Independent Scientific Review Panel

for the Northwest Power & Conservation Council
851 SW 6th Avenue, Suite 1100
Portland, Oregon 97204
www.nwcouncil.org/fw/isrp

Memorandum (ISRP 2017-9)   **August 31, 2017**

To: Henry Lorenzen, Chair, Northwest Power and Conservation Council

From: Steve Schroder, ISRP Chair

Subject: Follow-up Review of IDFG Wildlife Projects - Albeni Falls Wildlife Mitigation-IDFG
             (Project 1992-061-03) and Southern Idaho Wildlife Mitigation (Project 1995-057-00)

Background

In response to the Northwest Power and Conservation Council's August 22, 2017 request, the
ISRP reviewed a cover letter and supporting documents from Idaho Department of Fish and
Game (IDFG) to address the ISRP's concerns with two IDFG projects: Albeni Falls Wildlife
Mitigation-IDFG (project 1992-061-03) and Southern Idaho Wildlife Mitigation (project 1995-
057-00). In its 2017 Final Wildlife Project Review, the ISRP found the projects did not meet
scientific review criteria because the project summary and response did not demonstrate that
the projects had adequate plans for individual mitigation parcels, quantifiable biological
objectives, monitoring protocols to assess progress toward objectives, or an adaptive
management framework (ISRP 2017-7).

ISRP Recommendation and Summary Comments

Meets Scientific Review Criteria (Qualified)

IDFG is implementing a state-wide, long-term habitat monitoring program for its Wildlife
Management Areas (WMAs), and it is commendable that IDFG has given thought to desired
endpoints for habitat types and associated monitoring on their WMAs. Nonetheless, the ISRP
recommends consideration of further improvements. The following concerns should be
addressed before the next ISRP review:

1. **Objectives.** IDFG's draft Statewide Wildlife Management Area Habitat Monitoring
   Implementation Plan and Techniques Guide (Appendix A) presents generic objectives for
   the five habitat types found on its WMAs. Although these all-purpose objectives
   represent a good start, they are inconsistent across habitat types. Some provide
   simplified quantitative goals with timelines (e.g., wetlands), while others describe
   desired habitat conditions (e.g., forested habitat). The draft guide needs to be modified

to provide consistent objectives for all five habitat types. Additionally, we urge IDFG to use these generic objectives as starting points for specific quantitative and time-explicit objectives that can be applied to parcels within individual WMAs. Quantitative and time-specific objectives will enable managers to ascertain via monitoring if desired habitat responses are being accomplished and will facilitate adaptive management.

2. **Vegetation and wildlife response monitoring.** Currently the proposed goals, objectives, and monitoring methods focus exclusively on vegetative responses to management actions. It is important to recognize that the ultimate purpose of improving or maintaining plant communities on WMA lands is to benefit wildlife (e.g., deer, elk, song birds, waterfowl, etc.). Consequently, we encourage IDFG to measure wildlife species responses to their management actions whenever possible. It is not anticipated that wildlife monitoring could occur at all the mitigation parcels but could potentially occur for large mitigation parcels or entire WMAs. Wildlife responses along with vegetative assessments will help determine the effectiveness of management actions and prioritize future work efforts.

3. **Monitoring methods.** Out-of-date methods (e.g., analysis of diversity) and errors in recommended statistical analyses are evident in some parts of the appendices. The appendices should be thoroughly reviewed by outside experts and modified to assure appropriate analytical methods are prescribed in the guide. If IDFG and the Council request, the ISRP would be pleased to review future drafts of the monitoring and evaluation (M&E) plan/guide.

4. **Adaptive management.** When the state-wide management plan is completed, IDFG will have an M&E plan and elements of adaptive management. However, there does not appear to be an explicit adaptive management framework. For example, for the Boise River WMA (p 21), IDFG states, "adaptive management will be implemented through…" followed by a monitoring schedule. There is no indication of how the monitoring data will be analyzed or used to guide future management. Consequently, a specific decision-making process needs to be incorporated into the management plans for each WMA along with a description of how monitoring data will be analyzed and used to guide future management. In summary, we recommend that the adaptive management process include:
   - Hypotheses and mechanisms to guide decision making
   - Quantitative objectives with scientifically credible rationales that define what is to be achieved and when
   - Monitoring protocols and metrics that are shown to be appropriate – and evenly applied across habitat types – for examining if quantitative objectives have been attained
   - An appropriate data management and analysis strategy designed to handle the volume and diversity of data expected.

Comments Specific to Albeni Falls Wildlife Mitigation

Many of the objectives are vague without a specification of what is a successful outcome. For example, one objective is to "control noxious weeds (p. 29)." The monitoring program shows that some progress has been made (e.g., coverage of Canadian thistle was apparently reduced from 8% to 4%, Table 9), but is this sufficient? What is the final target percentage for Canadian thistles or other noxious weeds? Many of the objectives listed in this section need more quantification along the lines of Appendix A.

Appendices B and C (pp. 168-272) present a general monitoring plan for specific habitat types that appear to be well conceived (but see comments below about specific areas that need further refinement).

The monitoring text in Appendix D (p. 333 and following) describes the results of the baseline monitoring conducted but does not discuss management objectives for this parcel.

Comments Specific to Southern Idaho Wildlife Mitigation

The baseline habitat assessment performed on the Boise River WMA was a carefully executed project that will provide important guidance to future restoration efforts. It appears that IDFG will be conducting similar assessments on all its WMAs. This is a good start, and we hope that similar assessments can be made in the future.

Tables 1 to 7 (p. 4 and following) have a mixture of general objectives and quantifiable objectives. For the general objectives, the performance measures are activity based (such as "acres treated" or "projects completed") with no quantification of treatment effectiveness. For example, one of the management objectives is to restore 25 acres of degraded habitat with several strategies listed, but there does not appear to be an evaluation to determine if the restoration strategies are working. Another objective is to expand the Boise River WMA to reduce mule deer and elk mortality, but by how much and how will progress be monitored?

The response also pointed to two projects – the wildlife underpass project and a bird and big game monitoring project on the Hammer Flat and Sandy Point parcels (Appendices B, C p. 319). The proponents present counts of wildlife using the underpass from November 2010 to December 2012 (Appendix C, p. 324), but there does not appear to be any analysis conducted. The presented data do not provide information on effectiveness of the underpass in reducing wildlife-automobile collisions.

The bird and big game monitoring data (Appendix C, p. 332) do not appear to be helpful in developing a baseline because they were sporadically collected. Data were collected in one month in 2011 and over three months in 2012. No context is provided for why the data were collected. For example, were these data collected to evaluate the effectiveness of a management action that took place after the initial 2011 survey?

Appendix C.2 (p. 258 and following) on species diversity analysis does not present the most efficient and effective way to measure species diversity. The described methods are out-of-date and not likely to be successful in practice. For example, the Shannon Index for diversity is insensitive to detect changes and does not have a simple interpretation. Rather than using the Shannon Index, the effective number of species could be used. A nice summary of the problems in the analysis of diversity measures is presented at the following web link.

Appendix C.3 (p. 263 and following) contains many erroneous statements and misunderstandings of hypothesis testing/estimation. A careful review by a statistician is needed. For example:

- The document makes a false distinction between estimation (and confidence intervals) used for target/threshold objectives and significance tests used for change/trend detection. Hypothesis tests and confidence intervals are equivalent and both can be used for both types of problems.
- The document implies that confidence intervals can only be constructed for single sample situations (p. 264). This is incorrect as confidence intervals can be computed for all types of designs.
- The document misinterprets p-values using statements such as: "Significance tests are used to assess the probability that a measured difference is a real change in the population or simply the result of random variation," or "The calculated P value indicates the percent chance our null hypothesis is wrong (p. 264)." A p-value does not measure the probability that a change has occurred.
- The documents contain misleading statements about the role of normality, such as "The population being sampled must approximately follow a normal distribution (p. 265)." The Central Limit Theorem indicates that many parametric tests are applicable even if the distribution of the response variable does not follow a normal distribution.
- The document reveals a misunderstanding of non-parametric tests. "Nonparametric tests are not as powerful as parametric tests, so it is recommend (sic) they only be applied when sample sizes are very small, data are highly skewed, or sample means have very different variances (p. 266)." These statements are incorrect. For example, if non-parametric tests are less powerful, then they will be worse when applied to datasets with small sample sizes; many non-parametric tests assume a symmetric distribution; and, the variance of the sample means is not relevant in the decision to use a non-parametric test.
- The recommendations on linear regression are vague and may be misleading, particularly in regarding to application of a log(x) transformation.