Appendix 2-B

Evaluation of Effects (EOE) Memoranda

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Evaluation Of Effects Memoranda

Mason, Bruce & Girard, Inc.
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MEMORANDUM

DATE: February 26, 2004

TO: Art Martin and Marc Liverman, NOAA Fisheries

FROM: Kendel Emmerson and Zak Toledo, MB&G

SUBJECT: ODOT OTIA III: Steller (Northern) Sea Lion (*Eumetopias jubatus*) Evaluation of Effects

Likely effects to the Steller sea lion as a result of the Bridge Program were analyzed using a combination of GIS database analysis, assumptions based on known biological requirements of the species, assumptions about the types of construction methods, and potential effects of disturbance that could be expected at each bridge site. The following describes the process used to determine which bridges would potentially affect Steller sea lions.

Step 1. Apply Effects Screening Criteria (Initial Screening Process)

To determine the number of bridges where repair and replacement activities could potentially affect Steller sea lions, the initial screening criteria for Steller sea lions were applied to all bridges in the Bridge Program. The following is a list of assumptions and results from the initial screening process.

Assumption:

- In Oregon the Steller sea lion only occurs along the Pacific Ocean shoreline, within the Bays and Estuaries Johnson and O'Neil habitat type, up to 1,640 feet from the mouth of rivers along the Oregon Coast, within the lower 70 miles of the Columbia River and the lower 8 miles of the Rogue River. Steller sea lions only occur with the Grays/Elokoman, Lower Columbia/Clatskanie 4th field HUCs of the Columbia River and Lower Rogue 4th field HUC of the Rogue River.
- Bridges with an API greater than 1,640 feet from the Pacific Ocean shoreline that do not include the Bays and Estuaries habitat type (Johnson and O'Neil 2001) will have no effect on the Steller sea lions.
- Bridges with an API within 1,640 feet of the Pacific Ocean shoreline, Bays and Estuaries habitat type (Johnson and O'Neil 2001), or within the Lower Rogue, Grays/Elokoman, or Lower Columbia/Clatskanie 4th field HUCs may affect foraging. Further, bridges with an API that is within 3,000 feet of a designated critical habitat area or Three Arch National Wildlife Refuge may affect Steller sea lion breeding.

Result:

- A total of seven bridges were identified within 1,640 feet of the Pacific Ocean shoreline, the Bays and Estuaries habitat type (Johnson and O'Neil 2001), within the Lower Rogue,

Grays/Elokoman, and Lower Columbia/Clatskanie 4th field HUCs, or within 3,000 feet of a designated critical habitat area or Three Arch National Wildlife Refuge.

Step 2. Identify Potential Noise Effects

Construction noise occurring within 1,640 feet of Steller sea lion habitat has the potential to affect breeding Steller sea lions or Steller sea lions that are hauled out (resting). The following is a list of assumptions and results from the noise disturbance screening process:

Assumption:

- Noise disturbance to Steller sea lions (especially short, high-intensity noises such as blasting, pile driving, pipe ramming, etc.) is assumed to be attenuated to background levels within 1,640 feet of the source of the disturbance. Beyond 1,640 feet there would be no effect to Steller sea lions from noise disturbance.
- Noise disturbance to Steller sea lions is assumed to be limited to Johnson and O'Neil (2001) habitat types that are capable of supporting Steller sea lions, or within the above-listed HUCs within 1,640 feet of a bridge API.
- There is no topographic or vegetative buffer between haulouts or rookeries and the bridge API.

Result:

- A net total area of 974 acres, (gross total of 1,036 acres) of Steller sea lion habitat may be affected by noise disturbance.

Step 3. Identify Potential Visual Effects

For purposes of the Bridge Program, visual disturbance occurring within 3,000 feet of Steller sea lion habitat may have the potential to affect Steller sea lions. This distance is the NOAA Fisheries-established buffer around designated critical habitat to protect Steller sea lion rookery sites (58 FR 45269).

Assumptions:

- Visual disturbance to Steller sea lions (e.g. construction equipment staging and operation, general human presence, etc.) is assumed to be limited to Steller sea lion critical habitat and documented haulouts provided by ODFW (2003c)..

Result:

- Of the seven bridges identified in the initial screening process, none have an API within 3,000 feet of Steller sea lion critical habitat or documented haulouts, therefore the proposed action will have no potential for visual disturbance effects to the Steller sea lion.

Step 4. Identify Potential Species Effects

Direct removal or modification of a haulout or rookery site may affect Steller sea lions. However, direct adverse affects to the species would be rare due to Steller sea lions capability of leaving the area of effect. Direct effects to Steller sea lions may also occur through effects to prey species. However, by following performance standards outlined in this program, effects to prey species for the Steller sea lion would be minimized.

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MEMORANDUM

DATE: January 21, 2004

TO: David Leal, USFWS

FROM: Kendel Emmerson and Zak Toledo, MB&G

SUBJECT: ODOT OTIA III: Columbian White-tailed deer (*Odocoileus virginianus leucurus*)

Evaluation of Effects

Likely effects to the Columbian white-tailed deer as a result of the Bridge Program were analyzed using a combination of GIS database analysis, assumptions based on known biological requirements of the species, assumptions about the types of construction methods, and potential effects of disturbance that could be expected at each bridge site. The following describes the process used to determine which bridges would potentially affect Columbian white-tailed deer.

Step 1. Apply Effects Screening Criteria (Initial Screening Process)

To determine the number of bridges where repair and replacement activities could potentially affect Columbian white-tailed deer, the initial screening criteria for Columbian white-tailed deer were applied to all bridges in the Bridge Program. The following is a list of assumptions and results from the initial screening process.

Assumption:

- The preferred habitat for Columbia white-tailed deer Columbia River DPS in Oregon is below 10 feet in elevation along the floodplain of the Columbia River in Columbia and Clatsop Counties. To provide an estimate of the amount of preferred habitat within the APIs of the Bridge Program, the analysis of preferred habitat evaluated areas along the floodplain of the Columbia River in Columbia and Clatsop Counties below 100 feet in elevation.
- Bridges outside of the Lower Columbia/Clatskanie and Grays/Elokoman 4th field HUC in Clatsop and Columbia Counties will have no effect on Columbian white-tailed deer.
- Bridges that are within the Lower Columbia/Clatskanie and Grays/Elokoman 4th field HUC, but are above 100 feet in elevation would have no effect on Columbian white-tailed deer.

Result:

- One bridge (Big Creek Bridge- No. 07417) was identified within the Lower Columbia/Clatskanie and Grays/Elokoman 4th field HUC's and below 100 feet in elevation.

Step 2. Identify Potential Noise Effects

Construction noise occurring within 1 mile of identified Columbian white-tailed deer habitat has the potential to harass Columbian white-tailed deer. Only Big Creek Bridge (No. 07417) was identified in the initial screening process as being within the range of Columbian white-tailed deer and having the potential to adversely affect Columbian white-tailed deer through noise disturbance. The following is a list of assumptions and results from the noise disturbance screening process:

Assumption:

- Bridge APIs within 1 mile of Columbian white-tailed deer habitat would have the potential to cause noise harassment.
- Assume that the entire habitat within a 1-mile radius around the Big Creek Bridge is suitable Columbian white-tailed deer habitat.

Result:

- A total area of 3,913 acres within a 1-mile radius around the Big Creek Bridge API could be affected by noise disturbance.

Step 3. Identify Potential Visual Effects

An over-estimate of visual disturbance threshold for Columbian white-tailed deer would be the distance from the source of the visual disturbance to suitable hiding cover, or 1,500 feet, whichever is less. The following is a list of assumptions and results from the visual disturbance screening process.

Assumption:

- Bridge API's within 1,500 feet of Columbian white-tailed deer habitat would have the potential to cause visual harassment.
- Assume that all habitats within a 1,500-feet radius around the Big Creek Bridge (No. 07417) are suitable Columbian white-tailed deer habitat.

Result:

- A total area of 959 acres within a 1,500-feet radius around the Big Creek Bridge API could be affected by visual disturbance.

Step 4. Identify Potential Plant Effects (Affected Habitat)

The preferred habitat for the Columbian white-tailed deer includes riparian forest, brushlands, and pastures within tidally-influenced floodplains of the Columbia River, typically below 10 feet in elevation (WDFW 1990, ODFW 1995a). To obtain an estimate of the number of bridges within the Bridge Program that could potentially affect Columbian white-tailed deer habitat, the initial screening process evaluated all bridge locations below 100 feet elevation along the tidally-influenced floodplains of the Columbia River. This initial screening identified only one bridge (Big Creek Bridge – No. 07417) in Clatsop County as being within the preferred habitat range of

the Columbian white-tailed deer. The following is a list of the assumptions and results used to determine the area of affected habitat:

Assumption:

- Assume that all habitats within a 1,500-foot radius around Big Creek Bridge are suitable Columbian white-tailed deer habitat.

Result:

- A total area of 959 ac within a 1,500-foot radius around the Big Creek Bridge API contains suitable habitat for Columbian white-tailed deer.

Step 5. Identify Potential Plant Effects (Habitat Removal Area)

The Bridge Program would require the removal of suitable Columbian white-tailed deer habitat, which could cause adverse effects to Columbian white-tailed deer. The Vegetation Removal and Site Restoration Performance Standard will be followed to limit the amount of vegetation cleared and to ensure that any vegetation removed outside of a specific bridge footprint area is restored. For the one bridge identified above in the Affected Habitat Area Pathway, it is expected that approximately 2 acres of Columbian white-tailed deer habitat would be removed. The following is a list of assumptions and results used to determine the area of habitat removal:

Assumption:

- It is expected that 2 acres of habitat will be removed within a 500-foot radius of Big Creek Bridge (No. 07417) center point identified in the initial screening process. This represents the maximum expected area of disturbance from work bridges or detour routes within the bridge project area. The 2 acres is based on the following information from previous bridge replacement projects:

1. Based on analysis of two large ODOT bridge replacement projects, the Row River Bridge (ODOT 2003c) and the Lower Quarry Bridges (ODOT 2003d), the area of actual ground disturbance from work bridges, detour bridges and detour roads did not exceed 2 acres per construction site (1.3 and 0.7 acres, respectively). The Habitat Avoidance Performance Standard prohibits staging areas and access roads to be constructed in protected species habitat; therefore, these project elements are not included in the estimate of habitat removal.
2. Based on an analysis of two small ODOT bridge projects, Jackass Creek Bridge (ODOT 2003e) and Bear Creek Bridge (ODOT 2002c), the area of actual ground disturbance from work bridges, detour bridges and detour roads was less than 0.5 acres per construction site (0.5 and 0.2 acres, respectively).
3. Given the relatively small areas of disturbance for most bridge construction activities, applying the 2 acres estimate of ground disturbance from the larger ODOT bridge projects to the Big Creek Bridge project is considered an overestimate estimate of the actual expected habitat effects. The Big Creek Bridge replacement project is one of the smaller projects within the Bridge Program and its actual effect on Columbia white-tailed deer habitat is expected to be less than 2 acres.

Result:

- The area of likely Columbia white-tailed deer habitat removal equals 2 acres for the one bridge (Big Creek Bridge – No. 07417) identified within the initial screening methods.

Step 6. Identify Potential Species Effects

Direct removal of hiding cover has the potential to directly affect Columbian white-tailed deer by increasing the deer's vulnerability to predation. In addition, improvements to bridges or roadways may increase traffic speed, decrease driver line-of-sight or make other changes in traffic patterns that may make deer crossing roadways more vulnerable to collisions with vehicles. The implementation of timing restrictions (Wildlife Avoidance Performance Standard and Habitat Avoidance Performance Standard) for the one bridge (Big Creek Bridge – No. 07417) identified with potential Columbian white-tailed deer habitat will eliminate any direct species effects from removal of individual deer. The removal of hiding cover and vegetation from suitable habitat could open these areas up to predators; however, estimating take from this indirect effect, such as predation, is unquantifiable.

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MEMORANDUM

DATE: January 21, 2004

TO: David Leal, USFWS

FROM: Kendel Emmerson and Zak Toledo, MB&G

SUBJECT: ODOT OTIA III: Canada lynx (*Lynx canadensis*) Evaluation of Effects

Likely effects to the Canada lynx as a result of the Bridge Program were analyzed using a combination of GIS database analysis, assumptions based on known biological requirements of the species, assumptions about the types of construction methods, and potential effects of disturbance that could be expected at each bridge site. The following describes the process used to determine which bridges would potentially affect Canada lynx.

Step 1. Apply Effects Screening Criteria (Initial Screening Process)

To determine the number of bridges where repair and replacement activities could potentially affect the Canada lynx, the initial screening criteria for Canada lynx were applied to all bridges in Bridge Program. The following is a list of assumptions and results from the initial screening process:

Assumption:

- Camryn Lee (USFWS Biologist) provided a schematic of the area of concern for lynx habitat blocks (MB&G created a map of the habitat blocks to determine which bridges were within the area of concern) and connectivity in Oregon via a fax to Jessica Burton (MB&G GIS specialist) on October 9, 2003. This schematic was used to create a map of the area of concern for lynx. To ensure that the fax was interpreted correctly, the map was sent as a JPEG to Camryn Lee to review in an email sent on October 15, 2003 from Kendel Emmerson. MB&G received verbal approval via David Leal on October 21, 2003.
- All habitats and areas necessary for maintaining connectivity in Oregon are within the USFWS Canada lynx area of concern.
- Bridges with API that are completely outside of the area of concern will have no effect on Canada lynx.

Result:

- There are a total of 38 bridges within the USFWS Canada lynx area of concern.
- The 38 bridges will be subjected to further analysis to determine what, if any, adverse effects may be delivered through the Effects Pathways.

Step 2. Identify Potential Noise Effects

Only Bridges within USFWS designated Area of Concern for Canada lynx may have an effect on Canada lynx. There are 38 Bridges within this Area of Concern. Due to the variation in annual timing of dispersing lynx, it would not be feasible to apply a seasonal restriction to minimize the potential effects of noise harassment. Canada lynx habitat that could be affected by noise disturbance includes all lands within 1 mile of the bridge API.

Assumption:

- Bridges with an API within the area of concern for Canada lynx have the potential to cause noise disturbance to the Canada lynx.
- Noise disturbance to wildlife (blasting, pile driving, pipe ramming, etc.) is assumed to be limited to within 1 mile of a project site (this figure is generally accepted by most agency wildlife biologists). Beyond 1 mile, there will be no effect to Canada lynx.

Result:

- The area of potential noise disturbance ranged from 1,733 to 4,544 acres that may affect Canada lynx per individual bridge API. The size varies depending on the size of the bridge and proximity to Canada lynx area of concern. A total of 114,665 net acres and 148,995 gross acres within the area of concern for Canada lynx could be affected by noise disturbance.

Step 3. Identify Potential Visual Effects

Only bridges within the USFWS Area of Concern for Canada lynx may have an effect on Canada lynx. There are 38 Bridges within this Area of Concern. It would not be feasible to apply a seasonal restriction to minimize the potential effects of visual disturbance on dispersing Canada lynx. Canada lynx habitat that would be affected by visual disturbance includes all lands within 330 feet of the Bridge API.

Assumption:

- Visual disturbance to the Canada lynx is limited to suitable Canada lynx habitat within 330 feet of the Bridge API.

Result:

- The area of potential visual disturbance ranged from 138 to 1,011 acres depending on the bridge size and proximity to lynx area of concern. A total of 14,462 net acres and 17,002 gross acres within the area of concern for the Canada lynx could be affected by visual disturbance.

Step 4. Identify Potential Plant Effects

The Vegetation Removal and Site Restoration Performance Standards will be followed to minimize the amount of vegetation cleared and to ensure that any vegetation removed outside of the bridge footprint area is restored. There is no designated critical habitat for the Canada lynx; therefore no critical habitat will be removed.

Assumptions:

- It is expected that 2 acres of habitat will be removed within a 500-foot radius of each of the 38 bridge center points identified in the Affected Habitat Area Pathway. This represents a maximum expected area of disturbance from work bridges or detour routes for any given bridge project area. The 2 acres is based on the following bridge replacement projects:

  1. Based on analysis of two large ODOT bridge replacement projects, the Row River Bridge (ODOT 2003c) and the Lower Quarry Bridges (ODOT 2003d), the area of actual ground disturbance from work bridges, detour bridges and detour roads did not exceed 2 acres per construction site (1.3 and 0.7 acres, respectively). The Habitat Avoidance Performance Standard prohibits staging areas and access roads to be constructed in protected species habitat; therefore, these are not included in the estimated habitat removal.
  2. Based on analysis of two small ODOT bridge projects, Jackass Creek Bridge (ODOT 2003e) and Bear Creek Bridge (ODOT 2002c), the area of actual ground disturbance from work bridges, detour bridges and detour roads was less than 0.5 acres per construction site (0.5 and 0.2 acres, respectively). However, it is understood that some projects, such as Santiam Pass Bridges, may have considerably larger amounts of ground disturbance. Therefore, the 2 acres standard should account for the few bridges that require large amounts of clearing.
  3. Given these relatively small areas of disturbance, the 2 acres areas of ground disturbance will likely be an overestimate for most projects. This estimate for most projects may be offset by a large bridge project with a ground disturbance area greater than 2 acres. However, the overall area of ground disturbance for the Bridge Program is over-estimated.

Result:

- The area of likely suitable Canada lynx habitat removal equals 2 acres for each bridge times the 38 bridges that were determined to be within the USFWS area of concern for a total of 76 acres.

Step 5. Identify Potential Species Effects

Direct mortality from vehicular collisions will be minimized by implementing the Wildlife Passage Performance Standards and the Fluvial Performance Standards at all Bridges within the USFWS Area of Concern for Canada lynx connectivity.

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MEMORANDUM

DATE: January 21, 2004

TO: David Leal, USFWS

FROM: Kendel Emmerson and Zak Toledo, MB&G

SUBJECT: ODOT OTIA III: Marbled Murrelet (*Brachyramphus marmoratus*) Evaluation of Effects

Likely effects to the marbled murrelet as a result of the Bridge Program were analyzed using a combination of GIS database analysis, assumptions based on known biological requirements of the species, assumptions about the types of construction methods, and potential effects of disturbance that could be expected at each bridge site. The following describes the process used to determine which bridges would potentially affect marbled murrelet.

Step 1. Apply Effects Screening Criteria (Initial Screening Process)

To determine how many bridges where repair and replacement activities could potentially affect the marbled murrelet, the initial screening criteria for marbled murrelet were applied to all bridges in the Bridge Program. The following is a list of assumptions and the results of the initial screening process:

Assumption:

- Bridges that are greater than 40 miles from the Pacific Coast shoreline will have no effect on the marbled murrelet.
- Bridges that have the potential to affect marbled murrelets are those within 40 miles of the Pacific Coast shoreline and containing the following Johnson and O'Neil (2001) habitat types within a 1 mile radius surrounding the API for each bridge (API equals 2,000 feet from the ends of each bridge) (Johnson and O'Neil 2001): Westside Lowland Conifer-Hardwood Forest, Southwest Oregon Mixed Conifer-Hardwood, Forest, Bays and Estuaries, Marine Nearshore, and Marine Shelf.
- The Johnson and O'Neil (2001) habitat types do not specify the age class, diameter breast height, species, or density of trees; therefore, for the purposes of the Bridge Program the Westside Lowland Conifer-Hardwood Forest and Southwest Oregon Mixed Conifer-Hardwood Forest habitat types are assumed to provide suitable and occupied marbled murrelet nesting habitat.

Result:

- A total of 159 bridges were identified within 40 miles of the Pacific Coast shoreline.
- 72 of these bridges are within the Willamette Valley Ecoregion (Bryce and Woods 2000). This Ecoregion does not provide nesting habitat for marbled murrelet; therefore, those bridges were eliminated.
- The remaining 87 bridges within the range of the marbled murrelet were further analyzed to determine if at least one of the above-mentioned habitat types are within a 1-mile radius around the bridge API. Sixty-eight bridges met this criterion.

Step 2. Identify Potential Noise Effects

Construction noise occurring within the range of the marbled murrelet may affect those marbled murrelets at the nest site as well as those traveling to or from the nest during the breeding season. Consequently, all 87 bridges within the range of the marbled murrelet, regardless of the habitat types within a 1 mile radius of the bridge API, have the potential to adversely affect marbled murrelet. The following is a list of assumptions and results of the screening for noise disturbance effects:

Assumptions:

- Noise disturbance to marbled murrelets (especially short, high-intensity noises such as blasting, pile driving, pipe ramming, etc.) is assumed to be attenuated to background levels within 1 mile of a project site. Beyond 1 mile, there will be no effect to marbled murrelets from noise disturbances.

Result:

- The area of potential noise disturbance for individual bridges ranged from 3,824 acres to 4,725 acres depending on bridge size. A net total of 153,445 acres of potential marbled murrelet habitat could be affected by noise disturbance. A gross total, including overlapping API areas that are counted more than once, is 255,463 acres of marbled murrelet habitat that could be affected by noise disturbance.

Step 3. Identify Potential Visual Effects

Visual disturbance that occurs within 300 feet of a marbled murrelet nest site has the potential to adversely affect marbled murrelets (USFWS 2003a). Although marbled murrelets are known to nest within 33 feet of a highway, it is uncommon (USFWS 2003a). Additionally, marbled murrelets nesting in proximity to highways are acclimated to higher noise levels and the presence of people; therefore, they are less likely to be affected by a potential visual disturbance. Therefore, it is unlikely that any of the bridges will actually affect marbled murrelets through visual disturbance. By following the timing restrictions described under the Wildlife Avoidance Performance Standard, the potential for visual disturbance to adversely affect marbled murrelets will be minimized. Sixty one of the 68 bridges identified in the initial screening contain marbled murrelet nesting habitat within the bridge API and therefore have the potential to affect marbled murrelets through visual disturbance. Therefore, the area of visual disturbances was calculated

for these 61 bridges. Assumptions and results for the visual disturbance effects calculation are described below:

Assumptions:

- Visual disturbance to marbled murrelets (e.g., construction equipment staging and operation, general human presence, etc.) is assumed to be limited to an area within a 300-feet radius surrounding the API of a project site.
- The Johnson and O'Neil (2001) Westside Lowland Conifer-Hardwood Forest and Southwest Oregon Mixed Conifer-Hardwood Forest habitat types provide occupied nesting habitat for marbled murrelet.
- The marbled murrelet nesting habitat is within line-of-sight of the visual disturbance.

Result:

- The area of potential visual disturbance for individual bridges ranges from 5 acres to 705 acres depending on bridge size. A net total of 19,127 acres (gross total of 21,095 acres) of marbled murrelet habitat could be affected by visual disturbance.

Step 4. Identify Potential Plant Effects

Analysis of potential affects to marbled murrelet nesting habitat delivered via the plant pathway was conducted using a three-step approach: 1) the presence or absence of potential murrelet nesting habitat was determined for the 87 bridges identified in the initial screening process, 2) estimated habitat area to be removed was determined for bridges identified in step 1, and 3) potential effects on designated critical habitat were assessed. The latter involved identification of the number of bridges with an API that contained or was within 0.5 miles of designated critical habitat.

Affected Habitat Area

A 500-foot radius around the center point of each of the 87 bridges identified in the initial screening process was used to identify the presence or absence of marbled murrelet nesting habitat within that circle (presence/absence only were identified, there were no area calculations for amount of suitable habitat type). This analysis was based on the understanding that use of the 500-foot radius circle would overestimate the amount of marbled murrelet habitat types present at some bridge locations and underestimate it at others. However, given the unknowns for each bridge crossing, this number should account for most of the Bridge Program affected habitat. The assumptions used to determine presence or absence of marbled murrelet nesting habitat and the results of this analysis area are as follows:

Assumptions:

- The Bridge Program will not remove or modify marine habitat; therefore, those bridges that contain only marine marbled murrelet habitat within a 500-foot radius around the center point of the bridge are not included in this analysis. This eliminates 7 bridges from the affected habitat analysis.
- A circle of 500-foot radius would encompass the area where direct ground- disturbing activities associated with bridge replacement would occur. Some bridges may require long

detour routes outside of this circle, but most will not. Therefore, it is assumed that any ground-disturbing activities would occur within 500 foot of the center point of the bridge for most bridges.

- A 500-foot radius would cover the length of all but one or two of the largest bridges (maximum bridge length is approximately 1,300 feet).
- The Johnson and O'Neil (2001) Westside Lowland Conifer-Hardwood Forest and Southwest Oregon Mixed Conifer-Hardwood Forest habitat types provide occupied nesting habitat for marbled murrelet.

Result:

- Fifty bridges contain potential marbled murrelet nesting habitat within a 500-foot radius of the center point of each bridge.

Habitat Removal Area

The Bridge Program would require the removal of marbled murrelet nesting habitat, and thus could have adverse effects on the marbled murrelet. The Vegetation Removal and Site Restoration Performance Standards will be followed to limit the amount of vegetation cleared and to ensure that any vegetation removed outside of the bridge footprint area is restored. For the 50 bridges identified above, the likely area of habitat removed was calculated by multiplying that number of bridges by 2 acres. The assumptions used to determine the area of habitat removal, and the results of this analysis are presented below:

Assumptions:

- The Johnson and O'Neil (2001) Westside Lowland Conifer-Hardwood Forest and Southwest Oregon Mixed Conifer-Hardwood Forest habitat types provide occupied nesting habitat for marbled murrelet.
- An area of 500 feet in radius around each bridge's center point will contain a marbled murrelet nesting habitat of between zero and 57 acres.
- It is expected that 2 acres of marbled murrelet nesting habitat (as described in the initial screening methods) within a 500-foot radius of each bridge center point will be removed. This represents a maximum expected area of disturbance from work bridges or detour routes for any given bridge project area. The 2 acres estimate is based on the recent bridge replacement projects described below:
  1. According to an analysis of two large ODOT bridge replacement projects, the Row River Bridge (ODOT 2003c) and the Lower Quarry Bridges (ODOT 2003d), the area of actual ground disturbance from work bridges, detour bridges, and detour roads did not exceed 2 acres per construction site (1.3 and 0.7 acres, respectively).
  2. According to an analysis of two small ODOT bridge projects, Jackass Creek Bridge (ODOT 2003e) and Bear Creek Bridge (ODOT 2002c), the area of actual ground disturbance from work bridges, detour bridges, and detour roads was less than 0.5 acres per construction site (0.5 and 0.2 acres, respectively). However, it is understood that some projects, such as the Santiam Pass Bridges, may have considerably larger amounts of ground disturbance. Therefore, the 2 acres standard should account for the few bridges that require large amounts of clearing.

3. Given these relatively small areas of disturbance, the 2 acres areas of ground disturbance is likely to be conservative for most projects. Even with the occasional large bridge project with a ground disturbance area greater than 2 acres, the overall estimated area of ground disturbance for the Bridge Program is conservatively high.

Result:

- The area of likely marbled murrelet nesting habitat removed equals 2 acres for each bridge multiplied by the 50 bridges that were determined to be within the area of affected habitat, for a total of 100 acres.

Designated Critical Habitat Removal

Removal of designated critical habitat, regardless of the actual vegetation type present at a site, is considered by USFWS to have an adverse effect on marbled murrelets. The amount of designated critical habitat for the marbled murrelet that could be affected by the proposed project is estimated below. These calculations represent a maximum amount of critical habitat that would be removed. The Habitat Avoidance Performance Standard and Vegetation Removal and Site Restoration Performance Standards will be followed to minimize the amount of vegetation cleared and to ensure that any vegetation removed is restored; thus, the actual amount of vegetation removed is likely to be less than this estimate.

For each of the 87 bridges identified in the initial screening process, a 0.5-mile radius surrounding the bridge's API was used to identify the amount of designated critical marbled murrelet habitat that could be affected by construction activities. Location of designated critical habitat was obtained from Region Ecosystems Office GIS database (REO 2003). Bridges containing designated critical habitat within a 0.5 mile radius surrounding the bridge API were further analyzed to determine if designated critical habitat was within a 500-foot radius of the center point of each bridge; it was then assumed that 2 acres of critical habitat would be removed at each of the bridges. The following is a list of assumptions used to determine the area of designated critical habitat that would be affected, and the results of the analysis:

Assumptions:

- Critical habitat outside of a 0.5 mile radius around the center point of each bridge will not be affected by construction activities.
- A circle with a 500-foot radius encompasses the area where direct ground-disturbing activities will occur. Some bridges may require long detour routes outside of the 500-foot radius circle; however, it is assumed that for most bridges all ground-disturbing activities will occur within 500 feet of the center point of the bridge.
- A 500-foot radius would apply to all but one or two of the largest bridges (maximum bridge length is approximately 1,300 feet.
- Each bridge containing designated critical habitat within a 500-foot radius of the center point of each bridge will not have any primary constituent elements of designated critical habitat removed.

Result:

- Thirteen bridges contain designated marbled murrelet critical habitat within a 0.5-mile radius around the bridge API. A total of 6,067 acres of critical habitat could therefore be affected by construction activities (noise and visual disturbance, but not critical habitat removal).
- Two bridges contained designated critical marbled murrelet habitat within 500 feet of the center point of each bridge. No primary constituent elements of designated critical habitat will be removed at these bridge sites.

Species Effects Pathway

Direct removal of occupied habitat or designated critical habitat could affect the marbled murrelet. The implementation of timing restrictions (the Wildlife Avoidance Performance Standard and the Habitat Avoidance Performance Standard) for bridges in potentially occupied marbled murrelet habitat or designated critical habitat will likely eliminate any direct species effects from removal of individual marbled murrelets. The removal of cover and vegetation near nesting habitat could open these areas up to predators; however, estimating take from predation is unquantifiable.

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MEMORANDUM

DATE: January 21, 2004

TO: David Leal, USFWS

FROM: Kendel Emmerson and Zak Toledo, MB&G

SUBJECT: ODOT OTIA III: Bald eagle (*Haliaeetus leucocephalus*) Evaluation of Effects

Likely effects to the bald eagle as a result of the Bridge Program were analyzed using a combination of GIS database analysis, assumptions based on known biological requirements of the species, assumptions about the types of construction methods, and potential effects of disturbance that could be expected at each bridge site. The following describes the process used to determine which bridges would potentially affect bald eagle.

Step 1. Apply Effects Screening Criteria (Initial Screening Process)

To determine the number of bridges where repair and replacement activities could potentially affect the bald eagle, the initial screening criterion for bald eagles were applied to all bridges in the Bridge Program. The following is a list of assumptions and results from the initial screening process:

Assumptions:

- Bridges that are greater than 1 mile from a known bald eagle nest site or winter communal roosting site will have no effect on bald eagles.
- Only bridges that are within 1 mile of a known bald eagle nest site or communal winter roost site have the potential to adversely affect bald eagles.
- The current bald eagle nest data maintained by the Oregon Cooperative Fish and Wildlife Research Unit is the most current and accurate data for bald eagle nest sites in Oregon (Isaacs and Anthony 2003).
- There is no current or consistent data available for bald eagle communal winter roost sites within the State. Therefore, for the purposes of the Bridge Program, it is assumed that each nesting territory also supports a communal winter roost, unless otherwise determined by a biologist.
- For the purposes of the Bridge Program, a communal winter roost site will be defined as three or more bald eagles roosting in the same tree, structure, or cliff face for consecutive nights (WDFW 1990).

Result:

- Thirty-one bridges were identified as having an API within 1 mile of a bald eagle nest or communal winter roost site and will be analyzed further.

Step 2. Identify Potential Noise Effects

Construction noise occurring within 1 mile of an identified bald eagle nest or communal winter roost site has the potential to harass bald eagles. As a result, all 31 bridges identified in the initial screening process may adversely affect bald eagles through noise disturbance. The following is a list of assumptions and results from the noise disturbance screening process:

Assumptions:

- Bridge APIs within 1 mile of an identified bald eagle nest site or communal winter roost site would have the potential to cause noise harassment to bald eagles.
- Assume that each nest site also supports a communal winter roost site.

Result:

- Thirty-one bridges have bald eagle nest sites or communal winter roost sites within a 1-mile radius of the bridge API.
- The 31 bald eagle nest sites comprise 17 bald eagle pair nesting territories. Therefore, the 31 bridges have the potential to adversely affect 17 pairs of bald eagles from noise disturbance.

Step 3. Identify Potential Visual Effects

The USFWS evaluates the visual effects of disturbance that occur within line-of-sight of a bald eagle nest or communal winter roost site within of 2,640 feet (0.5 miles) of the visual disturbance (Isaacs and Anthony, 1989). Following the timing restrictions described under the Wildlife Avoidance Performance Standard will minimize the potential for visual disturbance to adversely affect bald eagles. In addition, the line-of-sight to several of these nest sites or communal winter roost sites would be buffered by topography and vegetation. Therefore, the 2,640-foot (0.5-mile) line-of-sight disturbance threshold is considered a safe distance. Only the 31 bridges identified in the initial screening methods will be evaluated for visual disturbance. The following is a list of assumptions and results from the visual disturbance screening process.

Assumptions:

- Visual disturbance(s) (e.g. construction equipment staging and operation, general human presence, etc.) occurring within 2,640 feet (0.5 miles) of a identified bald eagle nest or communal winter roost site have the potential to adversely effect bald eagles.
- The visual disturbances are within line-of-sight to the bald eagle nest site or communal winter roost.

Result:

- Fourteen bald eagle nest sites or communal wintering roost sites are within 2,640 feet (0.5 miles) of 12 bridge APIs.

- The 14 bald eagle nest sites lie within nine bald eagle pair nesting territories. Therefore, these 12 bridges have the potential to adversely affect nine pairs of bald eagles from visual disturbance.

Step 4. Identify Potential Chemical Effects

Chemical effects resulting from a chemical spill at a construction site near bald eagle foraging habitat could affect bald eagles or their prey. However, by following the Chemical Contamination Performance Standard, most foreseeable chemical spills can be avoided or contained and cleaned up before they reach a waterway; therefore the effect to bald eagles from chemical spills is considered negligible.

Assumptions:

- Chemical effects would be contained or diluted to an undetectable level within 1 mile of a bridge center point.
- Only those bridges that have center points within 1 mile of a bald eagle nest site or communal winter roost site and bridge center points that cross water have the potential to affect bald eagles by a chemical spill.

Result:

- Sixteen bridges have a bald eagle nest site or communal winter roost site within a 1-mile radius of the bridge center point. Of those 16 bridges, 12 bridge center points are across water.
- The 12 bridges lie within eight bald eagle pair nesting territories. Therefore, the 12 bridges have the potential to adversely affect eight pairs of bald eagles from chemical contamination.

Step 5. Identify Potential Plant Effects (Affected Habitat Area)

The bald eagle management guidelines for Oregon and Washington recommend restricting all land development and timber harvest activities within 660 feet around a bald eagle nest site (USFWS 1981). However more recent guidance in Oregon recommends that no clear-cut logging, road building, hiking trails, or boat launches be allowed within 1,320 feet (0.25 miles) of a bald eagle nest site (Anthony and Isaacs, 1989). By applying this guidance to the of Bridge Program, each bridge with a center point that is within 1,320 feet (0.25 miles)of a bald eagle nest site or communal winter roost site would have the potential to adversely affect bald eagle habitat. The Habitat Avoidance Performance Standards will also be followed to minimize the amount of vegetation cleared and to ensure that any vegetation removed is restored. As such, effects to bald eagle habitat would not result in a permanent net habitat loss. Because there is no designated critical habitat for bald eagles, the Bridge Program will not affect designated critical habitat. The following is a list of assumptions and results used to determine the area of affected habitat:

Assumptions:

- Only those bridges with a center point that is within 1,320 feet (0.25 miles) of a bald eagle nest site or communal winter roost site have the potential to adversely affect bald eagle habitat.

Result:

- There are two bridges with a center point that is within 1,320 feet (0.25 miles) of a known bald eagle nest or communal winter roost site (one is 1,305 feet from the bridge center point, the other is 830 feet from the bridge center point).

Step 6. Identify Potential Plant Effects (Habitat Removal Area)

The Bridge Program would require the removal of suitable bald eagle nesting or roosting habitat, which could cause adverse effects to bald eagles. The Vegetation Removal and Site Restoration Performance Standard will be followed to limit the amount of vegetation cleared and to ensure that any vegetation removed outside of a specific bridge footprint area is restored. For the two bridges identified above in the Affected Habitat Area Pathway, the likely area of habitat removed was calculated by multiplying that number of bridges by 2 acres. The following is a list of assumptions and results used to determine the area of habitat:

Assumptions:

- It is expected that 2 acres of bald eagle habitat (as described in the initial screening process) within a 500-foot radius of each bridge center point will be removed. This represents a maximum expected area of disturbance from work bridges or detour routes for any given bridge project area. The 2 acre estimate is based on the recent bridge replacement projects described below:

  1. According to an analysis of two large ODOT bridge replacement projects, the Row River Bridge (ODOT 2003c) and the Lower Quarry Bridges (ODOT 2003d), the area of actual ground disturbance from work bridges, detour bridges, and detour roads did not exceed 2 acres per construction site (1.3 and 0.7 acres, respectively).
  2. According to an analysis of two small ODOT bridge projects, Jackass Creek Bridge (ODOT 2003e) and Bear Creek Bridge (ODOT 2002c), the area of actual ground disturbance from work bridges, detour bridges, and detour roads was less than 0.5 acres per construction site (0.5 and 0.2 acres, respectively). However, it is understood that some projects, such as the Santiam Pass Bridges, may have considerably larger amounts of ground disturbance. Therefore, the 2 acres standard should account for the few bridges that require large amounts of clearing.
  3. Given these relatively small areas of disturbance, the 2 acres areas of ground disturbance is likely to be an overestimate for most projects. Even with the occasional large bridge project with a ground disturbance area greater than 2 acres, the overall ground disturbance estimate for the Bridge Program is an overestimate.

Result:

- The area of likely bald eagle nesting habitat removed equals 2 acres for each bridge times the two bridges that were determined to be within the area of affected habitat for a total of four acres.

Step 7. Identify Potential Species Effects

Direct removal of occupied nest or roost trees could affect bald eagles. The implementation of timing restrictions (Wildlife Avoidance Performance Standard and Habitat Avoidance Performance Standard) for those bridges within potentially occupied bald eagle nest or communal winter roost sites will eliminate any direct species effects from removal of individual bald eagles. The removal of cover and vegetation around suitable nesting habitat could open these areas up to predators; however, estimating take from this indirect effect, such as predation, is unquantifiable.

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MEMORANDUM

DATE: January 21, 2004

TO: David Leal, USFWS

FROM: Kendel Emmerson and Zak Toledo, MB&G

SUBJECT: ODOT OTIA III: Brown pelican (*Pelecanus occidentalis californicus*) Evaluation of Effects

Likely effects to the brown pelican as a result of the Bridge Program were analyzed using a combination of GIS database analysis, assumptions based on known biological requirements of the species, assumptions about the types of construction methods, and potential effects of disturbance that could be expected at each bridge site. The following describes the process used to determine which bridges would potentially affect brown pelican.

Step 1. Apply Effects Screening Criteria (Initial Screening Process)

To determine the number of bridges where bridge and repair activities could potentially affect brown pelicans, initial screening criteria for brown pelican were applied to all bridges in the Bridge Program. The following is a list of assumptions and results from the initial screening process:

Assumptions:

- Bridge APIs greater than 5 miles from the Pacific Ocean shoreline will have no effect on brown pelicans.
- Johnson and O'Neil (2001) habitat types capable of providing brown pelican habitat include Urban and Mixed Environs, Marine Nearshore, Coastal Headlands and Islets, and Bays and Estuaries.
- All bridge APIs within 5 miles of the Pacific Ocean shoreline that are greater than 1 mile from a Johnson and O'Neil (2001) habitat type capable of providing brown pelican habitat will have no effect on brown pelicans.
- Brown pelicans in Oregon are migratory or otherwise non-breeding individuals.

Result:

- A total of 6 bridge APIs are within 5 miles of the Pacific Ocean shoreline and within 1 mile of a Johnson and O'Neil (2001) habitat type capable of providing brown pelican habitat and would have the potential to affect brown pelicans.

Step 2. Identify Potential Noise Effects

Construction noise occurring within 1 mile of brown pelican habitat has the potential to affect roosting or loafing pelicans. The following is a list of assumptions and results from the noise disturbance screening methods:

Assumptions:

- Noise disturbance to brown pelicans (especially short, high-intensity noises such as blasting, pile driving, pipe ramming, etc.) is assumed to be attenuated to background levels within 1 mile of the source of the disturbance. Beyond 1 mile, there would be no effect to brown pelicans from noise disturbance.

Result:

- The area of potential noise disturbance for the six individual bridges ranges from 39 acres to 1,361 acres depending on bridge size. A net total area of 4,981 acres (5,716 gross acres) of brown pelican habitat that may be affected by noise disturbance.

Step 3. Identify Potential Visual Effects

For purposes of the Bridge Program, visual disturbance occurring within 1,500 feet of brown pelican habitat may have the potential to affect brown pelicans. This distance is the estimated distance the Channel Island National Park uses to protect brown pelican nesting colonies. This is a safe distance considering brown pelicans are not known to nest in Oregon (USFWS 1983).

Assumptions:

- Visual disturbance to brown pelicans (e.g. construction equipment staging and operation, general human presence, etc.) is assumed to be limited to Johnson and O'Neil (2001) habitat types that are capable of supporting brown pelicans within 1,500 feet of a bridge API.

Result:

- Of the 6 bridges identified in the initial screening process, 5 bridges have an API that is within 1,500 feet of a Johnson and O'Neil (2001) habitat type capable of providing brown pelican habitat.
- The area of potential visual disturbance for individual bridges ranges from 180 acres to 534 acres depending on bridge size. A net total area of 1,780 acres (gross total area of 1,900 acres) of brown pelican habitat could be affected by visual disturbance.

Step 4. Identify Potential Species Effects

Direct removal or modification of a roosting or loafing site, particularly alteration of man-made structures, may affect brown pelicans. However, direct adverse affects to the species would be rare due to the ephemeral use of roost sites and that non-breeding pelicans are capable of leaving the area of effect. Direct effects to the species would be minimal because most occurrences of brown pelicans in Oregon are limited to a few individuals, instead of large colonies.

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MEMORANDUM

DATE: January 21, 2004

TO: David Leal, USFWS

FROM: Kendel Emmerson and Zak Toledo, MB&G

SUBJECT: ODOT OTIA III: Northern spotted owl (*Strix occidentalis*) Evaluation of Effects

Likely effects to the northern spotted owl as a result of the Bridge Program were analyzed using a combination of GIS database analysis, assumptions based on known biological requirements of the species, assumptions about the types of construction methods, and potential effects of disturbance that could be expected at each bridge site. The following describes the process used to determine where bridge repair and replacement activities have the potential to affect the northern spotted owl.

Step 1. Apply Effects Screening Criteria (Initial Screening Process)

To determine the number of bridges where repair and replacement activities could potentially affect the northern spotted owl, the initial screening criteria for this species were applied to all bridges in the Bridge Program. The following presents a list of assumptions and results from the initial screening methods.

Assumptions:

- Bridges that are greater than 1.0 mile from the easternmost boundary of the Forest Ecosystem Management Assessment Team (FEMAT) 1993 Range of the Northern Spotted Owl and Northwest Forest Plan Boundary (REO 2003) will have no effect on northern spotted owls.
- The following Johnson & O'Neil (2001) habitat types are capable of supporting northern spotted owls: Westside Lowland Conifer-Hardwood Forest, Westside Oak and Dry Douglas-fir Forest and Woodland, Southwest Oregon Mixed Conifer-Hardwood Forest, Montane Mixed Conifer Forests, Eastside (Interior) Mixed Conifer Forests, Lodgepole Pine Forest and Woodland, Ponderosa Pine and Eastside White Oak Forest and Woodlands, and Upland Aspen Forests (Johnson and O'Neil 2001).
- Bridges that are less than 1.0 mile from the easternmost boundary of the Oregon Cascade Province or within the FEMAT 1993 Range of the Northern Spotted Owl and Northwest Forest Plan Boundary, and have suitable Johnson and O'Neil habitat types within 500 feet of the bridge center point may have the potential to affect northern spotted owls.
- A 500-foot radius circle around the bridge center point would encompass the area where direct ground disturbing activities associated with bridge replacement are most likely to occur. Some bridges may require long detour routes outside of the 500-foot radius circle;

however, it is assumed that for most bridges any ground disturbing activities will occur within 500 feet of the center point of the bridge.

- A 500-foot radius would cover the length of all but one or two of the largest bridges (maximum bridge length is approximately 1,300 feet).

Results:

- A total of 141 bridges were identified within 1.0 miles of the Forest Ecosystem Management Assessment Team (FEMAT) 1993 Range of the Northern Spotted Owl that have suitable Johnson and O'Neil habitat types within 500 feet of the bridge center point.

Step 2. Identify Potential Noise Effects

Construction noise occurring within the range of the northern spotted owl may potentially affect nesting northern spotted owls during the breeding season. As a result all 141 bridges identified in the initial screening process have the potential to adversely affect northern spotted owls. The following is a list of assumptions and results from the noise disturbance screening methods:

Assumptions:

- Blasting will occur outside the critical northern spotted owl nesting period, therefore noise harassment from blasting will not occur.
- Noise disturbance to northern spotted owls is assumed to be attenuated to background levels beyond 300 feet of a bridge center point (see BA for supporting details). Within 300 feet of the bridge center point, the potential for noise harassment to the northern spotted owl exists.

Result:

- A total of 915 acres of northern spotted owl habitat associated with the 141 bridges identified in the initial screening process could be affected by noise harassment.

Step 3. Identify Potential Visual Effects

Construction occurring within the range of the northern spotted owl may potentially affect nesting northern spotted owls during the breeding season by causing visual harassment. As a result all 141 bridges identified in the initial screening process have the potential to adversely affect northern spotted owls. The following is a list of assumptions and results from the visual disturbance screening methods:

Assumptions:

- Visual disturbance to northern spotted owls is assumed to only occur within 300 feet of a bridge API. Beyond 300 feet, there will be no effect to northern spotted owls from visual disturbances.

Result:

- A total of 915 ac of northern spotted owl habitat associated with the 141 bridges identified in the initial screening process could be affected by noise harassment.

Step 4. Identify Potential Plant Effects (Habitat Removal Area)

The Bridge Program would require the removal of suitable northern spotted owl nesting habitat, which could cause adverse effects to northern spotted owls. The Habitat Avoidance Performance Standard and Site Restoration Performance Standard will be followed to limit the amount of vegetation cleared and to ensure that any vegetation removed outside of the bridge footprint area is restored. For the 141 bridges identified in the initial screening process, the likely area of habitat removed was calculated by multiplying that number of bridges by 2 acres. This analysis was based on the understanding that use of the 500-foot radius circle would overestimate the amount of suitable northern spotted owl habitat types present at some bridge locations and underestimate it at others. However, given the unknowns about each bridge crossing, this number is considered to be conservative and should account for most of the habitat affected by the Bridge Program. The following is a list of assumptions and results used to determine the area of affected habitat: The following is a list of assumptions and results used to determine the habitat removal area:

Assumptions:

- A 500-foot radius circle extending around each of the bridge center points identified in the initial screening process will have suitable northern spotted owl nesting habitat ranging between 0 and 57 acres.
- All bridges with any suitable northern spotted owl habitat as described in the initial screening methods will have 2 acres of that habitat removed. This represents a maximum expected area of disturbance from work bridges or detour routes for any given bridge project area. The 2 acres is based on the following bridge replacement projects:
    1. Based on analysis of two large ODOT bridge replacement projects, the Row River Bridge (ODOT 2003c) and the Lower Quarry Bridges (ODOT 2003d), the area of actual ground disturbance from work bridges, detour bridges and detour roads did not exceed 2 acres per construction site (1.3 and 0.7 acres respectively). The Habitat Avoidance Performance Standard prohibits staging areas and access roads to be constructed in protected species habitat; therefore, these construction activities are not included in the estimated habitat removal.
    2. Based on analysis of two small ODOT bridge projects, Jackass Creek Bridge (ODOT 2003e) and Bear Creek Bridge (ODOT 2002c), the area of actual ground disturbance from work bridges, detour bridges and detour roads was less than 0.5 acres per construction site (0.5 and 0.2 acres, respectively). However, it is understood that some projects, such as the Santiam Pass Bridges, may have considerably larger amounts of ground disturbance. Therefore, the 2 acres standard should account for the few bridges that require large amounts of clearing.
    3. Given these relatively small areas of disturbance, the 2-acre ground disturbance area will likely be an over estimate for most projects. This conservative number for most projects may be offset by a large bridge project with a ground disturbance area greater than 2 acres. However, the overall ground disturbance area for the Bridge Program is likely overestimated.

Result:

- The area of likely suitable northern spotted owl habitat removed equals 2 acres for each bridge times the 141 bridges that were identified in the initial screening process for a total of 282 acres.

Step 6. Identify Potential Species Effects

Direct removal of occupied habitat or designated critical habitat could affect the northern spotted owl. The implementation of timing restrictions (Wildlife Avoidance Performance Standard and Habitat Avoidance Performance Standard) for those bridges within potentially occupied northern spotted owl habitat or designated critical habitat will eliminate any direct species effects from removal of individual northern spotted owls or the removal of primary constituent elements of designated critical habitat. The removal of cover and vegetation around suitable nesting habit could open these areas up to predators; however, estimating take from this indirect effect, such as predation, is unquantifiable.

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MEMORANDUM

DATE: January 21, 2004

TO: David Leal, USFWS

FROM: Kendel Emmerson and Zak Toledo, MB&G

SUBJECT: ODOT OTIA III: Vernal pool fairy shrimp (*Branchinecta lynchi*) Evaluation of Effects

Likely effects to the vernal pool fairy shrimp as a result of the Bridge Program were analyzed using a combination of GIS database analysis, assumptions based on known biological requirements of the species, assumptions about the types of construction methods, and potential effects of disturbance that could be expected at each bridge site. The following describes the process used to determine which bridges would potentially affect vernal pool fairy shrimp.

Step 1. Apply Effects Screening Criteria (Initial Screening Process)

To determine the number of bridges where bridge repair and replacement activities could potentially affect vernal pool fairy shrimp, the initial screening criteria for vernal pool fairy shrimp were applied to all bridges in the Bridge Program. The following is a list of assumptions and results from the initial screening process:

Assumptions:

- There is no vernal pool habitat located in Oregon outside of the Agate Desert in Jackson County (68 FR 46683).
- Bridges within Jackson County with Agate-Winlo Complex soils within the API for each bridge (API equals 2,000 feet from the ends of each bridge) have the potential to affect vernal pool fairy shrimp.
- Bridges outside of the Agate Desert in Jackson County, Oregon will have No Effect to vernal pool fairy shrimp.
- All vernal pools have Agate-Winlo Complex soils.

Result:

- Five bridges were identified within Jackson County that contain Agate-Winlo Complex soils within the API for each bridge.
- A net total of 63 acres of potential suitable habitat lies within these five bridge APIs (119 gross acres).

- Theses five bridges will be subjected to further analysis to determine what, if any, adverse effects may be delivered through the Effects Pathways.

Step 2. Identify Potential Soil Effects

Ground disturbing activities associated with the bridge project have the potential to affect vernal pool fairy shrimp and their habitats. There are five Bridge APIs identified within Jackson County that contain the Agate-Winlo Complex soils identified as suitable vernal pool fairy shrimp habitat.

Assumptions:

- Vernal pools indicated on the USFWS National Wetland Inventory Spring 1999 Vernal Pools are classified by vegetation condition and topographic condition. Vegetation classifications include "intact," "altered," "severely altered," and "developed." Topographical classifications include "intact," "weak," "leveled," and "developed." The "developed" classification indicates that human development via terrain leveling, and removal of native vegetation has eliminated the vernal pools.

Result:

- Within the five Bridge APIs, 63 net acres of suitable habitat may be potentially affected. Of the 63 acres, 7 acres are located within habitat that have severely altered vegetation and leveled topography and thus, altered hydrology. Approximately 29 acres are located within habitat that has altered vegetation and weak hydrology and topography. The remaining 26 acres are located within altered vegetation habitat. None of the 63 net acres are considered intact. The Vernal Pool Performance Standard will be followed, which requires that no disturbance to vernal pools or sedimentation of vernal pools will result from construction and operation of the project.

Step 3. Identify Potential Water Effects

The ground disturbing activities have the potential to affect hydrology and water quality of vernal pool fairy shrimp and their habitats. Each of the five Bridges identified as having vernal pool fairy shrimp habitat within their API's will follow the Stormwater and the Vernal Pool Performance Standards. The Vernal Pool Performance Standard requires that existing hydrologic regimes be maintained, while the implementation of the Stormwater Performance Standard will maintain existing peak and base flows, and treat water quality. Therefore, no effects to vernal pool fairy shrimp from changes in hydrology or stormwater runoff are expected.

Step 4. Identify Potential Chemical Effects

Chemical effects resulting from a chemical spill at a construction site near an occupied vernal pool could affect vernal pool fairy shrimp. Chemical effects would likely be contained or diluted to an undetectable level within 1,000 feet of the contamination. However, by following the Chemical Contamination Performance Standard and the Vernal Pool Performance Standard, most foreseeable chemical spills can be avoided or contained and cleaned up before they reach a

vernal pool, therefore the effect to vernal pool fairy shrimp from chemical spills is considered to be negligible.

Step 5. Identify Potential Plant Effects

There are five Bridge APIs within the Agate-Winlo Complex soils in Jackson County. The Vernal Pool Performance Standard will be followed at each of these bridges to protect vernal pool fairy shrimp habitat. In addition, the Vegetation Removal and Site Restoration Performance Standards will be followed to minimize the amount of vegetation cleared and to ensure that any vegetation removed outside of the bridge footprint area is restored, thus minimizing effects to vernal pool fairy shrimp from upland vegetation removal.

Step 6. Identify Potential Species Effects

Direct removal of occupied habitat may affect the vernal pool fairy shrimp. The implementation of the Vernal Pool Performance Standard for the five bridges within known vernal pool habitat will eliminate any direct species effects from removal of individual vernal pool fairy shrimp.

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MEMORANDUM

DATE: January 21, 2004

TO: David Leal, USFWS

FROM: Kendel Emmerson and Zak Toledo, MB&G

SUBJECT: ODOT OTIA III: Fender's blue butterfly (*Icaricia icarioides fenderi*) Evaluation of Effects

Likely effects to the Fender's blue butterfly as a result of the Bridge Program were analyzed using a combination of GIS database analysis, assumptions based on known biological requirements of the species, assumptions about the types of construction methods, and potential effects of disturbance that could be expected at each bridge site. The following describes the process used to determine which bridges would potentially affect Fender's blue butterfly.

Step 1. Apply Effects Screening Criteria (Initial Screening Process)

To determine the number of bridges where repair and replacement activities could potentially affect the Fender's blue butterfly, the initial screening criteria for Fender's blue butterfly were applied to all bridges in the Bridge Program. The following is a list of assumptions and results of the initial screening process:

Assumptions:

- All bridges with an API located completely outside of the Willamette Valley Ecoregion will have no effect on the Fender's blue butterfly (Bryce and Woods 2000).
- The Fender's blue butterfly only exists in Yamhill, Polk, Benton, and Lane Counties within the Willamette Valley Ecoregion. Therefore bridges with an API within the Willamette Valley Ecoregion that are within Yamhill, Polk, Benton, and Lane counties have potential to affect Fender's blue butterfly.
- Bridges with an API located within the Willamette Valley Ecoregion, but outside of Yamhill, Polk, Benton, and Lane Counties will have no effect on the Fender's blue butterfly.
- Only three Johnson and O'Neil (2001) habitat types are utilized by Fender's blue butterfly: Westside Grasslands, Herbaceous Wetlands, and Agriculture, Pasture, and Mixed Environments.
- Bridge APIs containing one or more of these habitat types have the potential to affect the Fender's blue butterfly.

Result:

- 74 bridges have an API within Yamhill, Polk, Benton and Lane Counties that are within the Willamette Valley Ecoregion and within the three Johnson and O'Neil (2001) habitat types utilized by Fender's blue butterfly. These 74 bridges will be analyzed further.

Step 2. Identify Potential Chemical Effects

A chemical spill or other chemical releases, such herbicide use, at a construction site could affect Fender's blue butterflies host plant or food source. For the purposes of the Bridge Program, it is assumed that chemical effects would likely be contained or diluted within a bridge's API. However by following the Chemical Contamination Performance Standard and Butterfly Avoidance Performance Standard, most foreseeable chemical spills would be avoided, contained, or cleaned up before they reached Fender's blue butterfly habitat and herbicide application would be seasonally restricted to protect host plants and food sources, therefore the effects to Fender's blue butterflies from herbicide and chemical spills are considered negligible. The following is a list of assumptions and results of screening for the chemical effects:

Assumptions:

- Chemical effects would be contained or diluted to an undetectable level within a bridge's API.
- Only those bridges identified in the initial screening process have potential to affect Fender's blue butterflies through the chemical effects pathway.

Result:

- Seventy Four bridges with an API in the Willamette Valley Ecoregion and within Yamhill, Polk, Benton and Lane Counties have potential to affect Fender's blue butterfly through chemical effects pathways.

Step 3. Identify Potential Plant Effects (Affected Habitat Area)

- There are three Johnson and O'Neil (2001) habitat types that are capable of providing Fender's blue butterfly habitat: Westside Grasslands, Herbaceous Wetlands, and Agriculture, Pasture, and Mixed Environments (Johnson and O'Neil, 2001). All 74 bridges identified in the initial screening process also contained Westside Grasslands, Herbaceous Wetlands, or Agriculture, Pasture, and Mixed Environments habitat types within their API (for a total of 9,067 net acres or 14,144 gross acres within the bridge APIs) (Kiilsgaard, C. and B.A Charley 1999). Table 2.B--1 has these acres of habitat type sorted by county.

Table 2.B-1 Estimated Acres of Affected Habitat for Fender's Blue Butterfly

Habitat Effects	Benton County	Lane County	Polk County	Yamhill County
Total number of OTIA III Bridges within the range of Fenders Blue Butterfly	4	58	12	0
Estimated total of Johnson and O'Neil habitat type acres that may potentially be affected by OTIA III Bridges	380	12,356	1,408	0
Westside Grassland	0	0	0	0
Herbaceous Wetlands	0	0	0	0
Agriculture, Pasture & Mixed Environments	380	12,356	1,408	0

Step 4. Identify Potential Plant Effects (Habitat Removal Area)

The Bridge Program may require the removal of Fender's blue butterfly habitat, and thus could cause adverse effects to the Fender's blue butterfly. The Habitat Avoidance Performance Standard, Butterfly Avoidance Performance Standard, and Vegetation Removal and Site Restoration Performance Standards will be followed to minimize effects to butterfly habitat removal through limiting the amount of vegetation cleared and to ensure that any vegetation removed outside of the bridge footprint area is restored. Assumptions used to determine the area of habitat removal, and results of this analysis are presented below:

Assumptions:

- Each of the bridges identified in the Affected Habitat Area have Fender's blue butterfly habitat within 500 feet of the bridge center.
- A 500-foot radius circle would encompass the area where direct ground disturbing activities associated with bridge replacement would occur. Some bridges may require long detour routes outside of the 500-foot radius circle, but most will not. However, it is assumed that any ground disturbing activities would occur within 500 feet of the center point of the bridge for most bridges.
- A 500-foot radius would cover the length of all but one or two of the largest bridges (maximum bridge length is approximately 1,300 feet).
- A 500-foot radius area around each of the bridge center points will have a range of Fender's blue butterfly habitat between 0 and 57 acres.
- It is expected that 2 acres of Fender's blue butterfly habitat, as described in the initial screening methods, within a 500-foot radius of each of the bridge center points will be removed. This represents a maximum expected area of disturbance from work bridges or detour routes for any given bridge project area. The 2 acres estimate is based on the recent bridge replacement projects described below:
  1. Based on analysis of two large ODOT bridge replacement projects, the Row River Bridge (ODOT 2003c) and the Lower Quarry Bridges (ODOT 2003d), the area of actual ground disturbance from work bridges, detour bridges and detour roads did not exceed 2 acres per construction site (1.3 and 0.7 acres, respectively).

2. Based on analysis of two small ODOT bridge projects, Jackass Creek Bridge (ODOT 2003e) and Bear Creek Bridge (ODOT 2002c), the area of actual ground disturbance from work bridges, detour bridges and detour roads was less than 0.5 acres per construction site (0.5 and 0.2 acres, respectively). However, it is understood that some projects, such as Santiam Pass Bridges, may have considerably larger amounts of ground disturbance. Therefore, the 2 acres standard should account for the few bridges that require large amounts of clearing.
3. Given these relatively small areas of disturbance, the 2 acres areas of ground disturbance will likely be an overestimate for most projects. Even with the occasional large bridge project with a ground disturbance area greater than 2 acres the overall area of ground disturbance for the Bridge Program is overestimated.

Result:

- The area of likely Fender's blue butterfly habitat removed equals 2 acres for each bridge multiplied by the 74 bridges that were determined to be within the area of affected habitat for a total of 148 acres.

Step 5. Identify Potential Species Effects

Direct removal or trampling of host plant species could directly affect the Fender's blue butterfly. The implementation of the Butterfly Avoidance Performance Standard for those bridges within potentially occupied Fender's blue butterfly habitat will eliminate any direct species effects to individual Fender's blue butterflies.

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