Title

Oregon Department of Transportation’s OTIA III State Bridge Delivery Program : 400 bridges one biological opinion

Authors

Bonoff, Michael B.
Toledo, Zachary O.
Ryan, William A.
et al.

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Oregon Department of Transportation's OTIA III State Bridge Delivery Program: 400 Bridges One Biological Opinion

Michael B. Bonoff (Phone: 503-224-3445, Email: mbonoff@masonbruce.com), Mason, Bruce & Girard, Inc., 707 S.W. Washington St., Suite 1300, Portland, OR 97205
Zachary O. Toledo (Phone: 503-587-2932, Email: ztoledo@OBDP.org), Oregon Bridge Delivery Partners, 1165 Union Street, Suite 200, Salem, OR 97301
William A. Ryan (Phone: 503-986-3478, Email: William.A.Ryan@state.or.us), Oregon Department of Transportation, 355 Capitol St. NE, Room 301, Salem, OR 97301-3871
Robert G. Carson (Phone: 503-224-3445, Email: bcarson@masonbruce.com), Mason, Bruce & Girard, Inc., 707 S.W. Washington St., Suite 1300, Portland, OR 97205

Abstract: The Oregon Department of Transportation (ODOT) concluded a study in 2001 of the condition of Oregon bridges nearing the end of their design life—those built in the late 1940's to the early 1960's. Funded under the first two phases of the Oregon Transportation Investment Act (OTIA I and II), this study found varying degrees of shear (diagonal cracking) in a large number of the state's bridges. In July 2003, Oregon Governor Ted Kulongoski signed legislation authorizing OTIA III, a $2.5 billion transportation package, including $1.3 billion to repair or replace over 400 bridges under the OTIA III State Bridge Delivery Program (Bridge Program) over the next 10 years.

Timely completion of environmental regulatory permitting was critical to meet the Bridge Program's aggressive construction schedule. To facilitate this, ODOT and the Federal Highway Administration (FHWA) began working with a number of federal and state regulatory and resource agencies in late 2002 to develop permitting strategies that would meet the dual goals of timely review of individual permitting and protection and enhancement of fish and wildlife habitat.

In addition to coverage under the Federal Endangered Species Act (ESA), the preferred regulatory compliance approach needed to ensure compliance with other state and federal statutes designed to protect fish, wildlife, and plant species and their habitat, including the Oregon ESA, Migratory Bird Treaty Act (MBTA), Marine Mammal Protection Act (MMPA), Magnuson-Stevens Fishery Conservation and Management Act (MSA), and Fish and Wildlife Coordination Act.

As a contractor to ODOT, Mason, Bruce & Girard, Inc. (MB&G) worked closely with ODOT and other state and federal agencies from 2003 through 2004 to prepare a programmatic Biological Assessment (BA) for the Bridge Program. Critical to the BA was the development of a set of environmental performance standards designed to minimize and avoid impacts to ESA listed species. In addition, a fluvial performance standard was developed to ensure that bridges replaced under the OTIA III Program would enhance, not simply maintain, geomorphological features at the bridge site.

The BA was submitted to the regulatory agencies in March 2004. In June 2004, ODOT received a joint Biological Opinion from NMFS and the USFWS addressing 73 threatened, endangered, proposed, and selected sensitive species and their designated or proposed critical habitat. In addition to listed fish, wildlife, and plants, the BA also satisfied the requirements of the MMPA, MBTA, FWCA, and MSA.

ODOT expects that 85 to 90 percent of the bridges under the OTIA III Bridge Program will be permitted using the programmatic approach, resulting in significant time and cost savings. ODOT anticipates that the programmatic approach to environmental compliance will, program-wide, result in time and cost savings of two years and $54 million over the 10-year program, exclusive of time saved on the part of state and federal resource agencies. Bridge design using the environmental performance standards developed for the program is now underway.

Introduction

The Oregon Department of Transportation (ODOT) concluded a study in 2001 of the condition of Oregon bridges nearing the end of their design life—those built primarily between 1947 and 1961. Funded under the first two phases of the Oregon Transportation Investment Act (OTIA I and II), this study found varying degrees of shear (diagonal cracking) in a large number of the State's bridges. In July 2003, Oregon Governor Ted Kulongoski signed legislation authorizing OTIA III, a $2.5 billion program to repair or replace over 400 bridges statewide under the OTIA III Statewide Bridge Delivery Program (Bridge Program) over the next 10 years.

One of the principal requirements to meet the Bridge Program's aggressive construction schedule was the timely completion of environmental regulatory permitting. To facilitate this, ODOT and the Federal Highway Administration (FHWA) began working with a number of federal and state regulatory and resource agencies in late 2002 to develop permitting strategies that meet the dual goals of providing timely review of individual permit applications, and protecting or enhancing the natural and built environments. A number of criteria were identified as being relevant to developing a permitting approach for the Bridge Program, including:

- Efficiency. A primary goal of the "streamlining" effort was to minimize redundancy of permitting hundreds of similar projects, reducing the duration of consultation with the Federal permitting agencies, the National Marine Fisheries Service (NOAA Fisheries) and the U.S. Fish and Wildlife Service (USFWS) (collectively referred to as the Services), and the State permitting agency, the Oregon Department of Fish and Wildlife (ODFW).
- Legal Defensibility. The higher the risk of liability and legal challenge, the less desirable the approach to ODOT.
- Simplicity. Approaches that reduce the regulatory process to the simplest method possible were favored.
- Stewardship. A key objective for ODOT was to demonstrate commitment to the stewardship component of the Agency's transportation mission through building green bridges with minimal effect to the environment.
- Agency Relations. Maintaining excellent agency relations was of paramount importance to ODOT. A collaborative approach was deemed critical to the success of this effort.

ODOT's development of an approach to environmental compliance was a collaborative effort and relied on three key elements: 1) extensive communication with regulatory and resource agencies, 2) national review and incorporation of existing consultations and strategies, and 3) use of a Geographic Information System (GIS) database designed to screen for and describe potential effects of the Bridge Program on federally listed fish, wildlife, and plant species.

In addition to coverage under the federal Endangered Species Act (ESA), the regulatory compliance approach needed to ensure compliance with other state and federal statutes designed to protect fish, wildlife, and plant species and their habitat: the Oregon ESA, Migratory Bird Treaty Act (MBTA), Marine Mammal Protection Act (MMPA), Magnuson-Stevens Fishery Conservation and Management Act (MSA), and Fish and Wildlife Coordination Act (FWCA).

A Vision of Green Bridges

ODOT's history of proactive environmental stewardship provided the credibility needed to assure the regulatory agencies of ODOT's commitment to "green bridges" (i.e., bridges designed to not only maintain, but improve habitat quality for fish and wildlife). Support of ODOT at the executive level of state government was also clear. Governor Kulongoski's Executive Order No. EO-03: A Sustainable Oregon for the 21st Century required enhancement and protection of the natural and built environments. ODOT therefore had both a culture of environmental stewardship as an agency and a mandate provided by executive order that essentially required ODOT to implement their vision. This proved to be a powerful combination and helped considerably to increase comfort on the part of the resource agencies in developing an overarching approach to environmental permitting.

Approach to the Consultation

In developing the ESA consultation approach for the Bridge Program, ODOT engaged the help of the private consulting community to review existing streamlined, programmatic ESA consultations and to obtain "lessons learned" information from other DOT and agency staff involved in these consultations. The purpose of this research was to learn from these previous experiences, specifically, to determine what worked, what did not work, what contributed to the success of a consultation, or what lead to delays and problems.

ODOT's consultants also requested information from entities involved in programmatic consultations regarding the level of effort (i.e., percent of their time and staff resources) and number of staff that were required from the action agency and the services for a successful consultation. This information further aided the development of ODOT's consultation strategy. The general consensus among entities contacted was that a large amount of staff time and commitment was extremely important to the success of the consultation. Low turnover of staff working on the consultation was another important success factor. An emphasis was placed on the importance of very committed service staff familiar with transportation issues, willing to make decisions, and who thoroughly understood the ESA.

The need for close collaboration between the action agency and the services was identified as an overarching trend throughout all programmatic processes and documents reviewed by ODOT. The Colorado DOT, USFWS, and FHWA collaborated on a successful Section 7 programmatic consultation that addressed over 20 species. These agencies collaborated early in the process and concluded that addressing species' needs on a project-by-project basis would have yielded scattered and fragmented habitat conservation or improvement, contributing little to the viability of individual species or to the habitat and ecosystems on which they depend. These agencies envisioned that contributing to multi-species recovery in an integrated and comprehensive fashion would aid in recovery of the species, alleviate some of the need for additional listings under the ESA, and improve predictability in the project development process.

The California Department of Transportation (CalTrans) also had considerable experience with programmatic consultations. Primary lessons learned from their Desert Tortoise and Valley Elderberry Longhorn Beetle consultation (USFWS 1996) were to seek buy-in from state resource agencies to avoid later complications, to keep agreements simple, and to incorporate adaptive methods to allow change by mutual agreement. These "lessons learned" from past programmatic consultations were incorporated into the Bridge Program consultation to help avoid pitfalls and to help ensure a successful consultation.

Based on this and other research, MB&G, other private consultants, and representatives from ODOT determined that a formal, streamlined batched-programmatic Section 7 Federal ESA Consultation would be the most effective and efficient approach to environmental compliance for the Bridge Program. In contrast to a strictly programmatic approach, a batched programmatic was deemed appropriate since the proximity, distribution, duration, and disturbance frequency of the proposed action were known (these are formally recognized batched elements) and the timing, nature of the effect, disturbance, intensity, and severity are controlled through measures administered throughout the Bridge Program (these are the programmatic elements) (USFWS and NOAA Fisheries 1988). This consultation approach has been used in previous Section 7 consultations such as the Wildland Urban Interface Fuel Treatment batched-programmatic BA prepared by the Southwestern Region of the U.S. Forest Service (USFS 2001). Formal consultation with the federal agencies was necessary due to the potential adverse effects to federally listed fish, wildlife, and plants. This batched-programmatic approach met both streamlining requirements and the goals of species conservation and environmental protection mandated by existing environmental laws.

The services formally recognize streamlining as a consultation approach and provide guidelines in the Endangered Species Consultation Handbook (NOAA Fisheries and USFWS 1998) and for certain types of projects (USFWS and NOAA Fisheries 2002). Streamlined consultations typically involve interagency teams that work together early in the process to narrow the scope of issues within consultation documents. ODOT recognized that early coordination and cooperation among ODOT/FHWA and the services would be essential to this streamlining process.

Programmatic consultations typically evaluate the potential for groups of related agency actions to affect listed and proposed species and designated and proposed critical habitat. Implementation of these actions is guided by established standards, guidelines, or governing criteria to which they must adhere. Programmatic consultations may be conducted on an action agency's proposal to apply specified standards or design criteria to future proposed actions. The NOAA Fisheries Standard Operating Procedures for Endangered Species (SLOPES) Programmatic Biological Opinion (NOAA Fisheries 2003) is an example of a widely used programmatic approach to ESA consultation.

ODOT's selection of a batched-programmatic consultation also assured the services that the level of effects analysis would provide the detail needed to adequately assess overall program impacts. This approach would provide numbers of bridges, acreages of affected habitat, and species-specific effects analysis. A strictly programmatic approach, lacking this level of detail, would not have allowed a no jeopardy determination under Section 7 of the ESA.

Framework for Collaboration

ODOT recognized early in this project that 1) a collaborative effort was key to success, 2) collaboration must be sustained, and that 3) a framework was needed to ensure that, if necessary, policy issues or conflicts could be identified early and resolved at the appropriate level. As described below, a tiered approach was used to guide the process and to ensure access to agency staff with decision-making authority.

A Tiered Development Team Approach

As a result of a fall 2002 planning and brainstorming workshop hosted by ODOT, representatives from FHWA, USFWS, NOAA Fisheries, ODOT, and private consultants concluded that a three-tiered review system would provide the highest likelihood of success. Roles and responsibilities of each of the three levels are described below.

Level 1 working group

The Level 1 Working Group was comprised of representatives from USFWS, NOAA Fisheries, ODFW, ODOT, and private consultants who were selected based on their understanding of the ESA and their familiarity with potential biological and physical (geomorphological) impacts at bridge projects. The "core" Level 1 Group adhered to a rigorous schedule of meetings (weekly from June 2003 through April 2004) and was responsible for the day-to-day work necessary to produce the batched-programmatic Biological Assessment (BA).

The Level 1 meetings were productive, lively, and technically challenging. These meetings resulted in key work products that were either directly incorporated into the BA or served to refine the analytical approach and methods. Products included 1) a consultation approach and outline, 2) an action area definition, 3) species ranges for effects analysis, 4) metrics to calculate potential project effects on species and habitats, 5) design- and construction-based environmental performance standards, and 6) a process to administer the Bridge Program, including monitoring strategies, a process for handling non-conforming activities, and continued communication between the action agency and the services.

Products of Level 1 meetings also included Effects Screening Layer (ESL) memos that documented assumptions used in assessing project impacts and Environmental Performance Standards (EPSs). The latter are a set of guidelines for bridge repair or replacement designed to minimize or avoid adverse effects to the species covered in the consultation. Effects of the project were ultimately considered assuming compliance with the EPSs within assumed areas of impact and given assumptions documented and approved by the services in ESL memos.

The primary role of MB&G for the Level 1 Group was to coordinate activities and schedules, compile and distribute meeting notes to all team members (at all tiers), develop the ESL memos, and develop the BA (MB&G 2004). Resource-agency members provided critical input throughout the Level 1 meetings and would later draft the project Biological Opinion.

Level 2 reviewing group

A Level 2 Reviewing Group met on an as-needed basis to resolve conflicts and receive progress reports and updates on important issues. The Level 2 Group was comprised of senior representatives from USFWS, NOAA Fisheries, and ODOT. The Level 2 Reviewing Group also provided feedback and approval to the Level 1 Work Groups regarding the consultation direction. The Level 2 Group met twice during the drafting of the BA.

Level 3 executive group

The Level 3 Executive Group was comprised of state and/or regional director-level representatives of USFWS, NOAA Fisheries, ODFW, and ODOT. The Level 3 Group was available to provide high-level policy direction and to provide input as needed to resolve policy conflicts. The Level 3 Group remained briefed through Level 1 meeting minutes and met once during the drafting of the BA and once during the drafting of the Biological Opinion (BiOp).

Development of the BA

Development of the Bridge Program BA was a collaborative effort that began with the first Level 1 Team meeting in the spring of 2003 and concluded with delivery of the BA to the services in March 2004. While the bulk of the analysis and writing of the document took place between November 2003 and February 2004, work on the BA was ongoing throughout this period.

All major activities critical to completion of the BA were conducted with active participation and support of federal agency staff that would ultimately write the Biological Opinion (BiOp). As noted, the Level 1 Group met on a weekly basis over much of this project. In addition to development and refinement of EPSs (see below), the focus of many of the Level 1 meetings was to review and approve the assumptions and approach used to assess potential impacts of the Bridge Program on individual species or on species groups. Agreements reached at these meetings on data sources, species ranges, habitat preferences, and analytical approach were captured in Effects Screening Layer (ESL) memos. These 2 to 3 page documents were submitted to the Services as they were developed by the Level 1 Group. Once approved, they served to guide and frame the Effects Analysis and became appendices to the BA. Major activities and milestones in the development of the BA are described below.

Definitions of the Action Area

Activities under the Bridge Program that may affect fish, wildlife, and plants included in the ODOT OTIA III Bridge Program BA (MB&G 2004) cover a wide range of actions ranging from direct physical injury to an individual fish, wildlife, plant, invertebrate, or plant species to visual disturbance of nesting birds. Even broader, the action area may justifiably encompass the entire state of Oregon given the broad geographic scope of this program and the programmatic nature of consultation with the federal agencies. Considering all of these factors, the Level 1 Group determined that the action area with respect to potential mitigation needs would encompass all areas within the same sixth field hydrologic unit code (HUC) of a particular program bridge. However, project-specific effects analysis would be conducted within a defined Area of Potential Impact (API). The API is a much smaller subset of the action area that varies from bridge to bridge.

Effects Analysis

The Bridge Program BA and BiOp addressed 73 threatened, endangered, proposed, and selected sensitive (TEPS) species and their designated or proposed critical habitat (Table 1). In addition to listed fish, wildlife, and plants, the BA also satisfied the requirements of the MMPA, MBTA, FWCA, and MSA.

The potential effects of the Bridge Program were considered based on the combined effects of all 430 program bridges, allowing the services in their BiOp to reach a conclusion as to the likelihood of jeopardy on a programmatic basis. This was accomplished in part by first defining the possible effects pathways, or avenues by which effects to species may be delivered. Effects may be in the form of habitat-altering actions, such as wetland impacts; effects to individuals (e.g., fish injury during work area isolation); or to entire populations, (e.g., effects to isolated plant populations). Effects pathways include soil (e.g., because soil can be the medium through which a species is affected), air, water, vegetation, and chemicals. Direct effects and incidental take of individuals of a species were also considered effects pathways.

Once the pathways of effects were defined, a series of environmental performance standards (EPSs) were developed to serve as barriers to or constrictions of these pathways with regard to their ability to deliver effects of project actions to species of concern. The overarching goal of the EPSs was to avoid and/or minimize effects to listed species and to create a net benefit of the program in terms of improved habitat conditions within the action area. Effects of the Bridge Program were thus evaluated assuming implementation of EPSs necessary to avoid and minimize effects, improve habitat for listed species, and to enhance their recovery. In essence, the EPSs provided a design framework describing desired outcomes and allowing creativity and innovation on the part of the bridge design and construction teams. This approach uses a “tell them what you would like to see” philosophy rather than the traditional “tell them what they cannot do.”

Table 1. List of TEPS species addressed in ODOT's Bridge Program consultation

Common Name	Scientific Name	Federal Status	State Status	Critical Habitat
Terrestrial Mammals				
Canada lynx	*Lynx Canadensis*	Threatened	Threatened	
Columbian white-tailed deer (Columbia River DPS)	*Odocoileus virginianus leucurus*	Endangered		
Kit fox	*Vulpes macrotis*		Threatened	
Wolverine	*Gulo gulo*		Threatened	
Washington ground squirrel	*Spermophilus washingtoni*		Endangered	
Marine Mammals				
Steller sea lion (Eastern population)	*Eumetopias jubatus*	Threatened		
Sei whale	*Balaenoptera borealis*	Endangered		
Blue whale	*Balaenoptera musculus*	Endangered		
Finback whale	*Balaenoptera physalus*	Endangered		
Right whale	*Eubalaena jubatus*	Endangered		
Humpback whale	*Megaptera novaeangliae*	Endangered		
Sperm whale	*Physeter macrocephalus*	Endangered		
Birds				
Marbled murrelet	*Brachyramphus marmoratus marmoratus*	Threatened	Threatened	Designated
Western snowy plover (Pacific Coast population)	*Charadrius alexandrinus nivosus*	Threatened		Designated
Bald eagle	*Haliaeetus leucocephalus*	Threatened	Threatened	
Northern spotted owl	*Strix occidentalis caurina*	Threatened	Threatened	Designated
Western snowy plover (Interior population)	*Charadrius alexandrinus nivosus*		Threatened	
Peregrine falcon	*Falco peregrinus anatum*		Endangered	
Short-tailed albatross	*Phoebastria albatrus*	Endangered		
Brown pelican	*Pelecanus occidentalis californicus*	Endangered		

Table 1 (continued)

Common Name	Scientific Name	Federal Status	State Status	Critical Habitat
Reptiles and Amphibians				
Loggerhead sea turtle	*Caretta caretta*	Threatened		
Green sea turtle	*Chelonia mydas*	Threatened		
Leatherback sea turtle	*Dermochelys coriacea*	Endangered		Designated
Olive (Pacific) Ridley sea turtle	*Lepidochelys olivacea*	Threatened		
Resident Fish				
Foskett speckled dace	*Rhinichthys osculus*	Threatened		
Shortnose sucker	*Chasmistes brevirostris*	Endangered	Endangered	Proposed
Lost River sucker	*Deltistes luxatus*	Endangered	Endangered	Proposed
Warner sucker	*Catostomus warnerensis*	Threatened		Designated
Oregon chub	*Oregonichthys crameri*	Endangered		
Hutton tui chub	*Gila bicolor*	Threatened		
Borax Lake chub	*Gila boraxobius*	Endangered		Designated
Lahontan cutthroat trout	*Oncorhychus clarki henshawi*	Threatened		
Bull trout	*Salvelinus confluentus*	Threatened		Proposed
Cutthroat trout (SW Washington/Columbia River DPS)	*Oncorhychus clarki clarki*	Species of Concern		
Pacific lamprey	*Lampetra tridentata*	Petitioned	Sensitive	
River lamprey	*Lampetra ayresi*	Petitioned	Sensitive	
Western brook lamprey	*Lampetra richardsoni*	Petitioned	Sensitive	
Anadromous Fish				
Chum salmon (Columbia River ESU)	*Oncorhynchus keta*	Threatened		
Coho salmon (Southern Oregon/Northern California Coasts ESU)	*Oncorhynchus kisutch*	Threatened		Designated
Coho salmon (Oregon Coast ESU)	*Oncorhynchus kisutch*	Threatened		
Coho salmon (Lower Columbia River ESU)	*Oncorhynchus kisutch*		Endangered	
Steelhead (Upper Columbia River ESU)	*Oncorhynchus mykiss*	Endangered		

Table 1 (continued)

Common Name	Scientific Name	Federal Status	State Status	Critical Habitat
Steelhead (Lower Columbia River ESU)	*Oncorhynchus mykiss*	Threatened		
Steelhead (Middle Columbia River ESU)	*Oncorhynchus mykiss*	Threatened		
Steelhead (Snake River Basin ESU)	*Oncorhynchus mykiss*	Threatened		
Steelhead (Upper Willamette River ESU)	*Oncorhynchus mykiss*	Threatened		
Sockeye salmon (Snake River ESU)	*Oncorhynchus nerka*	Endangered		Designated
Chinook salmon (Snake River Spring/Summer-run ESU)	*Oncorhynchus tschawytscha*	Threatened		Designated
Chinook salmon (Snake River Fall-run ESU)	*Oncorhynchus tschawytscha*	Threatened		Designated
Chinook salmon (Upper Willamette ESU)	*Oncorhynchus tschawytscha*	Threatened		
Chinook salmon (Upper Columbia River Spring-run ESU)	*Oncorhynchus tschawytscha*	Endangered		
Chinook salmon (Lower Columbia River ESU)	*Oncorhynchus tschawytscha*	Threatened		
Invertebrates				
Vernal pool fairy shrimp	*Branchinecta lynchi*	Threatened		Designated
Fender's blue butterfly	*Icaricia icariodes fenderi*	Endangered		
Oregon silverspot butterfly	*Speyeria zerene hippolyta*	Threatened		Designated
Plants				
McDonald's rock-cress	*Arabis mcdonaldiana*	Endangered		
Applegate's milk-vetch	*Astragalus applegatei*	Endangered	Endangered	
Golden paintbrush	*Castilleja levisecta*	Threatened	Endangered	
Willamette daisy	*Erigeron decumbens var. decumbens*	Endangered	Endangered	
Gentner's fritillary	*Fritillaria gentneri*	Endangered	Endangered	
Water howellia	*Howellia aquatilis*	Threatened		
Western lily	*Lilium occidentale*	Endangered	Endangered	
Large-flowered wooly meadowfoam	*Limnanthes floccosa ssp. grandiflora*	Endangered	Endangered	
Bradshaw's Lomatium	*Lomatium bradshawii*	Endangered	Endangered	

Table 1 (continued)

Common Name	Scientific Name	Federal Status	State Status	Critical Habitat
Cook's Lomatium	*Lomatium cookii*	Endangered	Endangered	
Kincaid's lupine	*Lupinus sulphureus ssp. kincaidii*	Threatened	Threatened	
MacFarlane's four-o'clock	*Mirabilis macfarlanei*	Threatened	Endangered	
Rough popcornflower	*Plagiobothrys hirtus*	Endangered	Endangered	
Nelson's checker-mallow	*Sidalcea nelsoniana*	Threatened	Threatened	
Spalding's catchfly	*Silene spaldingii*	Threatened	Endangered	
Malheur wire-lettuce	*Stephanomeria malheurensis*	Endangered	Endangered	Designated
Howell's spectacular thelypody	*Thelypodium howellii ssp. spectabilis*	Threatened	Endangered	
Marsh sandwort	*Arenaria paludicola*	Endangered		

E = Endangered, T = Threatened, Can = Candidate, CH = Designated Critical Habitat, Prop = Proposed for listing, Prop CH = Proposed Critical Habitat.

Effects Screening

Based on agreed-to assumptions documented in ESL memos (e.g., preferences for specific habitat types, species ranges, etc.), all 430 program bridges (with their respective APIs and effects buffers) were mapped and entered into a GIS database. The bridges were then screened to describe and estimate the effects of the proposed action on listed species and their habitats. Results of this analysis were documented in Evaluation of Effect (EOE) memos submitted to the services for review and approval. Like the ESL Memos, the EOE memos became appendices to the BA memorializing critical decisions and assumptions used in analyzing program effects and summarizing results in terms of the number of bridges, if any, affecting particular species.

Environmental Performance Standards

ODOT/FHWA, in collaboration with the services involved in this consultation, developed Environmental Performance Standards (EPSs) to guide project design and construction. The EPSs were a critical component of the BA that ensured avoidance of potential long-term adverse effects and minimization of short-term, unavoidable effects. The EPSs require that unavoidable long-term effects be offset with restorative or mitigative actions that result in no net long-term adverse effect to listed species and their habitats. In addition, the EPSs were developed to maximize the potential for short and long-term beneficial effects to listed species, non-listed species, and their habitats. Bridge replacement or repair activities that cannot conform to the EPSs are not covered under the BiOp and therefore require individual consultation under Section 7 of the ESA.

The EPSs developed for the Bridge Program are summarized below. As noted earlier, the SLOPES Programmatic BiOp is currently in use for U.S. Army Corps activities that may impact listed species. ODOT/FHWA and the Services built on many of the performance standards developed for SLOPES and developed new EPSs as necessary based on the unique goals and objectives of the Bridge Program.

Program administration

The Program Administration EPS includes requirements for monitoring and reporting, program-management guidelines, environmental documentation, communication protocols, and variances. In short, this is the "accountability" EPS.

The Program Administration EPS describes the required content of the Pre-Construction Assessment (PCA). The PCA is prepared in lieu of a BA and ensures that the effects of activities at a particular bridge or group of bridges are within the range of effects considered in the BiOp. The PCA also quantifies project-level take estimates, verifies that program-level permitted take is not likely to be exceeded, and that all appropriate EPSs are being properly followed. The PCA is submitted to the services at least 30 days prior to starting construction activities.

Another critical element of the Program Administration Standard is the protocol for variances. For purposes of this consultation, variances are defined as actions not clearly addressed within the environmental performance standards, but that do not result in greater effects or greater take than provided in the BiOp. An example of a variance in this context is an extension of an in-water work window to avoid the need for a second year of construction. The PCA is used to formally request a variance.

Species avoidance and adverse effect minimization
The Species Avoidance EPS consists of a comprehensive set of actions and measures required to avoid and minimize incidental take of listed fish, wildlife, and plant species resulting from construction activities. Measures required of construction contractors are described in detail in the BiOp and cover timing of in-water work (for activities below the Ordinary High Water (OHW) elevation), work-area isolation, fish-screen criteria and installation, and noise attenuation for steel piles driven through water when listed fish may be present.

For wildlife, this EPS is designed to minimize incidental take and harassment of listed wildlife species and adverse effects to wildlife and migratory birds from high-noise producing activities. Wildlife species addressed specifically in the OTIA III BiOp include marbled murrelet, bald eagle, and northern spotted owl. Timing restrictions for blasting and non-blasting high noise producing construction activities are limited to regionally specific non-nesting periods for these species and to times of day that were developed in close coordination with ODFW and USFWS biologists.

For listed plants, the Species Avoidance EPS requires surveys for state and federally listed plants and their occupied habitat during appropriate flowering periods and within the geographic range of listed plants as described in the BA. If listed plants are found, a management buffer is established to protect the population from construction activities or as a result of indirect effects such as herbicide drift.

Habitat avoidance
Technically referred to as Habitat Avoidance and Removal Minimization, this EPS provides specific guidance to avoid and minimize adverse effects to natural stream and floodplain function by limiting streambank protection actions to those not expected to have long-term adverse effects on aquatic habitats. This EPS provides a wide range of approved bank-protection techniques for use individually, or in combination at a particular bridge site.

Actions that could potentially result in habitat removal or that may impair the ability of threatened, endangered, proposed, or selected sensitive species to complete essential biological behaviors, such as breeding, spawning, rearing, migrating, feeding, and sheltering, are restricted via this EPS. Specifically, activities are restricted that may adversely affect nest trees of listed species (e.g., bald eagle, marbled murrelet, or northern spotted owl) and non-listed species. Avoidance of adverse effects on breeding and functional habitat is also required under this EPS unless protocol surveys show the area is not occupied or except in cases where public safety takes precedence.

Water quality/quantity
A critical concern of ODOT/FHWA and the Services was: 1) the potential transfer of pollutants (via spills, equipment leakage, etc.) to soils and waters of the U.S. caused by construction operations and 2) an increase in impervious surface that may result from replacement of program bridges. The Water Quality EPS requires development of a pollution and erosion control plan which specifies measures to prevent delivery of contaminants, and containment of pollutants (including petroleum products, contaminated water, silt, welding slag, sandblasting abrasive, green concrete, or grout cured less than 24 hours) to contact any area within 150 feet of waters of the U.S. unless approved by the Services and the appropriate regulatory authorities. Control of drilling discharge and drilling fluids is addressed in detail in this EPS, as is removal of treated wood piles.

With respect to stormwater management, this EPS requires that adverse effects resulting from changes to the quality and quantity of stormwater runoff be avoided or minimized for the life of the project by improving or maintaining natural runoff conditions within project watersheds. Protection of groundwater is also addressed; stormwater runoff from pollution generating surfaces requires pretreatment (using described approaches) before infiltration to groundwater or discharge into waters of the U.S.

Site restoration
The Site Restoration EPS requires renewal of habitat access, water quality, production of habitat elements, channel conditions, flows, watershed conditions, and other ecosystem processes that form and maintain productive habitats. A site-restoration plan is required to ensure that all habitats (e.g., streambanks, soils, large woody material, and vegetation) disturbed by the project are cleaned up and restored. Detailed guidance and recommendations on the use of pesticides, fertilizers, streambank shaping, as well as recommended materials and methodologies to achieve site restoration, are presented in the Site Restoration EPS. A site-restoration work plan is required that includes: boundaries for the restoration area; restoration methods; timing and sequence; an irrigation plan, including water supply source; and a five-year monitoring and maintenance plan.

Compensatory mitigation
Effects that are not offset by site restoration must be addressed through compensatory mitigation. The compensatory mitigation EPS requires that the Bridge Program meet the goal of no net loss of habitat function by offsetting unavoidable permanent and temporary adverse effects to habitats. Activities that reduce or remove habitat function or that delay or prevent development of desired function or condition of habitat will trigger the need for a Compensatory Mitigation Plan. The Compensatory Mitigation EPS requires that these plans be based on a functional assessment of adverse effects of the proposed project and functional replacement (i.e., 'no net loss of function') whenever feasible, using a minimum one-to-one linear foot or acreage-replacement ratio. Mitigation actions associated with the Bridge Program must comply with the USFWS' Conservation Banking for Threatened and Endangered Species (May 8, 2003, 68 FR 24753), and the Corps' Regulatory Guidance Letter on Compensatory Mitigation (USACE 2002).

Fluvial
A critical goal on the part of ODOT/FHWA and the services for this consultation was a performance standard that would prevent adverse effects on geomorphic features of streams and rivers crossed by program bridges, thus precluding corresponding effects on their floodplains. The Fluvial EPS is designed to allow normative physical processes within the stream-floodplain corridor. This EPS requires that program bridges span the functional floodplain (determined as specified within this EPS), thereby promoting natural sediment transport patterns for the reach and providing unaltered fluvial debris movement. In essence, this standard requires that program bridges go unnoticed by passing water bodies, that natural sediment and wood loads are maintained, and that localized scour of streambanks and likely spawning areas is prevented. From a maintenance perspective, this standard reduces the need for removal of large wood resting against bridge-support structures.

Bridging the BA and BiOp

The Bridge Program BA was completed in March 2004, which was approximately one year after the first meeting of the Level 1 Team and three months prior to the desired June 1 signing of the BiOp. Recognizing that design work could not be initiated without a signed BiOp and faced with looming construction deadlines, ODOT and the Level 1 Team continued to meet on a weekly basis while the services drafted the BiOp. Despite the familiarity of the services with the BA (the same staff attending Level 1 meetings drafted the BiOp), more detailed review by senior NOAA and USFWS staff led to questions and policy issues which, if not immediately addressed, could have threatened the project timeline. Meetings throughout this period included Level 1 Team members, ODOT, and, as necessary, senior staff from the services.

The Conservation Conundrum

While relatively minor issues arose and were resolved during preparation of the BiOp, it was clear that ODOT's required level of commitment to Section 7(a)(1) of the ESA and varying expectations regarding conservation within the Bridge Program were not minor issues. Section 7(a)(1) of the ESA directs federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of threatened and endangered species. Conservation recommendations are discretionary measures suggested to minimize or avoid adverse affects of a proposed action on listed species, to minimize or avoid adverse modification of critical habitat, or to develop additional information. *The Environmental Law Reporter Endangered Species Deskbook* (Liebesman and Peterson 2003) states that there are currently no regulations directly interpreting or implementing 7(a)(1). Further, they note that Section 7(a)(1) emerged from a Ninth Circuit Decision as "a little something extra" and "in the absence of firm guidance by the biological agencies, there is considerable leeway as to what that something will be." The issue of conservation within the Bridge Program proved considerably difficult, but was resolved in large measure due to the trust that had been developed among ODOT and the services over the previous 12 months of collaboration.

Central to the discussion on conservation was the role of ODOT's Comprehensive Mitigation and Conservation Strategy (CMCS) within the Bridge Program. The CMCS may be considered a net beneath the Environmental Performance Standards, designed to ensure application of an ecologically-based approach to mitigating unavoidable impacts on both a site-specific and a regional basis. While the CMCS was not specifically designed to address Section 7(a)(1) of the ESA, it was ODOT's opinion that it ensured mitigation well above that required on strictly a compensatory basis. Moreover, the CMCS emphasizes species' habitat relationships and functional values to determine mitigation needs, an approach that greatly increases the probability of success on many levels. In short, use of the CMCS, in ODOT's opinion, ensured that conservation needs within the Bridge Program would be more than met.

The Services agreed that the CMCS process offered substantial benefits over the traditional, ratio-based approach to mitigation. However, the CMCS program had yet to be implemented at the time the BiOp was being prepared and a great deal of uncertainty existed regarding issues such as impact assessment and mitigation tracking and development of a combined mitigation/conservation credit and accounting method. Given these uncertainties, the USFWS requested that program-level conservation targets be based on one of the following three methods (in order of preference):

1. Estimates of permanent and temporary take provided in the BA, regardless of actual loss;
2. A collaborative approach developed through the CMCS; and
3. Permanent and temporary take, modified as follows:
   - 1.5:1 mitigation to impact ratio for marginal or low quality habitat;
   - 2:1 mitigation to impact ratio for higher quality habitat; and
   - Various time-dependency ratios based on time to achieve desired future condition, ranging from 1.5:1 for 5 to 10 years and 5:1 for greater than 50 years.

Take estimates presented in the Bridge Program BA represented the upper limit of anticipated take. ODOT had not anticipated their use as mitigation targets. However, ODOT recognized the difficulty on the part of the USFWS in basing conservation and mitigation requirements solely on the yet-to-be implemented CMCS approach. Negotiation on this point led to considerable discussion within the text of the BiOp on the application and benefits of the CMCS to the

Bridge Program. The final, signed BiOp ultimately provided the assurances needed by the Services, a commitment on their part to continue to work within the CMCS framework, and a commitment by ODOT to stewardship, regardless of the means of defining mitigation and conservation requirements.

Lessons Learned

A meeting in July 2004, one week after the signing of the Bridge Program BiOp, was held among those actively involved in the Bridge Program ESA consultation, including senior staff from NOAA, USFWS, ODOT, FHWA, and consultants. While this was a working meeting to discuss program implementation and continuing expectations/roles for the services, there was a discernable celebratory tone. A joint, batched programmatic BiOp for repair and replacement of over 400 bridges in the State of Oregon had just been signed by both NOAA and USFWS, requiring "extreme collaboration" among a large number of individuals for over a year. Participants at this meeting acknowledged that many were skeptical of the batched-programmatic approach and of the likelihood of the signing of a joint BiOp. Thus, there was a sense of relief, pride, and camaraderie at the accomplishment.

Acknowledging the value of a discussion on lessons learned, participants voiced several factors that, in combination, allowed a successful outcome of this project. These included:

- Visionary Senior Staff. This program was the vision of ODOT senior policy advisors who actively encouraged and nurtured it from inception of the BA to final signing of the BO.
- Team Continuity. No single member of the project team (ODOT, USFWS, NOAA, other agency staff and consultants) ever left the project; all core members who began remained actively involved throughout.
- Productive Meetings. As stated earlier in this document, meetings among ODOT and the services were held on virtually a weekly basis over the course of a year, with subgroup meetings occurring as needed throughout this period. Each of these had clear agendas, defined products, and most importantly, guided the analysis of project effects. Project meetings were extremely productive, lively, and technically challenging, and were building blocks to the Biological Assessment.
- True Collaboration. Participants in this consultation, particularly the Level 1 Group, worked together for a sufficient period of time to establish close working relationships. While roles remained well defined, distinctions among regulators, consultants, and ODOT staff were blurred. All were team members with a clear mission: develop a Bridge Program that would allow creative engineering, but within a framework that avoided environmental impacts.
- Trust. Mutual trust was key to the successful conclusion of this consultation. This was embodied by the decision, reached late in the consultation, to do without a Memorandum of Agreement initially discussed as necessary to provide the services the assurances they sought with respect to conservation. Without this level of trust on both sides, it is unlikely a joint BiOp would have been possible.

In summary, ODOT's collaborative approach to ESA consultation met the agency's goals of compliance with the Federal ESA, Oregon State ESA, MBTA, MMPA, MSA, and FWCA. Adherence to the EPSs that are the basis for this consultation will further ODOT's vision of green bridges and ensure that the Bridge Program is clearly in line with the Governor's Executive Order No. EO-03 to promote sustainable actions among all Oregon state agencies. Collaboration, trust, and creative solutions characterized this consultation from the outset. ODOT looks forward to implementing this program and to the benefits it will provide to the traveling public and the natural resources they so value.

Biographical Sketches: Michael B. Bonoff, MB&G, Senior Aquatic Scientist/Project Manager. Mike is an aquatic scientist in MB&G's Portland, Oregon office with 25 years of experience in surface water impact assessment and mitigation. He has worked closely with resource agencies, utilities, and local governments throughout the U.S. on Clean Water Act and ESA issues. Mike has served as a technical reviewer for the Oregon DEQ and the Governor's Office, and has published peer-reviewed technical papers on topics including reservoir limnology, watershed/stream enhancement, stream ecology, and field methods for sample collection in lakes, streams, and rivers.

Robert G. Carson, MB&G, Principal/Manager, Environmental Services Group. Bob has served as project manager for over 200 projects involving Endangered Species Act permitting, biological resource studies, wetland delineation/mitigation projects, and due-diligence analyses for land transactions. He has authored numerous publications on ecology, wildlife habitat, and wetlands and is a frequent speaker at conferences and workshops dealing with endangered-species issues.

Zachary O. Toledo, OR Bridge Delivery Partners. Zak is the Endangered Species Act Discipline Leader and a project manager for the Environmental and Resource Management group in the Portland, Oregon office. He has prepared and managed wetland and Endangered Species Act (ESA) documents for more than 100 transportation projects, including the batched-programmatic biological assessment described in this paper. He has experience obtaining and overseeing receipt of federal and state approvals and permits under the federal ESA, Fish and Wildlife Coordination Act, Clean Water Act Section 404, Oregon Removal-Fill Law, Migratory Bird Treaty Act, Marine Mammal Protection Act, and Magnuson-Stevens Fishery Conservation and Management Act. Zak has conducted environmental analyses throughout Oregon including monitoring of nesting seabirds, intertidal communities, and marine mammals; sampling of riparian vegetation, water quality, stream invertebrates, and fish; as well as Rosgen Level II channel cross-sections in headwater streams.

William A. Ryan, Oregon Department of Transportation. Bill has 16 years of experience in the environmental and transportation fields and has been with ODOT since 1996. As Permitting and Mitigation Manager and later Environmental Program Manager, Bill directed and oversaw development and implementation of the environmental stewardship and streamlining strategy for the OTIA III State Bridge Delivery Program, including the programmatic-batched BiOp that is the subject of this paper.

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