HABITAT EVALUATION PROJECT

RHT Final Assessment And Analysis Of The NW Power Act Funded By BPA

Southern Idaho Sub-region

HEP Project Number: 2006-006-00

HEP Contract Number: 64637

Work Element 141

Paul R. Ashley – Regional HEP Team

Pacific States Marine Fisheries Commission

November 25, 2014

Table of Contents

List of Tables

Purpose

The purpose of this document is to describe HEP protocol and crediting issues the Regional HEP Team (RHT) encountered in the Southern Idaho Sub-region and to share the RHT's perspective regarding the factors that contributed to creating the issues. Furthermore, this document fulfills the Crediting Forum's recommendation that the RHT *identify inconsistencies in technical HEP applications throughout the Region* (NPCC 2011).

RHT Background

The RHT was established in 2004 to fulfill three purposes: to create a region-wide standard for Habitat Evaluation Procedures (HEP) protocols and crediting practices; to independently apply them fairly to all BPA wildlife mitigation projects throughout the Columbia Basin; and to provide HEP technical assistance to agency and tribe project managers and BPA staff. After 2004, the RHT carried out the majority of HEP surveys within the Columbia Basin and conducted HEP and habitat survey training for project managers, BPA staff, and other interested individuals.

In all actions and activities the RHT did the utmost to:

1. Ensure the RHT remained neutral and objective.
2. Ensure consistent application of HEP protocols and scientific principles on all HEP projects.
3. Ensure that HEP projects/sponsors throughout the Columbia Basin and BPA were treated in a consistent, fair manner.
4. Ensure that HEP results were credited appropriately and impartially.

Introduction

Bonneville Power Administration (BPA) in partnership with Idaho Department of Fish and Game (IDFG), the Shoshone-Bannock Tribe (Sho-Ban Tribes), and the Shoshone-Paiute Tribe (Sho-Pai Tribes) purchased/protected property in Southern Idaho to compensate for habitat losses due to the construction and inundation (C&I) of Anderson Ranch Dam, Black Canyon Dam, Deadwood Dam[1], Minidoka Dam, and Palisades Dam.

Habitat Evaluation Procedures (HEP) (Appendix A) assessments were used in the late 1980s and early 1990s to determine both C&I habitat unit losses and compensation site habitat unit gains. Southern Idaho hydro facility HEP loss assessments were prepared by IDFG or the U.S. Fish and Wildlife Service (USFWS) while compensation site HEP analyses were conducted by

[1] IDFG and BPA recently agreed to address operational effect from Deadwood Dam as part of a long-term agreement. BPA does not recognize Deadwood Dam as a Federal Columbia River Power System project for which it has an obligation to mitigate construction and inundation impacts.

project sponsors and/or the Regional HEP Team[2] (RHT). The project sponsors agreed to allocate BPA's Southern Idaho mitigation debt as shown in Appendix B.

Prior to establishing the RHT, little consistency existed between Southern Idaho project sponsors regarding how HEP was applied, how HEP surveys were conducted, and how habitat unit credit was calculated and reported. Similarly, there was considerable variation regarding BPA Contract Officer Technical Representatives' (COTRs) understanding and interpretation of HEP principles and protocols and, more important, the level of consistency and accountability COTRs expected and/or received from project sponsors to ensure HEP principles and practices were applied appropriately. This situation was further exacerbated as BPA COTRs changed over time, BPA program managers placed less emphasis on HEP as an accounting tool, and project sponsors opposed and rejected suggestions made by the RHT to ensure the consistent application of HEP principles and protocols.

Although not ascribed to all project sponsors, the primary HEP application/protocol issues encountered by the RHT in Southern Idaho included:

1. Project cover type/species matrix development
2. HEP model modification
3. HEP model substitution

While the three issues overlap, each issue is addressed separately in this document.

Issue 1 - Cover Type/HEP Model Species Matrix Development

Background

The RHT develops most compensation site cover type/species matrices with input from the local project sponsor. When compensation site and loss assessment cover types are identical i.e., in-kind, the RHT uses the same HEP species models to evaluate compensation site cover types as were used to evaluate cover types listed in each dam's loss assessment matrix (Appendix C), including appropriate "stacking"[3], which is discussed further in Appendix D.

Loss assessment and compensation site cover types, however, are seldom completely the same. When compensation site and loss assessment cover types are dissimilar[4], the RHT "pairs" dissimilar project cover types with cover types listed in the credited dam's habitat loss assessment matrix to determine the number of HEP models to apply to dissimilar project cover

[2] The RHT was established by Columbia Basin Fish and Wildlife Association (CBFWA) members to conduct consistent, unbiased HEP analyses on compensation sites across the Columbia Basin.
[3] Stacking is the number of HEP species models used to evaluate each cover type. Loss assessment and compensation site "stacking" should be identical. This is necessary to accurately compare habitat gains, losses, and changes between the original loss assessment and a compensation site for each cover type.
[4] Dissimilar cover types are those project cover types that are not listed in the credited hydro facility's cover type matrix.

types (Appendix E). The RHT's cover type pairings between loss assessment cover types and compensation site dissimilar cover types were not agreed to by all parties in Southern Idaho

The RHT developed compensation site cover type/species model matrices for each Southern Idaho dam being mitigated, but not all of the three entities working with BPA on mitigating that area agreed with the matrices proposed by the RHT. Although HU "stacking" was not a major concern with project sponsors, the RHT was unable to reach consensus among wildlife managers regarding compensation site cover type/HEP model species matrices for all HEP projects in Southern Idaho. On the other hand, BPA supported matrices developed by the RHT.

Issue

Whether only the HEP species models listed in the original loss assessment of the dam being mitigated should be used to evaluate compensation site cover types even when the loss assessment and compensation site cover types were mismatched and loss assessment HEP models were biologically inappropriate to evaluate compensation site cover types.

Project Proponent Issue Rationale

The proponent of an alternative matrix believed that some cover type losses e.g., the riverine cover type, resulting from C&I were now difficult if not impossible to find locally let alone acquire. Therefore, the only option available was to acquire compensation sites that frequently included out-of- kind cover types not included in the original loss assessment of the dam being mitigated- that is, where target cover types came with non-target cover types as a package. In those cases, one project sponsor argued that BPA should only receive credit for those cover types listed in the associated loss assessment as the dissimilar cover types were considered part of the "cost of doing business" and thus BPA should not receive habitat unit (HU) credit for its investment in acquiring the dissimilar cover types.

There was not a science/HEP based rationale for using loss assessment HEP species models that biologically did not fit compensation site conditions or were clearly inappropriate to evaluate dissimilar cover types[5]. Moreover, this was clearly inconsistent with how project sponsors credited BPA elsewhere throughout the Columbia Basin[6] and resulted in a "gridlock" situation that was a no-win situation for all involved parties.

RHT Response and Actions

Prior to 2011, the RHT and BPA staff met with Southern Idaho managers a number of times in an effort to develop a resolution acceptable to all parties; agreement could not be reached. Since it was abundantly clear that a resolution was not forth coming and to move forward with the crediting process, BPA asked the RHT to independently develop cover type/HEP species

[5] Using inappropriate HEP models to evaluate a cover type nearly always results in a 0.00 habitat suitability index (HSI) and zero habitat units (HUs), which does not change over time.
[6] Most if not all other project sponsors throughout the Columbia Basin agreed that BPA should receive HU credit for all land purchased/protected with BPA funds; albeit the amount of HU credit suggested by project sponsors varied.

matrices, based on HEP protocols and principles and guidelines used elsewhere in the Region, for the Southern Idaho dams and compensation sites at issue.

The RHT followed-up by conducting HEP analyses over several years using the matrices proposed by the RHT. One wildlife manager disagreed with the HEP results and, in at least one case, insisted that the RHT modify the HEP results by dropping one or more of the species models used in the HEP analysis. The RHT did this but in so doing, invalidated HEP model stacking protocols.

Over an objection by one wildlife manager, the RHT uploaded HU results of its initial, unaltered HEP analysis to BPA's Pisces data base because the matrix and draft report based on it followed HEP principles and no entity had raised science-based objections to the RHT's matrix or report. However, the RHT did not complete compensation site final HEP reports due to the controversy. No further action took place for a number of years and the impasse continued until the Northwest Power and Conservation Council (NPCC) established the Wildlife Crediting Forum (NPCC 2011).

By FY 2010, project managers across the Basin, BPA staff, and the Northwest Power and Conservation Council (NPCC) alike recognized the need to confirm HU crediting status and to acknowledge and address other Basin level HEP/crediting related issues. As a result, the NPCC chartered the Wildlife Crediting Forum and contracted with Parametrix[7] to facilitate Crediting Forum (NPCC 2011) meetings and to make recommendations regarding the NPCC's Wildlife Crediting Program (Program). Most, if not all, project sponsors - including the three for Southern Idaho - participated in or monitored the process. Equally important, project sponsors agreed to implement *standard operations procedures* (SOPs) suggested by the Crediting Forum (NPCC 2011) (Appendix F).

> *The Crediting Forum's Technical Committee (NPCC 2011) stated that, "When disagreements arise, the project proponent should seek resolution through consultation with BPA, HEP team, and subbasin or provincial co-managers to assure consistency and accuracy".*

Following this guidance, RHT, BPA, and Southern Idaho wildlife managers met several more times to resolve cover type/HEP model species matrix issues. All parties agreed that the RHT would develop cover type/species matrices for each Southern Idaho Federal Columbia River Power System (FCRPS) dam based on HEP protocols and principles and the guidance provided by the Crediting Forum's Technical Team (NPCC 2011) and that the RHT would redo earlier HEP surveys and report new HU results.

The RHT developed new cover type/HEP species matrices and re-conducted HEP surveys. Once again, one wildlife manager objected to the results but was unable to provide a HEP

[7] Parametrix is a consulting firm located at 700 NE Multnomah, Suite 1000, Portland, OR 97232-4110 - (503) 233-2400 - www.parametrix.com

based, scientifically principled basis for those objections. This time in response, the RHT completed the HEP reports based on the new data and with BPA's encouragement uploaded the HEP results in Pisces.

Issue 2 - HEP Model Modification

Background

When loss assessment HEP models are based on a different set of ecological, biological, and/or habitat structural conditions or assumptions than those found on a given compensation site, HEP model modifications may be necessary to ensure HEP model applicability and integrity are maintained. The over-arching principle guiding the HEP model modification process is that changes must make biological sense. Modifications can range from adjusting habitat suitability index mathematical equations to "tweaking" and/or dropping/adding habitat variables.

For example, using a winter habitat mule deer HEP model, that includes an evergreen tree "threshold" habitat variable, to evaluate mule deer shrubsteppe winter range historically and currently devoid of evergreen trees would skew HSI results. Instead, under HEP the proper approach would be to modify the winter habitat mule deer model by de-emphasizing the evergreen tree component in the HSI equation, or eliminating the evergreen tree variable(s) altogether and then modify the HSI equation accordingly. The number of HUs (±) that may result from HEP model modification is not a consideration when deciding whether or not to modify a HEP model.

R. Stiehl (1995) stated that HEP model modification is appropriate:

- In response to the results of model testing
- When relationships are believed to be incorrect, illogical, or incomplete
- When the desired standard of comparison differs from that in the model
- When the required level of resolution differs from that in the model
- When the available data differ from those required by the model, or are measured differently than recommended in the model

Modified HEP models should:

- More accurately reflect the expected responses of the species to changes in habitat, or
- Better meet the objectives and/or constraints of the study

The RHT believed it necessary to modify several Southern Idaho loss assessment HEP models. The Wildlife Crediting Forum's standard operating procedures supported this approach. Specifically, the RHT wanted to modify the mule deer HEP model (for the reasons cited in the above example) and the blue grouse HEP model found in the Anderson Ranch Dam loss assessment (Ablin-Stone and others 1986).

Issue

One project sponsor did not support modifying loss assessment HEP models.

Project Proponent Issue Rationale

Regardless of whether or not unmodified assessment models were a good biological fit, one project sponsor insisted that loss assessment models should not be modified. They argued this was necessary to ensure "comparability" between loss assessment HEP results and compensation site HEP results. When asked to explain using HEP models that, as written, were biologically inappropriate to evaluate compensation sites, the project sponsor could not tie its objection to the Wildlife Crediting Forum's standard operating procedures or any other science based criteria.

RHT Response and Actions

The RHT did not modify HEP models for HEP surveys conducted before FY 2011 on compensation sites acquired by one project sponsor. Consequently, HEP results for the unmodified mule deer HEP model (Ablin-Stone and others 1986) and blue grouse HEP model (Schroeder 1984) were significantly skewed and unrealistic. In its report, the RHT noted that:

> *Like the mule deer HEP model, the blue grouse HEP model was used to evaluate the shrubsteppe cover type that, by definition, is dominated by shrubs and herbaceous cover. The blue grouse model includes a "tree" habitat variable that is a threshold variable in the model's HSI equation. If the "tree" habitat variable's suitability index (SI) is zero, then the blue grouse HEP model HSI equals zero (law of the minimum) and would continue to be zero without evergreen and aspen (populous tremuloides) trees. In this compensation site example, no evergreen trees occurred on or near the site and only a few deciduous trees were observed in a riparian zone. Yet blue grouse were present in sufficient numbers to recognize that, biologically, the compensation site was of adequate habitat quality to support blue grouse i.e., habitat suitability/quality should exceed 0.00 HSI.*

The RHT conducted several compensation site HEP evaluations using the unmodified models and reported the results in Pisces noting the RHT's concerns regarding the use of unmodified HEP models. Pursuant to the guidance provided by the Crediting Forum's Technical Team (NPCC 2011), the RHT modified the mule deer HEP model and replaced the blue grouse HEP model (Schroeder 1984) with the Minidoka Dam loss assessment (Martin and Meuleman 1989) sage grouse HEP model for HEP surveys conducted in FY 2012.

Issue 3 HEP Model Substitution

Background

When loss assessment HEP models cannot be modified enough to pass the "red face" test[8], HEP protocols (Stiehl 1995, USFWS 1980, and USFWS 1980a) allow for HEP model species substitution. Likewise, the Crediting Forum Technical Team (NPCC 2011) clearly supported species substitution by stating, *"Use tools, models, and methods that most accurately reflect the quality and quantity of the habitats being protected and managed".* The Technical Team further stated that, *"HEP methods used should reflect the site specific habitat parameters and management goals of the property and may differ from the HEP methods used in determining the losses".*

HEP model substitution may also be warranted when dissimilar cover types[9] are acquired and the HEP models listed in the credited hydro facility's "species/cover type matrix" are not a "good fit." Substituted HEP model selection criteria could include:

- The importance of the HEP species to management agencies/local constituents
- How well model variables "capture" local habitat conditions
- The presence/absence of the species on the site[10]

Again, potential HU results (±) should not be a consideration when modifying or substituting HEP species models. The primary consideration is to ensure that modified/substituted HEP models accurately reflect compensation site environmental conditions and habitat quality.

Issue

One project sponsor did not support any species substitution.

Project Proponent Issue Rationale

The sponsor's rationale is the same as that listed for HEP model modification.

RHT Response and Actions

To maintain appropriate stacking and ensure the consistent application of HEP, the RHT substituted HEP models or added HEP models not included in loss assessments as needed. The sponsor objected to this practice and did not accept the HU results generated on the associated HEP surveys.

[8] Examples of not passing the "red face test" include using the sage grouse model in shrubsteppe habitat that is comprised of only bitterbrush, or the blue grouse model in shrubsteppe habitat where conifer trees are absent and will never be present. Using these models without modification results in no credit for BPA's habitat investment and underreports the quality and quantity of habitat compensation.
[9] Dissimilar cover types are cover types that are acquired that are different from those specified in the credited loss assessment.
[10] This short criterion list is just an example as is not meant to be all inclusive.

Discussion

Fundamentally, the HEP process was meant to be a team of individuals representing varying interests and disciplines collaborating to mitigate/compensate habitat losses associated with hydro power construction and inundation. HEP is a consensus based tool that requires all stakeholders to address and work through issues as a team in order to move the HEP process forward. This means that all parties agree to "make their best argument" for the things that are important to their constituency, but at the end of the day everyone agrees not to frustrate the HEP process.

Unfortunately, this was not the case in Southern Idaho. One of the three project sponsors was unwilling to compromise their position regarding cover type/HEP model matrices and HEP model modification/substitution issues and was also unwilling to accept the RHT's HEP survey results. Without agreement by all parties on basic cover type/HEP model species matrices let alone species model modification and substitution, the HEP process quickly became mired from the start and ended up with results that were not acceptable to one or more of the involved parties i.e., the project sponsor, BPA, and/or the RHT.

When HEP models are applied inappropriately, including not applying model modification and substitution when needed, there is a high risk that any HEP based outcome is less likely biologically meaningful or legally sustainable. In addition, a "double standard" was created when some project sponsors generally followed HEP protocols and HU accounting practices (as applied by nearly all other project sponsors across the Columbia Basin), while one project sponsor did not. This resulted in a skewed accounting of HUs that could have undermined the mitigation allocation agreed to by the Southern Idaho wildlife managers (Attachment B) in the absence of negotiated settlement agreements.

The HU accounting uncertainty not only exacerbated the task of determining how much wildlife mitigation/compensation was completed and how much mitigation/compensation remained for each sponsor, but also made reconciling the NPCC's *Program Table C-4* crediting ledger impossible for Southern Idaho. In other words, accurately and fairly tracking wildlife mitigation under the Northwest Power Act was becoming impossible. The resulting frustration not only polarized participants, but on the positive side, possibly helped all parties to recognize the need for negotiated settlements as a crediting option.

Although there may be additional causes, the RHT identified three primary factors that contributed to the situation in Southern Idaho. These same factors, all or in part, were present elsewhere throughout the Columbia Basin.

1. Project sponsors viewing BPA as an adversary/advisor, not a partner. Therefore, making even principled compromises based on HEP protocols and Wildlife Crediting Forum

consensuses e.g., modifying matrices and models, appear to some sponsors as capitulating to BPA.

This unwillingness to work through HEP/crediting issues bewildered the RHT. In Southern Idaho, all parties clearly understood HEP protocols and practices and what was at stake. They followed HEP protocols more closely than any other project sponsor to develop Idaho loss assessment calculations which included subtracting estimated post-project HU gains from the total losses to report "net" losses. Most other loss assessments show just the "total" losses, rather than the "net" HU losses reported in Idaho loss assessments (to be consistent with loss assessment calculations elsewhere in the Columbia Basin, "net" HUs losses should be replaced by "total" losses in Idaho HU loss calculations).

The RHT also questioned whether or not BPA COTRs over the years updated sponsors regarding how HEP protocols and crediting practices were applied throughout the rest of the Columbia Basin, or if they, like the RHT, hit a "stonewall" and gave up trying to work through HEP issues. Since there were no consequences for ignoring present policies and practices and/or thwarting the HEP process, there was no incentive for sponsors to work through issues.

2. The apparent lack of an internal BPA policy that required all COTRs to know and understand HEP principles and protocols and that required all COTRs to consistently implement HU accounting policy and practices across the Columbia Basin.

A recurring HEP application and crediting technical/policy issue faced by the RHT was the lack of consistent direction to project sponsors by some BPA COTRs. Oversight and direction varied from little involvement to COTRs providing direction that was not consistent with HEP crediting practices or Mitigation Program crediting policies. Across the Region, COTR participation ranges from refusing to address HEP crediting issues, leaving the RHT and other BPA staff with the responsibility to engage project sponsors, to a COTR establishing their own crediting policy e.g., one HU per acre.

When project sponsors did not agree with or did not want to follow established HEP protocols or crediting guidelines, the direction given to the RHT for many years was to "just work it out with the sponsors". It would have been far more effective to have a clear and consistent message from BPA to project sponsors affirming BPA's expectation that project sponsors will follow HEP protocols/practices i.e., use appropriate HEP model matrices, apply appropriate species stacking, modify or substitute HEP models as needed, and follow Program crediting policies. Failing this, there was little incentive for sponsors to workout issues with COTRs or the RHT as there were few, if any, consequences.

As a technical body without authority, the RHT was very sensitive to potential "policy" implications when we attempted to convince project sponsors to follow established HEP protocols and crediting practices when they did not agree. It often created a circular process that the RHT could not resolve. Nevertheless, the RHT always followed established HEP

protocols and practices. The exception to this was when project sponsors adamantly disagreed with and/or refused to follow HEP protocols and COTRs advised the RHT to conduct HEP surveys per the project sponsor's guidance to prevent further controversy (with contentious HEP projects, it often appeared that BPA preferred "no controversy" over consistently following established HEP protocols).

Finally, HEP reports for some of the completed controversial HEP surveys were not written until nearly the end of the HEP program when BPA contracted with Pacific States Marine Fisheries Commission to have the RHT write the reports consistent with the data collected by the RHT, regardless of whether or not the project sponsor agreed. Likewise the contract (and the Council's Program) directed the RHT to conduct remaining HEP surveys using appropriate HEP protocols and practices and Crediting Forum (NPCC 2011) guidance. From the RHT's perspective, this was significantly more efficient and added much needed BPA support to the HEP process; albeit late in the Program.

3. The failure of BPA managers to support those COTRs who attempted to consistently apply HEP protocols and practices and crediting principles.

This "undermined" the COTR's authority in the eyes of the project sponsor and "encouraged" project sponsors to circumvent the resolution process if they didn't agree with the COTR's Council/decisions or the RHT's suggestions. The lack of management support may have had a "chilling effect" on the willingness of some COTRs to address HEP crediting concerns with project sponsors.

Closing Comments

When HEP surveys are not conducted consistent with established HEP protocols or crediting practices it almost always results in fewer HU's credited towards BPA's wildlife mitigation obligation and to NPCC's "crediting ledger". In addition to crediting ledger issues, this also creates a potential unintended consequence involving equity and fairness to other project sponsors in the Columbia Basin who followed the rules and credited the ledger with more HUs than project sponsors who were not held to the same standard. A number of project sponsors have voiced concerns to the RHT that following HEP protocols/crediting practices may work against them by potentially lowering the value of their future construction and inundation mitigation settlements.

As of December 2014, Pisces records indicate that 44,676 HUs (76%) out of the total 58,830 HUs available in the Upper and Mid Snake River Provinces have been mitigated leaving 14,154 unmitigated HUs (24%). HU debt allocations based on an agreement between IDFG, the Sho-Ban Tribes, and Sho-Pai Tribes[11] are listed for Minidoka, Palisades, Black Canyon, and

[11] BPA was not a party to the HU allocation agreement.

Anderson Ranch Dams in Table 1. Deadwood Dam HUs are not included in Table 1 as Deadwood Dam is not a hydro power dam, but is considered a water flow regulation facility.

Table 1 Upper and Mid Snake River HU allocations

Hydro Facility	Minidoka	Palisades	Black Canyon	Anderson Ranch	Total
IDFG HUs[a]	5,251.50	18,535.00	819.00	4,809.50	**29,415.00**
Sho-Ban Tribes[b]	5,251.50	18,535.00	163.80	961.90	**24,912.20**
Sho-Pai Tribes[c]	0.00	0.00	655.20	3,847.60	**4,502.80**
Total HU Loss	10,503.00	37,070.00	1,638.00	9,619.00	**58,830.00**

[a] Based on agreement between the Sho-Ban and Sho-Pai Tribes, IDFG is entitled to 50% of the HU debt in the Upper Snake River Province and 50% of the HU debt in the Mid Snake River Province.

[b] Based on agreement between the Sho-Pai Tribes and IDFG, the Sho-Ban Tribes are entitled to 50% of the HU debt in the Upper Snake River Province and 10% of the HU debt in the Mid Snake River Province.

[c] Based on agreement between the Sho-Ban Tribes and IDFG, the Sho-Pai Tribes are entitled to 40% of the HU debt in the Mid Snake River Province.

Upper and Mid Snake River mitigated HUs are displayed for each dam and project sponsor in Table 2. IDFG settled its share of C&I HUs through a negotiated agreement with BPA. The remaining unmitigated HUs are listed in Table 3 for each Southern Idaho project sponsor and for each dam.

Table 2 Upper and Mid Snake River HU mitigation summary

Hydro Facility	Minidoka	Palisades	Black Canyon	Anderson Ranch	Total
Total HU Loss	10,503	37,070	1,638	9,619	**58,830**
IDFG Mitigated HUs[a]	5,252	18,535	819	4,810	**29,415**
Sho-Ban Tribes Mitigated HUs	3,283	8,296	0	0	**11,579**
Sho-Pai Tribes Mitigated HUs	0	0	0	3,682	**3,682**
Total Mitigated HUs	**8,535**	**26,831**	**819**	**8,492**	**44,676**
Remaining Unmitigated HUs	**1,969**	**10,239**	**819**	**1,128**	**14,154**

[a] The mitigated HUs presented in the table reflect IDFG's 50% share of the C&I mitigation debt for the Upper and Mid Snake River Provinces, which BPA and IDFG have settled through a negotiated agreement.

Table 3 Remaining unmitigated HUs by hydro facility and project sponsor

Hydro Facility	Minidoka	Palisades	Black Canyon	Anderson Ranch	Total
IDFG Unmitigated HUs	0.00	0.00	0.00	0.00	**0.00**
Sho-Ban Tribes Unmitigated HUs	1,968.50	10,239.00	163.80	961.90	**13,333.20**
Sho-Pai Tribes Unmitigated HUs	-	-	655.20	165.60	**820.80**
Total Remaining Unmitigated HUs	**1,968.50**	**10,239.00**	**819.00**	**1,127.50**	**14,154.00**

Although negotiated settlements are favored by most project sponsors and BPA at this juncture, it should be recognized that the HEP process has served an important role by providing “how much remains unmitigated for each project sponsor”, which is the basis for establishing the starting point for all C&I settlement negotiations. In addition, a vast array of habitat conditions over a large geographical area have been documented through HEP surveys; the scope of which is likely unprecedented in the United States. I believe the time, funding, and effort put into the HEP process were well spent.

References

Ablin-Stone, K., R. C. Martin, and G. A. Meulman. 1986. Anderson Ranch, Black Canyon, and Boise Diversion Projects, Idaho. Final report. Project No. 85-1. IDFG. Boise, ID.

Martin, R. C. and G. A. Meulman. 1989. Minidoka Dam Wildlife Impact Assessment. Final report. Project No. 88-110. IDFG. Boise, ID.

Stiehl, R. B. 1995. Habitat Evaluation Procedures Workbook. National Biological Service. Midcontinent Ecological Science Center. Fort Collins, Colorado

NPCC. 2011. Wildlife Crediting Forum Report on Forum Deliberations. January 2010 – May 2011. Prepared by Parametrix, Portland, Oregon. September 2011.

Schroeder, R. L. 1984. Habitat suitability index models: Blue Grouse. U.S. Department of the Interior, Fish and Wildlife Service. FWS/OBS-82/10.81.

USFWS. 1980. Ecological Services Manuals. ESM 101, 102, and 103. U. S. Department of the Interior. Division of Ecological Services. Fish and Wildlife Service. Washington, DC.

_____. 1980a. Habitat Evaluation Procedures (HEP), Ecological Services Manual (ESM) 102. Division of Ecological Services, U.S. Fish and Wildlife Service, Washington, DC: Department of the Interior.

Appendix A – Habitat Evaluation Procedures Synopsis

HEP, developed by the U.S. Fish and Wildlife Service (USFWS), is used to quantify the impacts of development, protection, and restoration projects/measures on terrestrial and aquatic habitats by assessing changes, both negative and positive, in habitat quality and quantity (USFWS 1980), (USFWS 1980a).

HEP is a habitat based approach to impact assessment that documents change through use of a habitat suitability index (HSI). The HSI value is derived from an evaluation of the ability of key habitat components to provide the life requisites of selected wildlife and fish species.

The HSI value is an index to habitat carrying capacity for a specific species or guild of species based on a performance measure (e.g. number of deer per square mile) described in HEP species models. The index ranges from 0.0 to 1.0. Each increment of change is identical. For example, a change in HSI from 0.1 to 0.2 represents the same magnitude of change as a change from 0.2 to 0.3, and so forth. A HSI of 0.3 indicates that habitat quality/carrying capacity is marginal while a HSI of 0.7 suggests that habitat quality/carrying capacity is relatively good for a particular species (Table 4).

Table 4 Habitat suitability verbal equivalent rating

Habitat Suitability Index	Verbal Equivalent
0.0 < 0.2	Poor
0.2 < 0.4	Marginal
0.4 < 0.6	Fair
0.6 < 0.9	Good
0.9 ≤ 1.0	Optimum

Habitat units are determined by multiplying the habitat suitability index by the number of acres of habitat (cover type) protected. For example, if the HSI output for a mule deer HEP model is 0.50 and the number of acres of shrubsteppe habitat protected is 100, then the number of HUs are 50 (0.50 HSI x 100 acres = 50 HUs).

Habitat variables, suggested mensuration techniques, and mathematical aggregations of assessment results are included in HEP evaluation species models. In some cases, habitat variable measurement techniques have been modified to take advantage of current global information system (GIS) data/capabilities.

Appendix B – Southern Idaho Mitigation Debt Allocation

August 13, 2010

Lorri Bodi
Bonneville Power Administration
P.O. Box 3621
Portland, OR 97208-3621

Dear Mrs. Bodi,

In coordination with the Bonneville Power Administration, the Southern Idaho Wildlife mitigation partners; the Idaho Dept of Fish and Game, the Shoshone-Bannock Tribe, and the Shoshone-Paiute Tribe, have cooperatively been working on a permanent settlement solution for the wildlife mitigation program. In an effort to facilitate each partners successful settlement agreement with Bonneville Power Administration, the partners have agreed to an allocation of habitat units (HU) that define the wildlife mitigation debt incurred by construction and inundation of the federal hydrosystem projects in the Mid and Upper Snake Provinces.

The partners agree that this wildlife mitigation debt be allocated as follows:

- **Shoshone-Bannock Tribe** – 50% of the total debt in the Upper Snake province and 10% of the total debt in the Mid Snake province, then reduced by the habitat units already mitigated for by the Shoshone-Bannock Tribes.
- **Shoshone-Paiute-Tribe** – 40% of the total debt in the Mid Snake province then reduced by habitat units already mitigated for by the Shoshone-PaiuteTribe.
- **Idaho Department of Fish and Game** – 50% of the total debt in the Upper Snake province and 50% of the total debt in the Mid Snake province then reduced by habitat units already mitigated for by the Idaho Department of Fish and Game.

We hope this information is helpful to you in your considerations of settlement for Southern Idaho.

We look forward to timely discussions on this important topic.

Respectfully,

Idaho Dept of Fish and Game	Shoshone-Bannock Tribes	Shoshone-Paiute Tribes
Cal Groen	Nathan Small	Robert Bear
Deputy Director	Council Chairman	Chairman, Business Council

cc: Governor Butch Otter, Bill Booth, NPCC

Appendix C – Southern Idaho Loss Assessment Cover Type/Species Matrices

Anderson Ranch Dam Cover Type/Species Matrix									
Target Species	**Deciduous Forested Wetland**	**Deciduous Scrub-shrub Wetland**	**Shrubsteppe**	**Evergreen Forest**	**Deciduous Shrubland**	**Agriculture and Pasture**	**Riverine -Rock Bottom**	**Lacustrine-Open Water**	**Other[a]**
Mule Deer	X	X	X	X	X				NA
Mink	X	X					X	X	NA
Mallard	X	X	X[b]	X[b]	X[b]	X[b]	X	X	NA
Ruffed Grouse	X								NA
Blue Grouse			X	X	X				NA
Black-capped Chickadee	X								NA
Yellow Warbler		X			X				NA
Totals	**5**	**4**	**2+**	**2+**	**3+**	**1**	**2**	2	NA
[a] Included dam and power plant staging areas									
[b] Included 100 meter band along the shoreline. Red "X"/+ indicates that only the area within 100m of shoreline is evaluated for these cover types.									

Minidoka Dam Cover Type/Species Matrix										
Target Species	**Emergent Wetland**	**Scrub-shrub Wetland**	**Forested Wetland**	**Lacustrine**	**Riverine**	**Sagebrush - Grassland**	**Grassland [a]**	**Russian Olive [a]**	**Juniper [a]**	**Other[b]**
Mallard [c]	X	X	X	X	X	X	X	X	X	NA
Redhead				X	X					NA
Western grebe	X									NA
Marsh wren	X	X								NA
Yellow Warbler		X								NA
River otter [d]					X					NA
Mule deer	X	X	X			X				NA
Sage grouse						X				NA
Total Species	**4**	**4**	**2**	**2**	**3**	**2+**	**1**	**1**	**1**	**NA**
[a] Cover type occurred only within nesting habitat portion of mallard evaluation area										
[b] Included dam and power plant staging areas										
[c] Evaluation area included upland nesting habitat within 100m of wetland edge (red "X").										
[d] Evaluation area included 20m of riparian habitat adjacent to river shorelines										

Black Canyon Cover Type/Species Matrix								
Target Species	**Deciduous Forested Wetland**	**Shrubsteppe**	**Agriculture and Pasture**	**Riverine**	**Deciduous Scrub-shrub Wetland**	**Emergent Wetland**	**Lacustrine - Open Water**	**Other[a]**
Mule Deer	X	X			X			N/A
Mink	X			X	X	X	X	N/A
Mallard[b]	X	X	X	X	X	X	X	N/A
Canada Goose[b]	X	X	X	X	X	X	X	N/A
Pheasant[c]	X	X	X		X	X		N/A
Black-capped Chickadee	X							N/A
Yellow Warbler					X			N/A
Species Total	**4+**	**2+**	**1+**	**3**	**4+**	**4**	**3**	**N/A**

[a] Included dam and power plant staging areas

[b] Includes 100 meter band along the shoreline for habitats designated with a red "X". If these cover types are not adjacent to water capable of being utilized by mallards/geese, don't include them in the "HU stacking" e. g. a "3+" species total means that HU stacking is 3 species unless adjacent to water in which case, a 100 meter band of habitat adjacent to the water would be evaluated for mallard/geese in addition to the other 3 species.

[c] On page 71, para. 3 of the loss assessment it is stated that, "currently, the Black Canyon study area provides 915 acres of pheasant habitat…". If added, the "post construction" acres for the deciduous forested wetlands, shrubsteppe, agriculture, deciduous scrub-shrub wetland, and emergent wetland totals 915 acres. Therefore, it is assumed that the pheasant model should be applied to afore mentioned cover types.

Palisades Dam Cover Type/Species Matrix											
Target Species	**Forest Wetland**	**Scrub Wetland**	**Riverine**	**Grassland**	**Shrubsteppe**	**Agriculture**	**Coniferous Forest**	**Aspen**	**Emergent Wetland**	**Lacustrine**	**Other[a]**
Mule deer	X	X		X	X		X	X			N/A
Mink	X	X	X						X	X	N/A
Mallard [b]	X	X	X	X	X	X	X	X	X	X	N/A
Canada goose [c]	X	X	X	X	X	X	X	X	X	X	N/A
Ruffed grouse	X							X			N/A
Bald eagle (breeding)	X	X	X	X	X	X	X	X	X	X	N/A
Bald eagle (wintering)	X	X	X	X	X	X	X	X	X	X	N/A
Black-capped chickadee	X										N/A
Yellow warbler	X	X									N/A
Total	**7+**	**5+**	**5**	**3+**	**3+**	**2+**	**3+**	**4+**	**5**	**5**	N/A
[a] Included dam and power plant staging areas											
[b] Evaluation occurred along 100m from edge of rivers and streams (X/+)											
[c] Evaluation occurred along 100m for edge of rivers (X/+)											

Appendix D – Stacking Definition and Standard Operation Procedures

Definition

The Crediting Forum Technical Team (NPCC 2011) stated, "Stacking occurs when multiple species are used to characterize the quality of a single cover type. It becomes a crediting issue when the same number of species used to assess losses is not in turn used to characterize the compensation lands. Stacking is an issue of how you adjust the credits of the mitigation sites to be in balance with the number of species used to characterize the losses. Loss assessments are what they are and should not be revised or replaced to address stacking issues".

Stacking Standard Operation Procedures (SOP)

- SOP options to address stacking issues include:

  a. Use the same number of species to characterize the out of kind cover types as were used to characterize the loss assessment cover types (see example table at bottom of page).

  b. If using fewer species to characterize the mitigation site cover type than were used to characterize the losses, average the HSIs of the out of kind mitigation cover types and multiply by the number of species used in the losses. However, species selection must be peer reviewed and approved by the regional HEP team, BPA and the project proponent.

  c. If incidental out of kind cover types (inclusions) are associated with a mitigation acquisition, assume the same HSI as the adjacent cover type.

  d. Do not credit the same acres of a given cover type between two or more hydro-projects with a combination of species from both.

"Paired" Anderson Ranch Dam Cover Type/HEP Model "Stacking" Matrix				
Anderson Ranch Cover Types	**Deciduous Scrub-shrub Wetland**	**Shrubsteppe**	**Agriculture and Pasture**	**N/A**
Number of Models	4	2+	1	0
"Paired" Wilson Ranch Cover Types	**Deciduous Scrub-shrub Wetland**	**Shrubsteppe**	**Agriculture and Pasture**	**Farmstead**
Number of Models	4	2+	1	0

Appendix E – Cover Type Pairing Background

Cover type "pairing" was a concept developed in the early years of the Columbia River Wildlife Mitigation Program as a method to guide how BPA received credit for acquiring "out of kind/dissimilar" cover types[12]. BPA and the Northwest Power Conservation Council (NPCC) supported Columbia River wildlife mitigation project managers who wanted the ability to acquire high quality functional habitat and important high value "out of kind" cover types. In exchange, wildlife managers agreed to give BPA credit for all lands acquired with BPA wildlife mitigation funds, thus establishing the need to develop the cover type "pairing" concept[13]. Cover type "pairing" addressed the question, "how are out of kind/dissimilar cover types, HEP models, and habitat units credited against a given loss assessment"?

Pairing "in kind" loss assessment and project cover types is simply aligning "like" cover types and, in most cases, evaluating like cover types with the same number of HEP models (stacking) and the same species listed in the credited loss assessment. For example, the project area grassland cover type would correspond to the loss assessment grassland cover type. If four HEP models were used to evaluate the grassland cover type in the loss assessment, then four HEP models would be used to evaluate the project area grassland cover type.

Similarly, "pairing" "out of kind" project cover types with loss assessment cover types involves "pairing" project cover types with loss assessment cover types comprised of "similar" habitat elements or structural conditions such as shrubs, trees, and snags. For example, a compensation site upland deciduous shrub cover type may be "paired" with the riparian shrub cover type listed in a loss assessment matrix because the "similar" habitat element/structural condition shared by both cover types is the shrub component; specifically, deciduous shrubs.

A secondary consideration is the HEP species models associated with the "paired" loss assessment cover type. If habitat elements/structure conditions are similar between a compensation site cover type and more than one loss assessment cover type, the RHT generally "paired" the compensation site cover type with the loss assessment cover type

[12] "Out of kind/dissimilar cover types" are cover types that are not identified as "losses" in a given loss assessment document.

[13] Standard HEP protocols (USFWS 1980) suggest that compensation acquisition and easement cover types should be identical (in-kind) to the cover types identified in the applicable loss assessment document unless another alternative is agreed upon by the involved parties. The mitigation program that BPA funds has become an out-of-kind equal compensation mitigation program by default because wildlife managers chose project lands that, in many cases, include large areas of out-of-kind cover types that are not identical to those identified in the loss assessments.

that included the most HEP models having the best biological fit for compensation site cover type conditions. Note that “pairing” dissimilar cover types does not automatically equate to total HEP model species substitution.

Appendix F – Abbreviated Crediting Forum Report

Wildlife Crediting Forum Report on Forum Deliberations
January 2010 – May 2011

Northwest Power and Conservation Council
851 S.W. Sixth Avenue, Suite 1100
Portland, Oregon 97204
503.222.5161

Facilitated by Parametrix
700 NE Multnomah, Suite 1000
Portland, OR 97232-4110
T. 503.233.2400 T. 360.694.5020
www.parametrix.com

TABLE OF CONTENTS

EXECUTIVE SUMMARY

The Council chartered the Forum to provide advice on the crediting and accounting of wildlife habitat mitigation associated with the construction and inundation impacts of the Federal Columbia River Power System (FCRPS). The Forum consists of wildlife program managers representing tribes (14 in all) and state fish and game departments (Oregon, Washington, Idaho) impacted by the FCRPS, the U.S. Fish and Wildlife Service (USFWS), and representatives from the Bonneville Power Administration (BPA) and BPA Customers. The State of Montana is not a participant as wildlife mitigation issues relating to the FCRPS have been settled by prior agreement between BPA and the state.

The instructions to the Forum were to make recommendations regarding the NPCC Wildlife Crediting Program (Program) with respect to:

- Developing a commonly accepted "ledger" of habitat units acquired by BPA
- Developing a common database for tracking, assigning and recording habitat units
- Resolving issues about accounting for habitat units
- Other issues related to wildlife crediting, including the use of Habitat Evaluation Procedures (HEP) or alternative evaluation procedures

The charter also allowed for the development of strategies that will allow the parties to achieve long-term agreements.

The Forum and several subcommittees have been meeting since January, 2010 to address Program issues. Much of the Forum's early deliberations focused on the difficulty of coming to collective agreement on all issues posed by the Council's Fish and Wildlife Program. Crediting issues were found to differ depending on geographic area, specific hydropower projects, and the entities involved in specific crediting decisions. The methodologies involved in crediting decisions have also changed and evolved over time, been interpreted and applied in differing ways, and in some cases crediting has been resolved through individual project agreements. Reflecting on these factors, the Forum felt that the many technical and recordkeeping issues with the ledger, overlaid with unresolved policy issues, would make full resolution at the Forum level difficult, and decided that "agreements" were more likely to be an effective means of resolution. At the same time, the Forum indicated that the technical analysis of the ledger should continue in order to help

resolve or make clear as many outstanding issues as possible. The Forum dedicated considerable effort over several months and while not every issue or dispute was resolved, and while significant anomalies remain, the commonalities developed by the Forum provide a solid basis for bringing this portion of the Program to a successful conclusion. Major areas of accomplishment include:

- Establishment of a ledger depicting the current status of Bonneville-funded wildlife mitigation activities
- Development of Standard Operating Procedures for future applications of HEP
- Development protocols for determining the amount of credit Bonneville should receive for management actions that occur on Federal lands
- Development of protocols for determining the amount of credit that Bonneville should receive for fish mitigation projects that benefit wildlife
- Acceptance of the Fish and Wildlife Program loss assessments as the agreed upon measure of wildlife losses

However, several policy-related issues remain unresolved including:

- Agreement on the application of the crediting ratio established in the Fish and Wildlife Program
- Agreement on how to deal with wildlife species benefiting from open water habitats resulting from reservoirs associated with dam construction
- Agreement on how to account for mitigation that occurred prior to the 1980 Northwest Power Act

While these issues remain unresolved, the report provides important background information on them which can form the basis for negotiations focused on agreements and for future Council policy deliberations associated with future Fish and Wildlife Program amendment processes.

PURPOSE

The purpose of this summary report is to capture the work conducted by the Wildlife Crediting Forum (**Forum**). The Forum was chartered in late 2009 by the Northwest Power and Conservation Council (**NPCC**) to provide input on the Council's Columbia River Basin Fish and Wildlife Program (Program). This summary report provides an overview of the Forum's discussions and direction through December 2, 2010. This summary report and appendices also reflect the additional work conducted in January and February 2011 with Bonneville Power

Administration (BPA) and Columbia Basin Fish and Wildlife Authority (CBFWA) staff to further analyze Program records by subbasin.

This summary report only reflects the input of individual Forum members and does not necessarily represent the policy position(s) of the tribes, agencies, and stakeholders they represent. Forum members have been made aware that they serve only in an advisory role to NPCC.

BACKGROUND

NPCC chartered the Forum to provide advice on the quantifying and accounting system (informally known as the **Ledger**) for the wildlife habitat mitigation credits associated with the construction and inundation impacts of the Federal Columbia River Power System (**FCRPS**) within the Columbia River Basin (**Basin**). The database that currently houses the Ledger is called **Pisces**. The Program was initiated in 1981, and has been modified from time to time (most recently in 2009) by NPCC in updating the overarching **Northwest Power Plan, which by law includes the Program as a component**.

The Forum consists of wildlife co-managers representing the 14 tribes and 3 state fish and game departments (Oregon, Washington, Idaho) impacted by FCRPS; and representatives of the U.S. Fish and Wildlife Service (USFWS), BPA, and BPA Customers. The State of Montana is not a Forum participant, as wildlife mitigation issues relating to FCRPS have been settled by prior agreement between BPA and that state. CBFWA and NPCC staff acted as advisors to the Forum. A private consulting firm (Parametrix) was engaged to facilitate Forum processes and to provide for augmented technical analysis of the Ledger.

The original Forum charter called for the development of recommendations with respect to:

- Developing and recommending to the Council a commonly accepted ledger of habitat units acquired by the Bonneville Power Administration.
- Recommendations to the Council on ways to resolve issues about accounting for habitat units.
- Developing a common data base for tracking, assigning and recording habitat units.
- Reviewing issues related to wildlife crediting, such as the frequency and use of the Habitat Evaluation Procedure (HEP) following the initial baseline evaluation. The forum could also provide recommendations on acceptable alternative evaluation procedures.

The Forum met eight times in 2010 to address the Program issues. The Forum also convened three sub- committees to discuss specific issues (credits for fish projects, Federal lands, and general Ledger issues). Each of these subcommittees met one or two times, and produced

reports which were provided to the full Forum. The Forum conducted wildlife crediting issues orientation and reviews over the course of its first three meetings. Starting in May 2010, the Forum focused on the difficulty of coming to collective agreement on the resolution of even the first issue specified in its NPCC charter (see above). Several factors contributed to this challenge:

- Over the course of nearly 30 years, the NPCC has modified the Program from time to time. In addition, some changes have not been uniformly interpreted by the co-managers or BPA.

- Wildlife mitigation is largely, though not exclusively, out-of-place and out-of-kind, which means the areas and species used for mitigation are not necessarily the same as those lost through the construction and inundation of FCRPS dams. Thus, the habitats and species used in the loss assessments were in many cases not the same as those needing crediting on the mitigation sites.

- Crediting issues were found to differ depending on geographic area, specific hydropower projects, and the tribes or agencies involved.

The database system housing the Ledger has also changed and evolved, and some ad-hoc
"workarounds" have been made to fit data into database formats.

- The methodologies involved in the Program have changed and evolved, and interpretation and application has varied in the field, across different subregions, and as entered in the ledger.

- The tool used to evaluate the quality of habitat being acquired or enhanced (the Habitat Evaluation Procedure or HEP) was not designed to provide comparability across a region as large and diverse as the Columbia River Basin.

In some cases, (e.g. Montana, Dworshak, Willamette) crediting has been resolved through individual wildlife mitigation agreements. Generally, these types of agreements have resulted in a comprehensive resolution of wildlife mitigation issues. *NOTE: the use of individual agreements is permitted by the Program.*

Reflecting on these factors, the Forum concluded that the many technical and recordkeeping issues with the Ledger, overlaid with unresolved policy issues, would make full resolution in accordance with the original NPCC charter difficult. The Forum discussed, therefore, the possibility of "settlement agreements" as a more effective means of resolution. At the same time, the Forum indicated that the technical analysis of the Ledger should continue to help resolve or make clear as many outstanding issues as possible. NPCC concurred with this overall "revised" approach and goals at its July 2010 meeting.

NOTE: The possibility of shifting to a "settlement agreement" option is referenced as an acceptable alternative in the original Forum charter: ".... or strategies that will allow parties to achieve long-term settlement agreements." In October 2010, a settlement for the Willamette River Subbasin of the FCRPS was signed between BPA and the State of Oregon (Oregon participated during the early phases of the Forum, but discontinued participation following completion of the Willamette Wildlife Agreement).

On December 2, 2010, the Forum met and discussed ongoing issues and concerns. NPCC staff and the consultants recommended that additional basinwide technical analysis was becoming more costly than merited by the resulting understanding or improvements to the ledger. The suggestion was made that the most valuable additional analysis would be that conducted at the subregional level. A considerable effort with respect to this detailed technical analysis was undertaken **up through May 20, 2011**. The outcomes of these subregional reviews are attached as Appendix D.

Also at the Forum's December 2 meeting, a matrix prepared by NPCC and Parametrix staff was presented that estimated the level of agreement (high, medium, low) by sub-region for each of the remaining issue topics. A version of this matrix, revised as per sub-region reviews, is included in each of the attached sub- region appendices.

NOTE: Inclusion of the following issue topics in this summary report does not mean that the Forum has reached full consensus on any given item. Each may require additional discussion on the part of the full Forum and/or at the subgroup level. Accordingly, specific recommendations are not included. Some divergent viewpoints remain (an example being over the 2:1 crediting ratio). It is also important to keep in mind that within the context of developing settlement agreement(s) a full resolution of many of the remaining Ledger issues identified herein may be moot, as settlement(s) may simply supplant the issue irrespective of the degree to which it is technically resolved (or not).

VARIABILITY AND EXPECTATIONS OF HEP

NOTE: This issue was referred to an ad-hoc subcommittee of the Forum. The summary below reflects the deliberations of that subcommittee. In addition, this particular subcommittee addressed other Crediting issues. ***The full report of the subcommittee is attached as Appendix A.***

At the May meeting of the FORUM, the Ledger Subcommittee provided a report that identified a number of technical and policy issues that would need to be addressed in order to develop a comprehensive and consistent crediting ledger based on habitat unit accounting. The subcommittee was tasked with working through known issues such as: lack of consistency in the use of the Habitat Evaluation Procedure (HEP), HEP models, data collection, "stacking" and other related issues.

Inherent Variability in HEP

However, the subcommittee acknowledged at the outset that a major cause of the variation in the region is the nature of the HEP tool itself. The HEP tool was designed and is very effective as a comparative tool to address mitigation for specific losses. The habitat units provided through the HEP process provide
relative value but should not be seen as an absolute value. HEP was not intended as a comprehensive accounting tool tracking progress over a broad geographic area and over a long period of time. For that
reason, the group recognized and accepted there is great variation, either positive or negative, in the habitat units attributed to any given property.

Other Issues

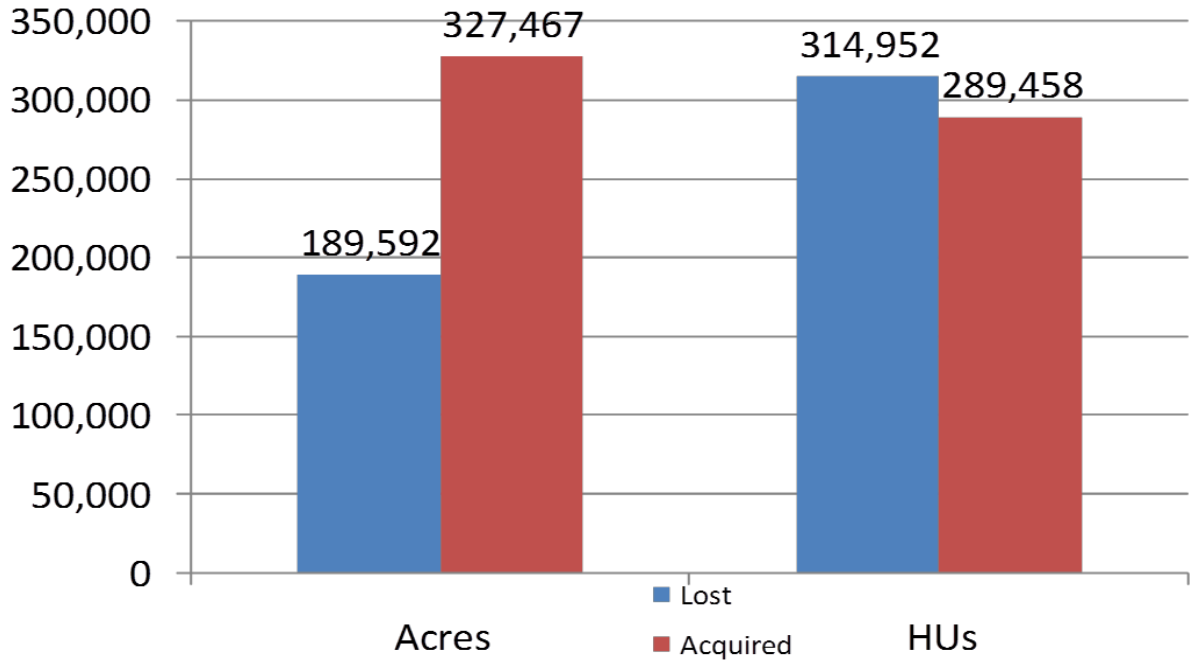
The subcommittee worked through the many issues identified above. Appendix A includes a summary of each of the issues and recommended standard operating procedures for the following:

- HEP Methods
- Stacking
- Crediting

Team Recommendation

In recent years, however, the application of HEP has been relatively consistent among projects. The subcommittee identified that Program crediting issues were found to differ depending on geographic area, specific hydropower projects, and the entities involved in the specific crediting decisions. The methodologies involved in crediting decisions have also changed and evolved over time, been interpreted and applied in differing ways, and in some cases crediting has been resolved through individual project agreements. Reflecting on these factors, the Forum felt that the many technical and recordkeeping issues with the ledger, overlaid with unresolved policy issues, would make full resolution at the Forum level difficult, and discussed the possibility of “agreements” as a more effective means of resolution. At the same time, the Forum indicated that the technical analysis of the ledger should continue to help resolve or make clear as many outstanding issues as possible while recognizing the numerical values from such an exercise are subject to the inherent discrepancies described above.

Figure 1 Acres and Habitat Units Lost and Acquired.



ISSUES RESOLVED

STANDARD OPERATING PROCEDURES FOR HEP

The quality of habitat varies widely between watersheds, subbasins, and major regions across the basin. Thus the number of HUs per acre will also vary from watershed to watershed, subbasin to subbasin, etc. (Figure 1). The type of protection method also varies greatly. These variables were recognized by the Forum as a "fact of life" across such a large region, and such variation cannot be necessarily construed as inequity. The ledger subcommittee's suggestions focused primarily on resolving such issues in future applications of HEP through the development of standard operating procedures to address the following issues:

- Sources of Variation in Crediting Due to HEP Methods: Methodological choices beginning with how habitat types are delineated for analysis and ending with the species models and inputs used can dramatically alter HEP results and therefore the HUs credited.

- Species Stacking: Using fewer species per cover type in the crediting HEP than were used in the loss assessments results in underreporting of HU credit.

- Crediting for Actions on public and other non-Permanent or Unsecured Mitigation: Either HUs on such sites have not been credited yet, or the credit was agreed to absent clear consistent guidance.

See Appendix A for a complete listing of the standard operating procedures recommended by the ledger subcommittee.

CREDITS ON FEDERAL LANDS

NOTE: This issue was referred to an ad-hoc subcommittee of the Forum. The summary below reflects the deliberations of that subcommittee.

Some management actions included in the Program occur on federal lands. This raises the question of how much credit BPA should receive for these actions. The Forum has concluded that for all future projects involving federal lands, the following considerations need to be addressed.

- Whether Bonneville funded actions on federal lands that are generally creditable, but have happened or would have happened anyway based on a Federal agency's usual and customary responsibilities should be included.
- Whether the federal agency's usual and customary responsibilities are such that the protections for wildlife values are assured over time.

This Forum subcommittee suggested that the following standards be applied to the question of crediting of federal land projects:

- Must meet the current Program criteria for wildlife projects
- Must be "permanently" protected – minimum of an easement with a term of equal to the life of the FCRPS, or an appropriately formulated and adopted federal management plan
- Must primarily benefit priority wildlife habitat, species or populations (as defined by federal, state, or tribal wildlife management plans or subbasin plans).
- Subject to a completed wildlife management plan
- Subject to an "adequately funded" long-term restoration and/or maintenance agreement
- Located in the same province as the FCRPS hydroelectric dam against which it is being credited

The subcommittee also suggested that BPA receive credit for any enhancement provided by the management actions taken by the Federal agency, subject to:

- The enhancement credit shall be determined through the use of baseline HEP data if available, or from existing Federal agency data sets if HEP data are not available

- The enhancement credit being in "perpetuity" (e.g.: life of the FCRPS), unless there is a change in the management plan employed by the federal agency that results in the reduction of enhancement values. In such cases, the enhancement credits would be adjusted to reflect the reduced value.

CREDITS FOR FISH MITIGATION

NOTE: This issue was referred to an ad-hoc subcommittee of the Forum. The summary below reflects the deliberations of that subcommittee.

This Forum subcommittee clearly recognized that acquisition and restoration projects primarily, or even exclusively, designed for the purposes of mitigating for fish losses resulting from the FCRPS hydroelectric dam system could and does benefit wildlife. The subcommittee identified the need to develop guidelines for future habitat projects; and the need to state upfront what type of benefits were being sought (e.g.: what are the benefits for fish and wildlife?). The subcommittee also felt that projects that have joint benefits to fish and wildlife should be encouraged.

The subcommittee suggested the following should apply for fish projects to receive wildlife credits:

- Specific wildlife management plans for the project area need to be completed, approved and implemented
- Long-term operations and maintenance funding for wildlife species/habitats must be in place and "adequate"
- Appropriate permanent land protections (easements) should be applied, in perpetuity and with adequate protection language
- The protected wildlife species/populations/habitats should be "priority" and so defined by existing Federal, state or tribal management and subbasin plans
- Located in the same province as the FCRPS hydroelectric dam against which it is being credited

The subcommittee also reviewed a specific list of such projects (Table 1). Projects were classified into four tiers. Tier 1 includes wildlife projects supported by anadromous fish funds that should be credited. The projects shown as Tier 2 were left as subject to "further review." Projects in the Lower Columbia Estuary were flagged as "special case" and included as Tier 3. These Tier 3 projects were identified by the subcommittee as potentially available as operational loss offsets for projects elsewhere in the FCRPS. Tier 4 projects are special existing projects on federal lands that may be considered for credit but in some cases may be difficult to categorize because they are located in areas not directly affected by hydroelectric Development. These three projects (Bear Valley, Deer Creek, Elk Creek) were moved by the Forum from the Federal Lands topic of this summary report and were directed to be included in

Table 1. These types of projects potentially could lead to “overmitigation” in some subregions. However these issues could be addressed as part of an agreement, as was the case with the Dworshak Settlement Agreement or as part of operational losses in the future.

Table 1: Candidate Fish Projects for Wildlife Credits

Parcel Name	Proponent	Subbasin	Acres	Tier
Forrest Conservation Area	CTWSRO	John Day	4,232	1
Oxbow Conservation Area	CTWSRO	John Day	1,022	1
Pine Creek (Wagner Conservation Area)	CTWSRO	John Day	9,000	1
Rainwater Wildlife Area (Part II)	CTUIR	Walla Walla	2,340	1
Yakama Nation Riparian/Wetlands Restoration	Yakama Nation	Yakima	5,000*	1
Yakima Side Channels (Lower Naches)	Yakama Nation	Yakima	376	2
Colville Fish Habitat Projects	Colville Tribes	Okonogan	176	2
Cottonwood Farms / Witte Place	NFWF, Methow Conservancy	Methow	54	2
Hancock Springs	NFWF, Methow Conservancy	Methow	122	2
Heath	NFWF, Methow Conservancy	Methow	140	2
Mid-Methow / Lehman	NFWF, Methow Conservancy	Methow	93	2
Oak Flats (Naches River)	WDFW	Yakima	289	2
Red River Wildlife Area (Little Ponderosa)	IDFG	Clearwater	1,300	2
Sandy River Delta	Forest Service	Sandy	1,400	2
Yakima Side Channels (Upper Yakima)	Yakama Nation	Yakima	544	2
Zumwalt Prairie Preserve (Camp Creek Ranch)	Nature Conservancy	Imnaha	27,000	2
Crims Island	Columbia Land Trust	Columbia Estuary	451	3
Crazy Johnson Creek	Columbia Land Trust	Grays	305	3
Crooked Creek (F&W)	Columbia Land Trust	Columbia Estuary	60	3
Elochoman River	Columbia Land Trust	Columbia Estuary	183	3
Germany Creek	Columbia Land Trust	Columbia Estuary	155	3
Walker Island	Columbia Land Trust	Columbia Estuary	100	3

Willow Grove	Columbia Land Trust	Columbia Estuary	312	3
Bear Valley	IDFG/ShoBan	Salmon	n/a	4
Deer Creek	IDFG/ShoBan	Salmon	n/a	4
Elk Creek	IDFG/ShoBan	Salmon	n/a	4

LOSS ASSESSMENTS

The Forum chose not to reconsider prior loss assessments, and generally accepted *Wildlife Crediting Program Table C-4* (as published in the NPCC-approved 2009 Program) as an agreed to measure of loss assessments (Program Table C-4 is attached as Appendix B to this summary report).

The Forum's determination notwithstanding, in 2009 the Shoshone-Bannock Tribe, Shoshone-PaiuteTribe, Idaho Department of Fish and Game (IDFG) and CBWFA staff re-examined the Anderson Ranch, Palisades, Black Canyon, Minadoka, and Deadwood loss assessments in Southern Idaho for accuracy and consistency relative to other loss assessments across the Basin, and for the number of HUs credited against hydro facilities. HU losses reported in *Program Table C-4* were found by this group to be in error for the number of HUs listed for the Anderson Ranch, Black Canyon, and Palisades projects. In one instance, HUs were listed for sharp-tailed grouse, which was not a target species in any of the SE Idaho loss assessments and yellow-rumped warbler were not listed for Deadwood when they were included in the loss assessment.

NOTE: BPA's position is that it is not responsible for Deadwood Dam mitigation.

Southern Idaho loss assessment calculations subtracted estimated post-project HU gains from the total losses in reporting "net" losses. Because most other loss assessments show just the "total" losses, the "net" HU losses reported in Southern Idaho were 4,835 fewer than if the Southern Idaho loss assessments had listed only the "total" HU losses (as was the case in other parts of the Basin). Wildlife managers now believe that Habitat units gained from Southern Idaho mitigation projects should be examined and subtracted from the losses shown in *Program Table C-4*. .

NOTE: Program Table C-4 as published also included habitat gains.

ISSUES UNRESOLVED

CREDITING RATIO

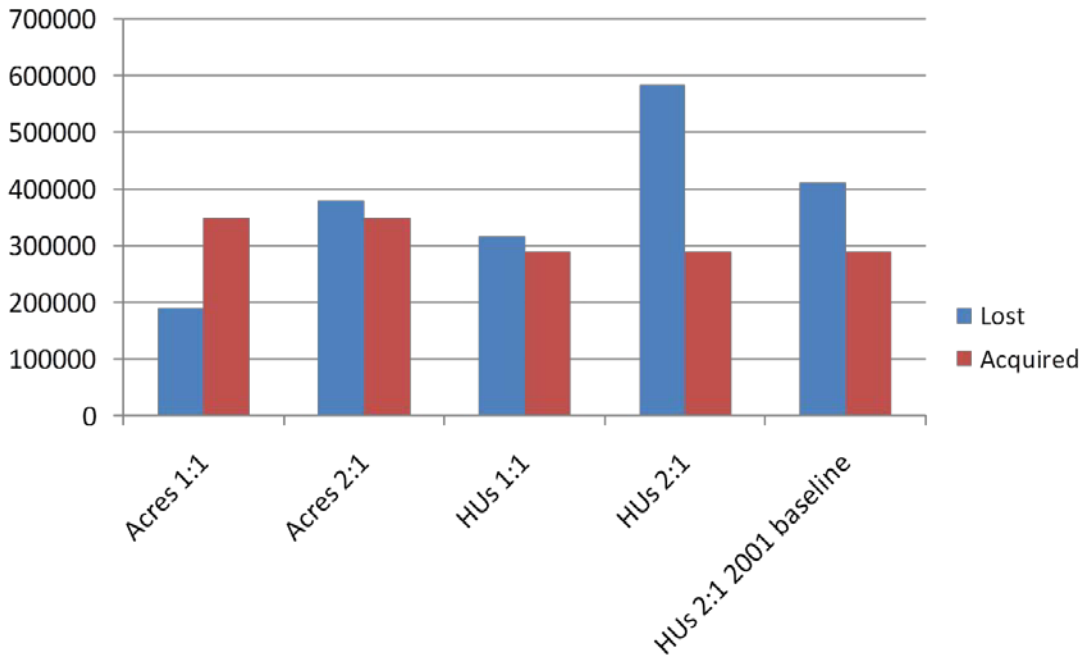
The 2000 Program applied a 2:1 ratio to all remaining habitat units (HUs) in the Ledger that had not been previously satisfied by habitat acquisitions and projects, and went into effect on April 1, 2001. The balance of HUs that remained on April 1, 2001 were to be doubled as a means of "settling" questions over the actual mitigation work remaining to reach full compensation for dam

inundation and construction losses. NPCC specified that all credits from projects prior to April 2001 were to remain at the levels previously agreed to by BPA and project proponents. Moreover, the findings section of the Program acknowledged that "the Council recognized existing mitigation project agreements, even if such agreements have a crediting ratio of 1:1. The 2009 Program reaffirmed the 2:1 crediting ratio (see Appendix E for 2009 Program language).

At its April 2010 meeting, the NPCC responded to questions put by some Forum members with respect to this policy, and confirmed its earlier policy decision establishing a 2:1 ratio effective April 1, 2001. Notwithstanding the NPCC's recent confirmation, Forum members indicated that there is either disagreement with or different interpretations of the Council's position. Further, members indicated that not all entities had made a formal policy decision relative to the Council's 2:1 position. (See Appendix F for a more complete discussion of this issue).

The application of the 2:1 mitigation ratio and its varying interpretations results in changes in the total habitat units outstanding for mitigation. Figure I-2 shows the increase in habitat units or acreage needed to meet the mitigation obligation with the 2:1 ratio applied.

Figure 2.



HYDROELECTRIC FACILITY CREDIT ASSIGNMENTS

Credits are assigned to specific FCRPS hydroelectric facilities. In some cases, credits have been assigned to hydro facilities in different subbasins from the actual project, to facilities that are

more distant from projects than other hydro sites or to more than one facility. Although to an extent a recordkeeping issue, this practice has resulted in uncertainty over what HUs remain in any given subregion, whether mitigation has been adequately met for a given dam (or even overmitigated), and concern that other subregions may end up being “short changed” when mitigation responsibilities are rolled up to the system-wide total. Figure 3 maps the location of wildlife projects and shows the relationship with facilities mitigated by the projects.

Forum members asked that the assignment of wildlife projects to multiple dams be evaluated. The available data does not specify the specific division of HUs to each dam. The way the data is stored in the ledger prevents double counting of credits when applied to multiple projects, but it does create new groupings of dams in addition to individual dams. Accordingly, a single dam may not easily be reviewed based on mitigation projects. Another concern raised by the Forum was the sets of species used for HEP evaluation when spread across multiple dams. The available data does not indicate the species used, or if the species at the dam site are the same as at the wildlife project site.

It also should be noted that the Loss Assessments for the Lower Snake River Dams included in the Fish and Wildlife Program are aggregated for all four dams. Because of the complex relationship of these projects with the Lower Snake River Compensation Plan and other federal responsibilities no individual loss assessments were performed.

Ideally, the geographic distribution of projects effectively assigns projects to the closest dam. In some cases this can be a considerable distance, such as in the lower Snake. However, these projects are in the watershed nearest to the facilities. The Forum has indicated a preference that projects assigned to a hydro facility should at a minimum be in the same province as that hydro facility.

Additionally, it is also important to note that BPA does not believe that it has a mitigation responsibility for losses caused by the construction and operation of Deadwood Dam.

INUNDATION GAINS

The permanent dam reservoir pools resulting from inundation created a significant expansion of open- water habitat on the Columbia River. Not all wildlife species benefiting (and expanding) from new open water were those that lost suitable habitat due to inundation. Tribes and agencies (WDFW and IDFG) concurred that allowing credit for such species did not appear to be appropriate. The following species appear to have increased as a result of open-water gains created by inundation:

Table 2: Species and Gains from the 2009 Wildlife Program

Species	Habitat Units
Bald Eagle	5,693
Black-capped Chickadee	68
Common Merganser	1,042
Greater Scaup	820
Lesser Scaup	20,577
Mallard	174
Mallard (wintering)	13,744
Marsh Wren	207
Osprey	6,159
Redhead	4,475
Other Waterfowl	423
Western Grebe	273
Yellow Warbler	8
Total	**53,663**

PRE-ACT MITIGATION

Prior to the Northwest Power Act of 1980, official mitigation efforts in response to FCRPS system impacts were undertaken by Federal water resource managers (U.S. Army Corps of Engineers, Bureau of Reclamation) and the U.S. Fish and Wildlife Service. Some mitigation actions go back as far as the 1910s, and in many cases are very difficult or impossible to fully document and assess. Wildlife mitigation prior to 1980 was in part generated through consultation with the U.S. Fish and Wildlife Service under the Fish and Wildlife Coordination Act of 1934, and the subsequently more rigorous requirements from amendments in 1946 and 1958. The majority of the pre-Act mitigation is associated with the McNary and John Day dams. The 1991 Geiger Report and 2004 USFWS Coordination Act Report identified 50,938 acres of Pre-Act mitigation and recommended that 14,032 HUs be credited as mitigation. (See Appendix D for Giger Report). Because this issue affects each of the subregions differently, the impact of the recommended credits will be addressed among the parties within each of the sub-regions.

AGREEMENTS

Following a lengthy discussion of the issues related to the use of HEP, the Forum agreed that resolution of many of these issues would require reevaluation and assessment of many of the original HEPs and a number of the subsequent project HEPs. The Forum concluded that these efforts likely would be both labor intensive and time-consuming, and that it was likely that a better course of action would be to focus on long-term agreements that address the unique situations represented in the various geographic areas. HEP analysis to date can form the

underpinnings of agreements. The intent of this report is to help guide the resolution of these issues.

Agreements can provide benefits to both the wildlife managers and to BPA. For managers, they provide an assured funding stream for project implementation and maintenance and greater management flexibility. For BPA the advantages are greater certainty in budgeting and the ability to complete its mitigation responsibility for wildlife construction and inundation losses.

AGREEMENT SUBREGIONS

The Forum suggests that several agreements are more feasible than a single basin-wide settlement agreement. Several sets of subregions based on groupings of hydroelectric projects were identified. The Forum decided on the following subregions on which to base further technical analysis and potentially to define agreement groups:

- Lower Columbia (Bonneville, The Dalles, John Day, McNary)
- Lower Snake (Ice Harbor, Little Goose, Lower Monumental, Granite)
- Upper Snake (Anderson Ranch, Palisades, Black Canyon, Minidoka, and Deadwood)
- Northern Idaho (Albeni Falls)
- Upper Columbia (Chief Joseph, Grand Coulee)

AGREEMENT LENGTH & “CURRENCY”

The term of the mitigation is either in perpetuity or for the life of the hydro project(s) to which losses are credited. However, the term of any agreement(s) conceptually could range from 10 years, as with the Fish Accords to the life of the federal hydroelectric system (FCRPS). The recent Willamette River Basin Memorandum of Agreement Regarding Wildlife Habitat Protection and Enhancement (Willamette MOA)specifies a term of 15 years to complete the purchases associated with the agreement which was deemed to be an adequate period for remaining mitigation obligations to be satisfied in that subbasin.

An issue to consider is the consequences of any events, natural or human-made, that may change habitat conditions over the term of the agreement(s). This requires predicting those natural events that would increase or change the calculations of the remaining habitat needed for “full” mitigation, or identifying the impacts of other agreements in the basin, such as the Fish Accords.

The value of the agreement could also vary based on the term and the type of losses to be mitigated. For example, the value of the Willamette MOA varies across several increments within its overall term. Settlement agreement(s) could also potentially use a variety of “currencies,”

including habitat units, acres, or funding. Agreements based on lump-sum payments are considered most desirable by many Forum members although there are challenges around how this may occur based on appropriate Federal funding levels and regulatory compliance issues for BPA.

PRIOR AGREEMENTS

Prior BPA-to-tribe/agency agreements, Memoranda of Agreements, or contracts may inform and/or affect how agreement(s) are reached. Some of these prior agreements include specific decisions about issue topics discussed in this summary report (for instance the 2:1 ratio), as well as including differing terms and requirements. The Forum recognizes the impact such prior agreements may have on settlement considerations.

OPERATION AND MAINTENANCE (O&M)

The success of mitigation projects often relies on active and ongoing management to maintain the habitat benefits obtained from land acquisition and restoration. Properties are purchased based on a number of criteria and. many properties purchased are not in pristine condition so O&M costs may vary considerably, particularly for the first several years after purchase. However, the 2007 Independent Economic Analysis Board (IEAB) report, “Investigation of Wildlife O&M Costs” concluded that Program costs for O&M are generally comparable to other land management agencies costs Settlement agreements should address this issue.

Other key findings relevant to the charter of the Forum include:

- O&M cost data in Pisces is very coarse and needs to be more detailed to provide support for informed comparisons. Current data on O&M does not allow for parcel to parcel comparisons.
- IEAB recommended data be added to Pisces to capture the other non-BPA cost shares and the expected life of investments.

AGREEMENT PROCESS

For any settlement agreement(s) to be funded, a series of steps must first occur, including NEPA review, budgeting and inclusion in a future rate case for BPA. These steps are identified in Appendix C as requested by the Forum, including estimated time requirements for each step. Appendix C assumed a certain timeframe for initiating negotiations, but as these are not definitive, this information should only be treated as an EXAMPLE of the relative time scale of any settlement process.

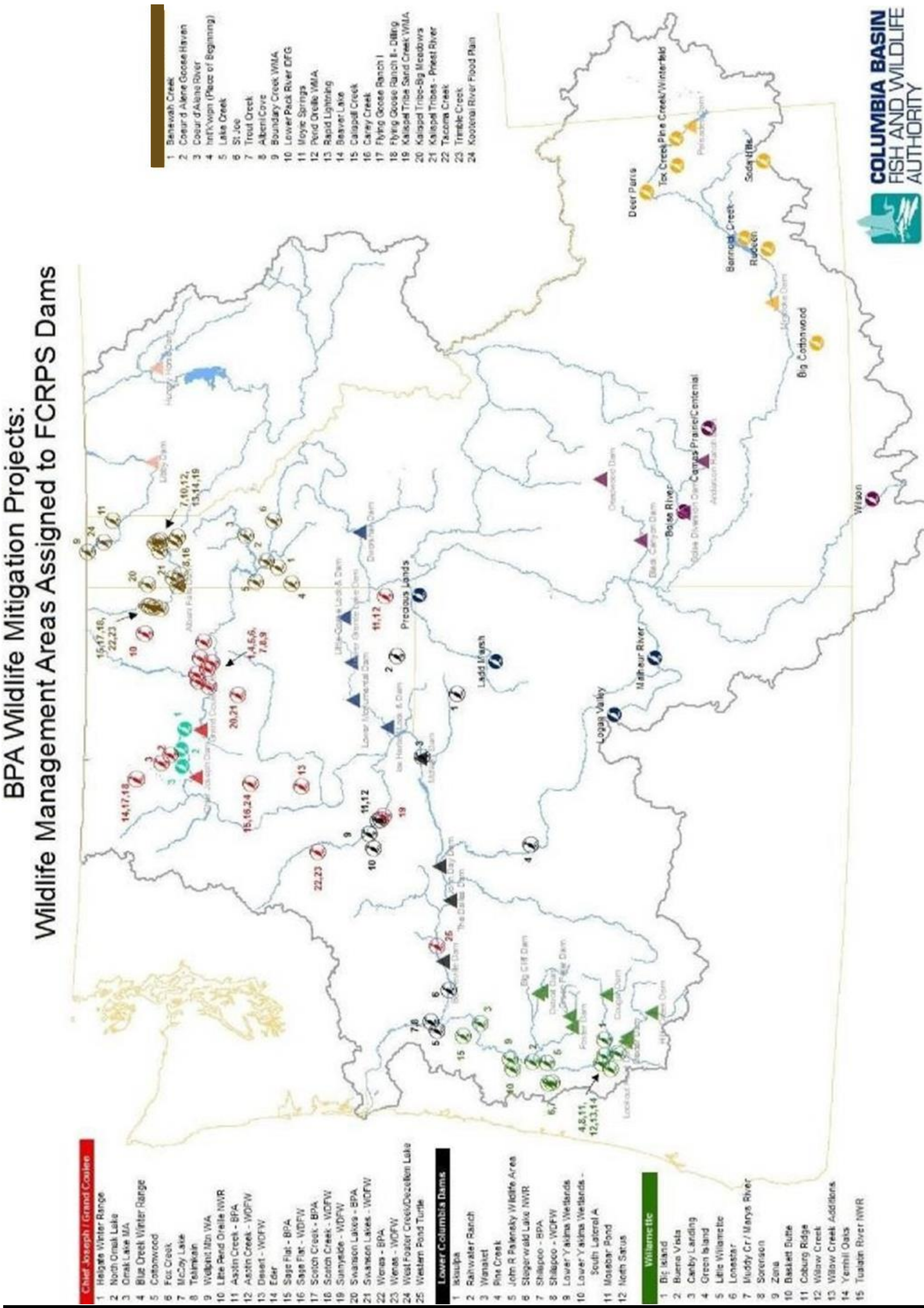


Figure 3: Projects and Facilities Mitigated

Appendix A – HEP Crediting Subcommittee Report

April 20-21, 2010 Crediting Forum Technical Team Meeting

The Crediting Technical Team addressed technical HEP issues that make reconciling the crediting ledger difficult and contribute to the different interpretations within the region on crediting. We identified issues in three tiers with the first tier representing technical HEP issues, the second tier focusing more on subregional issues that have policy implications for some but not all managers or areas in the region, and the third tier being primarily overarching, regional policy issues needing resolution. We sought to establish a foundation for greater consistency to the extent possible while recognizing the limitations of existing agreements. The following are working notes from the meeting and have not received regional peer review or input.

Tier 1 Issues: Technical HEP w/ little or no policy implications Sources of Variation in crediting due to HEP methods

1. Cover Typing - Delineation of cover type boundaries
2. Similarity (or lack thereof), between habitats characterized in losses and compensation lands
3. Choice of HEP species- for original losses and compensation lands
    - *Should be a good representation of habitat quality*
4. Lack of peer review or consistency of HEP models chosen for losses or compensation lands.
5. Choice of substitute HEP species when out of kind-
    - Covering same habitat attributes with same number of species
6. Modification or lack of suitable modification of HEP models.
    - Appropriate/inappropriate selection of model
    - Use of updated models for mitigation while losses are static with old models.
    - Appropriate/inappropriate alteration of equations to address site specific realities.

- Real world differences in application of model from original area

7. Field Data Collection techniques

    - Changes in Techniques and intensity of survey
    - Changes in survey staff
    - Season of survey/phenology
    - Under represented or over represented cover types

Variation SOP

- *Use tools, models, and methods that most accurately reflect the quality and quantity of the habitats being protected and managed.*
- *HEP methods used should reflect the site specific habitat parameters and management goals of the property and may differ from the HEP methods used in determining the losses.*
- *When disagreements arise, the project proponent should seek resolution through consultation with BPA, HEP team, and subbasin or provincial co-managers to assure consistency and accuracy.*
- *Consider validating new or significantly modified models with appropriate testing and review.*

Species Stacking

Stacking occurs when multiple species are used to characterize the quality of a single cover type. It becomes a crediting issue when the same number of species used to assess losses are not in turn used to characterize the compensation lands. *Stacking is an issue of how you adjust the credits of the mitigation sites to be in balance with the number of species used to characterize the losses. Loss assessments are what they are and should not be revised or replaced to address stacking issues.*

Stacking SOP

- *SOP options to address staking issues include:*

a. Use the same number of species to characterize the out of kind cover types as were used to characterize the loss assessment cover types.

b. If using fewer species to characterize the mitigation site cover type than were used to characterize the losses, average the HSIs of the out of kind mitigation cover types and multiply by the number of species used in the losses. However, species selection must be peer reviewed and approved by the regional HEP team, BPA and the project proponent.

c. If incidental out of kind cover types (inclusions) are associated with a mitigation acquisition, assume the same HSI as the adjacent cover type.

d. Do not credit the same acres of a given cover type between two or more hydroprojects with a combination of species from both.

Tier 2 Issues: Subregional issues with policy implications

Crediting public lands actions, trust lands, and non-permanent or unsecured lands mitigations

- How to credit BLM lease for range lands.
- How to credit State DNR Land mitigations.
- How to credit BIA Trust lands leases or easements
- How to credit leases or easements on fee lands
- How to credit areas where BPA contributed to but did not fully provide protection or operations and maintenance funding.
- How to credit BPA where they were not involved in the protection of the habitat but provide all or part of the O&M and enhancements.

Crediting SOP

- *Project proponents must provide minimum irreducible HU letter for each compensation site including statements on each of the following issues:*

a. Hydro project being mitigated

b. Cover type(s) and target species used to characterize habitat quality on the compensation site

c. Commitment to follow SOPs to quantify and qualify habitat

d. Minimum number of habitat units being credited from the site

- *Crediting of Non-permanent protection- The Crediting Technical Team recommends that the region have a Crediting SOP covering sites without permanent protection. The specific operating procedure adopted needs to be further defined and agreed to.*

- *Partial purchase- credit for proportion of protection funding provided.*

- *Partial O&M or enhancements- credit for HU increases proportional to 10 year average investment.*

- *Credit for leases that may not provide permanent protection- credit against operational or secondary losses or normal full credit when the protection and credit from a non- permanent compensation site gets rolled over to another non-permanent site with an equal or greater amount of habitat value*

- *Credit for lands protected with partial lease such as the purchase of an annual grazing lease on Indian trust lands or a federal grazing allotment - receive credit for cover types enhanced by the annual protection and O&M. Assumption of replacement with similar lease if lease terminated.*

Tier 3 Issues: Policy level resolution required

1. Socio-political issues of crediting projects that are out of kind and out of place from impacts.

2. Allocation HUs among resource managers.

    a. Crossing political boundaries with mitigation actions.
    b. Crossing ecological/population boundaries.

3. Crediting of fish projects against construction and inundation wildlife losses.

4. Crediting non-permanent or unsecured lands

5. How to deal with “over mitigation”?

Where do we go from here?

1. Regional Agreements on SOPs after vetting through all Forum members.

2. Direct the HEP team to work with project managers at each compensation site to address technical shortcomings identified above.

    - For new projects, do this with baseline HEPs.
    - For existing projects, do this with follow-up HEPs.
    - Consider adding to HEP team’s contract an express mandate and responsibility to identify inconsistencies in technical HEP applications throughout the region.

3. Incorporate fish credit findings and recommendations as appropriate.

4. Reassign credits within lower four mainstem Columbia River dams.

    - Unlike other areas in the basin, the lower four crediting can be reassigned based on existing HEP reports, so no need to wait or gather additional data.

5. Develop draft ledger for recommendation to Council for review and approval.
    - The ledger will report HUs protected and enhanced through the Council’s Fish and Wildlife Program.

Appendix B - Loss Assessment Summary, Table C-4, 2009 Program

Table C-4 Estimated Losses and Gains Due to Hydropower Construction
(losses are preceded by a "-", gains by a "+")

Species	Total Habitat Units
Albeni Falls	
• Mallard Duck	-5,985
• Canada Goose	-4,699
• Redhead Duck	-3,379
• Breeding Bald Eagle	-4,508
• Wintering Bald Eagle	-4,365
• Black-Capped Chickadee	-2,286
• White-tailed Deer	-1,680
• Muskrat	-1,756
• Yellow Warbler	+171
Lower Snake Projects	
• Downy Woodpecker	-364.9
• Song Sparrow	-287.6
• Yellow Warbler	-927.0
• California Quail	-20,508.0
• Ring-necked Pheasant	-2,646.8
• Canada Goose	-2,039.8
Anderson Ranch	
• Mallard	-1,048
• Mink	-1,732
• Yellow Warbler	-361
• Black Capped Chickadee	-890
• Ruffed Grouse	-919
• Blue Grouse	-1,980
• Mule Deer	-2,689
• Peregrine Falcon	-1,222 acres*
* Acres of riparian habitat lost. Does not require purchase of any lands.	
Black Canyon	
• Mallard	-270
• Mink	-652
• Canada Goose	-214
• Ring-necked Pheasant	-260
• Sharp-tailed Grouse	-532
• Mule Deer	-242
• Yellow Warbler	+8
• Black-capped Chickadee	+68
Deadwood	
• Mule Deer	-2080
• Mink	-987
• Spruce Grouse	-1411
• Yellow Warbler	-309

Table C-4 (cont.) Estimated Losses and Gains Due to Hydropower Construction (losses are preceded by a "-", gains by a "+")

Species	Total Habitat Units
Palisades	
• Bald Eagle	-5,941 breeding -18,565 wintering
• Yellow Warbler	-718 scrub-shrub
• Black Capped Chickadee	-1,358 forested
• Elk/Mule Deer	-2,454
• Waterfowl and Aquatic Furbearers	-5,703
• Ruffed Grouse	-2,331
• Peregrine Falcon*	-1,677 acres of forested wetland -832 acres of scrub-shrub wetland +68 acres of emergent wetland
* Acres of riparian habitat lost. Does not require purchase of any lands.	
Willamette Basin Projects	
• Black-tailed Deer	-17,254
• Roosevelt Elk	-15,295
• Black Bear	-4,814
• Cougar	-3,853
• Beaver	-4,477
• River Otter	-2,408
• Mink	-2,418
• Red Fox	-2,590
• Ruffed Grouse	-11,145
• California Quail	-2,986
• Ring-necked Pheasant	-1,986
• Band-tailed Pigeon	-3,487
• Western Gray Squirrel	-1,354
• Harlequin Duck	-551
• Wood Duck	-1,947
• Spotted Owl	-5,711
• Pileated Woodpecker	-8,690
• American Dipper	-954
• Yellow Warbler	-2,355
• Common Merganser	+1,042
• Greater Scaup	+820
• Waterfowl	+423
• Bald Eagle	+5,693
• Osprey	+6,159
Grand Coulee	
• Sage Grouse	-2,746
• Sharp-tailed Grouse	-32,723
• Ruffed Grouse	-16,502
• Mourning Dove	-9,316
• Mule Deer	-27,133
• White-tailed Deer	-21,362
• Riparian Forest	-1,632
• Riparian Shrub	-27
• Canada Goose Nest Sites	-74

Table C-4 (cont.) Estimated Losses and Gains Due to Hydropower Construction (losses are preceded by a "-", gains by a "+")

Species	Total Habitat Units
McNary	
• Mallard (wintering)	+ 13,744
• Mallard (nesting)	-6,959
• Western Meadowlark	-3,469
• Canada Goose	-3,484
• Spotted Sandpiper	-1,363
• Yellow Warbler	-329
• Downy Woodpecker	-377
• Mink	-1,250
• California Quail	-6,314
John Day	
• Lesser Scaup	+14,398
• Great Blue Heron	-3,186
• Canada Goose	-8,010
• Spotted Sandpiper	-3,186
• Yellow Warbler	-1,085
• Black-capped Chickadee	-869
• Western Meadowlark	-5,059
• California Quail	-6,324
• Mallard	-7,399
• Mink	-1,437
The Dalles	
• Lesser Scaup	+2,068
• Great Blue Heron	-427
• Canada Goose	-439
• Spotted Sandpiper	-534
• Yellow Warbler	-170
• Black-capped Chickadee	-183
• Western Meadowlark	-247
• Mink	-330
Bonneville	
• Lesser Scaup	+2,671
• Great Blue Heron	-4,300
• Canada Goose	-2,443
• Spotted Sandpiper	-2,767
• Yellow Warbler	-163
• Black-capped Chickadee	-1,022
• Mink	-1,622
Dworshak	
• Canada Goose-(breeding)	-16
• Black-capped Chickadee	-91
• River Otter	-4,312
• Pileated Woodpecker	-3,524
• Elk	-11,603
• White-tailed Deer	-8,906
• Canada Goose (wintering)	+323
• Bald Eagle	+2,678
• Osprey	+1,674
• Yellow Warbler	+119

Table C-4 (cont.) Estimated Losses and Gains Due to Hydropower Construction (losses are preceded by a "-", gains by a "+"

Species	Total Habitat Units
Minidoka	
• Mallard	+174
• Redhead	+4,475
• Western Grebe	+273
• Marsh Wren	+207
• Yellow Warbler	-342
• River Otter	-2,993
• Mule Deer	-3,413
• Sage Grouse	-3,755
Chief Joseph	
• Lesser Scaup	+1,440
• Sharp-tailed Grouse	-2,290
• Mule Deer	-1,992
• Spotted Sandpiper	-1,255
• Sage Grouse	-1,179
• Mink	-920
• Bobcat	-401
• Lewis' Woodpecker	-286
• Ring-necked Pheasant	-239
• Canada Goose	-213
• Yellow Warbler	-58

(Appendices C through G not included due to data download issues)

Cite as:

Ashley, P. R. 2014. Southern Idaho HEP Document. BPA Contract 64637: WE-141. Pacific States Marine Fisheries Commission. Portland, OR.