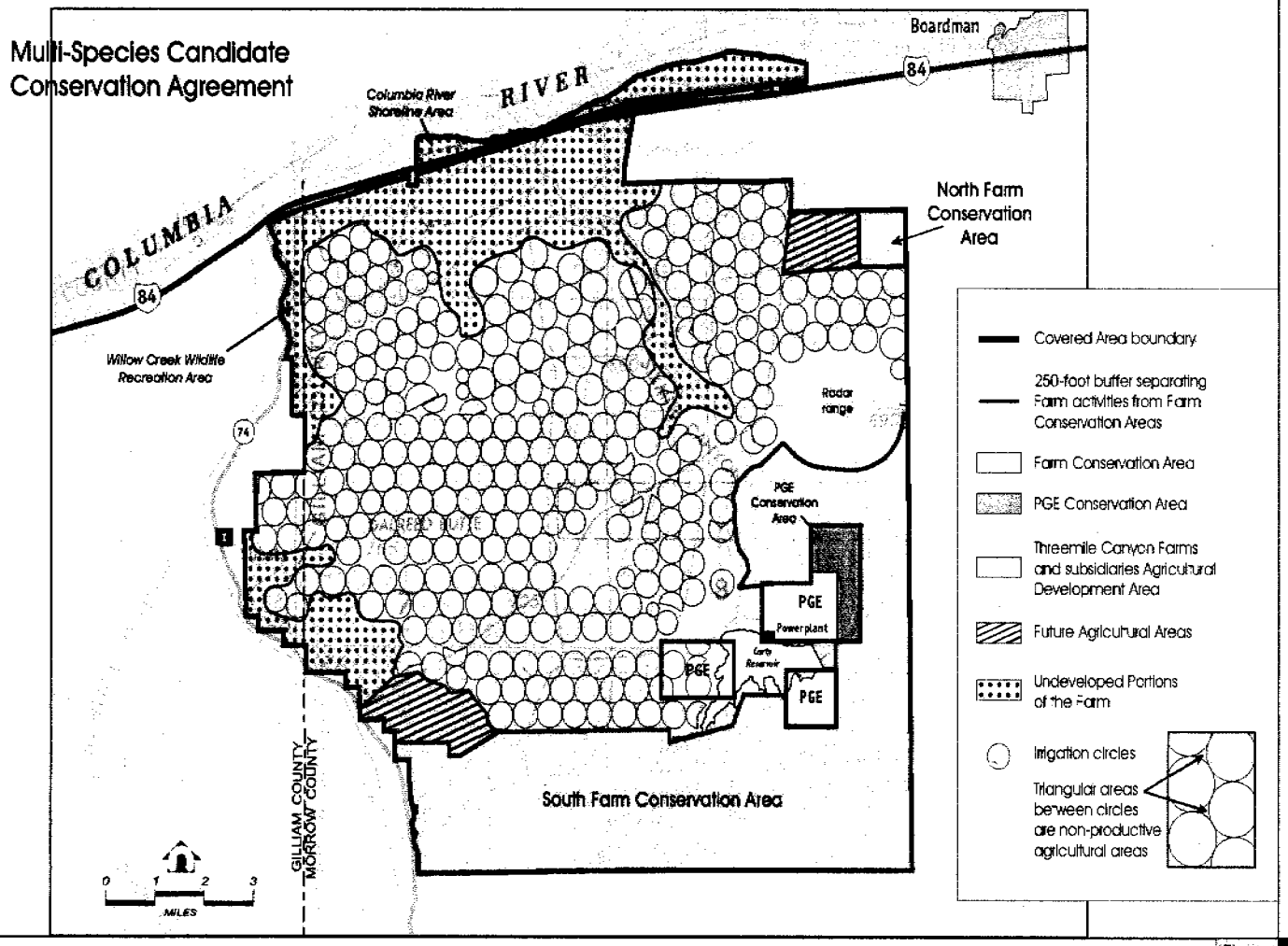
INTRODUCTION

This is the Fish and Wildlife Service (Service), Oregon Fish and Wildlife Office's (OFWO) conference opinion (CO) on the proposed issuance of the subject permits, in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*). The Agreement was collaboratively prepared by the Service, Threemile Canyon Farms (the Farm), The Nature Conservancy (TNC), Portland General Electric (PGE), and the Oregon Department of Fish and Wildlife (ODFW). The purpose of the Agreement is to provide conservation measures for the Washington ground squirrel (*Spermophilus washingtoni*), loggerhead shrike (*Lanius ludovicianus*), ferruginous hawk (*Buteo regalis),* and sage sparrow (*Amphispiza belli*) (collectively, the covered species), and to provide regulatory certainty to participating land managers allowing them to make long-term land use decisions. The Farm, TNC, PGE, and ODFW are the named permittees on the Enhancement of Survival Permits (Permits), which accompanies this Agreement and are issued by Region 1 of the Service (RO). For details on the Service's legal authority to issue Permits in this capacity, refer to section 2 of the Agreement, which is hereby incorporated by reference (David Evans and Associates 2003).

The bald eagle (*Haliaeetus leucocephalus,* threatened) is the only federally listed threatened and endangered species that may occur in the area covered by the Agreement (Covered Area) (Figure 1) eagles commonly occur around Carty Reservoir (PGE Plant Property) within the Covered Area during the winter months; however, there is no suitable nesting habitat in the Covered Area. Bald eagles may also forage along the Columbia River and Willow Creek. Critical habitat has not been designated for the bald eagle. The bald eagle is not a Covered Species in the Agreement, and consequently, the Agreement and associated permits do not cover impacts to the bald eagle from the Covered Activities. Based on the information presented in the Agreement, you have determined that issuance of this Agreement will likely have no effect on the bald eagle, and this species is not addressed further in this consultation.

Conference History

Informal consultation for the proposed project includes several meetings between the RO and the OFWO throughout the development of the Agreement. These meetings were held both internally and with the permittees between October 2000 and May 2003. On October 27, 2003, our office received a memorandum dated, October 22, 2003, from the RO requesting initiation of formal consultation.



Covered area **Figure 1**

hereby incorporated by reference (David Evans and Associates 2003).

A summary of each of the permittees' conservation measures is provided below. For a detailed explanation of these conservation measures, refer to section 7 of the Agreement, which is hereby incorporated by reference (David Evans and Associates 2003).

Proposed Conservation Measures

The Farm

1. A total of 22,600 acres within the Farm's property have been designated as Farm Conservation Areas. As part of Threemile Canyon Farm's conservation planning and commitments relating to the Agreement, these areas are subject to a permanent conservation easement.

2. The Farm shall create and maintain a 250-foot buffer zone separating the Farm Conservation Areas from farm activities. There will be no development within the buffer zones; however, vehicle access and emergency fire control and suppression activities are allowed.

3. Threemile Canyon Farms will fund TNC's management activities within the Farm Conservation Areas up to a maximum of $130,000 annually. TNC's actual costs will determine the specific level of annual funding, up to the maximum $130,000, and will continue until an endowment is in place to meet annual funding needs. Alternatively, the Farm is committed to fund up to a maximum of $2,500,000 (dependent upon the sale price) for the endowment from the proceeds of the sale of the Conservation Areas for long-term funding security.

4. The Farm has first responsibility for controlling and suppressing wildfire on the Farm Conservation Areas and the Undeveloped Portions of the Farm. TNC and the Farm cooperatively developed the Wildfire Response Plan (Appendix I) (David Evans and Associates 2003). The Farm will implement fire control and suppression measures according to the Wildfire Response Plan. Fire control and suppression measures will benefit most species by protecting large shrub patches, nesting trees, and native grasses, while minimizing the potential for invasion of cheatgrass (*Bromus tectorum*) and other noxious species.

5. Subject to the terms of the existing grazing lease agreement (through April 2005), the Farm will not allow grazing on the Undeveloped Portions of the Farm and the Conservation Areas between May 15 and November 1 beginning in 2003. ODFW suggested this timeframe for grazing to minimize impacts to native vegetation. In addition, the Farm will coordinate between the grazing lessee, TNC and the Service to recommend sound grazing practices on the Farm Conservation Areas.

6. In the absence of emergency circumstances, such as responding to wildfire, the Farm will notify the Service and ODFW at least 30 days in advance of when they expect to incidentally take any Covered Species to facilitate translocation efforts.

TNC

TNC will manage the Farm Conservation Areas in accordance with the terms of the ODFW Conservation Easement and with available funding to maintain, and improve where feasible, the integrity of the existing native communities and the associated Covered Species. TNC will utilize a variety of management options in achieving this goal which may include: discing for weed abatement, restoration, or fire control; drilling as a means for revegetation; weed control; fire suppression; prescribed fire; vegetation and wildlife surveys; research; controlling access; grazing; and fence removal, construction, and/or maintenance.

The following are specific conservation measures that TNC will implement through the Agreement. These measures were adapted from those identified by ODFW as having the potential to benefit the Covered Species within the Covered Area.

1. All Covered Activities (Table 1) will be conducted with the intent of avoiding or minimizing impacts to the Covered Species and their habitats. The timing, extent, location, and specific methods for each management activity will be evaluated and modified as possible to provide the best, overall long-term collective benefits to the Covered Species.

2. TNC will manage noxious weeds in the Farm Conservation Areas with the intent of limiting their spread to the greatest extent practicable, while minimizing impact to surrounding native vegetation and wildlife. Current weed distribution and abundance will be mapped, monitored, and controlled as funding allows using best management practices. Prevention measures will be developed and implemented to minimize the spread of weeds by vehicles and personnel in consultation with the Farm, PGE, Service, and ODFW.

3. TNC will implement fire control measures throughout the Farm Conservation Areas according to the Wildfire Response Plan in an effort to minimize impacts from suppression and uncontrolled wildfires. TNC will update the Wildfire Response Plan annually and inform the Farm, PGE, the Navy, neighboring landowners, and the Boardman and Ione Fire Departments. As funding allows, TNC will eliminate unnatural fuel loads (non-native vegetation) and other fire hazards to reduce the risk and intensity of fires and expand wildfire response capacity.

4. For the duration of the grazing lease agreement, TNC will work closely with the Farm, the grazing leaseholder and the Service to recommend methods of reducing impacts of grazing and livestock management activities on Covered Species and their habitats on the Farm Conservation Areas.

5. Vehicle and equipment access will be planned and implemented to minimize potential impacts to the Covered Species and their habitats on the Farm Conservation Areas.

PGE

1. PGE has designated an 880-acre PGE Conservation Area within its property boundaries. As a Signatory to this Agreement, PGE is committed to protecting and maintaining Covered Species' habitat within the Conservation Area, consistent with the tenets of the Agreement, and for the duration of the Agreement.

2. When grazing is permitted, PGE Environmental staff will coordinate with the Service and use professional judgment to determine the actual length of the grazing period and number of livestock permitted.

3. PGE will implement an expanded weed management program to control the establishment and spread of noxious weeds throughout its property, with an emphasis on the Conservation Area. This program will be broadened to include an integrated approach to pest management. The new program will address more than one weed species, employ a range of control measures, and promote preventative practices.

4. PGE will implement measures to protect habitats on the Conservation Area from damaging range fires. The Wildfire Management Response Plan will identify these measures. Most species will benefit from fire control measures by protecting large shrub patches, nesting trees, and native grasses, while minimizing the potential for invasion of cheatgrass and other noxious plant species.

5. When it becomes necessary for PGE to decommission a landfill, PGE will meet with the Service, ODFW, and TNC to develop a revegetation plan. If PGE eventually develops the by-product disposal area east of the coal yard, a 250-foot buffer will be maintained between the disposal area and the designated PGE Conservation Area.

7. PGE will develop a management plan for the PGE Conservation Area within the first six months after the Agreement is signed. The management plan will identify the various management actions PGE will implement on the Conservation Area to fulfill the tenets of this Agreement. The plan will emphasize adaptive management and provide enough flexibility to accommodate changing conditions or unforeseen circumstances.

ODFW

ODFW will assume certain responsibilities in the implementation of the Agreement to benefit the Covered Species. They may include any or all of the following:

1. Conducting surveys for the Covered Species and otherwise monitoring the distribution and status of the Covered Species within the Conservation Areas of the Farm and PGE.

2. Managing the timing, number, and methods of any hunting to be allowed on the conservation areas to minimize take and/or the harassment of the Covered Species and their habitat.

3. Coordinating controlled hunts.

4. Assisting with annual reports as may be necessary.

5. ODFW will also help to ensure that this Agreement is consistent with current applicable State laws and regulations governing management of non-listed species.

Upon issuance of the Agreement and permits, each of the named permittees is authorized to implement specific activities as per the Agreement (Covered Activities), within identified Management Areas of the Covered Area (David Evans and Associates 2003).

Table 1 provides a list of Covered Activities for each of the delineated Management Areas and indicates which permittee is authorized to implement the Covered Activities. For a detailed description of each of the Covered Activities, refer to section 6 of the Agreement, which is hereby incorporated by reference (David Evans and Associates 2003).

Table 1. Covered Activities by Management Area.

Management Area	*MSCCAA Covered Activities*
Farm Development Areas (including the radar range)	**Authorized for the Farm** • General Development Activities • Agricultural Activities • Grazing • Fire Control and Suppression • Controlled Burning • Vehicle Access • Hunting and Recreational Public Access • Dairy Facilities, Feed Lots and Associated Waste Management
Farm Conservation Areas	**Authorized for TNC and ODFW** • Discing • Drilling (i.e., seeds) • Fire Suppression • Prescribed Burning • Fence Removal, Construction and Maintenance • Biological Monitoring and Research • Vehicle and equipment access • PGE Access • Grazing • Controlled Hunts • Cleanup of Abandoned Refuse Site • Non-native Species Control • Pedestrian Access within Farm Conservation Areas
PGE Plant Property	**Authorized for PGE** • Electric Power Generation • Electric Power Transmission • Coal Storage and Handling • By-Product Storage, Handling and Disposal • Operation of Carty Reservoir • Fence Maintenance • Fire Suppression • Grazing • Environmental Monitoring • Recreation • Vehicle Access • Mammal Control
PGE Conservation Area	**Authorized for PGE, ODFW and TNC** • Fence Maintenance • Vehicle Access • Fire Suppression • Grazing • Environmental Monitoring • Recreation • Mammal Control

II. STATUS OF THE SPECIES

Washington Ground Squirrel

Listing status

The Service designated the Washington ground squirrel a candidate species (USFWS 1999). Candidates are those species for which we have on file sufficient information on biological vulnerability and threats to support proposals to list them as endangered or threatened under the Act. The Washington ground squirrel is a Washington State candidate species, which receives no legal protection.

In Oregon, the species is state listed as endangered due to loss of habitat, fragmentation and isolation of colonies and suitable habitat, proposed development of much of the species range within Oregon, and inadequate Federal and State regulations to protect the species (OAR 635-044-0130). The Oregon Endangered Species Act (OESA) provides protection from "take" (to kill or obtain possession or control of any wildlife, as defined by ORS 496.004) on State-owned, leased, or managed lands. Once listed, the OESA no longer provides any protection against take of Washington ground squirrels on private property (ORS 496.192), as was the case when the species was classified as sensitive (OAR 635-044-0130).

Natural History

The Washington ground squirrel is endemic to the Columbia Plateau, south of the Columbia River and east of the John Day River (Bailey 1936; Howell 1938; Betts 1990, Csuti et al. 1997; Verts and Carraway 1998). The Columbia Basin ecosystem provides a variety of shrub-steppe habitats in which the species is found (Quade 1994). Betts (1990) determined that the Washington ground squirrel occupied areas with a greater grass and forb cover than adjacent unoccupied areas. Greene (1999) compared occupied to unoccupied shrub and grassland habitats to determine the factors most commonly associated with habitats used by Washington ground squirrels and found that Washington ground squirrels occurred at sites with higher vegetative cover, but soil type may be the most important habitat feature (Rickart and Yensen 1991; Greene 1999). Greene (1999) determined that the species selects deep soils with a high silt content (suitable habitat). The Washington ground squirrel appears to prefer Warden soils, likely because they have a high silt content and are very deep (USDA 1983), allowing for deeper burrows that will maintain their structure compared to sandy or shallow soils. Warden soils occur east and south of the Columbia River.

The Washington ground squirrel spends much of its time underground. Adults emerge from hibernation between January and early March, depending on elevation and microhabitat conditions (Sherman 2000), with males emerging before females (Bailey 1936; Verts and Carraway 1998; Sherman 2000). Their active time is spent in reproduction and fattening for their 6-month or longer dormancy. Adults return to their burrows by late May to early June, and juveniles return about a month later (Verts and Carraway 1998).

Washington ground squirrels produce only one litter of young per year due to their limited period of activity and reproduction. Sherman (2000) observed that 1-year old and older females mated,

whereas males were not sexually mature until age two. Males defend territories of 370-930 square meters (4,000-10,000 square feet) with burrows of up to six females (Sherman 2000). Sherman (2000) also noted that females were sexually receptive on only one afternoon per season, usually 1-2 days post-hibernation, and copulation occurred underground.

Sherman (1999) indicated that Washington ground squirrels gave birth during the last two weeks in February near Othello, Washington, and the first litter of pups was seen above ground in mid-March. Sherman (1999) estimated that gestation and lactation required approximately 49-50 days.

Status and Distribution

Betts (1990, 1999) documented the curtailment of the Washington ground squirrel within the historical range of the species. His surveys on historic and documented occurrences focused on the perimeters of the range with the intent of evaluating reductions in numbers of colonies and the size of the current range. Although Betts' surveys do not provide an exhaustive survey of all potential squirrel locations or numbers of individual, they do provide a good estimate of the distribution and decline of Washington ground squirrels in Oregon and Washington. Betts found that the species had disappeared from 73.8 percent of the sites previously visited in Washington and 76.9 percent of the sites previously visited in Oregon.

The historic range of the species, distributed over much of the shrub-steppe habitat of southeastern Washington and northeastern Oregon, has been modified and reduced to three disjunct areas, separated by more than 50 km (30 miles) of unoccupied land (Betts 1990, 1999; Quade 1994; ODFW 1999; Vickerman et al. 2000). The Washington ground squirrel occurs east of the Columbia River in two populations in the State of Washington, and one population south of the Columbia River in the State of Oregon (Betts 1990, 1999).

The most northwesterly population in Washington, Badger Mountain, is the smallest and most isolated of the three populations. This population consisted of nine historic locations prior to 1989 (Betts 1990). When surveyed in 1987-1989, only four extant colonies were found, all of which were small and classified at a high vulnerability of extinction (Betts 1990). When surveyed again in 1998, squirrels were verified at only one of the four previously extant locations (Betts 1999). At two sites, one colony had been exterminated by the landowner, and the habitat had been removed for a house at the other (Betts 1999). Four additional colonies have been reported north of the Badger Mountain population, but details about these sites were not provided (Betts 1999).

The Columbia Basin population in southeast Washington, as described by Betts (1990), has not been exhaustively surveyed, but was reported to have 47 colonies in 1989 (Betts 1990) and 37 when resurveyed in 1998 (Betts 1999). Although this population is the least well surveyed, it appears to be the most widely distributed with a core area of occurrence at the center of the population range (Betts 1999). The Columbia Basin population is likely the most sparsely populated area within the species current range, both because of natural habitat conditions and modification of suitable habitat for agriculture. Historically, approximately 56 sites occurred in this area (Betts 1990). Betts' (1990) surveys indicated that about 43 sites had been lost in this area, about half since 1978. Of the approximately 47 historic and new confirmed sites in this

area in 1987-1988, Washington ground squirrels were still evident at 37 (78 percent) in 1998 (Betts 1999). Most of these losses have resulted in further range curtailment, occurring primarily at the northern and southern boundaries of the range of the Columbia Basin population.

Recent, site-specific studies have located more colonies within the range of the Columbia Basin population in the Seep Lakes Wildlife Management Area and Columbia National Wildlife Refuge near Othello, Washington (Sherman 1999, 2000). Sherman (1999, 2000) observed 23 sites with squirrels in 1999 and again observed squirrels at each site in 2000. This area may represent the best stronghold for Washington ground squirrels and their habitat in southeast Washington.

The Oregon population is centered almost entirely on the United States Naval Weapons Systems Test Facility (Naval Facility), and land owned by the Farm. Greene (1999) located 69 colonies on the Naval Facility and Morgan and Nugent (1999) located a minimum of 37 colonies on the southern portions of the Farm (South Farm Conservation Area). Most sites outside the Naval Facility and land owned by the Farm are extirpated with only two documented sitings and five possible sitings outside these areas (Betts 1999).

The Naval Facility supports the highest known concentration of Washington ground squirrels and best available habitat (Carlson et al. 1980; Betts 1990; Quade 1994; Greene 1999). Two portions of the site, totaling 2,046 ha (5,055 ac), are designated as Research Natural Areas and managed by The Nature Conservancy. The remaining 8,024 ha (19,827 ac) is managed by the Navy for military training and grazing allotments (Quade 1994; Greene 1999). Grazing is expected to continue at current levels, which Greene (1999) determined may not be conducive to Washington ground squirrel occurrence if bare ground cover increases above approximately 13 percent. The Navy will continue to manage the site for the foreseeable future.

Range reduction and documented habitat destruction have been greatest in Oregon (Betts 1990, 1999). Betts (1999) reported a decline of 75 percent of the colonies he surveyed in Oregon between 1987-89 and 1998. Although additional colonies were located on the Naval Facility (Greene 1999) and may continue to be located in some areas, the losses in historic populations provide a quantitative measure of known declines which likely parallels losses among previously undiscovered locations. Anecdotal accounts and references support this unquantified loss in Washington ground squirrel numbers and colonies (Bailey 1936; Howell 1938; Carlson et al. 1980; Verts and Carraway 1998).

Betts (1990) subjectively evaluated the vulnerability to extinction of each of the remaining known colonies based on colony size, isolation, land ownership, and threat from human activity. Approximately 29 percent of all colonies were highly vulnerable to extinction (19 percent in Oregon, 35 percent in Washington); 31 percent were moderately vulnerable (39 percent in Oregon, 25 percent in Washington); and 40 percent had low vulnerability (42 percent in Oregon, 39 percent in Washington). In many cases, Betts' predictions proved correct, and many colonies classified as vulnerable were no longer present by 1999 (Betts 1999).

Threats

Agricultural conversion of shrub-steppe habitat is the primary cause of the decline of the Washington ground squirrel (Carlson et al. 1980; Quade 1994; Betts 1990, 1999). However, certain types of agriculture are more destructive to squirrel habitat than others. Intensive grazing reduces cover and forage, adversely affecting Washington ground squirrels (Greene 1999). Carlson et al. (1984) found that Washington ground squirrels commence aestivation 2-4 weeks earlier in grazed areas, potentially indicating that green forage was in short supply. Early aestivation can be harmful to Washington ground squirrels if they fail to reach an adequate weight to maintain body functions until emergence the following spring (Carlson et al. 1984).

Soil disturbance associated with crop production may be the most damaging agricultural activity to Washington ground squirrels (Carlson et al. 1980, Quade et al. 1984, Greene 1999). Tilling and other soil disturbance destroys the necessary structure of the specific silty soil-types (i.e., Warden soils) on which the species relies (Greene 1999). The burrowing mammal seldom constructs burrows in areas of heavily disturbed soils, such as areas affected by activities including plowing, discing, crop production or others (Betts 1990, 1999; Greene 1999). Surveys of areas developed for irrigated agriculture on the Boeing tract have not yielded any Washington ground squirrel observations (CH2M Hill 2000).

In addition to changes in soil composition, historic and current agricultural practices may inadvertently affect adjacent Washington ground squirrel colonies. Greene (1999) found that in addition to soil type, Washington ground squirrel density and abundance decreased with higher percentages of bare ground. Certain practices, such as leaving croplands fallow, could adversely affect foraging Washington ground squirrels. Bare ground may also leave squirrels more vulnerable to predation (Greene 1999).

In addition to direct impacts to Washington ground squirrel habitat, agricultural and other development has led to fragmentation of habitat and isolation of colonies (Betts 1990, 1999). In analyses conducted using mark and recapture techniques, Washington ground squirrels moved only short average maximum distances 85 - 239 m (279 - 784 ft) between capture points (Carlson et al. 1980; Quade 1994; Greene 1999). Although the sample size was low, Sherman (2000) observed no movements between marked colonies in Washington. Given the lack of substantial dispersal movements, isolation and fragmentation of colonies and habitat can severely affect Washington ground squirrels by limiting genetic exchange and reproduction, exposing small colonies to destruction from unpredictable catastrophic events such as fire or drought, and limiting habitat available for escape if occupied habitat becomes unsuitable. The isolation of colonies and fragment of habitat therefore increases the risk of extinction by increasing the probability that these colonies and interactions between other colonies will be destroyed.

Continued agricultural conversion further fragments suitable habitat and isolates otherwise healthy populations. Betts (1990) predicted the vulnerability to extinction of known squirrel colonies based on the size, isolation, and land use, and subsequent surveys (Betts 1999) proved many of his predictions correct. As Betts (1999) states, while small isolated populations "may persist for some time, they are highly vulnerable to extinction from a variety of factors such as predation, parasitism, and weather that may reduce the population below a sustainable level or eliminate it entirely."

Other agricultural practices may adversely affect the continued existence of Washington ground squirrels. The species is often viewed as an agricultural pest (Bailey 1936; Howell 1938; Rickart and Yensen 1991), and is subject to recreational shooting and poisoning to reduce impacts to agricultural crops (Rickart and Yensen 1991; Betts 1990, 1999; Sherman 2000). As late as 1999, the Oregon Department of Agriculture received applications to apply pesticides to reduce Washington ground squirrel predation on crops. Other rodent species occur within and adjacent to the range of the Washington ground squirrel that are also considered agricultural and residential pests and are targeted with pesticides that could incidentally impact Washington ground squirrels. At least 27 pesticides are registered in Oregon and Washington for application targeted at ground squirrels (Washington State University 2000). Their uses vary from home and garden to general rangeland applications (Washington State University 2000). Applications may also be targeted at other species that occur near Washington ground squirrel colonies (Washington State University 2000), but Washington ground squirrels could inadvertently be affected by runoff, overspray, or accidental ingestion. The authorized use of these pesticides is widespread in Oregon and Washington (Washington State University 2000) and is particularly likely to impact small and isolated colonies, but the overall effect of these chemicals on the species is unknown. Sherman (2000) documented deaths of two individuals marked for study. One carcass of a pregnant female was found with a bullet wound in the back. The dominant male of the colony disappeared and was presumed shot. These individuals represented 22 percent of the marked individuals in the colony and were the only observed Washington ground squirrel mortalities during the 2000 field season.

Additionally, predation appears to be a major source of mortality (Carlson et al. 1980; Betts 1990, 1999; Greene 1999; Sherman 1999, 2000). Badgers (*Taxidea taxus*) appear to be an important predator of Washington ground squirrels (Bailey 1936; Rickart and Yensen 1991; Betts 1990, 1999; Morgan and Nugent 1999). Badgers are a particular threat to small, isolated colonies and may cause local extirpations (Betts 1999). Morgan and Nugent (1999) noted that some colonies appeared to have been eliminated by badgers on the Conservation Area, and badger activity (i.e., digging) is common within Washington ground squirrel colonies (Betts 1990; Sherman 1999, 2000). On two occasions, Sherman (1999) observed badgers attempting to dig out Washington ground squirrels. Long-tailed weasels (*Mustela frenata*) are frequently observed near colonies (Martin and Nugent 1999), and have been observed hunting and feeding on Washington ground squirrels (Sherman 1999). Other observed predators include: northern harriers (*Circus cyaneus*), golden eagles (*Aquila chrysaetos*), red-tailed hawks (*Buteo jamaicensis*), Swainson's hawks (*Buteo swainsoni*), ferruginous hawks (*Buteo regalis*), prairie falcons, (*Falco mexicanus*), rough-legged hawks (*Buteo lagopus*), short-eared owls (*Asio flammeus*), gopher snakes (*Pituophis melanoleucus*), and western rattlesnakes (*Crotalus viridis*) (Carson et al. 1980; Verts and Carraway 1998; Sherman 1999, 2000).

Ectoparasites (fleas, mites, etc.) are frequently observed on captured individuals but seldom appear to be problematic (Carlson et al. 1980; Sherman 1999, 2000). Townsend's ground squirrels (*Spermophilus townsendii*) were seriously reduced by an outbreak of sylvatic plague in Washington in 1936 (Betts 1990). Fleas found on Washington ground squirrels were tested for sylvatic plague, known to affect other related ground squirrels (Betts 1990), but none have tested positive (Carlson et al. 1980). Sylvatic plague is a continuing threat and could be devastating to the species.

Conservation Needs

- Long-term protection of large contiguous areas in order to minimize habitat fragmentation and consequently the isolation of Washington ground squirrel colonies

  Agricultural conversion of shrub-steppe habitat is the primary cause of the decline of the Washington ground squirrel.

  Isolation and fragmentation of colonies and habitat can severely affect Washington ground squirrels by limiting genetic exchange and reproduction, exposing small colonies to destruction from unpredictable catastrophic events such as fire or drought, and limiting habitat available for escape if occupied habitat becomes unsuitable.

- Maintain and enhance the quality of existing habitat

  In particular, controlling cheatgrass infestations in order to reduce the potential of wildfire and consequently increased areas of bare ground.

  Although Washington ground squirrels will often utilize cheatgrass as a short-term food source, they appear to avoid areas where perennial plants have been entirely replaced with cheatgrass.

- Conduct research to better understand dispersal and behavioral patterns of Washington ground squirrels in order to increase the potential for connectivity with other nearby populations.

- Improved grazing practices

  Traditional grazing practices contribute to the degradation of suitable habitat.

Loggerhead Shrike

Listing Status

The shrike is state listed as threatened or endangered in 14 states, and is also listed as endangered in eastern Canada and threatened in western Canada. In Oregon, loggerhead shrikes are a state sensitive (vulnerable) species. The Service designated it as a Migratory Nongame Bird of Management Concern in the United States in 1987. The loggerhead shrike is considered a Federal species of concern, a designation which carries no Federal protection.

The Migratory Bird Treaty Act of 1918 (MBTA) protects loggerhead shrikes from direct take throughout range. However, no protection is currently afforded to the habitats on which this species primarily depends.

Natural History

Northern populations of loggerhead shrikes will migrate south into the United States from Canada. Areas with an annual snow cover of ten to 30 days have less abundant winter populations (Miller 1936). The requirements for loggerhead shrike winter habitat appear to be similar to breeding habitat (Yosef 1996) because many of the southern populations of residents, living in the same location year round (Brooks and Temple 1990 and Miller 1931). Loggerhead shrikes may occur in almost any open vegetation type where there are occasional tall shrubs, trees, or structures for perching and nesting. This includes sagebrush (*Artemisia* spp.), bitterbrush (*Purshia tridentata*), juniper (*Juniperus occidentalis*) woodlands, and other desert communities (Csuti et al. 1997). Although their range covers a broad area, each occupied breeding territory includes the following: nesting substrate (tree or shrub), elevated perches for hunting, pair maintenance and territory advertisement, relatively short grass for foraging areas, and impaling sites (dense or multi-stemmed and/or thorny shrubs or barbed wire fences (USFWS 2000). Shrikes are known to use man-made or heavily altered habitat types to fulfill its habitat requirements. The shrike will use agricultural, pastureland, and other man-made habitat types (Temple 1995).

The shrike preys upon insects, small rodents, and small birds. The shrike's primary spring and summer diet is insects. In the winter, it primarily feeds upon small rodents (Fraser and Luukkonen 1986). It impales its prey on barbed wire, and thorns in the fork of branches. The shrike is often observed perching on branches, fences or other structures with an unobstructed view of its surrounding area. Shrikes are highly territorial; pairs defend breeding territories within which all nesting activities take place including foraging, mating, and raising young (Yosef 1996).

According to Miller (1931 in USFWS 2000), loggerhead shrikes breeding in Oregon are of the subspecies *L. l. gambeli*, with a zone of integration with *L. l. nevadensis* in southeast Oregon. Shrikes inhabiting the shrub-steppe portion of north-central Oregon (including the covered area) are *L. l. gambeli*. The breeding range of *L. l. gambeli* includes extreme southern British Columbia, western Montana, western Wyoming, Idaho, eastern Washington, and eastern Oregon (USFWS 2000). In Oregon, loggerhead shrikes arrive in March and depart by late September, with a few staying into November (Gilligan et al. 1994). Nesting begins in March and may continue into August. On the Naval Facility (adjacent to the Covered Area), the preferred nesting habitat for the loggerhead shrike is big sagebrush (with over 90 percent of the nests found in sagebrush) (Holmes and Geupel 1998) but nests have also been documented in juniper trees (Morgan 2002).

Loggerhead shrikes also use juniper for perching and foraging habitat. In other parts of Oregon, juniper is used extensively by this species for nesting habitat.

Status and Distribution

The historic range of loggerhead shrikes extended from central and southern Canada, throughout the United States, and most of Mexico (Cade and Woods 1997, Miller 1931). Prior to the late 1800s, loggerhead shrikes occupied prairie-like and parkland habitat in northwestern and southwestern Ontario. Their breeding range in Canada has changed considerably since the late

1880s, primarily due to clearing forests for cultivation in eastern Canada. Their range expanded throughout southern Ontario, into southern Quebec and the Maritimes (USFWS 2000).

Canadian loggerhead shrike range and population estimates have declined since the middle of the twentieth century. Breeding Bird Survey (BBS) trends show an annual 3.9 percent population decline in Alberta and annual 9.6 percent in Saskatchewan between 1966 and 1999 (Sauer et al. 2001). The remaining populations in eastern Canada are associated with three core areas in eastern Ontario. In these areas, loggerhead shrikes are associated with limestone plains and are found on actively grazed pastures. In the Prairie Provinces, they are found primarily on arid short grass or desert savanna and plains areas (USFWS 2000). Surveys detected only two breeding pairs in Quebec in 1991, 100 individuals in Ontario in 1992, and 450 breeding pairs in Manitoba in 1998. Alberta has approximately 400-2500 pairs that are distributed over large areas whereas the Saskatchewan likely has several thousand breeding pairs (USFWS 2000).

Although loggerhead shrikes are still widespread within the United States, they have experienced continent-wide population declines since the 1940s (Cade and Woods 1997). BBS data indicate United States populations declined an average 3.6 percent annually, survey-wide between 1966 and 1999 (Sauer et al. 2001). This decline has been prevalent across most states and provinces, and is greatest in the northeastern United States and in eastern Canada. Loggerhead shrikes breed inconsistently in portions of their historic range, including Ohio, Michigan, Wisconsin, and Minnesota (USFWS 2000).

In Oregon, loggerhead shrikes are present in lowland steppe habitats east of the Cascade Range, and are rarely found west of the Cascade Range (Gilligan et al. 1994, Marshall et al. 1996, USFWS 2000). Oregon provides mostly breeding habitat for loggerhead shrikes, and most are suspected to winter in California and Mexico (Marshall et al. 1996, Miller 1931 in USFWS 2000). During the 2001 Christmas Bird Counts (CBC) in Oregon, birders found 11 loggerhead shrikes in Oregon: four in Malheur National Wildlife Refuge, three at Hart Mountain, two in Burns, Oregon, one in Sodhouse, Oregon and one in Coos Bay, Oregon.

Although Poole (1992) and Woods (1995) documented high densities of *L. l. gambeli* in undisturbed shrub-steppe habitats of eastern Washington and Idaho, anecdotal evidence indicates this species was more widely distributed throughout eastern Oregon prior to World War II (Marshall et al. 1996). Jewitt and Garbielson reported shrikes to be common in sagebrush habitat in eastern Oregon and Washington in the early 1900s (Jewett et al. 1953 and Gabrielson and Jewett 1940 in Woods and Cade 1996). BBS trends indicate an annual 2.7 percent decline of loggerhead shrikes in Oregon between 1966 and 1999 (Sauer et al. 2001). Saab and Rich (1997) documented the loss of shrub-steppe habitats in the interior Columbia River Basin, likely contributing to this decline.

No declines were evident in the shrub-steppe habitat of southeastern Oregon between 1966 and 1998. This variability may be related to weather, specifically rainfall or because the conversion of shrub-steppe to agriculture is occurring at a slower rate in southeast Oregon (Marshall et al. 1996, USFWS 2000).

Threats

Survey data from a variety of sources has documented the declining trend in loggerhead shrike populations. However, surveys do not specify the factors causing this trend.

A variety of studies and professional opinions regard breeding habitat loss and/or degradation as the primary cause of declining loggerhead shrike populations. Cade and Woods (1997) analyzed eighteen studies of declining loggerhead shrike populations throughout the United States and Canada. They indicated that in 83 percent of the cases, declines were caused primarily by habitat alteration and/or loss on breeding grounds. Saab and Rich (1997) performed a large-scale conservation assessment of neotropical migratory land birds in the interior Columbia River Basin. In their assessment they noted nine species of management concern (including the loggerhead shrike), all of which use shrub-steppe habitat as their primary nesting habitat (USFWS 2000). In the 2000 status assessment for loggerhead shrikes, Oregon natural resource managers indicated habitat loss as the most important factor in (or most significant threat causing) the decline of Oregon populations (USFWS 2000). Habitat loss is attributed primarily to the conversion of native vegetation to agricultural use, and the introduction of exotic forbs and annual grasses. Conversion to non-native species is exacerbated by the susceptibility of annuals to increased frequency of wildfire and improper grazing practices (USFWS 2000).

Low winter survival is a key factor in declining migratory populations in the Midwest (Brooks and Temple 1990). Large-scale losses of winter range habitat have been documented. These losses are attributed to conversion to agriculture and pine plantations, reduced frequency in native grassland, and urbanization (USFWS 2000). Human alteration of wintering habitats affects habitat quantity and quality by increasing the competition for winter territories between migratory and resident shrikes (Cade and Woods 1997, Lymn and Temple 1991). The loss of winter habitat could affect Oregon populations in their wintering range, however winter habitat loss would be associated more with other states as loggerhead shrikes use Oregon habitat primarily for breeding.

Predation is considered a leading cause of nest failure in many populations. However, predation seems to be a more significant threat in wintering populations (USFWS 2000). Habitat fragmentation and linear habitats can increase the threat of predation by making shrikes more susceptible and noticeable to predators. This is especially true for populations in Indiana and Iowa that nest primarily along roadsides. Inclement weather can also increase predation by causing shrikes to move from more suitable habitat to areas where they are more prone to predation. Loggerhead shrike predators include feral cats, coyotes, badgers, sharp-shinned hawks, common ravens, blue jays, house wrens, black-billed magpies, black rat snakes, gopher snakes, western rattlesnakes, least chipmunk, and Townsend's ground squirrel (Luukkonen 1987, Novak 1989, Gawlik and Bildstein 1990, Yahner 1995 and Leu and Manuwal 1996 in USFWS 2000).

In a survey given to natural resource managers in 2000, 19 states listed pesticides as a potential factor for decline (second to habitat loss). Oregon did not specify pesticides as a potential threat (USFWS 2000). However, data is still inconclusive. Blumton et al. (1990) note declines coincided with increased use of organochloride, but others note this chemical was banned in the 1970s and that many other predatory birds affected by these recovered while shrikes declined.

The direct impacts of pesticides on adults and juveniles have been directly observed, but exact impacts have not been determined.

Human disturbance is a potential threat that needs further study. It is not likely a limiting factor for loggerhead shrike survival. Loggerhead shrikes are tolerant of human disturbance near their nests, and have been observed to abandon nests 1-16 percent of the time (Cadman 1985). However, shrikes nesting in shrub-steppe habitats are less tolerant of disturbance than in other habitats (Woods 1995). Nest disturbance can result in increased predation, from flushing females from the nest, exposure of nest locations, or nest abandonment (Leu and Manuwal 1996). Recreational birding can be particularly disruptive to small populations.

Interspecific competition and weather conditions can also contribute to the decline of some shrike populations. In some areas of the country, there is increased competition for prey and habitat with other species that appear to benefit from an altered landscape. An example of this is the American kestrel and common raven (Sauer et al. 1997 and Boardman and Berry 1995 in Campbell 1999). Furthermore, some states documented the introduction of fire ants as a potential threat (USFWS 2000); however, Oregon has no reported occurrences of fire ants (Oregon Department of Agriculture 2003). Inclement weather (Campbell 1999, Yosef 1996) can also affect shrikes, especially nestlings and fledglings. Shrikes are one of the earliest nesting passerines and may be subject to harsh weather (DeGeus 1990 in USFWS 2000).

Collisions with vehicles and man-made objects are a threat to shrike populations. There is a higher frequency of road-kills for shrikes compared to other species. This is partly due to fact that in some portions of their range, habitat is limited to roadsides. Loggerhead shrikes are known to perch on utility poles and power lines and fly just above the ground between the perches (over the road) when foraging. They forage for insects on road surfaces, picking up insects killed by cars at night. Fledglings with poor flying skills are more susceptible to vehicle collision. Roadside habitats are also subject to increased nest predation (USFWS 2000). Additionally, loggerhead shrikes are known to collide with towers and to use man-made perches, increasing the likelihood of electrocution. In California, 111 loggerhead shrikes (of 3000 birds) were killed in five years from perching on prison fences. Electric fencing is used extensively in shrike habitat in the southwestern United States (USFWS 2000).

Cade and Woods (1997) reported that the loggerhead shrike species, although declining in population numbers, does not appear threatened with foreseeable extinction. Consideration of the entire distribution of loggerhead shrikes in North America and its historical fluctuation in range distribution led Cade and Woods (1997) to this conclusion for the species as a whole. However, they noted site-specific locations and some subspecies are threatened (Cade and Woods 1997). Threats vary by range and habitat, and are not fully understood. However, it is generally agreed that loss and degradation of suitable habitat are the major underlying causes of continent-wide declines in loggerhead shrike populations. Loggerhead shrike population declines in north-central Oregon are primarily attributed to the loss and degradation of their shrub-steppe habitat.

Conservation Needs

- Long-term protection of large contiguous areas of suitable breeding habitat

  The loss of breeding habitat has been identified as the primary cause of population decline.

- Maintain and enhance the quality of existing habitat

  Controlling cheatgrass infestations will reduce the potential for a wildfire to eliminate suitable breeding habitat and cause nestling mortality.

  Increasing the quality of existing habitat will likely increase reproduction, as suggested by the low nest success reported in degraded shrub-steppe habitat.

- Improved grazing practices

  Traditional grazing practices contribute to the degradation of suitable habitat.

Ferruginous hawk

Listing Status

Ferruginous hawks are not federally listed, so do not receive protection against take under the ESA. They are considered threatened in Washington, and in Oregon are listed as a state sensitive species. The MBTA protects ferruginous hawks from direct take throughout their range. However, as was the case for loggerhead shrikes, no protection is currently afforded the habitats on which this species primarily depends.

Natural History

Ferruginous hawks occupy a variety of habitats including prairies, plains and badlands, shrubland, dry woodland, and desert. They prefer open grasslands and shrub-steppe communities and rolling, rugged terrain. They usually avoid high elevations, forest interiors, narrow canyons, and cliff areas (TNC 1999). Landscapes with moderate coverage provide good nesting and foraging habitat for this species. Nest site selection depends upon available substrates and surrounding land use. Ferruginous hawks nest in open areas and lone or peripheral trees. Agricultural fields can serve as important foraging habitat. For instance, in Washington, ferruginous hawks forage extensively in alfalfa and irrigated potato fields during the breeding season, presumably because of the high prey densities in these areas. In Idaho, Oregon, and California ferruginous hawks prefer native grassland and shrubland habitats to cropland, preferably without perches (Janes 1985 in TNC 1999). A study in Washington indicated ferruginous hawks prefer grassland, shrubland, and western juniper (Bechard et al. 1990 in TNC 1999).

Ferruginous hawks are migratory and arrive in Oregon (including the covered area) in early March with peak fall out-migration in September (Gilligan et al. 1994). The primary breeding season for the hawk is from March 1 to July 31. Ferruginous hawk nesting information collected by ODFW in 1991 and 1992 in the South Farm Conservation area indicates that eggs were laid in early April and young fledged in late June (ODFW 1993).

Territory and nest site re-occupancy is common. A single pair may use one of several nests within a territory in alternate years. Ferruginous hawks tend to have relatively large home ranges, documented from 1.3 to 3.1 mi^2 (Marshall et al. 2003). Selection of a nest site depends upon available substrates and surrounding land use. Ferruginous hawks nest in trees or on the ground (Dechant et al. 1999). The ferruginous hawk is very sensitive to human disturbance during the nesting season and may abandon nests, eggs, or chicks following prolonged disturbance. If abandonment occurs, re-nesting within the same year is rare (Dechant et al. 1999).

The ferruginous hawk generally forages in open habitats with short vegetation where prey is abundant (Tesky 1994). Ferruginous hawks prey primarily on jack rabbits (*Lepus* spp.), ground squirrels, pocket gophers (*Thomomys* spp.), and kangaroo rats (*Dipodomys* spp.) (Csuti et al. 1997). It often stalks its prey or waits at a burrow, a habitat that is only expedient in open country with sparse and short vegetation. Based on its foraging method, the hawk tends to avoid areas where tall, dense crops replace grasses (Schmutz 1987). Ferruginous hawk clutch size, fledgling rate, and/or breeding density tend to vary with prey availability, especially jack rabbits or ground squirrels (Dechant et al. 1999).

In the Covered Area, nests are located generally in western juniper trees with large support branches. The nest trees may be isolated or on the edge of dense areas of juniper. Ferruginous hawks that nest in trees seem to be less sensitive to surrounding land use than those that nest on the ground, but they still avoid areas of intensive agriculture or high human disturbance (Dechant et al. 1999).

Status and Distribution

The historic breeding range for ferruginous hawks was much larger than their present range. In Canada, their range decreased in Alberta, Saskatchewan, and Manitoba in the early 1900s due to agriculture and invasion of aspen into remaining prairie habitat (Hall et al. 1988 in TNC 1999). BBS data shows an annual 8.7 percent increase in Canadian populations between 1966 and 1999. However, they increased 11.00 percent annually between 1966 and 1979, indicating their upward trend is increasing at a slower rate (Sauer et al. 2001).

The historic breeding range of ferruginous hawks in the United States was also larger than their current breeding range (Hall et al. 1988 in TNC 1999). Ferruginous hawks were nearly extirpated in the northeast quarter of North Dakota before 1950 and declined in Utah during the 1980s (Bechard and Schmutz 1995). A widespread decline was not evident until the early 1990s (USFWS 1992 in TNC). BBS data shows a 3.4 percent annual increase in the United States populations from 1966 to 1999 (Sauer et al. 2001). However, like Canada, this trend is slowing. The increasing trend in BBS numbers for western states is attributed to steep increases in Colorado and Montana (Paige and Ritter 1999).

In the United States, the current ferruginous hawk breeding range includes eastern Washington, eastern Oregon, Nevada, northern Arizona, northern New Mexico, the Texas panhandle, extreme western Oklahoma, western Kansas, and California (TNC 1999). There are two subpopulations of ferruginous hawks, bisected by the Rocky Mountains. The North American population was estimated at 3000-4000 nesting pairs in 1980 (Marshall et al. 1996). Their non-breeding range includes the southwestern and south-central United States to Baja California and the central mainland of Mexico. Some ferruginous hawks in the northerly breeding areas winter locally, rather than migrating (Bechard and Schmutz 1995).

In Oregon, ferruginous hawks are present in the lowlands and prairies east of the Cascade Range. Most are located in Baker, Harney, Malheur, Morrow, Umatilla, and Wallowa Counties, but have also been seen in Crook, Gilliam, and Union Counties. A 1980 survey reported 93 known and estimated 255 nests in Oregon (Marshall et al. 1996). This survey noted 17 known and 50 estimated nests in Gilliam, Morrow, and Umatilla counties (Marshall et al. 1996). Ferruginous hawks are common in Oregon, but were more abundant in the early 1900s (Altman and Holmes 2000). Gabrielson and Jewett (1940 in Marshall et al. 1996) also indicated they were formerly more abundant in Oregon. They knew of 28 nests in Morrow and Umatilla counties alone, without performing a survey. Oregon BBS data show an annual 1.3 percent increase in Oregon between 1966 and 1999 (Sauer et al. 2001).

Threats

Several studies have documented the decline of the ferruginous hawk's range. Habitat loss and degradation are key factors in their decline (Altman and Holmes 2000, Berchard and Schmutz 1995, Csuti et al. 1997, Olendorff 1993 in TNC 1999, Tesky 1994, TNC 1999). Berchard and Schmutz (1995) noted the retraction of their range in Canada since the 1900s due to agriculture and invasion of aspen into remaining prairie habitat. Additionally, Olendorff (1993 in TNC) attributed overall population declines to cultivation, grazing, poisoning and controlling small mammals, mining, fire in nesting habitats, but primarily cultivation (Berchard and Schmutz 1995). Throughout the Columbia Plateau, source habitats for ferruginous hawks (juniper sage-steppe) have declined 53 percent from historic levels (Altman and Holmes 2000). In the interior Columbia Basin, 54 percent of all watersheds show moderate or strongly declining trends in source habitat for ferruginous hawks (Wisdom et al. 2000 in Altman and Holmes 2000).

Habitat loss and degradation threatens ferruginous hawks by reducing the number of sites for breeding, roosting, resting, and foraging. Generally, populations decline consistently as cultivation increases (Schmutz 1987). More specifically, conversion of native habitat to monotypic stands for grazing and agriculture can decrease ferruginous hawk density and reproductive success due to decreased prey, fewer nest sites, and increased nest disturbance (Tesky 1994). Nest sites are lost from the cutting of mature trees and grazing (or trampling) of potential nesting trees (Altman and Holmes 2000). Severe fires pose a threat to ferruginous hawks because fires destroy nest trees and their prey base. However, the complete exclusion of fire can negatively affect ferruginous hawks (Tesky 1994). Fire suppression can result in encroachment of trees and the conversion of shrub-steppe to woodlands (Altman and Holmes 2000).

Nest disturbance is a threat to ferruginous hawks. Human disturbance in the form of birding, mining operations, and off-road vehicle use (Altman and Holmes 2000, Marshall et al. 1996) have been linked to nest desertion (Olendorff 1993 in Berchard and Schmutz 1995). Human disturbance also causes low productivity, especially when prey populations are low (White and Thurow 1985 in Marshal et al. 1992). Ferruginous hawks rarely establish a second nest in the same year, even when they lose the first clutch (TNC 1999).

Pesticides are a possible but non-serious threat (Bechard and Schmutz 1995). Between 1974 and 1978, ferruginous hawk eggs were tested for the presence of organochlorine and mercury residue, and they were below levels known to adversely affect raptor reproduction. However, strychnine used to poison ground squirrels, a common prey item, may be a threat to the species (Bechard and Schmutz 1995).

Additional threats include collision with objects and the fluctuation in prey base (TNC 1999). Ferruginous hawks sometimes collide with vehicles, power lines, or other objects in areas where prey items are abundant (Berchard and Schmutz 1995). Additionally, studies of ferruginous hawk population trends indicate the fluctuation in population correlates with prey availability, especially jackrabbits and ground squirrels (TNC 1999). In north-central Oregon, one of their primary prey species is the Washington ground squirrel.

Consistent with loggerhead shrikes, the loss of habitat quality and quantity is the most significant threat to ferruginous hawks. This again is due to the conversion of native habitat to alternative uses, and the invasion of non-native species. Habitat reduction has decreased the amount of nesting sites available to the species, and the increased disturbance of nest sites (in conjunction with human disturbance and activities) can decrease productivity at nest sites. Finally, habitat loss and degradation has affected the population and distribution of an important prey species, the Washington ground squirrel.

Conservation Needs

- Long-term protection of large contiguous areas of suitable breeding and foraging habitat

  Conserving contiguous tracts of land reduces the potential for human disturbance and the resulting increased potential for nest abandonment.

  Long-Term protection of land eliminates the potential for future conversion into agricultural production which would consequently reduce available prey (including the Washington ground squirrel).

- Maintain and enhance the quality of existing habitat

  Increasing the quality of habitat will naturally increase prey populations.

  Controlling cheatgrass infestations will reduce the potential for a wildfire to eliminate suitable breeding habitat and cause nestling mortality.

- Improved grazing practices

  More than any other raptor, the ferruginous hawk is sensitive to disturbance and will readily abandon nests especially during the period of egg laying and incubation.

  Traditional grazing practices contribute to the degradation of suitable habitat.

Sage Sparrow

Listing Status

Sage sparrows are a species of concern throughout the Service's Pacific Region. The San Clemente subspecies of the sage sparrow is listed as threatened in California. They are a state sensitive species in Oregon, and have a critical designation in the Columbia Basin.

The MBTA protects sage sparrows from direct take throughout range. However, as was the case for loggerhead shrikes and ferruginous hawks no protection is currently afforded the habitats on which this species primarily depends.

Natural History

Sage sparrows are sagebrush obligates, associated with sagebrush shrublands dominated by large sagebrush and perennial bunchgrass (Paige and Ritter 1999). They require semi-open habitat with dense and evenly spaced shrubs that are 1-2 meters high (Chase et al. 2002). Vertical structure, habitat patch size, and vegetation density may be more important in habitat selection than shrub species (Martin and Carlson 1998). Sage sparrows are often missing from what appears to be suitable habitat, so other unknown habitat characteristics may be important. Sage sparrow abundance is correlated with grass and litter (Holmes and Geupel 1998), as well as deep, loamy soils (whereas shrikes associated with sandy soils) (Vander Haegen et al. 2000).

Spring migrants usually begin arriving in Oregon in late February, with the main spring migration in the middle of March (Gilligan et al. 1994). The sage sparrow generally breeds by April and the normal clutch size is three to four eggs. This species can raise two to three broods each year and builds a new nest for each clutch. Nests are built low in shrubs or occasionally on the ground. The selection of nest substrate may be related to the height of available shrubs and microclimate (Martin and Carlson 1998). Breeding territories generally do not overlap but boundaries may change slightly from day to day (Martin and Carlson 1998). Fall migration peaks in mid-September and most of this species leaves Oregon by October. Sage sparrow populations fluctuate from year to year (Gilligan et al. 1994; Csuti et al. 1997). There is no information on roosting habitat for this species (Martin and Carlson 1998).

Sage sparrows primarily eat insects from the ground May through August and glean seeds from the ground during the remainder of the year (Marshall et al. 2003). This species forages almost exclusively on the ground, usually near or under the edges of shrubs within sage habitat.

Status and Distribution

The breeding range of sage sparrows in North America includes parts of Washington, Oregon, Idaho, Wyoming, Nevada, Utah, Colorado, Arizona, New Mexico, California, and Montana (Martin and Carlson 1998). Sage sparrows winter in southern California, Baja, and some winter locally in Nevada, Utah, Arizona, New Mexico, Texas and Mexico. They rarely winter in northern and southern Oregon (Martin and Carlson 1998). BBS data indicates an annual 2.0 percent increase in populations between 1966 and 1999, and an increase of 6.2 percent between 1966 and 1979 (Sauer et al. 2001). This illustrates the slowing of an increasing population trend.

In Oregon, sage sparrows are found east of the Cascade Mountains, primarily in southern counties (Martin and Carlson 1998). BBS trends indicate a stable population in the Columbia River Basin (Holmes and Geupel 1998). Sage sparrows are common in Harney, Lake, Malheur, and southeast Deschutes counties, but are seldom located where juniper is plentiful (Gilligan 1994). Oregon is primarily breeding habitat for Sage sparrows, as the species rarely stays in the state throughout the winter (Martin and Carlson 1998). Sage sparrows were once abundant in sagebrush communities (Holmes and Geupel 1998). BBS data between 1966 and 1999 illustrate a 2.5 percent increase in Oregon populations (Sauer et al. 2001).

Threats

Sage sparrows are vulnerable to nest predation, and it is a major cause of nest mortality at the nestling stage (Martin and Carlson 1998). Nest predation can strongly reduce reproductive success and threaten population persistence (Reynolds 1981 in Chase et al. 2002, Rotenbery and Wiens 1989, Misenhelter and Rotenberry 2000 in Chase et al. 2002). Rotenberry and Wiens (1989 in Martin and Carlson 1998) indicate predation plays a large role in reducing reproductive sage sparrow success in shrub-steppe habitats during high densities of Townsend's ground squirrels. Nest predation is exacerbated by habitat fragmentation and degradation. Anything resulting in increased predation pressure is a threat that can result in low sage sparrow productivity, thereby threatening the long-term viability of this species (Chase et al. 2002).

Grazing can have an adverse effect on sage sparrow habitat because it decreases the amount of shrubby vegetation and prompts the invasion of exotic weeds (Chase et al. 2002).

Sage sparrows in Idaho and California are subject to brood parasitism by the brown-headed cowbird (Chase et al. 2002). Increased parasitism is associated with fragmented habitats (Martin and Carlson 1998). Local populations in southern California were extirpated due to urbanization and agricultural conversion of their habitat (Martin and Carlson 1998).

Because the sage sparrow is dependent on sagebrush communities , observed population declines are attributed to loss of sagebrush habitat quality and quantity (Martin and Carlson 1998). Declines in sage sparrow habitat are moderately high (40 percent) in the Columbia Plateau (Wisdom et al. 2000 in Altman and Holmes 2000). Additionally, within the interior Columbia Basin, over 48 percent of watersheds show moderately or strongly declining trends in source habitats for sage sparrows (Wisdom et al. 2000 in Altman and Holmes 2000).

Conservation Needs

- Long-term protection of large contiguous areas of suitable breeding habitat

  Habitat loss due to the conversion of land to agricultural production has impacted the availability of suitable breeding habitat.

- Maintain and enhance the quality of existing habitat

  Controlling cheatgrass infestations will reduce the potential for a wildfire to eliminate suitable breeding habitat and cause nestling mortality.

- Improved grazing practices

  Livestock grazing is believed to impact nesting success directly by disturbing nesting birds and damaging nests, and indirectly by enabling cowbird parasitism.

  Traditional grazing practices contribute to the degradation of suitable habitat.

III. ENVIRONMENTAL BASELINE

In 1963 the Covered Area was sold to the State of Oregon, which in turn entered into a 77 year lease with The Boeing Company, initially for aerospace development and testing. In 1974, Boeing subleased the property to Boeing Agri-Industrial Company (BAIC), for farming and ranching development. Agricultural land conversion and development began at the site in the 1970's and to-date approximately 35,000 acres have been developed for agricultural purposes. In 1975 the State of Oregon sold 3,520 acres at the site to Portland General Electric who developed the Boardman Coal Plant that began operations in 1980 (TNC 2004).

The grassland and shrub-steppe communities in the Covered Area have undergone substantial loss and/or degradation as a result of historic and on-going land use. Primary among these are intensive livestock grazing, introduction of invasive non-native plants, advent of dryland wheat farming and irrigated agriculture, and altered fire regimes.

The timing and intensity of grazing has varied. The Farm maintains the current grazing lease over the Farm and Conservation Areas. For the past 60 years, grazing on the South Farm Conservation Area has been managed by one family and primarily for cattle and sheep. The South Farm Conservation Area along with portions of the Farm lands are leased to this family until June 30, 2005, at which time there will be no renewal or extension of the term of the lease for the Conservation Area. Grazing consists of approximately 900 head of livestock over the entire area and generally occurs between late October and mid-May. All pastures are used each year, none are rested. Notable impacts from livestock are limited to watering and mineral feeding sites, corrals, and roads. Livestock grazing has occurred on the PGE property in the past and PGE maintains the option to allow grazing in the future. Livestock grazing practices have disturbed or eliminated cryptogamic crusts in many areas. Native grasses are heavily grazed for

an extended period each year, eliminating recruitment of seedlings and allowing further invasion of cheatgrass and other non-native species. Trampling causes damage to both grass and shrub species. Grazing cattle also spread noxious weed seeds (TNC 2003).

Invasion of non-native plant species is the most pervasive active threat to the plant communities in the Covered Area. Plant composition and structure have been altered by invasion of non-native species over much of the site. Cheatgrass invasion is widespread. Many areas have widespread noxious weed infestations, such as yellow starthistle (*Centaurea solstitialis*), Russian knapweed (*Acroptilon repens*), diffuse knapweed (*Centaurea diffusa*), and medusahead rye *Taeniatherum caput-medusae*). Invasion of non-native species causes increased competition for nutrients and moisture. Increased presence of cheatgrass has caused altered frequency and intensity of wildfire (TNC 2003).

Frequent and intense wildfires on the Conservation Area cause damage or death of native grass and shrub species. Native species that would survive less frequent, lower intensity fires are damaged or destroyed by the very hot fires that frequently occur. These hot fires are both caused by and contribute to the altered composition of the vegetation in the system (TNC 2003).

The existing conditions in the Covered Area affect all of the Covered Species by reducing the quality and quantity of habitat (foraging, breeding, and nesting) which can result in increased predation and mortality, decreased prey availability, and decreased productivity.

Within the Covered Area, population estimates of the Covered Species were developed in two ways. Survey data was used for the Washington ground squirrel and ferruginous hawk. For the loggerhead shrike and sage sparrow populations, data was extrapolated by comparing known population densities within a specific vegetation community to all similar communities within the Covered Area. For specific details on the population estimate derived for each Covered Species refer to Section 5 of the Agreement, which is hereby incorporated by reference (David Evans and Associates 2003).

Washington Ground Squirrel

Over time, most of the native vegetation on the Active Farm has been converted to agriculture and no longer provides suitable habitat for the Washington ground squirrel. As previously described, the squirrel is so closely tied to deep, silty soils (suitable habitat), particularly Warden and Sagehill soils (preferred habitat) on the property (Greene 1999), the tilling and other mechanisms involved in conversion of shrub-steppe habitats to agricultural crop production not only destroys the species' food source, but it also renders the soils necessary for burrowing unusable and irretrievably modified. Washington ground squirrels are not found in tilled croplands (Carlson et al. 1980; Betts 1990, 1999; Quade 1994), nor have they been located in undeveloped areas between irrigated crops within the Active Farm portion of the Covered Area (CH2M Hill 2000). In general, the soil conditions in the northern portion of the Farm along Interstate-84 do not provide suitable habitat for ground squirrels. In this area, soil depths are shallower with more underlying basalt and rock outcrops than preferred soil conditions. However, complete surveys have not occurred in this area and small pockets of suitable soil conditions may occur. It is unknown if ground squirrels would utilize these small isolated patches.

The South Farm Conservation Area provides a large undeveloped area of preferred ground squirrel habitat. Though ground squirrels may occur in the North Farm Conservation Area, numbers are expected to be low due to a limited amount of the preferred soil types. There has not been an opportunity to conduct ground squirrel surveys on the Radar Range but ground squirrels have been found throughout the adjacent Naval Facility, indicating that suitable soil conditions occur in this area (Quade 1994, Morgan 2001, Marr 2003). Approximately 355 acres of the radar range was scraped of vegetation several decades ago and it is not known whether there have been any other ground disturbing activities. It is unknown how much of the radar range still provides suitable soil conditions for the ground squirrel. In the undisturbed portions of the radar range (maximum 2,350 acres), the number of ground squirrel colonies may be similar to the number of colonies found on the northern portion of the South Farm Conservation Area and Naval Facility where soil conditions are similar.

In the Agreement, the number of ground squirrels in the Covered Area (excluding the Radar Range) is based on active sites (either colonies or individuals) located during surveys conducted by ODFW, TNC, and PGE on the southern portion of the Covered Area where the majority of this species' habitat occurs. All Washington ground squirrel surveys followed the protocol developed by ODFW in 1999. The 1999 ODFW survey identified 104 active sites on the South Farm Conservation Area (Morgan and Nugent 1999). The 2001 TNC survey on the South Conservation Area north of Carty Reservoir confirmed 17 active sites. Six unconfirmed sites were located but not included in the survey results. There were no observations of Washington ground squirrels within the north Future Agricultural Area, North Conservation Area and other isolated areas surveyed on the Farm in 2000 (CH2M HILL 2000). The south Future Agricultural Area was surveyed in 1999 by ODFW and no active sites were located (Morgan and Nugent 1999).

PGE conducted surveys on its Plant property in 1999 and 2001. Only one colony was located during the 2001 survey and it may be part of an adjacent colony located on the South Farm Conservation Area. Therefore, it was not counted as a separate site. An individual Washington ground squirrel was observed on the PGE Plant property in 2001 but not during the survey period (Nelson 2001). This sighting is included in the total number of active sites in the Covered Area. As of 2001, there are 122 known Washington ground squirrel locations (either colonies or individuals) on the Covered Area. All are in the designated Conservation Areas, with 121 on the South Farm Conservation Area and one on the PGE Conservation Area.

Loggerhead Shrike

Within the Covered Area, point count surveys for the loggerhead shrike have only been regularly conducted on PGE property (PGE 1996, PGE 1997, PGE 1999, PGE 2000, PGE 2001, PGE 2002a). Avian population studies have also been conducted on the adjacent Naval Facility. Breeding habitat data from these studies were used to determine suitable habitat and territory size within the Covered Area. The population estimate for the loggerhead shrike is based on suitable habitat identified from vegetation data and estimation of the habitat quality by ODFW and PGE biologists. The vegetation information was provided by TNC for the Farm Conservation Areas and by David Evans and Associates for the PGE Boardman Plant property and the Undeveloped Portions of the Farm. For a detailed discussion on the techniques used to estimate the population

of loggerhead shrikes within the Covered Area, refer to section 5.2.3.4 of the Agreement, which is hereby incorporated by reference (David Evans and Associates 2003).

The population estimate for loggerhead shrikes on the Covered Area in 2001 is 34.2 territories on the South Farm Conservation Area, 19.2 territories on the undeveloped portions of the Farm (excluding the Radar Range), 2.7 territories on the PGE Plant property, and 0.5 territory on the PGE Conservation Area. TNC surveyed the Threemile Canyon Farms Conservation Area in 2003 and detected 24 nests. However, many other pairs were detected displaying nesting behaviors, but their nests were not found. Detecting all of nesting pairs during any given breeding season may not be possible.

Ferruginous Hawk

Based on ODFW surveys from 1991 to 1993, seven ferruginous hawk nests occurred in the Covered Area (Morgan 1997), but surveys conducted by TNC in 2001 found two of these nest sites were occupied by Swainson's hawks (*Buteo swainsoni*) (Nelson 2001). Swainson's hawks forage primarily in grassland and sage-steppe habitats but are more likely than ferruginous hawks to forage in agricultural fields. With development of the Farm, nest trees located along the edge of the South Farm Conservation Area may provide more suitable habitat for Swainson's hawks than ferruginous hawks due to the increase in human disturbance.

A thorough survey of the entire Covered Area was not conducted for potential ferruginous hawk nests. However, the population estimate of the ferruginous hawk in the Covered Area is based on the number of known active nests and estimated nest territory sizes. The active nests were found during surveys that were conducted by TNC in 2001 and by PGE since 1995 over portions of the Covered Area (Nelson 2001, PGE 1996, PGE 1997, PGE 1999, PGE 2000, PGE 2001, PGE 2002a). These surveys located five known active nest sites in the Covered Area. Four of the active nests were located on the South Farm Conservation Area, and one active nest was located on the Farm in the south Future Agricultural Area (Nelson 2001). There are no documented nests located on the PGE Boardman Plant property, but one to two pairs have been observed foraging in the area. Studies have found eight to ten territories per 24,710 acres if local conditions are favorable (Dechant et al. 1999). Studies on the adjacent Naval Facility discovered an average of 1.6 miles between ferruginous hawk nests (Holmes and Geupel 1998).

Since the ferruginous hawk will use several nest trees within a single territory, potential nest trees were identified. The number of nest trees is based on three years of general ferruginous hawk nest surveys conducted by ODFW from 1991 to 1993, a verification of known nest locations on the Conservation Area by TNC in 2001, and a survey of the southwestern corner of the Farm by ODFW in 2002 (ODFW 1993, Nelson 2001, Morgan 2002, respectively). These surveys identified six nest trees on the Farm, four of which are located in the south Future Agricultural Area. In addition, 16 nest trees were found on the South Farm Conservation Area. However, one of the 16 on the Conservation Area was destroyed sometime between last year and April 2003 when the tree fell over, leaving 15 potential nest trees. To be considered a nest tree, the site had to have an actual nest in place or evidence of a previous nest. There were five, six, and two occupied ferruginous hawk nests in the Covered Area in 2001, 2002, and 2003, respectively.

Sage Sparrow

On the Covered Area, the only point count surveys conducted for the sage sparrow have been on PGE Plant property. This species was observed in only two of the six years that surveys have been conducted on the PGE Plant property (PGE 1996, PGE 1997, PGE 1999, PGE 2000, PGE 2001, PGE 2002a). Surveys have been conducted on the adjacent Naval Facility and breeding habitat information from these studies was used to determine suitable habitat and territory size (Morgan 2002). The population estimate for the sage sparrow in the Covered Area is based on the identification of suitable habitat by using vegetation data and an ODFW biologist's site-specific knowledge of the area. For a detailed discussion of the techniques used to estimate the population of sage sparrows within the Covered Area, refer to section 5.2.4.4 of the Agreement, which is hereby incorporated by reference (David Evans and Associates 2003).

The sage sparrow population estimate for the Covered Area in 2001 is 37.6 territories within the 3,344 acres of potentially suitable habitat, with 7.1 territories located on Undeveloped Portions of the Farm and 30.5 territories located on the South Farm Conservation Area. The Undeveloped Portions of the Farm provides approximately 710 acres of potentially suitable habitat and the South Farm Conservation Area provides approximately 2,634 acres of suitable habitat. TNC did survey for sage sparrows in the Threemile Canyon Farms Conservation Area in 2003 and only nine individual or sage sparrow pairs were detected. We have no information to explain why the observed number of territories differs from that expected based upon the densities present on the Naval Bombing Range.

IV. EFFECTS OF THE ACTION

ODFW

Overall ODFW's participation in the Agreement is anticipated to have a beneficial effect on the species by guiding adaptive management and conservation practices. When necessary, ODFW will assist the Farm, PGE and TNC with their Covered Activities, and therefore, the effects of their actions are fully considered in the analysis of effects described below. Additionally, if any of the Covered Species become listed over the life of the Agreement, ODFW is automatically covered to capture, handle and tag species through a blanket Cooperative Agreement between the Service and ODFW (USFWS and ODFW 1986). Therefore, ODFW is not anticipated to have any adverse effects on the Covered Species beyond what is described below.

Washington Ground Squirrel

The Farm

As previously described, the Washington ground squirrel generally prefers deep, silty soils (suitable habitat). Although the squirrel has been documented using a variety of soil classification meeting this description, within the Covered Area they have only been found in areas comprised of Warden and Sagehill soils (preferred habitat). The Agreement identifies 27,728 acres of Washington ground squirrel preferred habitat within the Covered Area based on the identified Warden and Sagehill soils. Additionally, we estimate the Radar Range provides approximately 2,350 acres of suitable habitat for the squirrel. This estimate is based on survey

data gathered from the adjacent Naval facility in comparable suitable soil types. Of the 30,078 acres of preferred and suitable habitat identified within the Covered Area, approximately 11,773 acres may be permanently impacted (altered or degraded) as a result of implementation of the Farm's Covered Activities over the 25-year permit term. This loss of habitat represents approximately 39 percent of the total preferred and suitable habitat known to occur within the Covered Area. The conversion of the Farm's land to agriculture production will destroy the soil structure necessary for suitable squirrel habitat. This loss of habitat will indirectly affect the Washington ground squirrel population by limiting dispersal and population expansion.

Most preferred habitat within the Farm Development Area has been surveyed for Washington ground squirrels and zero observations have been documented. As previously indicated, surveys have not been conducted on the Radar Range, but ground squirrels have been found throughout the adjacent Naval Facility (Quade 1994, Morgan 2001, Marr 2003), indicating that suitable soil conditions occur in all of the undisturbed portions of this area. In order to estimate the number of active squirrel sites anticipated to occur on the Radar Range, we used survey data collected in similar habitat on the adjacent Naval Facility (Marr 2003). We estimate a maximum of 6.5 active sites may occur on the 2,350 acres of suitable habitat (maximum expected to occur) within the Radar Range. Therefore, we anticipate a maximum of 6.5 Washington ground squirrel sites may be impacted as a result of ground disturbance in the Radar Range.

The 11,773 acres of potential development is the maximum anticipated effects likely to occur on the Farm Development Area (Figure 1) as a result of the Service's issuance of the Agreement. However, the Farm will not likely develop all undeveloped portions of their property during the life of the Agreement. Since Boeing has a lease on the Radar Range through 2040, and the proposed project only includes a 25-year Agreement, this area will likely remain undeveloped during the term of the Agreement. The Farm's current plans for their property include the development of 2,560 acres identified as Future Agricultural Areas, of which approximately 1,570 acres are preferred habitat for ground squirrels (Figure 2). Therefore, it is more likely that only the habitat in these areas will be completely removed. This loss represents approximately 5 percent of the preferred Washington ground squirrel habitat known to occur in the Covered Area. Because zero squirrels were located on the South Future Agricultural Area during ODFW's 1999 survey efforts (ODFW 1999) and development of this area will likely occur in the near future, direct harm of squirrel individuals is not anticipated to occur.

One of the Farm's Covered Activities includes grazing. Grazing on the Farm Development Areas throughout the 25-year permit duration is an on-going activity is not anticipated to increase adverse effects to the Washington ground squirrel.

Authorizing grazing within the Farm Conservation Areas through 2005, could potentially increase degradation of preferred squirrel habitat (including trampling of burrows). However, grazing has been an ongoing activity in this area for over 60 years and therefore, one additional year of grazing is not anticipated to provide a measurable increased adverse effect. The Farm has agreed to improve grazing practices within the Conservation Areas, based on guidance provided by TNC and ODFW, in order to further minimize potential disturbance to native habitats and the Covered Species. Once the existing grazing lease on the Conservation Areas is terminated in 2005, grazing will only be allowed by TNC, if it is shown to have a net positive

benefit to the Covered Species. We do not anticipate Washington ground squirrel individuals will be harmed as a result of allowing grazing to occur in the Conservation Areas through 2005.

The Wildfire Response Plan (Appendix I of the Agreement) identifies the Farm as the permittee with first response responsibility for all range fires. Fire control and suppression will emphasize habitat protection where feasible and limit ground disturbance to the greatest extent practicable. Direct attack with water is the preferred suppression strategy. If heavy machinery such as farm discs and bulldozers, is used, it will only be used to cut off the head of the fire to stop forward movement. Equipment access (direct attack with water and discing) is not anticipated to result in the direct harm of squirrel individuals but could slightly reduce the preferred habitat available in the short-term and result in harassment of individuals. All of the above described fire suppression activities may adversely affect Washington ground squirrels and their habitat however, discing a fire break will result in the worst case scenario, as described below.

It is unknown if discing to create a fire break will actually harm squirrel colonies. However, we presume there may be some loss of habitat and potential mortality. If discing is necessary to control wildfire, a worst case scenario would require discing an approximate 2-mile transect (Leslie Nelson, Columbia Basin Stewardship Coordinator, TNC, Boardman, Oregon, pers. comm., 2004). This estimate is based on the fire break that was required during the 2000 wildfire which occurred in the South Farm Conservation Area. Given these circumstances, we estimate a maximum of 10 active sites and a minimum of zero active sites may be impacted depending on the location of the fire break. Using the worst fire frequency expected to occur (every 3 years), we estimate a maximum of eight discing transects may be necessary on the South Farm Conservation Area over the 25-year Agreement duration (25 years / 3 years). Using a median value of five active sites, the estimated total number of squirrel sites anticipated to be impacted is 40 (8 years * 5 active sites). This number is likely an overestimate since there is a low likelihood of needing to create a fire break over occupied habitat every time a fire occurs.

Fire suppression activities are anticipated to have an overall beneficial effect because the potential impacts associated with an uncontrolled wildfire in the Conservation Areas could reduce or degrade Washington ground squirrel habitat. Wildfire significantly increases the invasion of undesirable plant species, particularly cheatgrass. Although Washington ground squirrels will often utilize cheatgrass as a short-term food source, they appear to avoid areas where perennial plants have been entirely replaced with cheatgrass. Because cheatgrass-infested areas burn at a much greater frequency, every 3-5 years (as cited in TNC 2003), native shrubs and perennial grasses cannot recover, and after a few wildfire cycles, a cheatgrass monoculture develops (TNC 2003).

To offset the loss of Washington ground squirrel habitat within the Development Area and address the conservation needs identified above, the Farm has permanently conserved large land areas (Conservation Areas) containing preferred habitat for the Washington ground squirrel and has committed to finance the management necessary for the conservation of the Covered Species. The Conservation Areas within the Agreement's Covered Area includes approximately 17,042 acres (57 percent) of Washington ground squirrel preferred habitat, which encompasses all but one of the known Washington ground squirrel colonies (DEA 2003). The permanent conservation of large contiguous areas, such as the South Farm Conservation Area, minimizes

the potential for fragmentation of preferred habitat and may provide important connectivity between unoccupied habitat within Farm Conservation Areas, the Naval Facility, Horn Butte and other areas of suitable habitat. The 250-foot buffer between the Farm Development Area and the Conservation Areas, established by the Farm, will reduce the potential for indirect effects associated with the Farm's future activities. The Farm's commitment to contribute a maximum of $130,000 annually to TNC for management activities, such as habitat restoration and enhancement, will possibly increase population numbers and distribution. Additionally, knowledge gained from testing and developing new conservation strategies within the Conservation Areas may be applicable for the management of the species throughout its range. The Farm's implementation of the Fire Response Plan will likely reduce effects to the Washington ground squirrel caused by potential catastrophic fire events.

PGE

PGE surveyed most of its Boardman Plant property for Washington ground squirrels in 1999 and 2001. There were no sightings in 1999, but one individual was observed in the PGE Conservation Area during the 2001 survey. Another individual was observed within the PGE Conservation Area outside of a survey period (Nelson 2001). Preferred habitat (appropriate soil conditions) occurs on approximately 1,263 acres of PGE property (4 percent of total within the Covered Area), of which approximately 928 acres occurs within the PGE Plant Property and 335 acres occurs on the PGE Conservation Area. The implementation of PGE's Covered Activities are not anticipated to harm Washington ground squirrels because squirrels only appear to occur within the PGE Conservation Area (one occurrence in 2000).

Most of the PGE Covered Activities (Table 1) do not include ground-disturbing activities within areas of preferred habitat. Power generation, transmission, coal storage and handling, fence maintenance, vehicle access, and the operation of Carty Reservoir are not anticipated to further impact preferred habitat for the ground squirrel. PGE's methods for conducting its currently required environmental monitoring are not anticipated to result in any measurable impacts to the ground squirrel.

The need for additional by-product storage may impact the ground squirrel over time by changing the condition of approximately 220 acres of preferred habitat on PGE Boardman Plant property south of Carty Reservoir. Of the 220 acres required for additional by-product storage, approximately 152 acres are identified as preferred habitat. Approximately 40 acres of the 220-acre area will be developed and in use at any one time. New landfills of a similar size will be developed incrementally over time as needed. When an existing landfill becomes full, it will be decommissioned, covered with at least 24 inches of soil, and revegetated with native species. PGE's removal of 152 acres of preferred squirrel habitat is anticipated to modify habitat enough to cause harm of individuals by impairing essential behavioral patterns including dispersal, breeding, feeding, and sheltering. Over the life of the Agreement, we estimate (based on occupancy of adjacent habitat) 152 acres could support less than one active squirrel site, and therefore, harm of one active site is anticipated to occur as a result of PGE's developing additional by-product storage. However, it is likely that only one additional landfill (40 acres) will be needed during the term of this Agreement.

In addition to the by-product disposal area south of Carty Reservoir, approximately 350 acres of undeveloped land east of the coal yard has been designated as a future "scrubber" by-product disposal area. This area currently serves as a deposition zone for fugitive coal dust and may include about 180 acres of preferred habitat. In the event that "scrubbers" become necessary to remove sulfur dioxide (SO_2) from boiler exhaust gas, a portion of the by-product disposal area east of the coal yard may need to be developed. The disposal area would be developed incrementally, similar to the disposal area south of Carty Reservoir. The principal by-product from the "scrubber" process is gypsum (calcium sulfate), which may be sold for off-site use as a product for manufacturing wallboard, or be solidified and deposited on site in a landfill. The landfill will be constructed to prevent leakage of gypsum residues into the soil or surrounding areas. Apart from the conversion of preferred habitat to a landfill, the disposal of "scrubber" by-product is not expected to adversely affect the Washington ground squirrel. Over the life of the Agreement, we estimate (based on occupancy of adjacent habitat) 180 acres could support less than one active squirrel site, and therefore, harm of one active site is anticipated to occur as a result of PGE's developing "scrubber" by-product storage.

Fire suppression may impact the ground squirrel, however these impacts have already been discussed under the Farm's potential effects. PGE will be responsible for revegetating all areas impacted from fire suppression.

PGE intends to manage livestock grazing so that it does not harm wildlife or native plant communities, but grazing may adversely affect Washington ground squirrels by degrading suitable habitat. Fence maintenance is typically associated with livestock grazing and usually involves driving a pickup truck or off-highway vehicle along fence lines to search for areas in need of repair. Vehicles will not be driven across known Washington ground squirrel sites, colonies, or burrows while conducting fence maintenance and therefore, is not anticipated to directly harm individuals. However, driving a truck through suitable squirrel habitat may adversely affect squirrels by degrading habitat.

Coal dust from the coal yard becomes windborne during handling and high winds and is carried to the east by prevailing winds. Most fugitive coal dust settles to the ground within 2,500 feet of the coal yard (PGE 2001). The longest distance estimated for coal dust dispersal is about 3,500 feet, but in a majority of years never exceeds 2,500 feet. A portion (~100 acres) of the PGE Conservation Area is located between 2,700 and 3,500 feet east of the coal yard, and from time to time, receives small amounts of airborne coal dust. The ecological effects of the coal dust plume on vegetation growing within 2,500 feet downwind of the coal yard were studied during the 1993-1995 growing seasons. Researchers found only subtle differences in vegetation response to coal dust accumulation on the soil (Tinnin and Spencer 1996). There were only minor differences noted in the frequency, cover, and growth characteristics of vascular plants. However, coal dust decreased the frequency of occurrence of lichen species. Within the PGE Conservation Area, 92 percent (approximately 307 acres) of the preferred habitat (Sagehill soils) for the Washington ground squirrel occurs beyond 3,500 feet from the coal yard. Based on the above described studies (Tinnin and Spencer 1996), the infrequent deposition of fugitive coal dust on approximately 7 percent (approximately 28 acres) of preferred habitat is not expected to adversely impact the ground squirrel or its habitat within the Conservation Area.

Operation of the current 40-acre ash disposal area, or landfill, south of Carty Reservoir does not appear to adversely affect the Washington ground squirrel or other Covered Species. Ash is contained within the landfill, and fugitive dust and leakage are controlled by watering fresh ash daily. Sampling and analysis of monitoring wells around the landfill as part of the Boardman Plant Groundwater Monitoring Program have confirmed no impact to groundwater from leaching (PGE 2002b).

Hunting seasons primarily fall outside of the ground squirrel's active period and therefore, are not anticipated to adversely affect the squirrel.

In order to offset the loss of potential preferred habitat that may occur due to implementation of PGE Covered Activities, PGE will maintain and improve preferred habitat within their Conservation Area throughout the duration of the Agreement. The PGE Conservation Area is adjacent to the Farm Conservation Area managed by TNC and contributes to the area managed as native habitat for all of the Covered Species. Preferred habitat in the Conservation Area currently appears under-populated by the ground squirrel; protecting this habitat offers the ground squirrel additional habitat to expand distribution. Much of the PGE Conservation Area is dominated by relatively healthy stands of native grasses, including western needle-and-thread grass (*Hesperostip comata*), Sandberg bluegrass (*Poa secuda*), and bluebunch wheatgrass (*Pseudoroegneria spicata*). Antelope bitterbrush (*Purshia tridentata*), big sagebrush (*Artemisia tridentata*), and gray rabbitbrush (*Chrysothamnus* spp.) occur as scattered populations throughout the area; cheatgrass is also present. Designation of this area for conservation purposes protects Washington ground squirrels in the area. PGE will actively manage the Conservation Area to maintain and protect its status as native grassland, but will also promote the establishment, growth, and expansion of bitterbrush and sagebrush in areas where these shrub species would naturally occur. Although the fugitive coal dust deposition occurs within approximately 2,500 feet of the coal yard, very little reaches the designated PGE Conservation Area. Long-term weed control and fire suppression will also protect and/or improve the condition of desired plant communities within suitable habitat in the Conservation Area.

TNC

The intent of the implementation of TNC's Covered Activities is to maintain, and improve where feasible, native vegetation conditions and wildlife habitat on the Farm Conservation Areas. All ground-disturbing activities on the Farm Conservation Areas will be conducted with the intent of avoiding any direct or indirect impact to squirrels or their habitat. We do not anticipate the direct harm or harassment of Washington ground squirrels as a result of implementation of TNC's Covered Activities. However, there may be a temporary loss of preferred habitat as a result of restoration activities.

As previously discussed (the Farm effects section above), fire suppression activities may result in disturbance of Washington ground squirrels and their habitats, however TNC's role is to assist the Farm to help reduce harm of individuals and minimize impacts to preferred habitat, restore impacted areas and report estimated losses to our office. Activities such as the control of non-native species (hand pulling, covering with black plastic, infrared treatments) and habitat restoration (discing, drilling, prescribed burn), may result in a short-term loss of available foraging habitat (removal of cheatgrass) and protective cover, for the Washington ground

squirrel. However, replacing cheatgrass with native perennials will provide a long-term benefit to the species possibly including an increase in population size and distribution. We anticipate that none of these activities will harm Washington ground squirrels or disrupt their normal behavior patterns.

If TNC allows grazing to occur on the Conservation Areas, the timing and location of grazing will be tailored to maximize benefits and minimize impacts to Covered Species. In areas of cheatgrass dominance, grazing may be an effective means of control if cattle are allowed to graze new growth of cheatgrass in early spring before the emergence of native bunchgrasses. In addition to being invasive, cheatgrass is highly flammable. Grazing may be used as a method to control wildfire by reducing the amount of cheatgrass and of standing dead material (USDA 1997). Intense grazing has occurred on these Management Areas for approximately 60 years with no apparent direct harm to Washington ground squirrels. We anticipate grazing for habitat management purposes will not directly harm Washington ground squirrels or disrupt their normal behavior patterns.

If the Farm, ODFW, USFWS and TNC mutually elect to allow hunting on the Farm Conservation Areas, it is not anticipated to impact ground squirrels or their habitat as hunting will not be allowed during the ground squirrels' active period. In addition, hunter education will be used to provide an understanding of conservation practices.

TNC will be conducting biological monitoring within preferred habitat for the ground squirrel including monitoring squirrel populations. This monitoring will be implemented strictly in an observatory manner and therefore impacts associated with monitoring activities are anticipated to be insignificant. Over the long term, it is anticipated that the status of the Washington ground squirrel will improve through the conservation commitments on the Farm Conservation Areas.

TNC will continue to allow a limited number of PGE employees (approximately 19) to access the PGE property on an existing road running through the South Farm Conservation Area. This activity is not anticipated to have a significant adverse effect on the Washington ground squirrel because it is ongoing activity and there have not been any documented adverse effects to the Washington ground squirrel (Leslie Nelson, pers. comm., 2003).

TNC will continue to maintain existing fencing when necessary, remove portions of fence where possible to improve wildlife conditions and may construct fences when necessary for habitat maintenance. Overall, these efforts are anticipated to have a neutral effect because the area impacted for future fence construction will be offset by those areas where fence is removed and habitat is restored. These Covered Activities are not anticipated to have a significant adverse effect on the Washington ground squirrel.

Loggerhead Shrike

The Farm

The Covered Area includes an estimated 11,170 acres of suitable habitat for the loggerhead shrike. As previously discussed, habitat and territory estimates for the shrike were established using breeding habitat information from studies conducted on the PGE Plant property and the

adjacent Naval Facility. The Radar Range is not anticipated to provide any additional suitable shrike habitat. The Covered Activities for the Farm include the development of all undeveloped portions of the Farm. Therefore, approximately 4,990 acres of suitable loggerhead shrike habitat may be permanently impacted (destroyed) as a result of implementation of the Farm's Covered Activities over the 25-year permit term. This area is estimated to support approximately 19.2 of the territories. This loss of habitat represents approximately 45 percent of the total suitable habitat within the Covered Area and 34 percent of the territory estimates in our data set. The Farm will avoid removing breeding habitat during the breeding season and will notify our office 30 days prior to habitat removal. However, the Farm's removal of 4,990 acres of suitable shrike habitat is anticipated to modify habitat enough to cause harm of individuals by impairing essential behavioral patterns including breeding, feeding and sheltering. Over the life of the Agreement this 4,990 acres may support a maximum of 19 breeding pairs, and therefore, harm of 19 breeding pairs is anticipated to occur as a result of implementation of the Farm's Covered Activities.

Allowing grazing to occur within the Farm Conservation Areas through 2005, could potentially increase degradation of suitable shrike habitat. However, grazing has been an ongoing activity in this area for over 60 years and therefore, one additional year of grazing is not anticipated to provide a measurable increased adverse effect. The Farm has agreed to improve grazing practices within the Conservation Areas, based on guidance provided by TNC and ODFW, in order to further minimize potential disturbance to native habitats and the Covered Species. Once the existing grazing lease on the Conservation Areas is terminated in 2005, grazing will only be allowed by TNC, if it is shown to have a net positive benefit to the Covered Species. We do not anticipate that any loggerhead shrike individuals will be harmed as a result of allowing grazing to occur in the Conservation Areas through 2005.

The Wildfire Response Plan (Appendix I of the Agreement) identifies the Farm as the permittee with first response responsibility for all range fires. Fire control and suppression will emphasize habitat protection where feasible and limit ground disturbance to the greatest extent practicable. Direct attack with water is the preferred suppression strategy. If heavy machinery such as farm discs and bulldozers, is used, it will only be used to cut off the head of the fire to stop forward movement. Equipment access (direct attack with water and discing) is not anticipated to result in the direct harm of shrike individuals but could slightly reduce the suitable habitat available in the short-term and result in harassment of individuals. If fire suppression in shrike breeding habitat is necessary between mid-March and mid-July, there is potential for shrike nestlings to be harmed. All of the above described fire suppression activities may adversely affect loggerhead shrikes and their habitat however, discing a fire break will result in the worst case scenario, as described below.

Given the high diversity of the habitat on the South Farm Conservation Area and the inherent unpredictability of fire, it is difficult to assess the number of individuals that may be impacted as a result of discing a fire break. However, it is clear that the loss of shrike individuals nestlings resulting from necessary fire suppression activities will be less than the loss that would naturally occur because of a catastrophic fire event. Within the South Farm Conservation Area, the average width required for an effective fire break, if necessary, is estimated to be 50 feet (15.2 m) (Jim Brewer, Threemile Canyon Farm Manager, Boardman, Oregon, pers comm., 2003). As

previously discussed, the worst anticipated fire break is estimated not to exceed 2 miles (3219 m) (Leslie Nelson, pers. comm., 2004). The maximum area anticipated to be affected for a given fire break is 12 acres (48,929 m^2) (15.2 m* 3219 m). The average density of shrikes on the adjacent Naval Facility indicates an estimated one territory per 167 acres. Since the maximum impact resulting from a given fire break is estimated to be 12 acres, we anticipate that less than one nest will be impacted for any given fire break (i.e., 0.07 nest/12 acres). Using the worst anticipated fire cycle of every 3-5 years, a maximum of eight fires is expected occur throughout the life of the Agreement. Therefore, we estimate a maximum of one nest (0.56 nest) may be impacted as a result of fire suppression activities. Using an average of six nestlings per nest (Marshall et al. 2003), we anticipate that no more than six nestlings will be impacted as a result of fire suppression activities.

Per the Wildfire Management Plan (Appendix 1 of the Agreement), TNC will be on-site, as quickly as possible to assistant with fire suppression activities. They will be responsible for working with the Farm to minimize the potential for impacting a shrike nest. As previously mentioned, discing fire breaks is not the preferred method of fire control.

An overall beneficial effect to shrike breeding habitat is anticipated to result from fire control activities because an uncontrolled wildfire in the Conservation Areas could significantly reduce the availability of suitable habitat over the long-term. As previously described, wildfire significantly increases the invasion of undesirable plant species, particularly cheatgrass. Because cheatgrass infested areas burn at a much greater frequency, every 3-5 years (as cited in TNC 2003), native shrubs and perennial grasses cannot recover and after a few wildfire cycles, a cheatgrass monoculture develops (TNC 2003). The draft management plan for the Farm Conservation Area (TNC 2003) identifies that the alteration of the natural fire regime has already modified the composition of the grassland and shrub-steppe communities within the Conservation Area where the loggerhead shrike hunts and nests. An uncontrolled wildfire could eliminate suitable habitat for the loggerhead shrike within the Conservation Area.

To offset the loss of loggerhead shrike habitat within the Development Area and address the conservation needs identified above, the Farm has permanently conserved large land areas (Conservation Areas) containing suitable habitat for the loggerhead shrike and has committed to finance the management of the areas for the conservation of the Covered Species. The Farm Conservation Areas includes an estimated 5,663 acres of suitable loggerhead shrike habitat, which represents approximately 51 percent of the suitable habitat located within the Covered Area. The permanent conservation of large contiguous areas such as the South Farm Conservation Area consequently reduces habitat fragmentation and increases habitat connectivity. The covered area will provide local loggerhead shrikes with breeding, roosting, resting, and foraging habitat they require. The 250-foot buffer between the Farm Development Area and the Conservation Areas, established by the Farm, will reduce the potential for indirect effects associated with the Farm's future activities.

The Farm's commitment to contribute a maximum of $130,000 annually to TNC for management activities provides the opportunity for TNC to maintain and where feasible, improve areas with large structure sagebrush and bitterbrush, especially at sites with juniper, sagebrush, and a bare soil understory. Habitat enhancement will be accomplished with weed

control and wildfire suppression efforts and could possibly increase loggerhead shrike population numbers and distribution. TNC has developed a draft management plan (TNC 2003) for the Conservation Areas which affords them the opportunity to test a variety of habitat management techniques. This type of adaptive plan is flexible enough to account for unforeseen circumstances and provides the opportunity to identify which techniques have proven to be most effective. Collecting this type of information may have implications for implementation of management activities throughout the species range. The Farm's implementation of the Fire Response Plan will likely reduce effects to the loggerhead shrike caused by potential catastrophic events.

PGE

There are approximately 439 acres of suitable shrike habitat within the PGE Plant property which represents approximately 4 percent of the suitable habitat within the Covered Area. This area is estimated to support approximately 2.7 shrike territories. Additionally, approximately 78 acres of suitable habitat and 0.5 territories are located in the PGE Conservation Area.

PGE's need for additional by-product storage is anticipated to have an adverse effect on the shrike by changing the condition of approximately 220 acres (2 percent of the total within the Covered Area) of suitable habitat on PGE Plant Property south of Carty Reservoir. Approximately 40 acres of the total area will be developed and in use at any one time as a by-product disposal site, or landfill. New landfills of a similar size will be developed incrementally over time as needed. When an existing landfill becomes full, it will be decommissioned, covered with at least 24 inches of soil, and revegetated. PGE's removal of 220 acres of suitable shrike habitat is anticipated to modify habitat enough to cause harm of individuals by impairing essential behavioral patterns including breeding, feeding, and sheltering. Over the life of the Agreement this 220 acres could support a maximum of two breeding pairs, and therefore, harm of two breeding pairs is anticipated to occur as a result of implementation of PGE's Covered Activities.

It is anticipated that shrike habitat within and adjacent to the PGE Conservation Area may be impacted by occasional grazing, fence maintenance, fire suppression, environmental monitoring and recreation. Impacts associated with these Covered Activities will be temporary and their effects short term. These activities are not anticipated to harm any shrike individuals directly.

On-going operation of the current 40-acre ash disposal area, or landfill, south of Carty Reservoir does not appear to adversely affect the loggerhead shrike. Ash is contained within the landfill; fugitive dust and leakage are controlled by watering fresh ash daily. Sampling and analysis of monitoring wells around the landfill as part of the Boardman Plant Groundwater Monitoring Program have confirmed no impact to groundwater from leaching (PGE 2002b).

It is anticipated that maintenance and improvement where feasible of the PGE Conservation Area, in addition to the Conservation benefits described in the Farm's effects section above, will result in a long-term beneficial impact to the loggerhead shrike population.

TNC

Loggerhead shrike habitat occurs throughout the South Farm Conservation Area. According to population estimates, there are approximately 34 territories over the 4,990 acres of low and medium quality habitats within this area. All activities over the South Farm Conservation Area will be conducted with the intent of avoiding any direct or indirect impact to loggerhead shrikes or their habitat; however, some of the Covered Activities may have short-term adverse effects on this species habitat. We do not anticipate that any shrike individuals will be directly harmed or harassed as a result of the implementation of TNC's Covered Activities.

As previously discussed, fire suppression activities may result in disturbance of shrike nesting and foraging habitats, however TNC's role is to assist the Farm to help reduce harm of individuals and minimize impacts to suitable habitat, restore impacted areas and report estimated losses to the our office. Fence removal and maintenance may impact roosting habitats, however shrikes are anticipated to find suitable replacement within close proximity to any of these temporary disturbances. As previously indicated, TNC anticipates they will construct sections of fence as needed for habitat management purposes, and this will likely result in a neutral effect. Biological monitoring may temporarily impact shrikes, but this monitoring will be strictly observatory and is not anticipated to result in harassment of harm of shrike individuals. Vegetation improvement activities, such as drilling, weed management, and prescription burning, will be planned to avoid any impacts to shrikes or their habitats. Prescribed burning will only occur in the grassland habitat and is not expected to impact the loggerhead shrike breeding habitat (L. Nelson, pers. comm.). If the Farm, ODFW, Service, and TNC mutually elect to allow hunting on the Farm Conservation Areas, it is not anticipated to impact the loggerhead shrike or its habitat as hunting will not be allowed during the primary breeding season. Over the long term, it is anticipated that the status of the loggerhead shrike will improve through the Covered Activities and Conservation Commitments on the Farm Conservation Area.

Ferruginous Hawk

The Farm

As previously described, population estimates for the ferruginous hawk in the Covered Area is based on the number of known active nests and estimated nest territory sizes. The greatest direct impact to the ferruginous hawk will result from planned conversion of the south future agricultural area, an area of 1,570 acres in the southwest portion of the Farm. This area currently contains approximately four nest trees which will be removed when the area is converted to agriculture. One of these nests was considered active while the other three were inactive in 2001.

Studies on the adjacent Naval Facility discovered an average of 1.6 miles between ferruginous hawk nests (Holmes and Geupel 1998). The greatest distance between the potential nest trees identified on the future agricultural area is approximately two miles; therefore, removal of these four potential nest trees may result in an impact to a maximum of two potential nesting territories. Conversion of this area to agriculture will result in the loss of 280 acres of suitable breeding habitat and approximately 1,570 acres of ferruginous hawk foraging habitat.

Since one of the Farm's Covered Activities includes the development of all undeveloped portions of the Farm Development Areas, it is assumed that in addition to the impacts noted above, all ferruginous hawk nesting, foraging and roosting habitat will be removed from the future development areas. There are at least two nest trees within the undeveloped portions of the farm outside of the future agricultural area, but additional potential nest trees may occur further north within the Willow Creek Canyon area. Assuming maximum saturation of this area, there is potential for an additional three nesting territories outside the future agricultural area. If development within the Willow Creek Canyon area occurs, this could result in the loss of a maximum of five potential ferruginous hawk nesting territories on the Farm over the life of the Agreement. Outside the Willow Creek Canyon area, there is no known ferruginous hawk habitat within the undeveloped portions of the Farm. The Farm will avoid removing breeding habitat during the breeding season and will notify our office 30 days prior to habitat removal. However, the Farm's alteration or removal of all suitable hawk breeding habitat within the development area is anticipated to modify habitat enough to cause harm of individuals by impairing essential behavioral patterns including breeding, feeding, and sheltering. Over the life of the Agreement (assuming hawk saturation in this area), this area is estimated to support a maximum of five breeding pairs, and therefore, harm of five breeding pairs is anticipated to occur as a result of implementation of the Farm's Covered Activities.

Grazing on the Farm Conservation Areas is considered a Farm activity and will occur only on the Farm Conservation Areas until 2005, without the opportunity to extend the lease. Grazing during this period may impact the ferruginous hawk through the degradation of foraging habitat and nest trees, and the short-term disturbance during turn-out and round-up of cattle.

Farm activities may disturb other ferruginous hawks within the Covered Area. This disturbance may occur by limiting the use of adjacent suitable habitat, or it may occur through direct disturbance of individuals should ferruginous hawks enter an active agricultural area.

The Wildfire Response Plan (Appendix I of the Agreement) identifies the Farm as the permittee with first response responsibility for all range fires. Fire control and suppression will emphasize habitat protection where feasible and limit ground disturbance to the greatest extent practicable. Direct attack with water is the preferred suppression strategy. If heavy machinery such as farm discs and bulldozers, is used, it will only be used to cut off the head of the fire to stop forward movement. Equipment access (direct attack with water and discing) is not anticipated to result in the direct harm of hawk individuals but could slightly reduce the suitable habitat available in the short-term and result in harassment of individuals. If fire suppression in hawk breeding habitat is necessary between late March and mid-June, there is potential for hawk nestlings to be harmed. All of the above described fire suppression activities may adversely affect ferruginous hawks and their habitat, however, discing a fire break will result in the worst case scenario, as described below.

Given the high diversity of the habitat on the South Farm Conservation Area and the inherent unpredictability of fire, it is difficult to assess the number of individuals that may be impacted as a result of discing a fire break. However, it is clear that the loss of hawk individuals and nestlings resulting from necessary fire suppression activities will be less than the loss that would naturally occur because of a catastrophic fire event. Within the South Farm Conservation Area,

the average width required for an effective fire break, if necessary, is estimated to be 50 feet (15.2 m) (Jim Brewer, Threemile Canyon Farm Manager, Boardman, Oregon, pers comm., 2003). As previously discussed, the worst anticipated fire break is estimated not to exceed 2 miles (3219 m) (Leslie Nelson, pers. comm., 2004). The maximum area anticipated to be affected for a given fire break is 12 acres (48,929 m^2) (15.2 m* 3219 m). The mean territory size for hawks is 2.2 mi^2 (1408 acres) (Marshall et al. 2003). Since the maximum impact resulting from a given fire break is estimated to be 12 acres, we anticipate that less than one nest will be impacted for any given fire break (i.e., 0.008 nest/12 acres). Using the worst anticipated fire cycle of every 3-5 years, a maximum of eight fires is expected occur throughout the life of the Agreement. Therefore, we estimate a maximum of one nest (0.07 nest) may be impacted as a result of fire suppression activities. Using an average clutch size of four eggs (Smith and Murphy 1978; Smith et al. 1981), we anticipate no more than 4 nestlings may be harmed as a result of nest abandonment resulting from fire suppression activities.

This loss of hawk nestlings would likely naturally occur as a result of an uncontrolled wildfire near an active hawk nest. An overall beneficial effect to hawk suitable habitat is anticipated to result from fire control activities because an uncontrolled wildfire in the Conservation Areas could significantly reduce the availability of suitable habitat over the long-term, particularly by reducing available prey populations.

To offset impacts associated with the Farm's Covered Activities and address the conservation needs identified above, the dedication of the South Farm Conservation Area protects 15 of the 21 known ferruginous hawk nesting trees. A total of 2,685 acres of suitable nesting and roosting habitat for the hawk occurs in the South Farm Conservation Area which is in addition to the available foraging habitat that exists throughout the entire approximately 22,000-acre Conservation Area. As previously described, the Farm's financial contribution to TNC for the management of the Conservation Area will provide for the maintenance and possible enhancement of ferruginous hawk breeding habitat and native and perennial grasses and shrubs to promote healthy prey populations. As previously described, fire suppression and control will benefit the species by protecting valuable nest sites and protecting the surrounding grasslands (prevention of cheatgrass invasion previously described) which provide valuable foraging habitat for the species. Fire is a potential catastrophic event that threatens local ferruginous hawk populations (TNC 2003). Severe fires can wipe out nesting trees. The combined application of fire suppression, control, and prescribed burns resulting can help decrease the fuel load of wildfires. Buffers are important conservation measures for ferruginous hawks as they are extremely sensitive to nest disturbance. A 0.6 mile radius buffer zone will be applied and enforced around nest sits on the Farm Conservation Areas during the nesting season. This buffer zone will help decrease nest disturbance, thereby increasing nest productivity and reducing nest desertion. Ferruginous hawks will also indirectly benefit from the 250-foot buffer between the Farm and the Farm Conservation Area because this area may be utilized by the Washington ground squirrel for dispersal.

PGE

There have been no ferruginous hawk nests located on the PGE Plant property; however, there is potential ferruginous hawk foraging habitat within the Plant Property south of Carty Reservoir. PGE will eventually need to develop a portion of this area for by-product disposal. This will

occur incrementally over time and could eventually result in the removal of scattered juniper trees found over approximately 220 acres. Foraging habitat will be temporarily affected during the time when a new disposal site, or landfill, is created and a decommissioned site becomes revegetated and populated by prey species. Although no known nest sites currently occur on this property, the area provides enough foraging habitat to support one hawk territory. PGE's removal of all suitable hawk habitat within their Development Area is anticipated to modify habitat enough to cause harm of individuals by impairing essential behavioral patterns including feeding and sheltering. Over the life of the Agreement (assuming hawk saturation in this area), this area is capable of supporting a maximum of one breeding pair, and therefore, harm of one breeding pair is anticipated to occur as a result of implementation of PGE's Covered Activities.

Fire suppression (effects previously described in the Farm section) and grazing have the potential to impact ferruginous hawk foraging areas, while human activities associated with grazing, environmental monitoring and recreation have the potential to disturb ferruginous hawks during the nesting season. To mitigate potential impacts to the hawk and allow for existing facilities and operations, PGE has committed to maintain an undeveloped buffer zone of a 0.6-mile radius around known ferruginous hawk nests. This buffer will minimize the potentially harmful human disturbances resulting from these activities during the nesting season (March 1 to July 15).

For all of the same reasons described in the Farm effects discussion for this species, it is anticipated that maintenance and improvement of the PGE Conservation Area, in addition to the Conservation Commitments of all parties to this Agreement, will result in a long-term beneficial impact to the ferruginous hawk population.

TNC

The intent of the TNC Covered Activities is to maintain, and improve native vegetation conditions and wildlife habitat on the Farm Conservation Areas. All activities will be conducted with the intent of avoiding any direct or indirect impact to ferruginous hawks or their habitat; however, some activities, such as those associated with habitat restoration, may result in a temporary loss of habitat. Biological monitoring will be strictly observatory and therefore is anticipated to result in an insignificant level of disturbance to individuals. As previously discussed, fire suppression activities may result in disturbance of hawk nesting and foraging habitats, however TNC's role is to assist the Farm to help reduce harm of individuals, minimize impacts to suitable habitat, restore impacted areas, and report estimated losses to our office.

If the Farm, ODFW, TNC, and the Service mutually elect to allow hunting on the Farm Conservation Areas, it is not anticipated to impact the ferruginous hawk or its habitat as hunting will not be allowed during the primary breeding season. Over the long term, it is anticipated that the status of the ferruginous hawk will improve through the conservation commitments on the Farm Conservation Areas.

Sage Sparrow

The Farm

The Covered Area provides a total of 3,344 acres of suitable sage sparrow habitat, all of which is located on the Farm's property. Of this habitat, approximately 710 acres (21 percent, all characterized as low quality) occurs in the southwest portion of the Farm, in the Future Agricultural Area. According to population estimates, this low quality habitat supports approximately seven potential sage sparrow territories. The Farm's Covered Activities may result in the removal of these territories on the Covered Area. The Farm will avoid removing breeding habitat during the breeding season and will notify our office 30 days prior to habitat removal. However, the Farm's removal of 710 acres of sage sparrow breeding habitat within their Development Area is anticipated to modify habitat enough to cause harm of individuals by impairing essential behavioral patterns including breeding, feeding and sheltering. Over the life of the Agreement, this area is estimated to support a maximum of seven breeding pairs, and therefore, harm of seven breeding pairs is anticipated to occur as a result of implementation of the Farm's Covered Activities.

Allowing grazing to occur within the Farm Conservation Areas through 2005 could potentially increase degradation of suitable sage sparrow habitat. However, grazing has been an ongoing activity in this area for over 60 years and therefore, one additional year of grazing is not anticipated to provide a measurable increased adverse effect. The Farm has agreed to improve grazing practices within the Conservation Areas, based on guidance provided by TNC and ODFW, in order to further minimize potential disturbance to native habitats and the Covered Species. Once the existing grazing lease on the Conservation Areas is terminated in 2005, grazing will only be allowed by TNC, if it is shown to have a net positive benefit to the Covered Species. We do not anticipate that any sage sparrow individuals will be harmed as a result of allowing grazing to occur in the Conservation Areas through 2005.

The effects associated with fire suppression activities are similar to those previously described for the loggerhead shrike. If the use of heavy machinery such as farm discs and bulldozers is necessary, the result may be disturbance of sage sparrow nesting and foraging habitats. All areas impacted as a result of fire suppression activities will be revegetated by TNC; however there may be a temporary loss of suitable habitat. Additionally, if fire suppression in sparrow breeding habitat is necessary between mid-April and mid-August, there is also potential for sage sparrow nestlings to be harmed. Given the high diversity of the habitat on the South Farm Conservation Area and the inherent unpredictability of fire, it is difficult to assess the number of individuals that may be impacted; however, it is clear that the loss of sparrow nestlings resulting from necessary fire suppression activities will be less than the loss that would naturally occur as a result of a catastrophic fire event.

It is not known if a wildfire will require the Farm to impact sparrow nestlings over the 25-year Agreement duration. However, we presume fire may cause loss of habitat and some mortality. As previously described, the maximum area anticipated to be affected for a given fire break is 12 acres (48,929 m^2). The average density of sage sparrows on the adjacent Naval Facility indicates an estimated one territory per 38 acres. Since the maximum impact resulting from a given fire break is estimated to be 12 acres, we anticipate less than one nest (0.32 nest) will be impacted for

any given fire break. Using the worst anticipated fire cycle of every 3-5 years, a maximum of eight fires is expected occur throughout the life of the Agreement. Therefore, we estimate a maximum of three nests (2.53 nests) may be impacted as a result of fire suppression activities. Using a maximum of four nestlings per nest (Marshall et al. 2003), we anticipate that no more than 12 nestlings will be impacted as a result of fire suppression activities. This number is likely an overestimate since there is a low likelihood of needing to create a fire break in the exact location of an occupied nest (particularly not every time a fire occurs). TNC will be on-site, as quickly as possible to assistant with fire suppression activities. They will work with the Farm to minimize the potential for impacts to nesting sage sparrows. As previously mentioned, discing fire breaks is not the preferred method of fire control.

An overall beneficial effect to sage sparrow breeding habitat is anticipated to result from fire control activities because an uncontrolled wildfire in the Conservation Area could significantly reduce the availability of suitable habitat over the long-term. As previously described, wildfire significantly increases the invasion of undesirable plant species, particularly cheatgrass. Because cheatgrass infested areas burn at a much greater frequency, every 3-5 years (as cited in TNC 2003), native shrubs and perennial grasses cannot recover and after a few wildfire cycles, a cheatgrass monoculture develops (TNC 2003). The draft management plan for the Farm Conservation Area (TNC 2003) identifies that the alteration of the natural fire regime has already modified the composition of the grassland and shrub-steppe communities within the Conservation Area where the sage sparrow forages and nests. An uncontrolled wildfire could eliminate suitable habitat for the sparrow habitat within the Conservation Area.

To offset the above described impacts and address the conservation needs identified above, the Farm's permanent conservation of the South Farm Conservation Area will protect all of the remaining 2,634 acres (79 percent, including some medium and high quality) of habitat on the Covered Area. This area is estimated to support 30 sage sparrow territories (81 percent estimated to occur within the Covered Area). As previously described, the long-term benefits of actively managing large tracts of lands (such as the Conservation Area) for the Covered Species will provide a number of benefits by reducing threats to the sage sparrow. These include prevention of catastrophic fire events which consequently maintains the integrity of suitable habitat, restoration of degraded habitat which may increase population and distribution in the area, and providing important habitat management information which may be beneficial to the species throughout its range.

PGE

There is no sage sparrow habitat identified within the PGE Plant property; therefore, there are no anticipated impacts to the sage sparrow or its habitat associated with the PGE Covered Activities.

TNC

Over the long term, it is anticipated that the status of the sage sparrow will improve through the Covered Activities and Conservation Commitments on the Farm Conservation Areas. All activities over the Farm Conservation Area will be conducted with the intent of avoiding any direct or indirect impact to sage sparrows or their habitat. However, similar to the other Covered

Species, some of Covered Activities such as habitat restoration, may have short-term effects on the species habitat. As previously discussed, fire suppression activities may result in disturbance of sage sparrow nesting and foraging habitats, however TNC's role is to assist the Farm to help reduce harm of individuals, minimize impacts to suitable habitat, restore impacted areas, and report estimated losses to our office. Biological monitoring, prescription burning (exclusively in the grasslands), vehicle access and cleanup of abandoned refuse sites are not anticipated to have any measurable impacts to the sage sparrow or suitable habitat. If the Farm, ODFW, USFWS and TNC mutually elect to allow hunting on the Farm Conservation Areas, it is not anticipated to impact the sage sparrow, as it will occur outside the breeding season.

V. CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this conference opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

We anticipate all existing threats to the covered species are reasonably certain to continue. As previously indicated, these include wildfire, agriculture and conversion of land for agriculture, grazing, road construction, and road maintenance.

VI. CONCLUSION

Washington Ground Squirrel

We anticipate the proposed action will adversely affect the Washington ground squirrel as described in the analysis above, including the loss of approximately 40 percent of its habitat in the Covered Area and an estimated maximum of 8.5 active sites as a result of habitat removal. We anticipate that this species will persist and possibly increase in numbers in the remaining 60 percent of the preferred habitat within the Conservation Areas, which is know to support 104 active squirrel sites. The Conservation Areas provide large contiguous blocks of habitat that will be managed and monitored to benefit the species. Implementation of the conservation measures identified in the Agreement will reduce the potential for direct harm of individuals (only expected to occur in the Radar Range). Additionally, implementation of the Fire Response Plan is anticipated to significantly reduce the potential of a catastrophic fire event, which could degrade a large portion of the preferred habitat currently supporting the only Oregon population of Washington ground squirrels. As discussed in the above effects analysis, the estimated impacts to squirrels associated with fire suppression activities (harm of no more than 40 active sites) is likely an overestimate. Nevertheless, loss of 38 percent of the active sites expected to occur within the Conservation Areas will not significantly reduce the numbers or distribution throughout the range of the population over the long-term. We anticipate that given TNC's commitment to restore all affected areas and manage the squirrel population for the benefit of the species, over the long-term the squirrel population will likely rebound and squirrels may recolonize areas affected by necessary discing actions.

After reviewing the current status of this species, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is our conference opinion that

the action, as proposed, is not likely to jeopardize the continued existence of the Washington ground squirrel. We reached this conclusion based on the long-term conservation benefit of permanently conserving an estimated 94 percent of the active squirrel sites expected to occur within the Covered Area (105 out of a possible 111.5 active sites). The Conservation Areas and the adjacent Naval Facility support the only sizeable Oregon squirrel population. We anticipate the permanent protection and management of habitat for the Washington ground squirrel, associated with issuance of this Agreement, will increase the likelihood of the continued existence of this species. No critical habitat has been designated for this species, therefore, none will be affected.

Loggerhead Shrike

We anticipate the proposed action will adversely affect the loggerhead shrike as described in the analysis above, including the loss of 47 percent (5,210 acres) of its habitat in the Covered Area. We anticipate that this species will persist in the 51 percent of the potential habitat located within the Conservation Areas. The Conservation Areas contain an estimated 34.7 of the 56.6 (61 percent) loggerhead shrike territories while 21.9 territories will remain located on the Farm and PGE Plant property. Although there will be loss of 47 percent of suitable habitat, the Agreement affords the conservation of the 61 percent of the total estimated territories within the Covered Area. The Conservation Areas contain the majority of the best quality habitat in the Covered Area. Implementation of the conservation measures identified in the Agreement will reduce the potential for any direct impacts to this species. The Conservation Areas provide a large contiguous habitat block that will be managed and monitored over the long-term to benefit the loggerhead shrike.

Additionally, implementation of the Fire Response Plan is anticipated to significantly reduce the potential a catastrophic fire that could eliminate large blocks of suitable breeding habitat for this species. As discussed in the above effects analysis, the harm of an estimated six shrike nestlings associated with fire suppression activities is regarded as a maximum estimate. However, if this loss were to occur, we do not anticipate this will significantly reduce the numbers or distribution throughout the species range. We anticipate that given TNC's commitment to restore all affected areas and manage the entire Conservation Area for the benefit of the species over the long-term, the shrike population in the area will rebound.

After reviewing the current status of this species, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is our conference opinion that the action, as proposed, is not likely to jeopardize the continued existence of the shrike. We reached this conclusion based on the species widespread distribution throughout the Conservation Areas and because the impacts associated with loss of this species' habitat, when viewed in conjunction with the permanent protection and management of the Conservation Areas, is not anticipated to result in an appreciable reduction in the number, reproduction, or distribution of this species throughout its range. In fact, we anticipate that implementation of the proposed action will result in an increase in numbers and distribution within the Conservation Areas and surrounding habitat. No critical habitat has been designated for this species, therefore, none will be affected.

Ferruginous Hawk

We anticipate that implementation of the proposed action may harm an estimated six hawk territories (five on the Farm's property and one on PGE's property) over the life of the Agreement, as described in the analysis above. Surveys of the Covered Area have identified a total of 21 possible nest sites. Of the 21 nest sites, five were identified as active hawk nests sites, only one of which is located within the proposed Development Area and four of which were located within the Conservation Areas. Fifteen of the 21 known ferruginous hawk nesting trees are located on the Conservation Area which contains 73 percent of the known breeding habitat. Additionally, the majority of the potential habitat (sandy-sagebrush-juniper communities) will be included in the Conservation Area. The Conservation Areas provide large contiguous habitat blocks that will be managed and monitored for the benefit the hawk providing suitable breeding, roosting, resting, and foraging habitat. Implementation of the conservation measures identified in the Agreement will reduce the potential for any direct impacts to this species. Additionally, implementation of the Fire Response Plan is anticipated to significantly reduce the potential for catastrophic fire that could eliminate nesting trees.

After reviewing the current status of this species, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is our conference opinion that the action, as proposed, is not likely to jeopardize the continued existence of the ferruginous hawk. We reached this conclusion based on the widespread distribution of the species habitat over the Conservation Areas and because the impacts associated with loss of this species' habitat, when viewed in conjunction with the permanent protection and long-term management the Conservation Areas for the benefit of this species, is not anticipated to result in an appreciable reduction in the numbers, reproduction, or distribution of this species throughout its range. Additionally, the Conservation Area represents of one of the largest contiguous tracts of shrub-steppe habitat left in the Columbia River Basin. No critical habitat has been designated for this species, therefore, none will be affected.

Sage Sparrow

We anticipate the proposed action will adversely affect the sage sparrow as described in the analysis above, including the loss of 21 percent of its habitat in the Covered Area. We anticipate that this species will persist in the remaining 79 percent of the potential habitat within the Conservation Area and population numbers and distribution may increase over the long-term. The Conservation Area, contains an estimated 30.5 of the 37.6 sage sparrow territories while 7.1 territories are located on the Farm Development Area. The loss of this habitat may result in the loss of a maximum of seven breeding pairs over the life of the Agreement. The Agreement will result in the conservation of the 81 percent of the total estimated territories within the Covered Area. The Conservation Areas contain the majority of the best quality habitat occurring in the Covered Area. Implementation of the conservation measures identified in the Agreement will reduce the potential for any direct impacts to this species. The Conservation Areas provide a large contiguous habitat block that will be managed and monitored over the long-term to benefit the loggerhead shrike.

Additionally, implementation of the Fire Response Plan is anticipated to significantly reduce the potential for a catastrophic fire event to occur, which otherwise could eliminate suitable breeding

and foraging habitat within the Conservation Area. As discussed in the above effects analysis, the loss of an estimated 12 sparrow nestlings over the 25-year life of the Agreement resulting from fire suppression activities is likely an overestimate. However, if this loss were to occur, we do not anticipate this will significantly reduce the numbers or distribution throughout the species range. We anticipate that given TNC's commitment to restore all affected areas and manage the entire Conservation Area for the benefit of the species over the long-term, the sparrow population in the area will likely be maintained or increased.

After reviewing the current status of this species, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is our conference opinion that the action, as proposed, is not likely to jeopardize the continued existence of the sage sparrow. We reached this conclusion based on the widespread distribution of suitable habitat on the Conservation Area and because the impacts associated loss of this species' habitat, when reviewed in conjunction with the permanent protection and management of the Conservation Area, is not likely to result in an appreciable reduction in the numbers, reproduction, or distribution of this species throughout its range. Additionally, the Conservation Area represents of one of the largest contiguous tracts of suitable habitat left in the Columbia River Basin. No critical habitat has been designated for this species, therefore, none will be affected.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. As previously described, take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The prohibitions against taking the species found in section 9 of the Act do not apply until the species is listed. However, the OFWO advises the RO to consider implementing the following reasonable and prudent measure. If this conference opinion is adopted as a biological opinion following a listing or designation, this measure, with its implementing term and condition, will be non-discretionary.

AMOUNT OR EXTENT OF TAKE ANTICIPATED

Washington Ground Squirrel

We anticipate incidental take of 6.5 active Washington ground squirrels sites will occur as a result of the Farm's development of the Radar Range. This incidental take is expected to be in the form of death or injury.

We anticipate incidental take of no more than 40 active Washington ground squirrel sites will result from the Farm's fire suppression activities. This take is expected to be in the form of death or injury.

We anticipated incidental take of two active Washington ground squirrel sites will result from PGE's development of by-product storage facilities. This take is anticipated to be in the form of harm (death or injury).

Loggerhead Shrike

Over the life of the Agreement, we anticipate the Farm will incidentally to take 19 breeding pairs as a result of developing the Farm Development Area. PGE will take two breeding pairs as a result of developing the by-product disposal site. This take is anticipated to occur in the form of harm (individuals unable to breed, forage, or shelter). Additionally, we anticipate incidental take of six nestlings as a result of the Farm's implementation of fire suppression activities. This take is anticipated to be in the form of harm (death or injury).

Ferruginous Hawk

We anticipate the incidental take of a maximum of six hawk breeding pairs over the life of the Agreement. The Farm is anticipated to take five breeding pairs as a result of developing the Farm Development Area and PGE is anticipated to take one breeding pair as a result of developing the by-product disposal site. This take is anticipated to occur in the form of harm (individuals unable to breed, forage, or shelter). Additionally, we anticipate incidental take of four nestlings as a result of the Farm's implementation of fire suppression activities. This take is anticipated to be in the form of harm (mortality).

Sage Sparrow

Over the life of the Agreement, we anticipate the Farm will incidentally to take seven breeding pairs as a result of developing the Farm Development Area . This take is anticipated to occur in the form of harm (individuals unable to breed, forage, or shelter). Additionally, we anticipate incidental take of 12 nestlings as a result of the Farm's implementation of fire suppression activities. This take is anticipated to be in the form of harm (death or injury).

REASONABLE AND PRUDENT MEASURE

We believe the following reasonable and prudent measure is necessary and appropriate to minimize incidental take of the Covered Species:

The OFWO shall closely track all take occurring as a result of implementation of Covered Activities.

TERMS AND CONDITIONS

The OFWO, in coordination with the RO, has a continuing duty to monitor the impacts associated with the activities covered by the Agreement. The Service shall review all monitoring reports submitted by TNC documenting current estimated population sizes of the Covered Species and any adverse effects (including the mortality of nestlings) that have occurred as a result of fire suppression activities. Additionally, the Service will maintain records of all notifications provided by the Farm regarding the development of habitat in order to track estimated take over the 25-year Agreement duration. Otherwise the protective coverage of section 7(o)(2) may lapse.

The RO shall include the following as conditions of the permits:

1. The applicants shall immediately report any mortality or injury of the Covered Species to the OFWO, La Grande Field Office. Please address reports to:

   Field Supervisor
   U.S. Fish and Wildlife Service
   La Grande Field Office
   3502 Hwy 30
   La Grande, OR 97850

2. As described in the Agreement, TNC will provide a written report to the Service on the progress of actions and any apparent impact on or benefits to the species. TNC will also provide a written report documenting the data collected during species monitoring. Please address reports to:

   Field Supervisor
   U.S. Fish and Wildlife Service
   La Grande Field Office
   3502 Hwy 30
   La Grande, OR 97850

VII. CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

The RO and OFWO should continue to work cooperatively with private land owners to develop more long-term agreements providing permanent protection of sensitive species.

VIII. REINITIATION REQUIREMENT

This concludes the conference with the Regional office on the issuance of the enhancement of survival permits for the Threemile Canyon Farms Multi-Species Candidate Conservation Agreement with Assurances. You may ask the OFWO to confirm the conference opinion as a biological opinion issued through formal consultation if any of the Covered Species become listed or critical habitat is designated. The request must be in writing. If the OFWO reviews the proposed action and finds that there have been no significant changes in the action as planned or in the information used during the conference, the OFWO will confirm the conference opinion as the biological opinion on the project and no further section 7 consultation will be necessary.

After listing of the Covered Species as endangered/threatened and/or designation of critical habitat for the Covered Species and any subsequent adoption of this conference opinion, the Federal Agency shall request reinitiation of consultation if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action.

The incidental take statement provided in this conference opinion does not become effective until the species is listed and the conference opinion is adopted as the biological opinion issued through formal consultation. At that time, the project will be reviewed to determine whether any take of the Covered Species has occurred. Modification of the opinion and incidental take statement may be appropriate to reflect that take. No take of the Covered species may occur between the listing of the Covered species and the adoption of the conference opinion through formal consultation, or the completion of a subsequent formal consultation.

We appreciate the opportunity to work closely with you in attaining our mutual goals for the enhancement and recovery of listed species. If you have any further questions regarding this consultation, please contact Mikki Collins or Laura Todd at (503) 231-6179.

LITERATURE CITED

Altman, B., and A. Holmes. 2000. Conservation strategy for landbirds in the Columbia Plateau of eastern Oregon and Washington. Prepared for Oregon-Washington Partners in Flight. (Final Draft, February 2000).

Bailey, V. 1936. The mammals and life zones of Oregon. North American Fauna, No. 55:1-416.

Bechard, M.J. and J.K. Schmutz. 1995. Ferruginous Hawk. in A. Poole and F. Gill, editors. The Birds of North America, No. 172. The American Ornithologist's Union. Cornell Laboratory of Ornithology and The Academy of Natural Sciences.

Bechard, M.J., R.L Knight, D.G. Smith, and R.E. Fitzner. 1990.Nest sites and habitats of sympatric hawks (*Buteo* spp.) in Washington. Journal of Field Ornithology 61:159-170. in The Nature Conservancy (TNC).1999. Species Management Abstract: Ferruginous Hawk (*Buteo regalis*).

Betts, B.J. 1990. Geographic distribution and habitat preferences of Washington ground squirrels (*Spermophilus washingtoni*). Northwestern Naturalist 71:27-37.

Betts, B.J. 1999. Current status of Washington ground squirrels in Oregon and Washington. Northwestern Naturalist 80:35-38.

Blumton, A.K., J.D. Fraser, R.W. Young, S. Goodbred, S.L. Porter, and D.L. Luukkonen. 1990. Pesticide and PCB residues for loggerhead shrikes in the Shenandoah Valley, Virginia, 1985-1988. Bulletin of Environmental Contamination and Toxicology 45:697-702.

Brooks, B.L., and S.A. Temple. 1990. Habitat availability and suitability for loggerhead shrike in the upper Midwest. The American Midland Naturalist, 123(1): 75-83.

Cade, T.J., and C.P. Woods. 1997. Changes in distribution and abundance of the Loggerhead Shrike. Conservation Biology, 11(1): 21-31.

Cadman, M.D. 1985. Status report on the loggerhead shrike (*Lanius ludovicianus*) in Canada. Committee on the status of endangered wildlife in Canada. 95 pp.

Campbell, K.F. 1999. Species account for West Mojave Plan: Loggerhead shrike. Bureau of Land Management, California Desert District Home Page. http://www.ca.blm.gov/cdd/Losh1.pdf (December 4, 2002)

Carlson L., G. Geupel, J. Kjelmyr, J. Maciver, M. Morton, and N. Shishido. 1980. Geographical range, habitat requirements, and a preliminary population study of *Spermophilus washingtoni*. Final Technical Report, National Science Foundation Student-originated Studies Program. 24 pp.

Chase, M.K, and B.A. Carlson. 2002. California Partners in Flight Coastal Scrub and Chaparral Bird Conservation Plan Draft Species Account. Prepared for California Partners in Flight (Draft, June, 2002)

CH2M Hill. 2000. Washington ground squirrel survey, April 12 and 13, 2000: Beef Northwest, Boeing Boardman Tract, Morrow County, Oregon. Field Report to Beef Northwest. 8 pp.

Csuti, B.A., A.J. Kimerling, T.A. O'Neil, M.M. Shaughnessy, E.P. Gaines, and M.M.P. Huso. 1997. Atlas of Oregon wildlife: distribution, habitat, and natural history. Oregon State University Press. Corvallis, Oregon. 492 pp.

David Evans and Associates. 2003. Multi-Species Candidate Conservation Agreement with Assurances. Portland, Oregon.

Dechant, J.A., M.L. Sondreal, D.H. Johnson, L.D.Igl, C.M. Goldade, P.A. Rabie, and B.R. Euliss. 1999. Effects of management practices on grassland birds: Ferruginous Hawk. Northern Prairie Wildlife Research Center, Jamestown, North Dakota. Jamestown, North Dakota: Northern Prairie Wildlife Research Center Home Page. http://www.npwrc.usgs.gov/resource/literatr/grasbird/ferhawk/ferhawk.htm. February 12, 2000.

Filipi, D.E. 2000. Incidental Take Application for the Washington ground squirrel. Stoel Rives, LLP, Counsel for Inland Land Co., LLC. Portland, OR 4 pp. + map

Gabrielson, I.N., and S.G. Jewett. 1940. Birds of Oregon. State Monographs, Studies in Zoology, No. 2. Oregon State College, Corvallis, OR in Woods, C.P., and T.J. Cade. 1996. Nesting habits of the Loggerhead Shrike in sagebrush. Condor, 98: 75-81.

Gilligan, J., M. Smith, D. Rogers, A. Contreras, editors. 1994. Birds of Oregon. Cinclus Publications, McMinnville, Oregon.

Greene, E. 1999. Abundance and habitat associations of Washington ground squirrels in North-Central Oregon. M.S. Thesis, Oregon State University, Corvallis, OR. 59 pp.

Hall, R. S., et al. 1988. Ferruginous hawk. Pages 111-118 in Glinski et al., editors Proceedings of the Southwest Raptor Manage. Symposium and Workshop. National Wildlife Federation Science and Technical Series No. 11 in The Nature Conservancy (TNC).1999. Species Management Abstract: Ferruginous Hawk (*Buteo regalis*).

Holmes, A.L., and G.R. Geupel. 1998. Avian populations studies at Naval Weapons Systems Training Facility, Boardman, Oregon. Point Reyes Bird Observatory. Stinson Beach, California.

Howell, A.H. 1938. Revision of the North American ground squirrels with a classification of the North American Sciuridae. North American Fauna 56:69-75.

Inland Land Company, LLC. 2000. Letter from Mr. Bob Hale to the Oregon Fish and Wildlife Commission regarding the petition to list the Washington ground squirrel under the Oregon Endangered Species Act. Inland Land Company, LLC, Hermiston, Oregon. 2 pp.

Jewett, S.G., W.P. Taylor, W.T. Shaw, and J.W. Aldrich. 1953. Birds of Washington State. University of Washington Press, Seattle, Washington. in Woods, C.P., and T.J. Cade. 1996. Nesting habits of the Loggerhead Shrike in sagebrush. Condor, 98: 75-81

Knick, S.T., and J.T. Rotenberry. 1995. Landscape characteristics of fragmented shrubsteppe habitats and breeding passerine birds. Conservation Biology, 9(5): 1059-1071.

Leu, M. and D.A. Manuwal. 1996. Habitat requirements, status, and management of the loggerhead shrike on the Yakima Training Center. Final report. College of Forest Resources, University of Washington. 88 pp. in U.S. Fish and Wildlife Service (USFWS). 2000. Loggerhead Shrike Status Assessment. Prepared by Lori Pruitt, USFWS, Bloomington, Indiana. 169 pp.

Lymn, N. and S.A. Temple. 1991. Land-use changes in the Gulf Coast region: links to declines in Midwestern loggerhead shrike populations. Passenger Pigeon 53: 315-325.

Marr, V. 2003. Unpublished Washington ground squirrel survey data collected on the Boardman Naval Facility.

Martin, J.W., and B.A. Carlson. 1998, Sage Sparrow. in A. Poole and F. Gill, editors. The Birds of North America, No. 326. The American Ornithologist's Union. Cornell Laboratory of Ornithology and The Academy of Natural Sciences.

Marshall, D.B., M.W. Chilcote, and H. Weeks. 1996. Species at risk: sensitive, threatened, and endangered vertebrates of Oregon. 2nd edition. Department of Fish and Wildlife, Portland, Oregon .

Marshall, D.B., M. Chilcote, H. Weeks. Sensitive Vertebrates of Oregon. 1st edition. Oregon Department of Fish and Wildlife, Portland, Oregon.

Marshall, D.B., M.G. Hunter, and A.L. Contreras, Editors. 2003 Birds of Oregon: A General Reference. Oregon State University , Corvallis, Oregon. Pp. 158-159, 398-400, 548-550.

Miller, A.H. 1931. Systematic Revision and Natural History of the American Shrikes (Lanius). University of California, Publications in Zoology. 38:11-242

Morgan, R.L. and M. Nugent. 1999. Status and habitat use of the Washington ground squirrel (*Spermophilus washingtoni*) on State of Oregon lands, South Boeing, Oregon in 1999. Oregon Department of Fish and Wildlife, Portland, OR. 27 pp.

Olendorff, R.R. 1993. Status, biology, and management of ferruginous hawks: a review. Raptor Research and Technical Assistance Center, Spec. Rep. U.S. Dept. Interior, Bur. Land Manage., Boise, Idaho. 84 pp. in The Nature Conservancy (TNC).1999. Species Management Abstract: Ferruginous Hawk (Buteo regalis).

Oregon Department of Fish and Wildlife (ODFW). 1999. Washington ground squirrel biological status assessment. ODFW, Portland, OR. 62 pp.

Paige, C. and S.A. Ritter. Birds in a sagebrush sea: managing sagebrush habitats for bird communities. Partners in Flight, Western Working Group.

Portland General Electric (PGE), Department of Environmental Services. 1994. Technical Basis Document-015: Land Management at the Boardman Plant.

_____. 1996. Ecological monitoring program for the Boardman coal-fired plant: October 1995-September 1996. PGE 3005-96.

_____. 1997. Ecological monitoring program for the Boardman coal-fired plant: October 1996-September 1997. PGE 3005-97.

_____. 1999. Ecological monitoring program for the Boardman coal-fired plant: October 1998-September 1999. PGE 3005-99.

_____. 2000. Ecological monitoring program for the Boardman coal-fired plant: October 1999-September 2000. PGE 3005-2000.

_____. 2001. Ecological monitoring program for the Boardman coal-fired plant: October 2000-September 2001. PGE 3005-2001.

_____. 2002a. Ecological monitoring program for the Boardman coal-fired plant: October 2001-September 2002. PGE 3005-2002.

_____. 2002b. Groundwater monitoring program for the Boardman coal-fired plant: March 2002-September 2002. PGE 3006-2002.

Poole, L.D. 1992. Reproductive success and nesting habitat of loggerhead shrike in shrubsteppe communities. Master's Thesis, Oregon State University. Corvallis, Oregon.

Quade, C. 1994. Status of Washington ground squirrels on the Boardman Naval Weapons Systems Training Facility: evaluation of monitoring methods, distribution, abundance, and seasonal activity patterns. Unpublished report submitted to the U.S. Department of the Navy, Whidbey Island, Washington. 86 pp.

Reynolds, T.D. 1981. Nesting of the Sage Thrasher, Sage Sparrow, and Brewer's Sparrow in southeastern Idaho. Condor 83:61-64. in Chase, M.K, and B.A. Carlson. 2002. California Partners in Flight Coastal Scrub and Chaparral Bird Conservation Plan Draft Species Account. Prepared for California Partners in Flight (Draft, June, 2002)

Rickart, E.A, and Yensen, E. 1991. *Spermophilus washingtoni.* Mammalian Species 371:1-5.

Saab, V.A., and T.D. Rich. 1997 Large-scale conservation assessment for Neotropical migratory land birds in the interior Columbia River basin. Gen. Tech. Rep. PNW-GTR-399. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station

Sauer, J.R., J.E. Hines, and J. Fallon. 2001. The North American Breeding Bird Survey, Results and Analysis 1966-2000. Version 2001.2, USGS Patuxent Wildlife Research Center, Laurel, Maryland.

Sauer, J.R., J.E. Hines, G. Gough, I. Thomas, and B.G. Peterjohn. 1997. The North American Breeding Bird Survey Results and Analysis. Version 96.4. Pauxent Wildlife Research Center, Laurel, Maryland. Updated 29 July 1997 in Campbell, K.F. 1999. Species account for West Mojave Plan: Loggerhead shrike. Bureau of Land Management, California Desert District Home Page. <http://www.ca.blm.gov/cdd/Losh1.pdf >(December 4, 2002)

Schmutz, J.K. 1987. The effect of agriculture on ferruginous and Swainson's hawks. Journal of Range Management, 40(5): 438-440.

Sherman, P.W. 1999. Behavioral ecology of Washington ground squirrels (*Spermophilus washingtoni*). Unpublished report, Cornell University, Ithaca, NY. 9 pp.

Sherman, P.W. 2000. Distribution and behavior of Washington ground squirrels (*Spermophilus washingtoni*) in Central Washington. Unpublished report, Cornell University, Ithaca, NY. 13 pp.

Sherman, P.W. 2001. Distribution and status of Washington Ground Squirrels (*Spermophilus washingtoni*) in Central Washington. Unpublished report, Cornell University, Ithaca, NY. 10 pp.

Tesky, J.L. 1994. *Buteo regalis.* In U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (2002, September). Fire Effects Information System, (Online). Available: http://www.fs.fed.us/database/feis/ (December 4, 2002).

The Nature Conservancy (TNC). 1999. Species Management Abstract: Ferruginous Hawk (*Buteo regalis*).

The Nature Conservancy (TNC). 2003. Draft Management Plan for the Boardman Conservation Area. On file at USFWS.

U.S. Department of Agriculture. 1983. Soil Survey of Morrow County Area, Oregon. Soil Conservation Service, Oregon Agricultural Experiment Station, Corvallis, OR. 223 pp. + maps.

U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 3 vol. (Quigley, Thomas M., tech. Ed.; Interior Columbia Basin Ecosystem Management Project: scientific assessment). in Altman, B., and A. Holmes. 2000. Conservation strategy for landbirds in the Columbia Plateau of eastern Oregon and Washington. Prepared for Oregon-Washington Partners in Flight. (Final Draft, February 2000).

U.S. Fish and Wildlife Service (USFWS). 2000. Loggerhead Shrike Status Assessment. Prepared by Lori Pruitt, USFWS, Bloomington, Indiana. 169 pp.

U.S. Fish and Wildlife Service (USFWS). 1992. Endangered and threatened wildlife and plants. Notice of finding on petition to list the Ferruginous Hawk. Federal Register 57(161): 37507-37513. in The Nature Conservancy (TNC).1999. Species Management Abstract: Ferruginous Hawk (*Buteo regalis*).

U.S. Fish and Wildlife Service and Oregon Department of Fish and Wildlife. Cooperative Agreement between the United States Fish and Wildlife Service and Oregon Department of Fish and Wildlife, Endangered and Threatened Fish and Wildlife. 1986.

Vander Haegen, W.M., F.C. Dobler, and D.J. Pierce. 1999. Shrubsteppe bird response to habitat and landscape variables in eastern Washington, USA. Conservation Biology, 14(4): 1145-1160.

Verts, B.J. and L.N. Carraway. 1998. Land mammals of Oregon. University of California Press, Berkeley, California. 668 pp.

Vickerman, S., J. Belsky, and K.G. Anuta. 2000. Petition for emergency listing of the Washington ground squirrel under the Endangered Species Act. Defenders of Wildlife, Oregon Natural Desert Association, and Northwest Environmental Defense Center. Portland, Oregon. 19 pp. + exhibits.

Washington Department of Fish and Wildlife. 1998. WDFW Policy M-6001. Washington Department of Fish and Wildlife, Olympia, WA.

White, C.M., and T.L. Thurow. 1985. Reproduction of ferruginous hawks exposed to controlled disturbance. Condor 87: 14-22. in Bechard, M.J. and J.K. Schmutz. 1995. Ferruginous Hawk. in A. Poole and F. Gill, eds. The Birds of North America, No. 172. The American Ornithologist's Union. Cornell Laboratory of Ornithology and The Academy of Natural Sciences.

Wisdom, M.J., R.S. Holthausen, B.C. Wales, C.D. Hargis, V.A. Saab, D.C. Lee, W.J. Hann, T.D. Rich, M.M. Rowland, W.J. Murphy, and M.R. Eames. 2000. Source habitats for terrestrial vertebrates of focus in the interior Columbia basin: broad scale trends and management implications. Gen. Tech. Rep. PNW-GTR-485. Portland, Oregon.

Woods, C.P. 1995. Status of loggerhead shrike in sagebrush habitat of southwestern Idaho. Pages 150-154 in Yosef and F.E. Lohrer, eds. Shrikes (Laniidae) of the world: biology and conservation. Proceedings of the Western Foundation of Vertebrate Zoology 6(1): 1-343

Woods, C.P., and T.J. Cade. 1996. Nesting habits of the Loggerhead Shrike in sagebrush. Condor, 98:75-81.

Yosef, R. 1996. Loggerhead Shrike. in A. Poole and F. Gill, eds. The Birds of North America, No. 231. The American Ornithologist's Union. Cornell Laboratory of Ornithology and The Academy of Natural Sciences.