A Discussion of Factors Affecting Operations and Maintenance Costs Associated with Wildlife Mitigation Projects Implemented Under the Northwest Power Planning and Conservation Act of 1980

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Introduction

The construction and operation of the Columbia River Basin hydropower system has had far reaching effects on wildlife and wildlife habitats. A framework for mitigating these effects was established under the Northwest Power Planning Council's Fish and Wildlife Program (Program) and agreements with Bonneville Power Administration (BPA). Under this framework, projects are reviewed, approved, and funded to achieve and sustain levels of habitat and species productivity.

Project funding includes not only that required for the initial habitat protection, restoration and enhancement efforts, but also funds for long term operations and maintenance of projects to provide and document continuing benefits to the rate payers of the Pacific Northwest. It is important to note that there are few bright lines distinguishing between restoration and enhancement of habitats from operations and maintenance (O&M). This distinction is blurred by differences in project implementation strategies that are driven by the realities of project size, configuration and ecologically complexity, and funding constraints. While a few projects may have a short intensive and extensive initial enhancement phase followed by a significantly reduced maintenance phase, large projects or projects with greater ecological challenges typically require a longer vision of restoration with persistent attention to habitat quality through application of multiple treatments over many years.

Individual mitigation projects are dispersed throughout the Columbia Basin and have diverse characteristics including size, approach, ecology, implementing agency, and other factors that may affect costs. While this document is intended to outline and discuss the primary causes for variation in implementation costs associated with ongoing wildlife habitat mitigation projects, it is not intended to cover all possible sources or to quantify their relative contributions to cost variations. It is important to note that not all causes for cost variations are within the reasonable control of the implementing agency because many are driven by the nature of the mitigation obligations, provisions of the Program, cost/share, and availability of suitable mitigation sites. Additionally, while the Program calls for managers to *utilize, where equally effective alternative means of achieving the same sound biological objective exist, the alternative with the minimum economic cost* [Northwest Power Act, §4(h)(6)(C), 94 Stat. 2709.], it does not mandate a program driven by cost at the expense of project effectiveness. Cost is only one of many critical factors that must be considered.

Cost Factors

Variations in project implementation costs may generally be attributed to four primary factors. These include mitigation goals, objectives and strategies; funding constraints and their effect on project strategies; site specific characteristics; and specific factors relating to the project sponsor.

Mitigation Goals, Objectives and Strategies

The obligation of BPA to mitigate for impacts to fish and wildlife is described in the NPCC Fish and Wildlife Program. *The Administrator shall use the Bonneville Power Administration fund and the authorities available to the Administrator under this chapter and other laws administered by the Administrator to protect, mitigate, and enhance fish and wildlife to the extent affected by the development and operation of any hydroelectric project of the Columbia River and its tributaries* [Northwest Power Act, §4(h)(10)(A), 94 Stat. 2710]. To partially determine the extent of the wildlife impacts from the development of the Federal Columbia River Power System (FCRPS), the losses attributed to the construction and subsequent inundation were estimated using the United States Fish and Wildlife Service's (USFWS) Habitat Evaluation Procedure (HEP) for each hydropower facility.

Under HEP losses were estimated for each habitat type affected and their qualitative nature modeled based on wildlife indicator species. The losses were quantified by multiplying the total acres impacted by the qualitative factors modeled to characterize losses in a common currency of habitat units (HU's). While these modeled losses are not a complete characterization of the extent of the impacts and were not consistently characterized across the Basin, they provide a reasonable, technically based foundation on which to build a mitigation program and to monitor progress towards the goal of full mitigation.

Mitigation project goals and objectives are driven by these specific habitats impacted as reported in the loss assessments and other provision of the Program. These other provisions include a priority for projects that are "in-kind" or of the same habitat types lost and where available, "in-place" or near to the site of the habitat losses and the wildlife populations impacted and for projects that provide dual benefits to anadromous fish. Associated with these different habitats are inherently different management considerations and management costs. Therefore, the first factor differentiating cost is a direct result of application of the habitat specific mitigation obligations through the framework of the Program.

Mitigation implementation strategies can also affect the costs of project operations and maintenance (O&M). Habitat Unit credits may be secured against mitigation obligations through one of two ways. They may be secured though either the protection of existing or baseline habitat values that are shown to be in imminent threat of loss in the absence of a mitigation project or though the net increase in habitat values on a mitigation project area through enhancement, restoration and management actions. These increased values may

be achieved in a relatively short period as a result of a major enhancement effort on a highly degraded site or through the protection of a large tract of highly threatened habitat. Conversely, benefits may accrue slowly over a prolonged period as a result of protective measures, appropriate management, and natural recovery of a degraded site. In reality, most HU gains are the result of a dynamic mixture of protective measures, short term enhancements, and long term treatment and management.

Under these dynamics, a large naturally functioning project with high existing habitat quality and low level of threat may generate the same net habitat values as a smaller highly degraded property once it is fully enhanced and restored. Likewise, a large project that relies more on natural recovery over time may have similar total O&M costs to a smaller project that relies on artificially maintaining elevated habitat suitability. Under this scenario, the cost of O&M per acre may be significantly different while the cost per net HU generated is similar. It is important to note that this distinction disappears when the funding agency claims full credit for all existing habitat value rather than just the net increase attributable to implementation of the mitigation project.

Funding Constraints

Funding limitations often preclude mitigation strategies that focus on intensive short-term enhancements, and favor long- term management as the primary restoration tool. This is particularly true with enhancements to large projects that are typically staged over many years in numerous smaller treatment areas. However, mitigation strategies that rely on natural processes and time must also account for the continuing accrual of debt from "interest" on the unmitigated losses over extended periods. This accrual of interest is a critical component of HEP and creates an incentive for mitigation to occur in a timely fashion thus limiting annual compounding impacts to the affected wildlife populations.

Additionally, regional budget constraints during initial management plan review and approval for funding may inadvertently establish a funding baseline that can have a long term affect on the rate of implementation and ultimately overall project effectiveness. Differences in funding levels between projects are often the result of the Program's project prioritization process where project sponsors may have accepted less than optimal funding in the interest of increasing the total number of funded projects for wildlife in the region. Once these funding levels and associated rates of implementation are established, it is rare to see significant increases approved as funding levels remain flat and the bias for starting new projects continues.

Site Specific Characteristics for Mitigation Projects

Factors associated directly with site specific characteristics of mitigation projects can have profound affects on management costs. Some of these factors are prescribed by the mitigation goals and objectives while others stem from the specific project strategies. Physical characteristics of the landscape including soils, topography, elevation, and climate directly affect the cover types found on mitigation sites and are therefore determined by mitigation goals and related in-place, in-kind Program directives. These

factors can affect costs associated with everything from fence construction and maintenance to weed control. They also largely determine restoration techniques and strategies, the potential rate of ecological recovery, and O&M costs.

Area configuration including size, continuity, shape, and orientation within the landscape can also affect management costs. Protecting project areas from factors that may degrade habitat value often require fence maintenance, signing, and control of trespass, control of weed vectors, and regulation of public and the cost of these measures vary greatly with changes in configuration. Large contiguous blocks with simple boundaries have a lower ratio of boundary to area than multiple smaller tracts or projects with highly complex boundaries. While these larger projects tend to have reduced costs associated with boundary defense, increased effort required to access core or remote sections with staff, materials and equipment may significantly elevate management costs. Conversely, smaller parcels may require more maintenance because core areas are more accessible to contamination by factors (weeds, exotic species) on adjacent properties.

The nature and extent of the external threats and pressures from adjacent land use also affects the cost of boundary defense with management costs generally decreasing with consistent or complementary adjacent use and costs increasing with incompatible or conflicting adjacent use. These external threats and their affect on increasing management costs typically decrease with increases in project size. Additionally, these external threats may increase or decrease with changes in ownership following project initiation.

Project location relative to population and commercial industrial centers affects the costs of providing service to the wildlife area. Increase costs associated with remote projects includes costs of materials, travel time, and the cost and availability of professional services. On the other hand, labor costs in the metropolitan areas may be very high, because of competition with other jobs. Typically in more remote areas there are fewer opportunities for jobs so wages are lower. Since land values tend to be less the greater the distance from population centers, large projects are usually initiated in more remote areas of the Basin.

Additionally, local, state, federal and tribal jurisdictions adjacent to and overlaying project areas can influence implementation costs because of the necessity to comply with environmental and cultural laws and other administrative procedures and preexisting management responsibilities. Similarly, the presence of certain federal or state protected fish and wildlife species and/or historic or prehistoric cultural resources on the project site may elevate management costs relative to projects that do not have such considerations.

Implementing Agency Specific Factors

Fish and wildlife management agencies and tribes and participating non-government organizations have inherently different costs associated with various aspects of project implementation and, as stated above, may have preexisting authorities and

responsibilities that may reduce implementation costs to the rate payers. Since costs of personnel make up the majority of long term costs of management, variations in organizational structure, fringe benefit rates, indirect or overhead rates, job classification and position requirements, institutional protocols, and inherent capacities and authorities can dramatically affect costs. Differences in management philosophies and institutional mandates may also affect cost through their influence on mitigation strategies.

Conclusion

All of the above elements can account for subtle and sometimes substantive variations in the cost of individual mitigation tasks and overall project operations. These elements work separately and synergistically to cause cost variations. The complex nature of these interactions may make standardization or bench marking of mitigation costs impractical and inefficient. While standardization may be accomplished through the development of "reasonable" or "target" cost ranges for particular activities, those ranges may be so wide as to make the value of the exercise questionable. While these differences may be negatively perceived by policy makers, they are not necessarily problematic. They are an unavoidable reality of implementing what is arguably the most complex and extensive fish and wildlife restoration and mitigation effort in history. Arbitrary attempts to eliminate or minimize these cost variations could have significant impacts on the effectiveness of the individual projects and the mitigation benefits to wildlife. We recommend that careful consideration be given to the issues raised in this brief paper and suggest that the NWPCC and IEAB fully consult with the Wildlife Managers as they attempt to "streamline" or "standardize" operation and management costs for wildlife mitigation projects.

Attachment A: Summary Outline of Cost Factors

1. Mitigation Goals, Objectives and Strategies
   - Habitat types based on loss assessments establishing mitigation obligations
   - Protection vs Restoration/Enhancement vs Conversion
   - Degree of self sustaining and naturally functioning ecologies inherent in project

2. Project Site Specifics (many are mitigation obligation driven)
   - Topography
   - Soils
   - Climate
   - Project size
   - Project continuity and configuration
   - Existing habitat types and conditions (note link to mitigation objectives)
   - Travel and access infrastructure
   - Adjacent land use and condition
   - Other peripheral threats
   - Distance to implementing agency facilities
   - Distance to major population centers
   - Local Economies
   - Surrounding and overlaying jurisdictions (local, state, federal, tribal)
   - Cultural Resources
   - TES Species
   - Environmental Hazards

3. Implementing Agency (efficiency and approach)
   - Indirect rate
   - Organizational structure
   - Job Classifications and requirements
   - Staff seniority
   - Management philosophy/mandates
   - Existing institutional protocols
   - Inherent capacities and authorities

4. Financial Resources/Rate of implementation
   - Initial restoration/enhancement funding levels
   - Funding availability/prioritization and affect on baseline management plan funding
   - Funding vehicles (trusts, funding streams, annual appropriations)