



# United States Department of the Interior



## FISH AND WILDLIFE SERVICE

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### Memorandum

To: Forest Resources Division Manager,  
Oregon Fish and Wildlife Office, Portland, Oregon

From: Endangered Species Division Manager,  
Oregon Fish and Wildlife Office, Portland, Oregon

Subject: Formal Consultation and Conference on Issuance of a Section 10(a)(1)(B) Permit for the Yamhill County Road Maintenance Habitat Conservation Plan

This document transmits the Oregon Fish and Wildlife Office's (OFWO) Intra-Service biological opinion on the issuance of an incidental take permit to Yamhill County for the implementation of the Yamhill County Road Maintenance Habitat Conservation Plan (HCP), in Yamhill County, Oregon. The incidental take permit will be issued pursuant to section 10(a)(1)(B) of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (ESA). The Fish and Wildlife Service proposes to issue the incidental take permit to Yamhill County for a period of 30 years.

The Yamhill County Road Maintenance HCP provides coverage for take of the endangered Fender's blue butterfly (*Icaricia icarioides fenderi*).

After reviewing the current status of the species, the environmental baselines for known populations, the effects of permit issuance and the cumulative effects within the action area, we conclude that these activities will not jeopardize the continued existence of Fender's blue butterfly or Kincaid's lupine (*Lupinus sulphureus* var. *kincaidii*), nor will they destroy or adversely modify designated critical habitat for Fender's blue butterfly or Kincaid's lupine. This biological opinion is based on information provided in the March 2012 Draft Yamhill County Road Maintenance HCP, available recovery plans and information and reference material in our files at the OFWO.

## Consultation History

The formal consultation for this HCP began at the conclusion of the HCP's public comment period, November 5<sup>th</sup>, 2012.

## BIOLOGICAL OPINION

### I. DESCRIPTION OF THE PROPOSED ACTION

Yamhill County has submitted a draft Road Maintenance Habitat Conservation Plan (Yamhill County 2010a) to the Fish and Wildlife Service (Service or USFWS) to allow the County to receive an incidental take permit under the Endangered Species Act section 10(a)(1)(B) for Fender's blue butterfly and Kincaid's lupine ("covered species"). An incidental take permit from the Service will allow the County to continue to perform its otherwise lawful duties, specifically road maintenance activities, which have the potential to affect these covered species. State law requires non-Federal public landowners who conduct activities that may harm threatened or endangered plants to obtain a permit from the Oregon Department of Agriculture. To offset effects to the covered species, the County will minimize and mitigate its impacts. The incidental take permit, once issued, will be in effect for 30 years.

The proposed action is discussed in the draft HCP in Chapter 2 (Covered Area), Chapter 4 (Covered Activities), Chapter 6 (Conservation Measures, including Restrictions and Best Management Practices) and Chapter 7 (HCP Implementation). We provide a summary of the proposed action below. The HCP (Yamhill County 2010a) is incorporated by reference into this biological opinion.

An activity is covered under the HCP only if it is one of the types of impacts evaluated in the HCP and:

- There is sufficient take coverage available under the incidental take permit issued to Yamhill County for that activity;
- The activity does not preclude achieving the biological goals and objectives of the HCP;
- The activity is an action under the jurisdiction of Yamhill County;
- The activity occurs within the Covered Area; and
- The activity occurs within the term of the incidental take permit.

#### A. Covered Entities and Lands

- B.** The covered area (action area) includes all roads and right-of-ways owned or managed by Yamhill County where road maintenance activities occur. The action area is the prairie habitat and potential prairie habitats within Yamhill County, Oregon, on lands owned or managed by non-federal, public agencies and conservation organizations included in the draft HCP, and on private lands (see Figure 3.1 in Chapter 3 of the HCP). The action area does not include any Federal lands.
- Covered Activities**

## 1. Maintenance Activities

Of the total of 1,090 km (677 miles) of road currently maintained by the County, 631 km (392 miles) are paved roads and 459 km (285 miles) are gravel roads. Covered Activities include road maintenance activities conducted on 1,090 km (677 miles) of County roads and right-of-way. For some roads, the County's right-of-way starts at the road centerline and extends 9.1 m (30 feet) on either side; for other roads, the right-of-way width from centerline is 6.1 m (20 feet). The access road to Deer Creek Park extends 5.0 m (16.5 feet) from centerline.

County right-of-way is divided into two distinct sections based on the activities performed in these sections of right-of-way: 1) the first 1.5 m (5 feet) from the shoulder of the road to the back of the ditch, referred to as the "Potential Impact Zone" and 2) the remaining 4.6 m (15 feet) from the back of the ditch to the end of the right-of-way, referred to as the "No Impact Zone." The Potential Impact Zone represents the area where normal maintenance activities occur. The No Impact Zone represents the area where normal maintenance is not performed. Typical road maintenance activities are described below.

### *Mowing*

Mowing along the County road right-of-way is generally done twice a year between April and November. This is generally done from 0.9 to 1.2 m (3 to 4 feet) on the foreslope, the slope from the edge of the shoulder to the bottom of the ditch or to the bottom of the roadway fill. A mower is driven along the road with a lateral cutter that is suspended out over the side of the road. The mower does not leave the road to perform this maintenance.

The County is considering use of a combination mower/sprayer unit, which would allow the County to spray a chemical growth retardant product (such as Roundup™) immediately after mowing to reduce the frequency of mowing necessary in these locations. The chemical growth retardant spray released from this unit would not extend past the mower arm. This is also discussed in the following section on Spraying.

### *Brush Cutting*

Brush cutting is performed as needed when line of sight is obscured or there is vegetative encroachment on the roadway. A brush cutter also operates by driving along the roadway with a cutter arm extended out over the shoulder to remove brush by cutting limbs and stalks. Plant material is chipped on site. The brush cutter also does not leave the road to perform this maintenance.

### *Spraying*

Noxious weeds may be controlled with the use of herbicides consistent with Oregon Revised Statute 570.505, Oregon Administrative Rule 603-052-1200, and Service policy. Pre- and post-emergent herbicides are applied along road shoulders to control grasses and weeds. The products currently used to control grass are Embark®, Accord®, Landmark®,

and Perspective™; these or similar products will be used in the future. Spraying for invasive species (i.e., Armenian blackberry (Himalaya) [*Rubus armeniacus*] and Scotch broom [*Cytisus scoparius*]) is done on both paved and gravel roads if they affect sight distance or safe road passage or threaten the structural integrity of the roadway. Broadcast spraying is done on both paved and gravel roads. The sprayer is attached to a truck on an adjustable boom that can be extended parallel to the road surface to adjust the distance the spray extends from the edge of the pavement. The sprayer boom can also be adjusted so that it sits perpendicular to the road surface, to allow spraying on taller brush and broadleaf plants. In spring, the shoulders of about 40 percent of County paved roads are sprayed, which generally includes about 0.6 m (2 feet) of the shoulder. Broadcast spraying on gravel roads is done as needed for invasive species control and to provide for safe sight distances.

Site and weed-specific spot application of broadleaf herbicide is used to control invasive and/or problematic species periodically during the spring. The product currently used for spring broadleaf control is Garlon® 3a. This or a similar product will be used in the future. Most of the broadleaf herbicide for Himalayan blackberry control is applied in the fall. The product currently used to control blackberries is Escort®. This or a similar product will be used in the future.

Herbicides are applied by a County employee or contractor (who holds a Public Pesticide Applicators License) in a manner consistent with label requirements and regulations. Herbicides are applied in conjunction with grading, mowing, and brush cutting, where feasible, to maximize effectiveness. Herbicides are applied during acceptable atmospheric conditions (calm, light wind) and during the appropriate season for the target species.

#### *Large Shrub and Tree Removal*

Shrub and tree removal occurs year-round as needed. Hazard trees are taken down by chainsaw and are generally donated for firewood or given to the landowner.

#### *Winter Road Maintenance*

De-icer (liquid magnesium chloride) is applied to halt or delay the formation of ice and/or frost on paved roads during the late fall or winter. The County uses a contractor to apply liquid magnesium chloride on the travel lanes of paved roads at known hazard locations, curves, intersections, and shady spots that have a history of ice-related accidents. Sanding is done primarily on paved roads to abate public hazards and improve traction during icy or snowy conditions, which generally occur between late October and February. The sand material is applied by sanding trucks with rotating sand applicator disks. The sand material includes a small amount of salt (27 kg [60 pounds] salt to 20,000 kg [44,092 pounds] of sand) to keep sanding material from freezing in the storage pile and the truck bed.

Snow plowing is done to remove snow and ice to improve winter driving conditions. It occurs on both paved and gravel roads in the winter. Snow is deposited along the side of the road and allowed to melt naturally.

### *Sign Posting*

Sign posting occurs throughout the year on gravel and paved roads to maintain existing signs and occasionally install new signs. Sign location is governed by the Manual of Uniform Traffic Control Devices and generally occurs within the Potential Impact Zone. This activity involves digging a post hole for the sign foundation, installing the post foundation, and installing the post and sign. A normal replacement schedule is once every 5 to 10 years due to environmental weathering; however, vandalism can significantly change that schedule.

### *Drainage Maintenance*

Drainage maintenance activities include cleaning and/or replacing existing culverts and clearing filled ditches and culverts on non fish-bearing streams. Drainage activities are scheduled during the dry season whenever possible. However, some work occurs in the wet periods during fall, winter and spring months. Ditches along gravel roads are generally maintained during grading operations. Emergency drainage work to clear ditches and plugged culverts may take place during precipitation events to abate public hazards and avoid damage to or failure of parts of the road system.

Cleaning and/or replacing existing culverts is normally scheduled during the dry time of the year for convenience and to avoid water complications during periods of high surface storm water runoff. If the culvert falls within state or Federal waters, a permit from the Division of State Lands and U.S. Army Corps of Engineers may be required. If a U.S. Army Corps of Engineer's permit is needed, endangered species consultation will take place under Section 7 of the ESA; no coverage is sought for these projects in this HCP. The County commits to working with the Army Corps of Engineers under section 7 of the ESA, if required. The County complies with all state and Federal permit requirements.

### *Seeding*

Hydro-seeding or hand seeding is performed for erosion control. This is usually done in the spring or fall to take advantage of existing moisture to initiate the growth cycle. The seed mix applied is often obtained from the Yamhill County Soil and Water Conservation District.

### *Emergency Earth Removal*

Emergency earth removal for landslides and erosion repairs are driven by emergencies and occur most frequently during the rainy season, but can occur at any time.

### *Road Improvements*

Road improvements include lane and shoulder widening activities and bike path construction. The County will occasionally perform minor widening activity along portions

of their roadway, in preparation for a hot mix asphalt concrete (HMAC) overlay project. Many county roads have substandard widths (2.7- to 3.0-m [9- to 10-foot] lane widths) for the travel lane and shoulders (0- to 0.3-m [0- to 1-foot] shoulder widths). Road widening activity provides for a wider travel surface, typically up to 3.7-m (12-foot) wide travel lanes and/or 0.6- to 1.2- m (2- to 4-foot) gravel shoulders outside of the travel lane. This activity may involve excavating banks and/or filling to expand the roadbed or shoulder area. Ditches and culverts are adjusted as part of this activity to match the new roadbed or shoulder.

Road improvements are also used to improve sight distance along the roadway, where the sight distance interferes with safe use of the roadway. Improved lines of sight may be needed for intersections, driveways and other hazardous locations to improve their safety. Road improvements may occur as emergency maintenance.

Oregon Law requires that one percent of the state highway tax funds be spent for bike path construction inside public right-of-ways. The County uses these funds to improve selected county roads to provide a safe dedicated bike path along a county road. This activity can involve cuts and fills next to the road to adjust ditches and culverts. The bike path is then constructed of an all-weather surface such as asphalt. Typically, this activity is proposed at the annual budget process, approved by the budget committee and the Board of County Commissioners and then scheduled for the next construction season.

#### *Dust Abatement*

Dust abatement typically occurs from May to September on county gravel roads. The approved dust abatement material in the county is lignosulfonate. This material is water soluble and is applied to the gravel road at the end of the spring rainy season. Lignosulfonate is applied by contractors at the request of property owners who are required to pay for the application.

#### *Grading and Gravel Replacement*

Grading of gravel road surfaces is typically conducted two to four times a year to eliminate hazards, improve drainage, and reshape road surfaces damaged by surface settlement, rutting, or erosion. During the grading process, the ditches are pulled (restored to provide positive drainage and conveyance of water off the roadway), the ditch material is blended with fresh gravel as needed, and the roadway is shaped and contoured. Typically, a 3 percent crown is constructed to optimize the drainage of storm water from the road to the adjacent ditch.

Gravel road maintenance schedules are driven by several factors including weather, traffic, soil types, terrain and geography of the area, travel speed, vehicle weight, and construction of the roadbed. Yamhill County is divided into four districts for grading gravel roads, with a grader assigned to each district. Grader operators work in their own districts on a pre-assigned route. Gravel roads will typically be graded and have additional gravel applied as needed, generally two to three times per year. Lower volume gravel roads may be graded

and graveled about two times per year; higher volume may be graded and graveled about four times per year.

Weather, soil type, and traffic volume act together to drive the maintenance schedule on a gravel road. High precipitation combined with a soil type that does not drain well, such as clay, will create a soft sub-grade condition that can pump mud up through the base of the gravel road, creating soft muddy spots and in some cases severe rutting. Depending on the severity of this condition, even normal traffic volumes can lead to higher maintenance. An increase in traffic, especially heavy truck traffic, will make this situation worse and require frequent repairs. The base rock on the road can bridge the soft sub-grade conditions with light traffic loading. Higher volumes of traffic and especially heavier vehicles (trucks) require a much stronger base to bridge the soft sub-grade. Most gravel roads are built with a relatively light base that functions well for normal traffic loads.

Travel speed on a gravel road can also be a maintenance issue. Strong acceleration and braking can cause stresses in the road surface materials and exceed the road's ability to support traffic weight. The result can be wash-boarding and rutting of the surface of the road. These symptoms are exaggerated by increased traffic volume and increased vehicle weight. Excessive road surface corrugation, wash-boarding and rutting is a significant public safety hazard and leads to a higher demand for maintenance.

The terrain and geography of the gravel road can also lead to higher maintenance requirements. Flat terrain would seem to favor a good gravel road, however if flat terrain and poor drainage combine with poor soil conditions, a higher level of maintenance can result. Steep terrain tends to encourage better drainage, however erosion and sedimentation can cause deeply eroded ditch lines, which then require maintenance to keep the drainage system functioning. Roads on steep terrain also tend to have wash-boarding issues. Steep terrain can also have dangerous conditions during snow and/or ice storms leading to more required maintenance.

Low maintenance road sections can and do have some of the characteristics described for high volume/high maintenance roads; however, the presence of lower traffic volumes and lower vehicle loads allows the roadbed to remain intact despite these issues. Moderate weather and traffic, well drained soils, moderate terrain, reasonably slow travel speeds, light vehicle weights and a well-constructed road base help to create a low maintenance gravel road, however it is rare that all of those favorable conditions are found in one spot. Low maintenance roads can become high maintenance when one of these conditions changes. The conditions that change the most frequently are weather and traffic. A prolonged wet weather stretch will increase the maintenance requirements on many County roads with poor soil sub-grades and erodible ditches, as described above. A logging, farming or rock quarry operation that starts hauling loads over a low maintenance gravel road can quickly change the road status to high maintenance for as long as the hauling operation occurs. Many of the logging, farming, or rock quarry activities are initiated by private property owners and are often seasonal or of limited duration, making the transition from a low maintenance road to a high maintenance road a one-time or temporary occurrence. Once the hauling activity (ies) has been completed, the road will generally return to low maintenance status. Soft spot

dig-outs are done as needed, and generally occur in wet months during or after periods of high precipitation.

### *Paved Road Maintenance*

Paved road maintenance activities include but are not limited to: soft spot dig-outs, grinding, HMAC overlays, chip sealing, crack sealing, shoulder preparation and rocking, sweeping and washing, centerline and fog-line striping, and deicing. These activities are generally seasonal in nature.

Soft spot dig-outs and grinding are two methods of repairing paved road defects and are done as needed, primarily in spring and summer months. HMAC overlays and chip seals are used to extend the life of a paved road. HMAC overlays are done during summer and early fall months to take advantage of the dry, warmer weather. Chip sealing is done in July and August. The County overlays or chip seals 3 to 5 percent of its paved roads every year. Roads are selected for this surface treatment on the basis of pavement condition. All of the above activities are performed within the existing roadway width.

Crack sealing is done during dry periods, usually during the summer or fall, however it can be done during longer dry periods in the winter as well. Crack sealing is performed on an as needed basis and typically starts about the mid-way through the life span of a paved road (approximately 20 years) and continues until its next HMAC overlay or chip seal.

Shoulder preparation and rocking is usually done in conjunction with summer paving operations to adjust the shoulder height to the new pavement height after an overlay. However, this may also occur during the fall, winter, or spring to correct vertical drop-offs that may develop due to traffic.

Sweeping and washing is done just prior to striping to provide a clean surface on which to apply the paint. Centerline and fog-line striping is done annually during dry weather, usually in the late summer or early fall after the paving season has ended. Sweeping and washing can also occur at other times of the year to address undesirable materials (such as mud or gravel) on the paved surface. Mud or gravel on the road may occur due to activities on private properties where a small amount of mud, gravel or other materials is tracked onto the road from vehicle traffic. These types of activities generally occur infrequently and are usually contained within the shoulder. If large quantities of gravel and/or mud need to be removed from the roadway, the County will sweep it up and haul it away as opposed to sweeping it on the shoulder.

## 2. Conservation Measures

The Yamhill County Commissioners will be responsible for the administration and implementation of the HCP. The Yamhill County Commissioners will establish an HCP Implementation Committee that has the responsibility to review the annual report required by this HCP and make recommendations to the Yamhill County Commissioners if conservation goals are not being achieved. The Yamhill County Commissioners would also alert the Service,

who will help in suggesting additional or new actions, if needed, to fulfill the mitigation requirements of the HCP.

The Service is conducting monitoring for Fender's blue butterfly and Kincaid's lupine in the County. This monitoring will continue to provide information regarding these populations. Yamhill County will work in partnership with the Service to ensure Fender's blue butterfly locations along Yamhill County right-of-ways are surveyed, while avoiding a duplication of effort. Monitoring of Fender's blue butterfly and Kincaid's lupine will be completed by Yamhill County in the Threatened and Endangered (T&E) Special Maintenance Zones, not including the locations currently known to the Service (USFWS known locations).

Monitoring for Fender's blue butterfly and Kincaid's lupine will occur at Deer Creek Park where habitat restoration, enhancement, and management will occur. This monitoring will be done annually until Kincaid's lupine is established. Once established, monitoring will occur every three years. The monitoring will determine the success of habitat restoration, enhancement, and management, as measured by tracking species status and habitat condition. Results from the monitoring efforts will be reported to the Service.

Monitoring will be conducted during the flight season of the Fender's blue butterfly and the flowering season of Kincaid's lupine. This timeframe can vary from one to three weeks each year depending on the weather and differences in site conditions. Monitoring will begin with year one and occur every three years. The HCP Implementation Committee can recommend more frequent monitoring for approval by Yamhill County Commissioners and the Service. If implementation of habitat restoration, enhancement, or management activities at a given site ceases, monitoring will be conducted for a minimum of two additional cycles after cessation of the activities.

Monitoring for Fender's blue butterfly and Kincaid's lupine will be completed at sites where mitigation work is performed. Abundance of each species will be measured using the following metrics: Fender's blue butterflies will be evaluated by the abundance of Fender's blue butterfly and the quality of butterfly habitat following the Service's monitoring protocol; and Kincaid's lupine will be evaluated on the basis of square meters of foliar cover.

The conservation strategies contained in the HCP build on the biological goals and objectives for these species as presented in the Service's Recovery Plan for the Prairie Species of Western Oregon and Southwest Washington (U.S. Fish and Wildlife Service 2010). Primary emphasis is given to:

- Preserving habitat for the covered species in the Yamhill County right-of-way.
- Protecting the reproduction cycles (continued existence) of covered species in the Yamhill County right-of-way.

Increasing habitat available for the covered species in an undisturbed area outside of the Yamhill County right-of-way. Specific objectives to achieve the goals include:

- a) Implementation of conservation measures to benefit the covered species within Yamhill County right-of-way. These include the following:

1. Establish T&E Species Special Maintenance Zones where covered species or designated critical habitat occurs along the Yamhill County right-of-way.
    - All T&E Special Maintenance Zones will be marked with placards at 0.5 km (0.3 mile) before and after locations of Kincaid's lupine and Fender's blue butterfly.
    - Place additional Yamhill County T&E Special Maintenance Zone placards at the Kincaid's lupine locations (seven) identified during the 2 km (1.2 mile) dispersal survey.
  2. Implement avoidance and minimization measures for roadside populations within T&E Special Maintenance Zones by way of modified road maintenance protocols for the protection and benefit of the covered species and their habitat (including nectar species).
  3. Control of invasive species in T&E Special Maintenance Zones.
  4. Monitoring and reporting
    - Annual summary and report of activities conducted associated with conservation measures and mitigation.
    - Integration with ongoing monitoring conducted by the Service for Fender's blue butterfly.
- b) Implementation of avoidance and minimization measures for road maintenance activities in the Yamhill County right-of-way to reduce potential impacts on the covered species and their habitat.

- **Timing Restrictions:** To avoid the active butterfly and caterpillar season for Fender's blue butterfly and the reproductive timeframe for Kincaid's lupine, a number of activities will not occur in T&E Special Maintenance Zones between March 1 and August 15. Activities subject to this timing restriction include mowing, brush cutting, spraying, large shrub and tree removal, routine drainage maintenance, shoulder preparation and rocking, sweeping and washing.

- **Other restrictions:**

*Mowing* - Mower deck will be set at a minimum of 15 cm (6 inches) above ground to avoid Fender's blue butterfly larvae.

*Spraying* - Chemical treatments will follow labeled restrictions and will be applied by licensed contractors.

*Sign posting* - Whenever possible, signs will be located 5 m (16 feet) away from Kincaid's lupine plants, reducing the potential for adverse effects to the plants as well as the larval butterflies they may contain.

*Seeding* - A native seed mixture comprised of Roemer's fescue (*Festuca roemerii*), California brome (*Bromus carinatus*), and native bent grass (*Agrostis* sp.) will be used for seeding.

*Non-County Work within the Right-of-Way* - Prior to working in County managed right-of-ways, non-County entities will be responsible for consulting with the Service to obtain the appropriate permits. If a permit is sought from the County, proof of consultation with the Service must accompany the permit application.

*Emergency Road Maintenance* - The County will notify the Service within 48 hours that an emergency has occurred and disclose the actions taken. The County will consult with the Service within 30 days of the emergency action to determine if additional actions and/or mitigation are required.

*Grading & Contouring* - These activities will be restricted to the foreslope and gravel road surface. This will avoid the area where Kincaid's lupine and consequently Fender's blue butterfly most often occur. Excess material created during grading will be disposed of at designated and approved locations for receiving such materials, not on top of vegetation.

*Dust Abatement* - All private contractors will obtain a permit from the County for each section of road that will receive a dust abatement application. Permits will include restrictions for use, such as confining materials to the roadway and having spill protection equipment on hand. Dust control chemicals will not be applied in T&E Special Maintenance Zones when it is raining.

*Major Road Improvements* - When planning major road improvement projects such as road widening or bike path construction activities, the County will retain a qualified botanist to perform surveys to identify covered species during the flowering season. If covered species are identified, the County will plant greenhouse-grown plants at a known location to offset the impacts of the road improvement activities. These activities will need to be scheduled the year prior to construction to allow for successful identification and planting of covered species.

*Employee and Contractor Training Program* -

- The County will acquaint its maintenance staff with the covered species and the avoidance and minimization measures to be applied in the T&E Special Maintenance Zones.
  - All County maintenance vehicles will be equipped with a manual that includes a description of the special maintenance measures, and photos of covered species.
  - The County will provide similar training for contractors working in T&E Special Maintenance Zones, and the contractor will be required to follow the avoidance and minimization measures in the HCP.
  - The County will update their Take Avoidance Manual (Blue Book). This manual will include (1) information about the covered species to help the road crew identify them in the field; (2) maps showing current known locations (with 0.5 km [1.2 mile] buffers); (3) a listing of all T&E Special Maintenance Zones on County maintained roads, including beginning and ending mileposts and GPS coordinates; and, (4) a graphic of T&E Special Maintenance Zones signs with an explanation of its codes.
- c) Mitigation through restoration of upland prairie habitat at County-owned Deer Creek Park or other areas containing suitable habitat within the County and conducting long-term management of these lands for the benefit of the covered species.

Mitigation will occur when impacts are unavoidable, and will be completed at sites with appropriate habitat in the County. Mitigation may be achieved by butterfly habitat enhancement for Fender's blue butterfly, or species planting for Kincaid's lupine.

Mitigation actions will occur at sites that already support the Fender's blue butterfly and Kincaid's lupine, or at sites that contain suitable habitat but do not currently have an established Fender's blue butterfly population or host plants. Mitigation will not occur at sites where there is no suitable habitat for the covered species. To mitigate for the effects of the covered activities, 2.8 ha (7.0 acres) of that land within the T&E Special Maintenance Zones and Deer Creek Park will be managed to benefit the listed species.

In summary, as part of the HCP and to provide a conservation benefit for the species, the County will provide the following mitigation:

- Establishment of additional T&E Special Maintenance Zones in 10.3 km (6.4 miles) of road to encompass the Kincaid's lupine identified during the 2 km (1.2 mile) dispersal survey.
- Enhancement and restoration of habitat in 2.8 ha (7.0 acres) of the County right-of-way in T&E Special Maintenance Zones and at Deer Creek Park. Habitat enhancement in the County right-of-way will be achieved through removal of invasive plants, trees and shrubs to allow more sunlight to reach the ground to benefit Kincaid's lupine and nectar species where practical. The restoration of upland prairie Fender's blue butterfly habitat will be implemented at Deer Creek Park by planting Kincaid's lupine and nectar species.
- Monitoring - an evaluation and summary report of the mitigation project at Deer Creek Park will be provided annually until Lupine is established, then every three years.

Within one year from issuance of the incidental take permit, the County will develop habitat restoration plans in conjunction with an appropriate outside partner. The habitat restoration plans will maintain and enhance the covered species habitat within the T&E Special Maintenance Zones in the County right-of-way and at the mitigation site for Kincaid's lupine and Fender's blue butterfly habitat located in Deer Creek Park.

## II. STATUS OF THE SPECIES

### A. Fender's Blue Butterfly

#### 1. Listing Status and Critical Habitat

Fender's blue butterfly was listed as endangered, without critical habitat, on January 25, 2000 (U.S. Fish and Wildlife Service 2000). Critical habitat for the Fender's blue butterfly was designated on October 6, 2006 (U.S. Fish and Wildlife Service 2006). Critical habitat units have been designated in Yamhill, Lane, Polk and Yamhill Counties, Oregon. The primary constituent elements (PCEs) of critical habitat for the Fender's blue butterfly are the habitat components that provide: (1) early seral upland prairie or oak savanna habitat with undisturbed subsoils that provides a mosaic of low-growing grasses and forbs, and an absence of dense canopy vegetation allowing access to sunlight needed to seek nectar and search for mates; (2) larval host-plants: Kincaid's lupine, longspur lupine (*L. arbustus*), or sickle-keeled lupine (*L. albicaulis*); (3) adult

nectar sources, and (4) stepping stone habitat: undeveloped open areas with the physical characteristics appropriate for supporting the low-growing prairie, oak savanna plant community (well drained soils), within and between natal lupine patches (about 2 km [1.2 miles]), necessary for dispersal, connectivity, population growth, and, ultimately, viability. Critical habitat does not include human-made structures existing on the effective date of the rule and not containing one or more of the PCEs, such as buildings, aqueducts, airports, and roads, and the land on which such structures are located.

## 2. Population Trends and Distribution

Fender's blue butterfly was believed to be extinct for nearly 50 years, and was rediscovered in 1989 at the McDonald Research Forest, Yamhill County, Oregon. It was found to be associated primarily with Kincaid's lupine, and occasionally longspur lupine or sickle-keeled lupine (Hammond and Wilson 1993). Recent surveys have determined that Fender's blue butterfly is endemic to the Willamette Valley and persists in about 17 populations on remnant prairies in Yamhill, Polk, Yamhill, and Lane Counties (Hammond and Wilson 1993, Schultz *et al.* 2003, U.S. Fish and Wildlife Service unpublished data). Fender's blue butterfly populations occur on upland prairies historically characterized by native bunch grasses (*Festuca* spp.) The association of Fender's blue butterfly with upland prairie is mostly a result of its dependence on Kincaid's lupine although Fender's blue butterfly often uses wet prairies for nectaring and dispersal habitat. Sites occupied by Fender's blue butterfly are predominantly located on the western side of the Willamette Valley, within 33 km (21 miles) of the Willamette River. A 2003 synthesis of existing data estimated the current range-wide number of butterflies to be about 3,000 to 5,000 individuals (Schultz *et al.* 2003). Fewer than ten sites with populations of 100 adult butterflies or more were known (Table 2). We acknowledge, however, that our data on Fender's blue butterfly populations are incomplete, and show some inconsistencies. Three different survey methods have been used to count populations over the last 20 years, and their results are not directly comparable (Fitzpatrick 2009). The quality of survey data depends on the experience level of the surveyors, weather conditions and the ability to schedule surveys at the peak of the species' short flight season (Fitzpatrick 2009). In addition, not all sites have been surveyed each year, and in most years, population counts have been obtained on only a portion of known sites, which results in incomplete counts and biased population estimates. A summary of the best available population estimates for Fender's blue butterfly from years 2000 through 2010 is provided in Table 1 (Hammond 2000 through Hammond 2010).

## 3. Life History and Ecology

Adult Fender's blue butterflies live approximately 10 to 15 days and apparently rarely travel farther than 2 km (1.2 miles) over their entire life span (Schultz 1998). Although only limited observations have been made of the early life stages of Fender's blue butterfly, the life cycle of the species likely is similar to other subspecies of *Icaricia icarioides* (Hammond and Wilson 1993). The life cycle of Fender's blue butterfly may be completed in one year. An adult Fender's blue butterfly may lay approximately 350 eggs over her 10 to 15-day lifespan, of which perhaps fewer than two will survive to adulthood (Schultz 1998, Schultz *et al.* 2003). Females lay their eggs on perennial lupines (Kincaid's lupine, longspur lupine, and sickle-keeled lupine, which are the larval food plants, during May and June (Ballmer and Pratt 1988). Newly hatched

Table 1. Fender's blue butterfly: estimated population sizes, 2000-2010

Population	Year											
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Yamhill County												
Oak Ridge	168	192	293	240	259	96	100?	226 <sup>2</sup>	226	600	(b)	260
Gopher Valley	12	7	22	21	10	12	20	80 - 100 <sup>2</sup>	(b)	173	(b)	20
Polk County												
Mill Creek	25	22	48	50	43	20	?	12	(ns)	(ns)	9 <sup>1</sup>	
Dallas <sup>1</sup>	(ns)	(ns)	(ns)	(ns)	(ns)	(ns)	(ns)	6	6	(ns)	(ns)	
Monmouth Road <sup>1</sup>	2	0	1	1	5	0		4	(ns)	(ns)	(ns)	
McTimmonds Valley <sup>1</sup>	4	10	6	6	10	3	(ns)	2	5	(ns)	(ns)	3
Baskett	922	223	753	1236	1615 <sub>2</sub>	768	1520	1385	(b)	1000	1027	735
Benton County												
Wren	(ns)	(ns)	(ns)	75	484 <sup>2</sup>	180 - 200	>800 <sup>2</sup>	1282	(b)	2660	(ns)	153
Lupine Meadows/ West Hills	(ns)	103	132	211	307	216	370	235	(b)	252	44 (b)	(ns)
Butterfly Meadows/ McDonald Forest	667	494	451	425	509	84	98	370	420	1335	(c) (b)	132
Greasy Creek <sup>1</sup>	(a)	(a)	(a)	(a)	1	2	20	20	(ns)	(ns)	(b)	
N. County	(a)	(a)	(a)	(a)	(a)	(a)	(a)	12 eggs	(ns)		(b)	
Linn County												
Oak Basin	(a)	(a)	(a)	(a)	(a)	(a)	23	(ns)	45		(b)	
Bond Butte	(a)	(a)	(a)	(a)	(a)	(a)	(a)	(c)	(c)		(b)	
Lane County												
Coburg	(ns)	(ns)	(ns)	154	236	23	221	355	121		(b)	41
Willow Creek	1439	577	2039	1336	1400	174	806	644	(b)		(b)	392
W. Eugene	179	119	195	795	1426	479	470	755	1188		(b)	1243
Washington County												
H. Hagg Lake												200
	<sup>1</sup> Estimates at these sites are the actual count of individuals detected, not populations estimates. <sup>2</sup> Substantial additional habitat area discovered this year. (ns) = Not surveyed. (a) = Population not yet known. (b) = Bad weather during flight season, no count conducted. (c) = Adult Fender's blue butterflies observed but no count conducted											

larvae feed for a short time, reaching their second instar in the early summer, at which point they enter an extended diapause. When the lupine plant senesces, diapausing larvae remain in the leaf litter at or near the base of the host plant through the fall and winter. Larvae become active again in March or April of the following year, although some larvae may be able to extend diapause for more than one season depending upon the individual and environmental conditions. Once diapause is broken, the larvae feed and grow through three to four additional instars, enter their pupal stage, and, after about two weeks, emerge as adult butterflies in May and June (Schultz *et al.* 2003).

Fender's blue butterflies have limited dispersal ability. Adult butterflies may remain within 2 km (1.2 miles) of their natal lupine patch (Schultz 1998), although anecdotal evidence exists of adult Fender's blues dispersing as far as 5 to 6 km (3.1 to 3.7 miles) (Hammond and Wilson 1992, Schultz 1998); dispersal of this magnitude is not likely anymore because of habitat fragmentation. At large patches, such as the main area at Willow Creek in Lane County, 95 percent of adult Fender's blue butterflies are found within 10 m (33 feet) of lupine patches (Schultz 1998).

#### 4. Habitat Characteristics

Habitat requirements for Fender's blue butterfly include lupine host plants (Kincaid's lupine, and occasionally longspur lupine or sickle-keeled lupine) for larval food and oviposition sites and native wildflowers for adult nectar food sources. Nectar sources used most frequently include narrowleaf onion (*Allium amplexans*), Tolmie star-tulip (*Calochortus tolmiei*), dwarf checkerbloom (*Sidalcea malviflora* ssp. *Virgate*), common woolly sunflower (*Eriophyllum lanatum*) and Oregon geranium (*Geranium oregonum*) (Wilson *et al.* 1997, York 2002, Schultz *et al.* 2003). Non-native vetches (*Vicia sativa* and *V. hirsuta*) are also frequently used as nectar sources, although they are inferior to the native nectar sources (Schultz *et al.* 2003). Population size of Fender's blue butterfly has been found to correlate directly with the abundance of native nectar sources (Schultz *et al.* 2003). At least 5 ha (12 acres) of high quality habitat are necessary to support a population of Fender's blue butterflies (Crone and Schultz 2003, Schultz and Hammond 2003). Most prairies in the region are degraded and of low quality, and thus a much larger area is likely required to support a viable butterfly population.

Kincaid's lupine is the preferred larval host plant at most known Fender's blue butterfly populations. At two sites, Coburg Ridge and Baskett Butte, Fender's blue butterfly feeds primarily on longspur lupine, even though Kincaid's lupine is present (Schultz *et al.* 2003). A third lupine, sickle-keeled lupine, is used by Fender's blue butterfly where it occurs in poorer quality habitats (Schultz *et al.* 2003). Fender's blue butterfly has not been found to use broadleaf lupine (*Lupinus latifolius*), a plant commonly eaten by other subspecies of *Icaricia icarioides*, even though it occurs in habitats occupied by the butterfly (Schultz *et al.* 2003).

#### 5. Threats/Reasons for Listing

Habitat loss, encroachment into prairie habitats by shrubs and trees due to fire suppression, fragmentation, invasion by non-native plants and elimination of natural disturbance regimes all threaten the survival of Fender's blue butterfly. Few populations occur on protected lands; most

occur on private lands which are not managed to maintain native prairie habitats. These populations are at high risk of loss to development or continuing habitat degradation (U.S. Fish and Wildlife Service 2000). Prairie habitats have been invaded by tall non-native grasses that may be limiting the ability of the Fender's blue butterfly to find its host plant (Severns 2008). There is concern about the effects of pesticide application for agriculture, gypsy moth control, or mosquito control (Oregon Department of Human Services 2003, Oregon Department of Agriculture 2006). Recent population viability analyses have determined that the Fender's blue butterfly is at high risk of extinction throughout most of its range (Schultz and Hammond 2003). Even the largest populations have a poor chance of survival over the next 100 years (Schultz *et al.* 2003).

## **B. Kincaid's Lupine**

### **1. Listing Status and Critical Habitat**

Kincaid's lupine was listed as threatened, without critical habitat, on January 25, 2000 (U.S. Fish and Wildlife Service 2000). Critical habitat was designated on October 6, 2006 (U.S. Fish and Wildlife Service 2006). Critical habitat units for Kincaid's lupine have been designated in Yamhill, Lane, Polk and Yamhill Counties, Oregon, and Lewis County, Washington. The PCEs of critical habitat are the habitat components that provide: (1) early seral upland prairie or oak savanna habitat with a mosaic of low growing grasses, forbs, and spaces to establish seedlings or new vegetative growth, with an absence of dense canopy vegetation providing sunlight for individual and population growth and reproduction, and with undisturbed subsoils and proper moisture and protection from competitive invasive species; and (2) the presence of insect pollinators, such as bumblebees (*Bombus mixtus* and *B. californicus*), with unrestricted movement between existing lupine patches, critical for successful lupine reproduction. Critical habitat does not include human-made structures existing on the effective date of the rule and not containing one or more of the PCEs, such as buildings, aqueducts, airports, and roads, and the land on which such structures are located.

### **2. Population Trends and Distribution**

Kincaid's lupine is found in dry upland prairies from Lewis County, Washington, in the north, south to the foothills of Douglas County, Oregon; however, most of the known and historical populations are found in the Willamette. Historically, the species was documented from Vancouver Island, British Columbia, Canada (Dunn and Gillet 1966), but has not been located in that region since the 1920s (Kaye 2000). Kincaid's lupine is currently known at about 146 sites, comprising about 2.3 ha (5.78 acres) of total coverage (U.S. Fish and Wildlife Service unpublished data). Until the summer of 2004, Kincaid's lupine was known from just two extant populations in Washington, in the Boistfort Valley in Lewis County, more than 160 km (100 miles) from the nearest population in the Willamette Valley. In 2004, two small populations were found at Drew's Prairie and Cowlitz Prairie to the east of the Boistfort Valley in Lewis County; only one plant was observed at Drew's Prairie, and more than 40 plants were found at Cowlitz Prairie (Caplow and Miller 2004, Ted Thomas, U.S. Fish and Wildlife Service, Lacey, Washington, pers. comm., 2006, Joe Arnett, Washington Department of Natural Resources, *in litt.* 2008). Before Euro-American settlement of the region, Kincaid's lupine was likely well

distributed throughout the prairies of western Oregon and southwestern Washington. Today, habitat fragmentation has resulted in existing populations that are widely separated by expanses of unsuitable habitat.

Monitoring the size of Kincaid's lupine populations is challenging because its pattern of vegetative growth renders it difficult to distinguish individuals (Wilson *et al.* 2003). Instead of counting plants, most monitoring for this species relies on counting the number of leaves per unit area, partly because there is a strong correlation between Fender's blue butterfly egg numbers and lupine leaf density (Schultz 1998, Kaye and Thorpe 2006). Leaf counts are time consuming, however, and recent evaluations have shown that lupine cover estimates are highly correlated with leaf counts, much faster to perform, and useful for detecting population trends (Kaye and Benfield 2005).

### 3. Life History and Ecology

Flowering begins in April and extends through June. As the summer dry season arrives, Kincaid's lupine becomes dormant, and is completely senescent by mid-August (Wilson *et al.* 2003). Pollination is largely accomplished by small native bumblebees (*Bombus mixtus* and *B. californicus*), solitary bees (*Osmia lignaria*, *Anthophora furcata*, *Habropoda* sp., *Andrena* spp., *Dialictus* sp.) and occasionally, European honey bees (*Apis mellifera*) (Wilson *et al.* 2003). Insect pollination appears to be critical for successful seed production (Wilson *et al.* 2003).

Kincaid's lupine reproduces by seed and vegetative spread. It is able to spread extensively through underground growth. Individual clones can be several centuries old (Wilson *et al.* 2003), and become quite large with age, producing many flowering stems. Excavations and morphological patterns suggest that plants 10 m (33 feet) or more apart can be interconnected by below-ground stems, and that clones can exceed 10 m (33 feet) across (Wilson *et al.* 2003). As part of a genetic evaluation, collections taken from small populations of Kincaid's lupine at the Baskett Slough National Wildlife Refuge were found to be genetically identical, indicating that the population consists of one or a few large clones (Liston *et al.* 1995). Reproduction by seed is common in large populations where inbreeding depression is minimized and ample numbers of seeds are produced. In small populations, seed production is reduced and this appears to be due, at least in part, to inbreeding depression (Severns 2003).

Kincaid's lupine is the primary larval host plant of the endangered Fender's blue butterfly (Wilson *et al.* 2003). Female Fender's blue butterflies lay their eggs on the underside of Kincaid's lupine leaves in May and June; the larvae hatch several weeks later and feed on the plant for a short time before entering an extended diapause, which lasts until the following spring (Schultz *et al.* 2003).

Kincaid's lupine, like other members of the genus *Lupinus*, is unpalatable to vertebrate grazers. Kincaid's lupine is vulnerable to seed, fruit and flower predation by insects, which may limit the production of seeds. Seed predation by bruchid beetles and weevils and larvae of other insects has been documented, and may result in substantially reduced production of viable seed (Kuykendall and Kaye 1993). Floral and fruit herbivory by larvae of the silvery blue butterfly (*Glaucopsyche lygdamus columbia*) has also been reported (Kuykendall and Kaye 1993). The

vegetative structures of Kincaid's lupine support a variety of insect herbivores, including root borers, sap suckers and defoliators (Wilson *et al.* 2003).

#### 4. Habitat Characteristics

In the Willamette Valley and southwestern Washington, Kincaid's lupine is found on upland prairie remnants where the species occurs in small populations at widely scattered sites. A number of populations are found in road rights-of-way, between the road shoulder and adjacent fence line, where they have survived because of a lack of agricultural disturbance. Some of the populations in Washington occur in pastures and appear to benefit from light grazing by livestock, which reduces the cover of competing shrubs and grasses (Joe Arnett, Washington Department of Natural Resources, *in litt* 2008). Common native species typically associated with Kincaid's lupine include: Roemer's fescue, California oatgrass (*Danthonia californica*), Tolmie star-tulip, common woolly sunflower, and Virginia strawberry (*Fragaria virginiana*). The species appears to prefer heavier, generally well-drained soils and has been found on 48 soil types, typically Ultic Haploxerolls, Ultic Argixerolls, and Xeric Palehumults (Wilson *et al.* 2003).

In Douglas County, Oregon, Kincaid's lupine appears to tolerate more shaded conditions, where it occurs at sites with canopy cover of 50 to 80 percent (Barnes 2004). In contrast to the open prairie habitats of the more northerly populations, in Douglas County, tree and shrub species dominate the sites, including Douglas-fir (*Pseudotsuga menziesii*), California black oak (*Quercus kelloggii*), Pacific madrone (*Arbutus menziesii*), ponderosa pine (*Pinus ponderosa*), incense cedar (*Calocedrus decurrens*), hairy manzanita (*Arctostaphylos columbiana*) and western poison oak (*Toxicodendron diversilobum*).

In contrast to historical ecosystem composition, invasive non-native species are a significant component of Kincaid's lupine habitat today. Common invasives include: tall oatgrass (*Arrhenatherum elatius*), false brome (*Brachypodium sylvaticum*), orchard grass (*Dactylis glomerata*), tall fescue (*Festuca arundinacea*), Himalayan blackberry and Scotch broom (Wilson *et al.* 2003). In the absence of fire, some native species, such as western poison oak and bracken fern (*Pteridium aquilina*), invade prairies and compete with Kincaid's lupine.

#### 5. Threats/Reasons for Listing

The three major threats to Kincaid's lupine populations are habitat loss, competition from non-native plants and elimination of historical disturbance regimes (Wilson *et al.* 2003). Habitat loss from a wide variety of causes (*e.g.*, urbanization, agriculture, silvicultural practices and roadside maintenance) has been the single largest factor in the decline of Kincaid's lupine (U.S. Fish and Wildlife Service 2000). Land development and alteration in the prairies of western Oregon and southwestern Washington have been so extensive that the remaining populations are essentially relegated to small, isolated patches of habitat. Habitat loss is likely to continue as private lands are developed; at least 49 of 54 sites occupied by Kincaid's lupine in 2000 at the time of listing were on private lands and are at risk of being lost unless conservation actions are implemented (U.S. Fish and Wildlife Service 2000).

Habitat fragmentation and isolation of small populations may be causing inbreeding depression in Kincaid's lupine. The subspecies was likely wide-spread historically, frequently outcrossing throughout much of its range, until habitat destruction and fragmentation severely isolated the remaining populations (Liston *et al.* 1995). There is some evidence of inbreeding depression, which may result in lower seed set (Severns 2003). Hybridization between Kincaid's lupine and longspur lupine has been detected at Baskett Slough National Wildlife Refuge (Liston *et al.* 1995).

Before settlement by Euro-Americans, the regular occurrence of fire maintained the open prairie habitats essential to Kincaid's lupine. The loss of a regular disturbance regime, primarily fire, has resulted in the decline of prairie habitats through succession by native trees and shrubs, and has allowed the establishment of numerous non-native grasses and forbs. Some aggressive non-native plants form dense monocultures, which compete for space, water and nutrients with the native prairie species, and ultimately inhibit the growth and reproduction of Kincaid's lupine by shading out the plants (Wilson *et al.* 2003). When Kincaid's lupine was listed, we estimated that 83 percent of upland prairie sites within its range were succeeding to forest (U.S. Fish and Wildlife Service 2000).

### III. ENVIRONMENTAL BASELINE

The action area is the prairie habitat and potential prairie habitats within Yamhill County, Oregon, on lands owned or managed by non-federal public agencies and conservation organizations included in the draft HCP, and on private lands (Yamhill County 2012, Chapter 3). The County maintains Vineyard Special Maintenance Zones, which primarily occur in right-of-ways adjacent to vineyards. Herbicide spraying is not performed at any of the sites to protect grape plants, which are very sensitive to herbicides. In addition, mowing and brushing activities are prohibited at the sites on Mineral Spring Road, Smithville Road, and Broadmead Road (Yamhill County 2012, Appendix F). The Vineyard Special Maintenance Zones encompass 27.5 ha (68.0 acres) along 21 km (13 miles) of road along County right-of-way (Yamhill County 2012, Appendix F).

#### A. Status of the Species in the Action Area

##### 1. Fender's Blue Butterfly

There are two populations of Fender's blue butterfly in Yamhill County: Gopher Valley (GVA) and Oak Ridge (ORA). The most recent population estimate for Gopher Valley was 600, and 180 for Oak Ridge (Hammond 2010). These two populations are comprised of multiple subpopulations that are found at 12 known locations along Yamhill County right-of-ways. The County conducted presence/absence surveys in 2011 for Fender's blue butterfly at the 12 sites (USFWS known locations). Typically Fender's blue butterfly surveys are conducted in mid-May through early June during the flight period and when conditions are conducive to butterfly activity (1000-1600 hours, sunny, >60 degrees F). However, in 2011, flight seasons were delayed due to the unusually cool, wet, and cloudy conditions (the majority of the presence/absence surveys were conducted in late May through June).

Surveys were conducted by slowly walking a given roadside and inspecting the right-of-way for butterflies. A butterfly net was used to flush insects from roadside vegetation and to catch butterflies for in-hand identification on some occasions. The USFWS known locations are designated by general road locations. GVA sites occur within the vicinity of Gopher Valley Road, and ORA sites occur within the vicinity of Oak Ridge Road. Fender's blue butterfly was documented at seven of the USFWS known locations and not observed at five locations (Table 2). Historically, Fender's blue butterfly is usually present at two of these five locations (GVA 1 and GVA 5 [Yamhill County 2012, Appendix B]). During the surveys, Fender's blue butterflies were observed in the vicinity of Kincaid's lupine, but the butterfly was not found everywhere that Kincaid's lupine was present. Appendix C of the HCP (Yamhill County 2012) contains maps of the USFWS known locations.

## 2. Kincaid's Lupine

In Yamhill County, there are two known populations of Kincaid's lupine. These occur primarily in the ORA and GVA. Botanical surveys completed by the County during the growing season are presented in Appendix B of the HCP (Yamhill County 2012). In June 2011, 13 USFWS known locations for Kincaid's lupine were surveyed utilizing protocols developed in collaboration with the Service to document presence of Kincaid's lupine as well as other federally-listed plants and native species. Kincaid's lupine surveys at USFWS known locations were conducted by the surveyor walking each side of the right-of-way. Occasional surveying was done into the right-of-way (perpendicular to a road) in wide areas to increase detectability. Due to the cool, wet spring, not all of the Kincaid's lupine observed were in flower. However, most were in bud and easily visible to the surveyor.

Kincaid's lupine was documented at 10 of the 13 sites (Yamhill County 2012, Appendix B) and occurred in the foreslope at four sites (Table 3). Two other lupine species, many-leaved lupine (*L. polyphyllus*) and small-flowered lupine (*L. polycarpus*), were noted in or near the survey sites. These are readily distinguished from Kincaid's lupine without technical botanical analysis. Many-leaved lupine is much larger and grows in moist to fairly wet areas. Small-flowered lupine is much smaller, and has much smaller flowers and inflorescences. It generally grows in areas with little competition from vegetation, such as road shoulders.

In late June, dispersal zone surveys covering an area with a radius extending 2 km (1.2 mile) outward from the USFWS known locations were conducted to determine if additional Kincaid's lupine were within the Fender's blue butterfly dispersal zone. Both sides of each of the designated roadways were driven slowly on the far right edge of the pavement. Portions of these areas that were walked for the previous survey were excluded. Areas excluded were driven at a normal speed without surveying. The 2 km (1.2 mile) survey occurred slightly past the peak of the flowering "window" that would have allowed for the highest detectability of Kincaid's lupine, leaving the possibility that some lupine plants were not seen. Most lupine plants observed were past their flowering period, and flowers were either not present, present but only at the top of a stalk, or partially present but partly brownish in color. Some of the lupine population observed consisted of one or a few vegetative plants partially concealed by surrounding vegetation.

Table 2. Summary of Survey Results for Fender's Blue Butterfly at USFWS Known Locations in Yamhill County in 2011

Site Name	Site (Description)	Fender's Blue Butterfly Observed
GVA1 <sup>1</sup>	Gopher Valley Rd., vicinity Dupee Valley Rd. N to Agee Lane	No
GVA 2	Gopher Valley Rd., Yamhill Oaks, The Nature Conservancy Property	Yes
GVA 4	Intersection Gopher Valley Rd. and Agee Lane	No
GVA 5	Deer Creek Park	No
GVA 6	Muddy Valley Rd.	No
Rock Creek	Rock Creek	No
ORA1 <sup>2</sup>	North side Oak Ridge Rd., near intersection with Fairdale Rd.	Yes
ORA 2	South side Oak Ridge Rd., near intersection with Fairdale Rd.	Yes
ORA 3	North Oak Ridge Rd.	Yes
ORA 5	Old Moores Valley Rd.	Yes
ORA 6	Moores Valley Rd.	Yes
ORA 7	Hacker Rd.	Yes
Source: Yamhill County 2012		
<sup>1</sup> U.S. Fish and Wildlife Service designation for Gopher Valley Area		
<sup>2</sup> U.S. Fish and Wildlife Service designation for Oak Ridge Area		

The dispersal zone surveys located Kincaid's lupine at seven new, undocumented Yamhill County Road right-of-way areas: Tupper Road, Oak Ridge Road, Beaver Creek Road, Moores Valley Road, Gopher Valley Road, Old Moores Valley Road, and Panther Creek Road (Yamhill County 2012, Appendix D) and occurred in the foreslope at one site (Table 4). Broadleaf lupine and many-leaved lupine were also seen during this survey effort. Broadleaf lupine was particularly numerous in western portions of the Oak Ridge area. Fender's blue butterflies do not use broadleaf lupine as a nectar species. A summary of the 2011 Kincaid's lupine surveys results is presented in Table 3.

#### **B. Status of Critical Habitat for Fender's blue butterfly and Kincaid's lupine in the Action Area**

Two critical habitat units for Fender's blue butterfly occur in Yamhill County, encompassing 28.9 ha (71.3 acres), most of which occur on private land. The critical habitats designated in Yamhill County include private land occurring within northern Yamhill County, within the Oak Ridge habitat network and private lands, and within southern Yamhill County along Gopher Valley Road (U.S. Fish and Wildlife Service 2006).

Four critical habitat units for Kincaid's lupine occur in Yamhill County, encompassing 57.3 ha (141.7 acres). Of the 57.4 ha (141.7 acres), 56.7 ha (140 acres) occur on private land and 0.7 ha (1.7 acres) occurs on state land (U.S. Fish and Wildlife Service 2006). The designations in

Yamhill County include the following: private land in the northern part of the County along Oak Creek Road; private land along the east and west sides of Gopher Valley Road near its intersection with Dupee Valley Road; private lands located west of Muddy Valley Road and south of Eagle Point Road; and Oregon Department of Transportation land south of Highway 18, east of Ballston Road, and approximately 1 km (0.6 miles) south of the Yamhill River (U.S. Fish and Wildlife Service 2006). Critical habitat for Kincaid's lupine is mostly coincident with critical habitat for Fender's blue butterfly (Table 4).

#### IV. EFFECTS OF THE ACTION

##### A. Basis for Effects Analysis

The HCP describes and quantifies the unavoidable impacts to the covered species that are predicted to result from covered activities over the 30-year term of the HCP. The analysis in this biological opinion is based on the analysis in the HCP. The effects assessment for the HCP assumed that both Fender's blue butterfly and Kincaid's lupine occupy all locations where the Service previously determined species presence (USFWS known locations). Additional locations were found during surveys conducted in support of the HCP within the 2 km (1.2 miles) area around the USFWS known locations (Yamhill County 2012, Appendix B and Appendix D), to identify additional suitable habitat in close proximity to the existing Fender's blue butterfly population that would allow colonization. The HCP used the following process to determine effects to Fender's blue butterfly over the 30-year term of the permit:

- Survey and map habitat: using GIS, known species locations and their designated critical habitat were overlaid with Yamhill County roads and right-of-ways to identify habitat areas that could be affected by covered activities. Potential effects on Fender's blue butterfly and Kincaid's lupine were assessed for these areas.
- County right-of-way varies between 12 and 18 m (40 and 60 feet); potential effects were assessed using the greater distance of 18 m (60 feet). Within the 18 m (60-foot) right-of-way, there is a 6 m (20-foot) road prism (includes the ditch, the shoulder and the roadbed). The road prism was eliminated from the analysis, since it does not provide usable habitat. The remaining right-of-way used for the analysis was 12 m (40 feet) wide, 6 m (20 feet) from the edge of each side of the road prism. This 6 m (20 foot) County right-of-way was divided into two distinct sections:
  1. "Potential Impact Zone" - the first 1.5 m (5 feet) from the shoulder of the road to the back of the ditch (where normal maintenance is performed), and
  2. "No Impact Zone" - the remaining 4.6 m (15 feet) from the back of the ditch to the end of the right-of-way (no normal maintenance is performed here).

Although the analysis in the HCP utilizes the terms Potential Impact Zone and No Impact Zone, the Service disagrees with the HCP's implied definition of "No Impact Zone" because there may still be impacts to listed species in this area, primarily from drift or wind dispersal. Any Fender's blue butterfly or Kincaid's lupine in this area might still be subject to drifting herbicides or wind-blown gravel dust.

Table 3. Summary of Survey Results for Kincaid's Lupine at USFWS Known Locations and the 2 km (1.24 mile) Dispersal Zones in Yamhill County in 2011

Site Name	Site (Description)	Species Present	Species Observed in the Potential Impact Zone	Approximate Number or Size of Area of Species <sup>5</sup>
<b>Known Locations</b>				
GVA <sup>1</sup> 1	Gopher Valley Rd., vicinity Dupee Valley Rd. N to Agee Lane	Yes	No	8 clumps
GVA 2	Gopher Valley Rd., Yamhill Oaks, The Nature Conservancy Property	Yes	No	2 large and many small patches
GVA 4	Intersection Gopher Valley Rd. and Agee Lane	No	No	None found
GVA 5	Deer Creek Park	Yes	No	208 plants
GVA 6	Muddy Valley Rd.	No	No	None found
Rock Creek	Rock Creek	No	No	None Found
Meadow Lake <sup>2</sup>	Meadow Lake	Yes	No	NA
ORA <sup>3</sup> 1	North side Oak Ridge Rd., near intersection with Fairdale Rd.	Yes	No	217 plants
ORA 2	South side Oak Ridge Rd., near intersection with Fairdale Rd.	Yes	Yes	185 plants plus 1 large patch leading to a patch; one clump; then hundreds of plants.
ORA 3	North Oak Ridge Rd.	Yes	No	414 plants plus 115 clumps
ORA 5	Old Moores Valley Rd.	Yes	Yes	769 clumps
ORA 6	Moores Valley Rd.	Yes	Yes	41 clumps
ORA 7	Hacker Rd.	Yes	Yes	90 clumps/patches
<b>Kincaid's Lupine Documented During the 2 km Dispersal Survey</b>				
Tupper Road	Tupper Rd.	Yes	No	NA
Oak Ridge Road	Oak Ridge Rd.	Yes	No	NA
Beaver Creek Road	Beaver Creek Rd.	Yes	Yes	NA
Moores Valley Road	Moores Valley Rd.	Yes	No	NA
Gopher Valley Road	Gopher Valley Rd.	Yes	No	5 clumps
Old Moores Valley Road	Old Moores Valley Rd.	Yes	No	NA
Panther Creek Road	Panther Creek Rd.	Yes	No	NA

Source: Yamhill County 2012

<sup>1</sup> U.S. Fish and Wildlife Service designation for Gopher Valley Area

<sup>2</sup> Meadow Lake was added as a known location after the surveys were complete. Fender's blue butterfly surveys were not performed at this location.

<sup>3</sup> U.S. Fish and Wildlife Service designation for Oak Ridge Area

<sup>4</sup> The number of plants is difficult to determine, as plants are somewhat clumpy, but may be rhizomatous. It is difficult to tell if a "clumpy patch" is one or more individual plants, so the "number of plants" should be interperated very generally as "number of clumps" A clump of lupines growing from a branching root crown is a clump. A patch of lupine contains multiple clumps.

<sup>5</sup> NA - Not available: Plant counts were not taken.

Table 4. Kilometers and Acres of Yamhill County Road Right-of-Way in Fender's Blue Butterfly and Kincaid's Lupine Designated Critical Habitat

Critical Habitat Units for Fender's Blue Butterfly <sup>1</sup>	Critical Habitat Units for Kincaid's Lupine <sup>1</sup>	Road Name	Km (Mile)	Hectares (Acres)
FBB <sup>2</sup> -1A	KL <sup>3</sup> -2A	Oak Ridge	0.38 (0.24)	0.46 (1.14)
FBB-1B	KL-2B	Oak Ridge	0.38 (0.24)	0.47 (1.17)
FBB-2	KL-3	Agee	0.09 (0.06)	0.10 (0.25)
FBB-2	KL-3	Gopher Valley	0.74 (0.46)	0.91 (2.25)
FBB-2	KL-3	Dupee Valley	0.03 (0.02)	0.04 (0.09)
-	KL-4 <sup>4</sup>	Muddy Valley	0.02 (0.01)	0.17 (0.41)
<b>Fender's Blue Butterfly Total</b>			<b>1.62 (1.02)</b>	<b>1.98 (4.90)</b>
<b>Kincaid's Lupine Total</b>			<b>1.64 (1.03)</b>	<b>2.15 (5.31)</b>

<sup>1</sup> See Appendix A of the HCP (Yamhill County 2012) for map of Fender's blue butterfly and Kincaid's lupine critical habitat.  
<sup>2</sup>FBB=Fender's blue butterfly  
<sup>3</sup>KL=Kincaid's lupine  
<sup>4</sup>KL-4 does not have an associated Fender's blue butterfly designated habitat unit

To determine the area inside the County's T&E Special Maintenance Zones that could potentially be affected by road maintenance activities, the HCP overlaid the known Fender's blue butterfly locations atop the 18 m (60-foot) right-of-way to identify the acreage that occurs within the County right-of-way. Kincaid's lupine identified within the Fender's blue butterfly 2 km (1.2 miles) dispersal zone were assigned GPS points. If the plant(s) covered an area 5 m<sup>2</sup> (54feet<sup>2</sup>) or less, the area was calculated as 5 m<sup>2</sup>(54 feet<sup>2</sup>). If the plant cover exceeded an area of 5 m<sup>2</sup> (54 feet<sup>2</sup>), GPS points were taken to define the entire area that the lupine occupied measure habitat occupancy and estimate the proportion of this area likely to contain Kincaid's lupine and nectar plants.

Within the Fender's blue butterfly 2 km (1.2 mile) dispersal zone, 118.3 ha (292.3 acres) of habitat along 96.6 km (60.0 miles) County road was surveyed for Kincaid's lupine (Salix Associates 2011b). Kincaid's lupine was identified on 0.2 ha (0.5 acre) during the 2 km (1.2 mile) dispersal survey. Based on this information, the HCP surmised that Kincaid's lupine will occur in 0.0015 percent of the potential suitable habitat outside the T&E Special Maintenance Zones in Yamhill County.

There are 1,283.8 ha (3,172.4 acres) of County right-of-way outside of the T&E Special Maintenance Zones. Using the percentage calculated above, the HCP concluded there will be a total of 2 ha (4.9 acres) in the County right-of-way, including both the Potential Impact and No Impact Zone, outside of the T&E Special Maintenance Zones. The Potential Impact Zone outside of the T&E Special Maintenance Zones were given a slightly larger buffer, extending the 1.5 m (5 foot) area to 2.0 m (6.6 feet) to account for spray drift and brushing. This increase in the Potential Impact Zone reduces the No Impact Zone to 4.1 m (13.4 feet) from 4.6 m (15 feet). Of the total acreage, 0.6 ha (1.6 acres) occurs in the Potential Impact Zone and 1.3 ha (3.3 acres) occurs in the No Impact Zone. Therefore, the HCP concluded that 0.6 ha (1.6 acres) could

potentially be affected by the covered activities outside of the T&E Special Maintenance Zones. Again, because there may still be impacts to listed species in the area labeled “No Impact Zone” from drift or wind dispersal, we will consider all of the 2 ha (4.9 acres) outside of the T&E Special Maintenance Zone to be within the area that may contain potential effects.

To determine the area of Kincaid’s lupine potentially affected by County road maintenance activities, the HCP utilized an analysis similar to what is described above. However, the area was corrected to reflect actual plant cover in the Potential Impact Zone. Kincaid’s lupine surveys identified lupine occurring in the Potential Impact Zone at 4 of 13 USFWS known locations and at 1 of 7 sites in the 2 km (1.2 mile) dispersal zone (Chapter 3 of the HCP). The combined Kincaid’s lupine cover at these five sites within the T&E Special Maintenance Zones was 0.004 ha (0.01 acre). To determine Kincaid’s lupine cover outside of the T&E Special Maintenance Zones, the HCP further refined the 0.6 ha (1.6 acres) identified above to account for actual plant cover. Kincaid’s lupine occurred in the Potential Impact Zone at 1 of 7 sites (14 percent) identified during the 2 km (1.2 mile) dispersal survey. Using this information, the HCP concludes that Kincaid’s lupine will occur in 0.1 ha (0.2 acre) of the potential suitable habitat outside the T&E Special Maintenance Zones in Yamhill County.

To determine the area of nectar plants used by Fender’s blue butterfly potentially affected by County road maintenance, a 0.5 km (0.3 mile) nectar zone was drawn around known Kincaid’s lupine locations. The area (hectare/acre) and frontage (km/mile) was then calculated using the Potential Impact and No Impact Zone for the area that occurs outside of the known locations, but inside of the 0.5 km (0.3 mile) nectar zone along the County right-of-way. Habitat within the 0.5 km (0.3 mile) nectar zone was not classified. For the purpose of the HCP analysis, it was assumed that the entire area could potentially contain nectar plants.

The implementation of special maintenance practices within the T&E Special Maintenance Zones protects nectar habitat in the vicinity of known populations of Fender’s blue butterfly. However, the question arose about the potential effect of road maintenance activities on forage habitat outside of the T&E Special Maintenance Zones. Since all known populations are protected by the T&E Special Maintenance Zones, potential effects to nectar species for undiscovered population of Fender’s blue butterfly that may exist in Yamhill County was evaluated. To perform this evaluation, the HCP assumed that a total of eight “unknown” Fender’s blue butterfly populations could occur in the vicinity of the County right-of way outside of the T&E Special Maintenance Zones. The forage area for Fender’s blue butterfly is 0.5 km (0.3 mile) from their host site. At least 5 ha (12 acres) of high quality habitat are necessary to support a populations of Fender’s blue butterfly, a larger quantity of lower grade habitat is required (U.S. Fish and Wildlife Service 2010). Nectar plants within the foraging area that occur within the Potential Impact Zone of the right-of-way could be affected by County road maintenance activities.

The HCP concluded that native nectar habitat associated with the eight unknown populations could potentially encompass as much as 148 ha (366 acres); of this, 32.5 ha (80.3 acres) would occur within County managed right-of-way, with 8.15 hectares (20.16 acres) occurring in the Potential Impact Zone. These 8.2 ha (20.2 acres) represents 5.5 percent of the total native nectar habitat (148 ha [366 acres]) potentially available. The HCP assumes that the nectar habitat in the remainder of the right-of-way, 24.4 ha (60.2 acres) will continue to be available to Fender’s blue

butterfly. Additional nectar habitat could also exist on the 115.6 ha (285.7 acres) that occurs within the 0.5 km (0.3 mile) nectar zone that is outside of the right-of-way. Additional nectar habitat may be available within the forage area outside of the right-of way, this area may support nectar species that could be used by the Fender's blue butterfly.

Effects to plants were quantified in the HCP on the basis of square meters of foliar cover impacted for Kincaid's lupine. The effects to designated critical habitat for Fender's blue butterfly, Kincaid's lupine were analyzed by evaluating the change in the PCEs caused by the activities covered in the HCP.

## **B. Effects to Covered Species**

Direct impacts result from activities causing ground disturbance or removing land cover, habitat, or populations (or portions of populations) of covered species. Indirect impacts are caused by the covered activities but are reasonably certain to occur later in time. Yamhill County contains approximately 2,000 ha (4,942 acres) of County right-of-way along 1,090 km (677 miles) of roadway. Continued County road maintenance within the right-of-way could potentially affect approximately 0.75 ha (1.9 acres) of Fender's blue butterfly and Kincaid's lupine habitat in the Potential Impact Zone along 3.7 km (2.30 miles) of County road within the T&E Special Maintenance Zones. The 0.75 ha (1.9 acres) along 3.7 km (2.3 miles) of County road represents the area where the species is known to be present, or where the species were identified during surveys. Indirect effects on Fender's blue butterfly nectar plants could potentially occur over 8.2 ha (20.2 acres) in the Potential Impact Zone.

Effects to covered species outside of the T&E Special Maintenance Zones could potentially occur in 2 ha (5.0 acres) of potential habitat along the County right-of-way. Within the above acreage, Kincaid's lupine cover occurs on 0.004 ha (0.01 acre) of the Potential Impact Zone within the T&E Special Maintenance Zones and could potentially occur on 0.09 ha (0.23 acre) of potential habitat outside of the T&E Special Maintenance Zones. There will be less impact on listed species in the Vineyard Special Maintenance Zones due to the spraying, brushing and mowing restrictions in those zones. Road maintenance activities could inhibit or promote the expansion of Fender's blue butterfly and Kincaid's lupine distribution. Table 5 identifies the activities with anticipated effects on each of the covered species, the frequency and duration of those activities, and the type of anticipated effect.

### **1. Fender's blue butterfly**

Adult Fender's blue butterflies will be vulnerable to more types of road maintenance activities than larvae or caterpillars. The County generally performs mowing and brushing activities between April and November. Posting signs and emergency earth removal occur throughout the year as necessary, while drainage activities, such as cleaning or replacing culverts, and are generally scheduled during the dry time of the year. In a typical year in the Willamette Valley, Fender's blue butterfly normally flies from mid-May through early-mid June, with the larva dropping to the ground in mid-June or July, where it hibernates through the fall and winter. If maintenance activities occur during times when the adults are present, butterfly death could occur if equipment contacts the butterflies. Direct effects could also occur if equipment kills,

mains, or displaces caterpillars on plants during their active stage or near the soil in their dormant phase. Road improvement projects will have effects similar to those described above; however, this type of project will encompass a much larger footprint and therefore potentially affect a greater number of butterflies than other road maintenance activities.

Mowing in habitat patches with eggs or larvae of Fender's blue butterfly at any time during the year may crush or otherwise kill a small number of individuals of these life stages of the butterfly. Studies in the southern Willamette Valley have found that both adult and larval Fender's blue butterflies increased in number following mowing to reduce the stature of herbaceous non-native vegetation, (Fitzpatrick 2005, Kaye and Benfield 2005). A study on the effects of fire and mowing on Fender's blue butterfly and native upland prairie at Baskett Slough National Wildlife Refuge found that Fender's blue butterfly eggs were 10 to 14 times more abundant in plots that were mowed or burned compared to undisturbed, control plots; woody plants were reduced 66 percent with mowing (Wilson and Clark 1997). At the U.S. Army Corps of Engineers' Fern Ridge Reservoir, the Fender's blue butterfly population has increased dramatically since fall mowing of lupine patches has been implemented (Messinger 2006). Fender's blue butterfly population trends have been correlated with lupine vigor; high leaf growth appears to produce larger butterfly populations. The abundance of Fender's blue butterfly eggs was found to be correlated with the abundance of Kincaid's lupine leaves at a number of study sites (Kaye and Cramer 2003). Egg abundance increased substantially at sites which had been treated to control non-native weeds (Schultz *et al.* 2003). Soil compaction by mowing equipment may adversely affect Fender's blue butterfly but the likelihood of this effect is expected to be small and will be prevented by the use of rubber tracks on tractors used for mowing.

Indirect effects on Fender's blue butterfly could occur through the loss of host plants as a result of vegetation maintenance, posting signs, emergency earth removal, drainage activities, cleaning or replacing culverts, and road improvement projects. These activities could lead to decreased fitness and potentially death of butterflies. There is potential for Fender's blue butterfly to experience greater pressure at nectar sources in the following areas- ORA 1, 2, 3, 5, and 6 and GVA 1, 2, and 4. Each of the three areas experience overlapping nectar zones (within the area, not overall; Yamhill County 2012, Appendix C) that could increase competition among the butterfly for access to high quality nectar sources. If vegetation maintenance (i.e., mowing, spraying, shrub and tree removal) is conducted in the late summer and early fall after plants have set seed and senesced (died off), it can be beneficial if it improves habitat conditions for host plant or by removing or lowering the height of plant species that compete for light and nutrients.

Grading, chip sealing, soft spot dig-outs and grinding, HMAC overlays, crack sealing, shoulder preparation and rocking, and centerline and fog-line striping are less likely to affect the butterfly both directly and indirectly than vegetation removal activities. For these activities, equipment is operated only to the ditch line of the road, and will only affect plants on the foreslope of the road. Plants have been observed growing in the foreslope of the road; however, this is not a common occurrence. Additionally, grading typically occurs during the wet winter months, when the caterpillars are dormant; thus, only caterpillars near the base of plants in the foreslope of the road would be affected.

Table 5. Activities with anticipated effects on Fender's Blue Butterfly and Kincaid's Lupine and the type of anticipated effect.

Activities with Anticipated Effects			Anticipated Effect			
			Fender's blue butterfly		Kincaid's lupine	
Activity	Average Frequency	Duration	Direct	Indirect	Direct	Indirect
<b>Activities on Gravel and Paved Roads</b>						
Mowing	Twice a year	7 lane miles/day	-	+/-	+/-	+/-
Brush Cutting	Once a year	0.5 lane mile/day	-	+/-	+/-	+/-
Contract Spraying (road shoulders)	Once a year	40 lane miles/day	-	+/-	+/-	+/-
In-house Spraying (invasive control)	Once a year	5 lane miles/day	-	+/-	+/-	+/-
Large Shrub and Tree Removal	Once a year	2-4 hours	+/-	+/-	+/-	+/-
Sign Posting	As needed	2 hours	-	-	-	x
Drainage Maintenance	Twice a year	Grader operation – 2-3 lane miles/day	-	-	-	x
Emergency Earth Removal	As needed	500 cubic yards/day	-	-	-	x
Road Improvements	As required for safety of the traveling public	-	-	-	-	x
<b>Activities on Gravel Roads</b>						
Grading	Up to four times a year	Moving operation 2 miles/shift	m	m	m	x
Dust Abatement	Citizen's permit request, once a year	6,200 gallons/day	+/-	+/-	+/-	+/-
<b>Activities on Paved Roads</b>						
Shoulder Preparation and Rocking	Once every 10 years	3 lane miles/shift	-	-	-	x
Sweeping and Washing	As needed, once a year	10 miles/day	m	m	m	x
Deicing	Weather dependent, 3 times a year	50 miles/shift	-	-	-	x
<b>Conservation Measures</b>						
Establishment of T&E maintenance zones	ongoing	ongoing	+	x	+	x
Avoidance and Minimization measures	ongoing	ongoing	+	x	+	x
Removal of Invasive species	As needed	As needed	+	x	+	x
Habitat restoration	As needed	As needed	+	x	+	x
Monitoring and Reporting	Annually, then every 3 years	To be determined	x	+	x	+
			+ positive effect	- negative effect	m minimal	x unlikely to affect

There are limited studies that can aid in identifying direct effects on Fender's blue butterfly from herbicide application, dust abatement (lignosulfonate) or deicer (liquid magnesium chloride). A study conducted by Bramble et al. (1997) indicates that butterfly populations are similarly affected by mechanical maintenance and herbicide application. Toxicological studies on

lignosulfonate indicate that the chemical is non-toxic to humans. However, studies to determine a lethal dose to butterflies have not been performed. It is possible that direct contact with liquid magnesium chloride could affect gene expression; again, no studies have been performed specific to butterflies. Effects on Fender's blue butterfly are more likely to result from application of herbicides, which could indirectly affect the butterfly if nectar species or host species are exposed to the herbicide, resulting in a die-off. However, removal of invasive species like blackberries and scotch broom provides additional habitat for prairie species such as Kincaid's lupine, which could benefit the butterfly.

Exposure to dust abatement product (lignosulfonate) or deicer (liquid magnesium chloride) is less likely. The products are applied directly to the road bed. The only pathway into the roadside areas will be by rain runoff. The rain may carry these chemicals into the ditch, but the opportunity for direct effects on the butterfly is remote. Application of these chemicals could result in indirect effects on nectar or host species for the butterfly if they are located in close proximity to the drainage ditch, as they could be exposed to chemicals in the runoff. Snowplowing is unlikely to affect the Fender's blue butterfly, as this activity occurs within the 6-m (20-foot) road prism. Sanding is also unlikely to affect the Fender's blue butterfly, as there is a very small proportion of salt in the sand mixture (27 kg (60 pounds) of salt to 20,000 kg (44,092 pounds) of sand). Additionally, these activities occur in the fall and winter months when the caterpillars are dormant. Hydro seeding is unlikely to affect the butterfly as the equipment stays on the road prism and this activity occurs along un-vegetated slopes where neither lupines, nor butterflies would be present. Hand seeding may cause trampling of caterpillars or lupines if they are present.

The conservation measures and mitigation project associated with HCP implementation will result in direct and indirect positive effects to Fender's blue butterfly and its habitat (prairie ecosystem, larval host plants, nectar sources, and stepping stone habitat). The establishment of T&E Species Special Maintenance Zones where covered species occur along the County right-of-way provides Fender's blue butterfly with a more secure environment with a reduced threat of adverse effects. The implementation of avoidance and minimization measures for roadside populations of the two species within T&E Special Maintenance Zones will reduce the possibility of adverse effects to the species. Control of invasive species in T&E Special Maintenance Zones will increase potential habitat for Fender's blue butterfly because this will provide host plant and native nectar species with increased potential for survival and reproduction. The designation and management of conservation areas for Fender's blue butterfly on County land will provide secure habitat for the species and thereby increase their potential for survival and reproduction. Any additional habitat enhancement in the County right-of-way that promotes ground-reaching sunlight will increase the survival and reproduction potential of present host plant and nectar species, thereby increasing potential habitat for Fender's blue butterfly. At Deer Creek Park, the planting of Kincaid's lupine and nectar species will increase potential habitat for Fender's blue butterfly. Finally, regular monitoring and reporting of the above conservation measures will inform managers of unforeseen adverse effects to Fender's blue butterfly and its primary host plant, Kincaid's lupine, and provide an opportunity to alter activities as necessary to minimize or eliminate those effects.

## 2. Kincaid's lupine

Kincaid's lupine could be directly affected by mowing, brushing, spraying, tree and shrub removal, hand seeding, drainage activities, cleaning or replacing culverts, emergency earth removal, and sign posting operations. Mowing could prevent reproduction by cutting off flowers or inhibiting seed set and dispersal. Other activities that may trample or damage listed plants, leading to death or decreased propagation include shrub removal, cleaning or replacing culverts, sign posting and emergency earth removal. Road improvement projects could have effects similar to those described above, as well as potentially reducing the population of Kincaid's lupine by digging up the plant.

Spring mowing within patches of listed plants may remove much of the above ground growing parts of the plants, which would reduce growth and reproductive success for that year. Fall mowing is not likely to have any adverse effects to listed plants, as the above ground portions of the plants will have senesced. Research on prairie management techniques has shown that mowing is an effective method for reducing non-native plants, with generally positive effects to native prairie species. Annual fall mowing has significant positive effects, including increased leaf, flower and foliar cover on Kincaid's lupine (Kaye and Thorpe 2006). Soil compaction by mowing equipment may adversely affect Kincaid's lupine but the likelihood of this effect is expected to be small and will be prevented by the use of rubber tracks on tractors used for mowing. In general, if vegetation maintenance (including mowing, brushing, shrub and tree removal, and spraying) within the County right-of-way is conducted during the fall, it can benefit Kincaid's lupine by removing or controlling species that compete for light and nutrients. Selective vegetation management will promote expansion of lupine populations.

Application of herbicides could kill plants or stunt growth. Application of dust abatement chemical (lignosulfonate) and deicer (liquid magnesium chloride) could affect the growth of vegetation adjacent to the roadway if it comes into contact with Kincaid's lupine. Particles of liquid magnesium chloride can get into the cells of the plants and make them less cold hardy and more susceptible to freezing (Perry n.d.). Application of lignosulfonates and liquid magnesium chloride could alter the pH of the soil, which could affect the growing environment. However, reduction of dust collecting on the plant will benefit lupine, as there will be no reduction of their photosynthetic rate (Hiarano *et al.* 1995).

Grading, chip sealing, soft spot dig-outs and grinding, HMAC overlays, crack sealing, shoulder preparation and rocking, and centerline and fog-line striping are less likely to affect lupines than mowing or other vegetation removal, as equipment is operated only to the ditch line of the road, and will only affect plants on the foreslope of the road. Road maintenance activities during the plant's dormant phase will be less likely to cause direct or indirect effects.

Snowplowing is unlikely to affect Kincaid's lupine, as this activity occurs within the 6-m (20-foot) road prism. Sanding is also unlikely to affect Kincaid's lupine as there is a very small proportion of salt in the sand mixture. Additionally, these activities occur in the fall and winter months when the plants are dormant. Hydro seeding is unlikely to affect Kincaid's lupine as the equipment stays on the road prism and this activity occurs along un-vegetated slopes where lupines are not present. Hand seeding may cause trampling of lupines if they are present.

The conservation measures and mitigation project associated with HCP implementation will result in direct and indirect positive effects to Kincaid's lupine. The establishment of T&E Species Special Maintenance Zones where covered species occur along the County right-of-way provides Kincaid's lupine with a more secure environment with a reduced threat of adverse effects. The implementation of avoidance and minimization measures for roadside populations of the two species within T&E Special Maintenance Zones will reduce the possibility of adverse effects to the species. Control of invasive species in T&E Special Maintenance Zones will increase potential habitat for Kincaid's lupine and provide the species with increased potential for survival and reproduction. The designation and management of conservation areas for Kincaid's lupine on County land will provide secure habitat for the species and thereby increase its potential for survival and reproduction. Any additional habitat enhancement in the County right-of-way that promotes ground-reaching sunlight will increase the survival and reproduction potential of Kincaid's lupine already present. At Deer Creek Park, the planting of Kincaid's lupine will increase the abundance of the species. Finally, regular monitoring and reporting of the above conservation measures will inform managers of unforeseen adverse effects to Kincaid's lupine and provide an opportunity to alter activities as necessary to minimize or eliminate those effects.

### **C. Effects to Critical Habitat for Fender's blue butterfly and Kincaid's lupine**

Critical habitat is designated by the Service to protect specific areas within the geographical area occupied by the species where physical or biological features essential to the conservation of the species are found. This habitat may require special management consideration and protection. Critical habitat has been designated in Yamhill County for Fender's blue butterfly and Kincaid's lupine.

Approximately seven percent of Fender's blue butterfly critical habitat within Yamhill County could be potentially affected by the covered activities. Yamhill County supports a total of 28.9 ha (71.3 acres) of critical habitat for Fender's blue butterfly. Road maintenance activities will occur along only 1.6 km (1.0 miles) or 2.0 ha (5.0 acres) of Fender's blue butterfly in critical habitat units FBB-1 and FBB-2 (Table 6).

Approximately four percent of Kincaid's lupine critical habitat within Yamhill County could be potentially affected by the covered activities. Yamhill County supports a total of 57.3 ha (141.7 acres) of critical habitat for Kincaid's lupine. Critical habitat for lupines is mostly coincident with critical habitat for Fender's blue butterfly (Table 6). Road maintenance activities will occur along 1.64 km (1.03 miles) or 2.1 ha (5.3 acres) of Kincaid's lupine critical habitat in units KL-2, KL-3, and KL-4.

The effect of mowing on designated critical habitat for Fender's blue butterfly and Kincaid's lupine is a short-term reduction in some PCEs (i.e., prairie ecosystem, larval host plants, nectar sources, and stepping stone habitat) with clear long-term benefits. Spring mowing will temporarily reduce the cover of native prairie species, which would be an adverse effect to that PCE for each of the three species. It will also reduce the cover of larval host plants and reduce the availability of nectar

Table 6. Kilometers and Acres of Yamhill County Road Right-of-Way in Fender's Blue Butterfly and Kincaid's Lupine Designated Critical Habitat

Critical Habitat Units for Fender's Blue Butterfly <sup>1</sup>	Critical Habitat Units for Kincaid's Lupine <sup>1</sup>	Road Name	Km (Mile)	Hectares (Acres)
FBB <sup>2</sup> -1A	KL <sup>3</sup> -2A	Oak Ridge	0.38 (0.24)	0.46 (1.14)
FBB-1B	KL-2B	Oak Ridge	0.38 (0.24)	0.47 (1.17)
FBB-2	KL-3	Agee	0.09 (0.06)	0.10 (0.25)
FBB-2	KL-3	Gopher Valley	0.74 (0.46)	0.91 (2.25)
FBB-2	KL-3	Dupee Valley	0.03 (0.02)	0.04 (0.09)
-	KL-4 <sup>4</sup>	Muddy Valley	0.02 (0.01)	0.17 (0.41)
<b>Fender's Blue Butterfly Total</b>			<b>1.62 (1.02)</b>	<b>1.98 (4.90)</b>
<b>Kincaid's Lupine Total</b>			<b>1.64 (1.03)</b>	<b>2.15 (5.31)</b>

<sup>1</sup> See Yamhill County 2012, Appendix A for map of Fender's blue butterfly and Kincaid's lupine critical habitat.  
<sup>2</sup>FBB=Fender's blue butterfly  
<sup>3</sup>KL=Kincaid's lupine  
<sup>4</sup>KL-4 does not have an associated Fender's blue butterfly designated habitat unit

sources for Fender's blue butterfly. Concomitantly, spring mowing will have beneficial effects to critical habitat for all three species as it removes competing non-native plant species. Fall mowing is not likely to have any adverse effects to the PCEs of designated critical habitat for any of the species. Both spring and fall mowing have clear beneficial effects in the long-term; mowing has been shown to be one of the most effective techniques for increasing native prairie species cover and reducing the dominance of competitive invasive species (Kaye and Benfield 2005, Messinger 2006).

Road maintenance activities, such as vegetation control, spraying, shrub and tree removal, and dust abatement, could have both positive and negative effects on the PCEs of critical habitat. If these activities are conducted in the late summer and early fall after plants have set seed and senesced (died off), they can be useful in restoring native prairies, larval host plants, nectar sources, and stepping-stone habitat by removing or lowering the height of plant species that compete for light and nutrients. However, if these activities are conducted during the reproduction season (April – June), they can have a negative effect on prairie ecosystems by reducing productivity of nectar and host plants or inhibiting reproduction. If maintenance activities occur from late April through June, road maintenance crews could trample, run over, remove, or otherwise prevent reproduction by flower and seed removal. Stepping stone habitat could be affected if large machinery (e.g., mowers and earthmovers) compact the soil so that prairie plant species can no longer flourish. However, this is unlikely because road maintenance machinery operates from the roadbed, where plants do not generally grow.

In addition to the effects described above, road improvement projects could negatively affect all PCEs associated with the Fender's blue butterfly critical habitat by digging up plants associated with these PCEs. Grading, chip sealing, soft spot dig-outs and grinding, HMA overlays, crack sealing, shoulder preparation and rocking, and centerline and fog-line striping is less likely to affect the PCEs, as equipment is operated only to the ditch line of the road, and will only affect plants in the foreslope of the road. Application of dust abatement chemicals (lignosulfonate) could potentially stunt the growth of vegetation in the area adjacent to the roadway. Sanding is unlikely to result in direct effects on the prairie habitat due to the very low proportion of salt included in the sand mixture. Maintenance activities conducted during the host and nectar plants' dormant phase are unlikely to have any effect on Fender's blue butterfly critical habitat.

Road maintenance activities such as vegetation control, spraying, shrub and tree removal, and dust abatement will have both positive and negative effects on the PCEs. These activities are useful in restoring and maintaining native prairies by removing or reducing the height of plant species that compete for light and nutrients. Road improvement projects could negatively affect the prairie ecosystem by digging up plants. Grading, chip sealing, soft spot dig-outs and grinding, HMAC overlays, crack sealing, shoulder preparation and rocking, and centerline and fog-line striping are unlikely to affect the PCEs, as equipment is operated only to the ditch line of the road. Spraying vegetation with herbicides could potentially reduce the insect pollinator population due to chemical-related mortality for a short time after spraying, but will not appreciably reduce the pollination success. Pollinators will quickly repopulate the area.

Application of dust abatement chemicals (lignosulfonate) could potentially retard the growth of prairie vegetation in the area adjacent to the roadway. Sanding is unlikely to result in direct effects on the prairie habitat due to the very low proportion of salt included in the sand mixture. Maintenance activities, such as vegetation control, spraying, shrub and tree removal, and dust abatement conducted during a plant's dormant period is unlikely to have any negative or adverse effect on the prairie ecosystem within Yamhill County. Road improvement projects will likely adversely affect the prairie ecosystem, due to plant removal, regardless of the timing.

The conservation measures and mitigation project associated with HCP implementation will directly and indirectly minimize adverse effects to the critical habitat of Kincaid's lupine and Fender's blue butterfly. The establishment of T&E Species Special Maintenance Zones where covered species occur along the County right-of-way will increase the security of any critical habitat that overlaps with those areas of species' occurrence, by reducing the threat of adverse effects in critical habitat. The implementation of avoidance and minimization measures for roadside populations of Kincaid's lupine that overlap with either Fender's blue butterfly critical habitat or Kincaid's lupine critical habitat within T&E Special Maintenance Zones will reduce the possibility of adverse effects to Kincaid's lupine and therefore critical habitat for either species. Control of invasive species in T&E Special Maintenance Zones will increase potential habitat for Kincaid's lupine and native nectar species. The designation and management of conservation areas for Kincaid's lupine and Fender's blue butterfly on County land will increase the security of any Fender's blue butterfly critical habitat or Kincaid's lupine critical habitat that overlaps with these conservation areas. Any additional habitat enhancement in the County right-of-way that occurs in critical habitat for Kincaid's lupine or Fender's blue butterfly will increase the quality of that critical habitat by promoting ground-reaching sunlight, increasing the growth potential of host plant and nectar species. At Deer Creek Park, the planting of Kincaid's lupine will increase the abundance of Kincaid's lupine and Fender's blue butterfly critical habitat. Finally, regular monitoring and reporting of the above conservation measures will inform managers of unforeseen adverse effects to the critical habitat of Fender's blue butterfly and Kincaid's lupine and provide an opportunity to alter activities as necessary to minimize or eliminate those effects.

#### **D. Summary of Effects**

Fender's blue butterfly and Kincaid's lupine could be affected by Yamhill County maintenance activities. Although Fender's blue butterflies could be directly affected (e.g., death) by

encounters with equipment or trampling, most of the effects of the covered activities will likely be indirect effects associated with effects on Kincaid's lupine and other plant species. Direct effects on Fender's blue butterflies could result from road improvement projects, depending on project timing. Adult Fender's blue butterflies, caterpillars, or larvae could be affected.

Mowing and herbicide application have the greatest opportunity to have an adverse effect on listed plants and therefore indirectly adversely affect Fender's blue butterfly. Mowing and herbicide application activities also have the greatest chance of indirectly benefiting plant species by removing competition and increasing sunlight on the ground. These factors benefit listed plants and prairie habitat. Brushing is also more likely to result in positive effects since it allows more sunlight to reach the soil, without disrupting existing colonies of listed plants. Selective vegetation management will promote expansion of lupine populations. This potential expansion of prairie habitat will indirectly benefit the Fender's blue butterfly.

Other activities, including tree and shrub removal, hand seeding, drainage activities, cleaning or replacing culverts, emergency earth removal, or sign posting operations may affect lupine by trampling or disrupting plants in a confined area where the disturbance occurs. Road improvement projects, such as widening and bike path development, will have effects similar to those described above; however, these effects will encompass a larger footprint. Dust abatement and deicing are conducted at specific locations on County roads. Information on lignosulfonates indicates that it can be harmful to plants, stunting growth and turning leaves brown (U.S. Environmental Protection Agency 2002). Sanding is unlikely to result in effects on the listed species due to the very low proportion of salt included in the sand mixture. Deicing and dust abatement may affect listed plants and butterfly habitat near the edge of the shoulder or from the ditch to the road. However, this is not an area where Kincaid's lupine is generally present. During surveys, some plants were found in this area, but it is not expected to support large numbers of prairie plants or covered species.

Road maintenance activities could potentially affect Fender's blue butterfly and Kincaid's lupine designated critical habitat. Effects on upland prairie habitat, larval host plants, adult nectar sources, and stepping stone habitat will be similar to the direct and indirect effects identified above for Kincaid's lupine. Spraying vegetation with herbicides could potentially reduce the insect pollinator population due to chemical-related mortality for a short time after spraying, but will not appreciably reduce the pollination success. Pollinators will quickly repopulate the area. Maintenance activities conducted during a plant's dormant period are unlikely to have any negative or adverse effect on the prairie ecosystem within Yamhill County.

The level of injury and mortality to Fender's blue butterfly larvae from the proposed activities is expected to be very low. Mowing and raking may kill or crush some larval butterflies in the duff and litter layer. We cannot estimate the actual number lost, but it is likely to be a very small percentage of the population. The conservation measures and mitigation project associated with HCP implementation will directly and indirectly minimize adverse effects to Fender's blue butterfly and Kincaid's lupine and their critical habitat. These activities are anticipated to minimize adverse effects of the proposed action on all habitat and PCEs associated with the Fender's blue butterfly and Kincaid's lupine (prairie ecosystem, larval host plants, nectar sources, and stepping stone habitat).

## 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 biological 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. The Yamhill County HCP addresses most of the likely development that will affect prairie habitats on private lands in the action area. We are unaware of any other non-federal actions in the action area that are reasonably certain to occur.

## VI. CONCLUSION

During the 30-year term of the 10(a)(1)(b) permit for the HCP, the permit will authorize take of covered species associated with the road maintenance activities of Yamhill County. Table 7 summarizes the amount of take to be authorized by the permit. Over the life of the permit, activities covered by the Yamhill County HCP will result in relatively minor adverse effects to each of the covered species. The mandated habitat restoration, enhancement, and management activities will all have some short term negative effects on the covered species, but in the long term, the effects will be beneficial, and each of the covered species will be more protected and secure than they are at present.

The Service anticipates that activities associated with the proposed action are reasonably certain to result in incidental take of Fender's blue butterfly. The Service anticipates incidental take of Fender's blue butterfly will be difficult to detect because the presence and number of individuals is difficult to determine within a project area and detecting a dead or impaired specimen of any life stage (adult, larva, or egg) is highly unlikely. Although the Service anticipates Fender's blue butterfly will be incidentally harmed (killed or injured) as a result of road maintenance activities, accurately quantifying these effects is difficult. For instance, injured butterflies that fly off to areas well beyond the project corridor before dying or that are consumed by birds, bats, or other predators because of injuries are not likely to be located for estimating take. Additionally, if an adult butterfly loses its main source of food because road maintenance activities destroyed a large patch of nectar, it would be difficult to determine that the death of that adult butterfly was connected to the loss of the nectar patch. Furthermore, larvae and eggs that are trampled, mowed down, or removed during activities will be extremely difficult to find in order to quantify incidental take. Therefore, even though take is expected to occur, data are not available and are not sufficient to enable the Service to estimate an exact number of individuals which are incidentally taken for most proposed activities.

The incidental take of Fender's blue butterfly take resulting from the proposed action will be minimized due to timing restrictions that will avoid the active butterfly and caterpillar season for Fender's blue butterfly; road maintenance activities will not occur in T&E Special Maintenance Zones between March 1 and August 15. Activities subject to this timing restriction include mowing, brush cutting, spraying, large shrub and tree removal, routine drainage maintenance, shoulder preparation and rocking, sweeping and washing. In addition, the mower deck will be set at a minimum of 15 cm (6 inches) above ground to avoid Fender's blue butterfly larvae.

These and other conservation measures will limit but not eliminate direct mortality to any Fender's blue butterfly larvae and eggs on or near Fender's blue butterfly host plants. The abundance of Fender's blue butterfly eggs has been found to be correlated with the abundance of Kincaid's lupine leaves at a site. Ninety-five percent of adult Fender's blue butterflies are found within 10 m (33 feet) of large lupine patches (USFWS 2010). As a density calculation of butterflies per acre of dominant host plant across the overlapping Recovery Zones where both species have been documented (5,695 butterflies/ 573.5 acres of plants cover) (USFWS 2010), there are approximately 10 butterflies per acre of Kincaid's lupine (or suitable habitat). With respect to this proposed action, the extent of the take is limited to all Fender's blue butterfly adults, larvae and eggs occurring within suitable habitat within the road maintenance right-of-way, estimated at 6.74 total acres. At a density estimate of 10 butterflies per acre, all of the eggs and larvae associated with 68 adult Fender's blue butterfly could be killed as a result of the proposed action (Table 7).

Table 7. Estimated amount acres of affected suitable habitat used to calculate take of Fender's blue butterfly from activities covered by the HCP and authorized by the section 10(a)(1)(B) permit.

	Acres
• Amount of Fender's blue butterfly and Kincaid's lupine habitat in the Potential Impact Zone along 3.7 km (2.3 miles) of County road within the T&E Special Maintenance Zones.	1.86
• Amount of suitable habitat for Fender's blue butterfly outside of the T&E Special Maintenance	4.88
<b>Total suitable Fender's blue butterfly habitat affected by the proposed action</b>	<b>6.74</b>
<i>Multiplied by 10 FBB/acre of suitable habitat</i>	<i>x 10</i>
<b>Annual take of Fender's blue butterfly associated with proposed action</b>	<b>68</b>

After reviewing the status of the Fender's blue butterfly and Kincaid's lupine, the environmental baseline for the action area, and the effects of the proposed action, including all measures proposed to avoid, minimize and mitigate adverse effects and the cumulative effects, it is the Service's biological opinion that the issuance of an incidental take permit to Yamhill County pursuant to section 10(a)(1)(B) of the Act is not likely to jeopardize the continued existence of any of these listed species nor destroy or adversely modify designated critical habitat. The reasons for this determination are summarized as follows:

1. The proposed action is not likely to appreciably diminish the effectiveness of the conservation program established under the Recovery Plan for the Prairie Species of Western Oregon and Southwest Washington to protect the Fender's blue butterfly and its habitat or Kincaid's lupine within their ranges.
2. The impacts from the proposed action will not alter the overall adverse cumulative impacts expected to occur in the action area.
3. The inherent significance of the effects associated with impacts of the proposed action will be reduced or perhaps eliminated through the conservation and mitigations actions included in the proposed action.

## VII. 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 animal species, respectively, without special exemption. 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 the 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.

Sections 7(b)(4) and 7(o)(2) of the Act generally do not apply to listed plant species. However, Yamhill County has requested that the 10(a)(1)(B) permit issued for the HCP include the plant addressed in the HCP, to protect the County in the event that the Act is ever amended to prohibit the take of plants. Accordingly, the take exemption for plants would be authorized under the HCP permit at the time, if ever, that the Act is amended to prohibit such take.

The draft Yamhill County Road Maintenance Activities HCP and its associated documents identify anticipated impacts to Fender's blue butterfly and Kincaid's lupine that are likely to result from the proposed action and the measures that are necessary and appropriate to minimize those impacts. All conservation measures described in the draft HCP together with terms and conditions described in the associated Implementing Agreement and any section 10(a)(1)(B) permit issued for the Yamhill County Road Maintenance Activities HCP, are hereby incorporated by reference as reasonable and prudent measures and terms and conditions within this incidental take statement pursuant to 50 CFR 402.14(i). Such terms and conditions are non-discretionary and must be undertaken for the exemptions under section 10(a)(1)(B) and section 7(o)(2) to apply. If the permittee fails to adhere to these terms and conditions, the protective coverage of the section 10(a)(1)(B) permit and section 7(o)(2) may lapse. The amount or extent of incidental take anticipated under the draft Yamhill County HCP, associated reporting requirements, and provisions for disposition of dead or injured animals are as described in the HCP and its accompanying section 10(a)(1)(B) permit.

### **Amount or Extent of Take Anticipated**

The disturbance and conversion of land that will follow from issuing the proposed 10(a)(1)(B) permit to Yamhill County is expected to result in incidental take of Fender's blue butterfly. Take will be in the form of disturbance, harm and death of individuals. Estimates of the total amount of annual take based on affected suitable habitat are shown in Table 7. We expect that annual take of all eggs and larvae associated with 68 adult Fender's blue butterfly will occur as a result of the issuance of a permit for the Yamhill County HCP. We expect that actual incidental take of

Fender's blue butterfly will be difficult to detect or quantify in the field for the following reasons: (1) the cryptic nature and relatively small body size of the butterflies makes the finding of a dead specimen unlikely, and (2) species abundance may be masked by seasonal fluctuations in numbers or other causes. Given the difficulty of tracking take of individuals, Yamhill County will track take using the surrogate measure of area of habitat affected (see Section 6.4.1 in the HCP).

Should the Act ever be amended to prohibit the take of plants, we estimate that the disturbance and conversion of land that will follow from issuing the proposed 10(a)(1)(B) permit to Yamhill County would be expected to result in incidental take of Kincaid's lupine. Take would be in the form of killing plants and seeds.

### **Effect of the Take**

For the reasons stated in the analyses of the proposed project's effects, we have determined that the level of incidental take specified in the effects of the action and this Incidental Take Statement is not likely to jeopardize the continued existence of Fender's blue butterfly or Kincaid's lupine.

### **Reasonable and Prudent Measures and Terms and Conditions**

The draft Yamhill County Prairie Species HCP and its associated documents clearly identify anticipated impacts to affected species likely to result from the proposed taking and the measures that are necessary and appropriate to minimize those impacts. All conservation measures described in the proposed HCP, together with terms and conditions described in the associated Implementing Agreement and any section 10(a)(1)(B) permit or permits issued with respect to the proposed HCP, are hereby incorporated by reference as reasonable and prudent measures and terms and conditions within this Incidental Take Statement pursuant to 50 CFR 402.14(i). Such terms and conditions are non-discretionary and must be undertaken for the exemptions under section 10(a)(1)(B) and section 7(o)(2) to apply. If the Applicants fail to adhere to these terms and conditions, protective coverage of the section 10(a)(1)(B) permit and section 7(o)(2) may lapse.

### **Reporting Requirements**

Section 7.2.1 of the HCP requires Yamhill County to submit an Annual Compliance Report to the Service by September 30<sup>th</sup> of each year. The annual report shall include, at a minimum, the following information:

- A description of conservation measures initiated, continued, or completed during the previous year, and a description of conservation measures projected to be implemented during the upcoming year.
- A summary of findings, results, and conclusions of monitoring activities, and a projection of monitoring needs for subsequent years.
- A tabulation and description of funds expended during the previous year, and a projection of funds to be expended during the upcoming year.

- Other recommendations, such as minor modifications or amendments to the HCP document.

### VIII. REINITIATION – CLOSING STATEMENT

This concludes formal consultation on the issuance of a permit to implement the Yamhill County Prairie Species HCP. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals that the agency action 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 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. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation. If you have any questions regarding this consultation, please contact Rebecca Toland or Rich Szlemp of my staff at (503) 231-6179.

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