A Pilot Study of Hydraulic Permit Compliance, Implementation, and Effectiveness in Region 6

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INTRODUCTION

The Revised Code of Washington (RCW) directs the Washington Department of Fish and Wildlife (hereafter Department) to "preserve, protect, perpetuate, and manage" the fish and wildlife species of the state as its paramount responsibility (RCW 77.04.012). To help achieve that goal, the state Legislature passed a law now known as the "Hydraulic Code" (chapter 77.55 RCW) in 1949. This law was designed to protect public fish resources by requiring a Hydraulic Project Approval (HPA) "permit" before conducting activities in fresh and salt waters of the state. Specifically, Washington Department of Fish and Wildlife (WDFW), who administers the Hydraulic Code, regulates work that "uses, obstructs, diverts or changes the natural flow or bed of state waters for the protection of fish life".

The Department reviews and issues approximately 5,000 HPA permits per year covering a wide range of activities. All HPA permits are issued with provisions to protect public resources. These provisions are consistent with Best Available Science as informed by comprehensive literature reviews and by experience gained by Department employees during the course of providing technical assistance, particularly in the area of culvert design. However, the Department has not had sufficient resources to conduct monitoring and thus there has been no formal adaptive management procedure to guide the HPA program through time. The work described here is the first attempt to develop a formal process to systematically review compliance and effectiveness of the HPA program.

METHODS

Survey Sample

We sorted 260 HPA permits issued after 1 December 2005 in the Department's Region 6 into five HPA project types, including Fresh Water Bank Protection, Marine Bank Protection, Fish Passage Culverts, Bridges, and

Marine Over-water Structures. The intent of this pilot study was to evaluate up to 30 permits of each type during November of 2006 to assess permit compliance and effectiveness. Evaluations were conducted by two teams, each consisting of two biologists, during field visits to the project site. Before visiting project sites, the evaluation team gathered all permit materials (HPA permit, construction plans, correspondence, etc.) and contacted the project proponent to receive permission to visit the site. In many cases, the project proponent met the evaluation team on site.

Assessing Provision, Compliance, and Implementation Rates

We developed survey questionnaires to assess the provision rate, compliance rate, implementation rate, and effectiveness of recent HPA projects. Provision rate was defined as the percent of permits containing a provision considered important to that permit type. Provision rate is a measure of permit completeness and important to interpreting where potential problems may occur in the HPA program. For example, if a permitted project is deemed ineffective at protecting public resources (see effectiveness measures below), it is useful to know if the permit lacked a necessary provision or if the actions of the project proponent were inadequate. Provision rate was determined for each of several provisions for each of the five project types.

Compliance rate was the percentage of projects that complied with a specific provision in the permit, and was determined by comparing project specifications, measured in the field, with each provision in the permit. A project could only be in compliance for a specific provision if that provision was explicitly written in the permit. Because of the pilot nature of the study, we limited our pilot survey to a subset of the most important provisions that could be assessed in the field during a single visit.

Implementation rate was the percentage of projects that were implemented consistent with the "intent of a provision" regardless of whether the provision was explicitly written into the permit. In other words, implementation rate was determined simply by measuring an outcome in the field as opposed to compliance rate that compared the permit provisions to outcomes. Determining implementation rate separate from compliance rate is important, since high implementation rate is a more meaningful indication of resource protection than compliance rate. In addition, compliance rate may underestimate the overall HPA program success since in

some cases provisions may have been excluded from a permit because the permit biologist and the project proponent had a common understanding of what was required, or the parties had a verbal agreement to do construction in a particular way based on past experience with similar projects.

For this study we did not attempt to determine why seemingly appropriate provisions had been excluded from a permit. In addition, we did not attempt to compare compliance and implementation rates for multiple provisions on the same permit. In other words, we did not ask if compliance and implementation rates were correlated by permit, i.e., poor compliance for one provision was related to poor compliance for another provision on the same permit. In the future, it would be useful to know if a small number or select type of projects, or specific kinds of project proponent (e.g., private consultant vs. Public Works Department) are causing the majority of noncompliance and non-implementation issues

Permit Effectiveness

Measures of effectiveness were based on more qualitative criteria than measures of compliance and implementation, that is, effectiveness was judged against standards defined in the language of WAC 220. To assess effectiveness, the evaluation team, who were not associated with issuance of the permit, were asked to judge (as a team) how well completed projects met the goals of *no net loss of fish life, or in the productive capacity of fish and shellfish habitat or functions* (WAC 220). Specifically, the evaluation team was asked to rank each implemented project on a scale from 1 (low) to 5 (high) based on three criteria: 1) Ability of the provisions to protect public resources, 2) Ability of provisions to meet no net loss of habitat/function, and 3) Ability of mitigation to compensate impacts beyond avoid and minimize. These effectiveness criteria were paired with a final question related to the overall implementation of the project also ranked on a scale of 1 (low) to 5 (high; See Appendix A). The intent of this last question was to gauge how overall implementation of the project might be related to the overall ability of the project to protect public resources. We were interested in determining if high (good) implementation was necessarily related to relatively good resource protection.

Field assessments were conducted within two years of the HPA approval and thus reflected the applicant's construction activities as well as stochastic activities (e.g., storms or floods) that might have affected

the project since the time of construction. Five different types of HPA projects were included in the assessment including culvert, bridges, fresh water bank protection, saltwater bank protection, and marine over-water structures. Each of these project types has a specific assessment questions (Appendix A).

We did not statistically analyze the data for several reasons. First, this study was a pilot designed to assess logistics and other key issues for conducting a more comprehensive and meaningful study in the future. Second, the sample sizes by permit type were small. Finally, it was clear from our preliminary analysis that the study suffered from quality control issues: 1) Some HPAs permits lacked documents describing specifications for construction and mitigation, 2) Some survey questions may have been ambiguously worded leading to a lack of common understanding about the intent of that question among the evaluation team, 3) Sample sites may have been biased to where we could obtain permission to visit the site in a short period of time, and 4) In some cases, the evaluation team lacked adequate survey equipment training.

RESULTS

Field Review

After excluding sites where work was not yet completed, sites at which we could not coordinate visits with landowners, and sites that were otherwise unavailable (e.g., could not arrange a time to meet landowner on site), we collected data from 58 projects permitted under the Department's HPA program. Of the 58 projects, 15 came from fresh water bank protection, 14 from marine bank protection, 14 from culvert installation, 9 from bridge construction, and 6 from marine over-water projects. Because we had very small samples for bridges and marine overwater structures, we did not analyze these types of projects separately like we did for fresh water bank protection, marine bank protection, and culvert installation. However, data from bridges and overwater structures were combined with data from other project type to summarize overall implementation and project effectiveness.

We spent a total of 460 person hours assessing 66 permits for an average of ~7 person hours per site. Coordinating with the landowner (i.e., contacting, consulting, and arranging meeting times) was the most time consuming process (process time), followed by travel time, and then assessment time. Some time spent on

minor activities including administrative, managerial, and logistic tasks (e.g., collecting, copying HPA) was not quantified. The time needed to assess the project on site starting from time of arrival to completion ranged from 15 – 60 minutes per site. We calculated the effort to assess 66 rather than the 58 projects for which we collected complete information because the determination that a project was unsuitable for survey was often only made after spending a significant amount of process time, and in some cases travel time.

Fresh Water Bank Protection

Provision rates for fresh water bank protection varied by type: with 57% of the permits containing the *do not constrict bankfull width* (BFW) provision, 69% containing *prevent sedimentation* provision, and 67% containing *mitigate project effects by the placement of boulders or large woody debris* provision (Fig. 1). Field assessments demonstrated that compliance rates were 50% for constriction of BFW, 89% for preventing sedimentation, and 80% for the placement of wood and boulders (Fig 1.). Implementation rates were higher than compliance rate for constriction of BFW and for preventing sedimentation but not for placement of wood and boulders (Fig. 1).

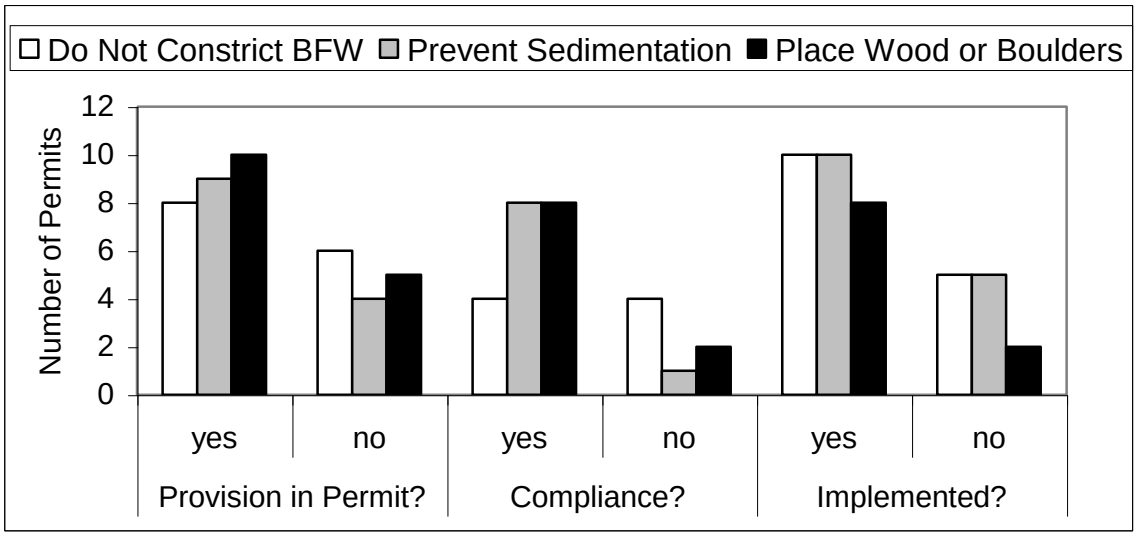

Figure 1. The number of Fresh Water Bank Protection Hydraulic Permits that contained provisions, the number of permitted projects that complied with those provisions, and the number of permitted projects that implemented or met the intent of those provisions regardless of whether those provisions was included in the permit.

In other words, the outcomes for two of three provisions as measured by implementation were better than expected based on the provisions rate. Re-vegetation provisions were uncommon in freshwater bank protection

permits, occurring in only 33% of the permits (Fig. 2). Implementation rates for re-vegetation efforts were largely judged as inadequate (Fig. 2).

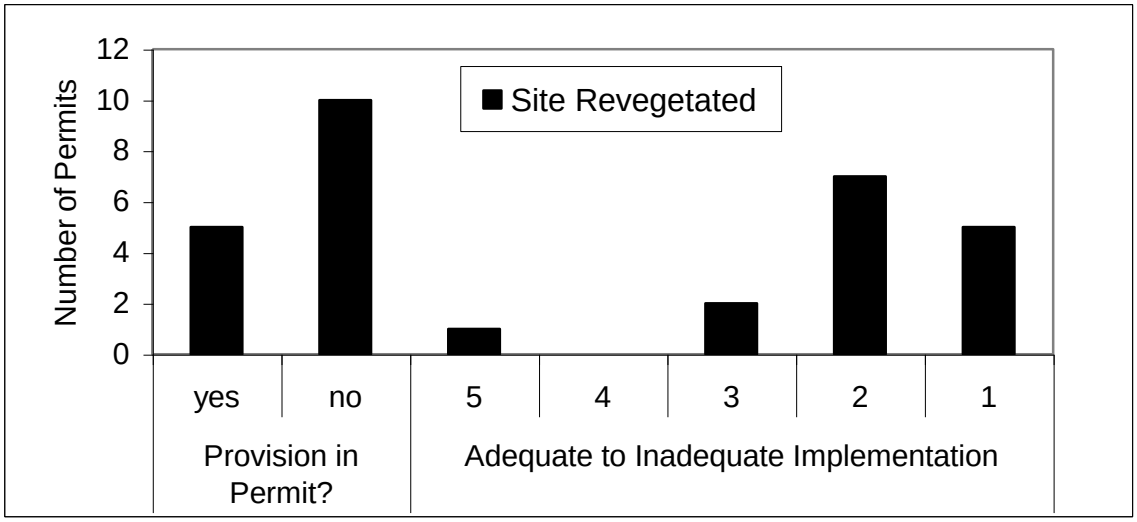

Figure 2. The number of Hydraulic Permits for Fresh Water Bank Protection containing re-vegetation provisions and implementation adequacy of re-vegetation as determined by field assessments.

It is interesting to note that overall permit compliance was judged mostly adequate to highly adequate when considering all types of provisions for freshwater bank protection (Fig. 3). This may be related to project age, that is, a lack of exposure to high flow events or other disturbances, and the inability of the evaluation team to determine compliance in some cases (e.g., it was difficult to determine if filter fabric was properly installed). Importantly, the judgment on overall compliance was often in contrast to project effectiveness as judged by the three summary effectiveness indicators (Fig.3). Most striking was the apparent disparity between overall compliance and the ability of the project to meet "no net loss" benchmark (Fig. 3).

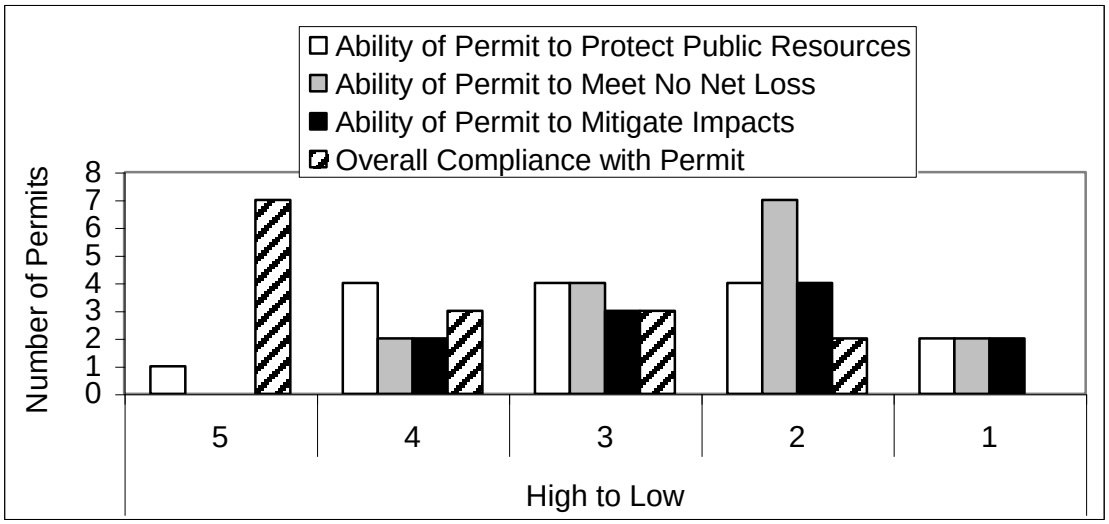

Figure 3. Three measures of permit effectiveness to protect public resources and overall permit compliance for Fresh Water Bank Protection.

Marine Water Bank Protection

Marine water bank protection permits had relatively high provision rates for *location of the bulkhead* (93%), *construction material for the bulkhead* (100%), *removal of material below the ordinary high water line* (OHWL; 86%), and *filling of depressions below the OHWL* (86%). The exception to high provision rate was the rate for placement of pea gravel (at 50%; Fig. 4), which likely reflects the perception on part of the permitting biologist that this provision was unnecessary in certain cases.

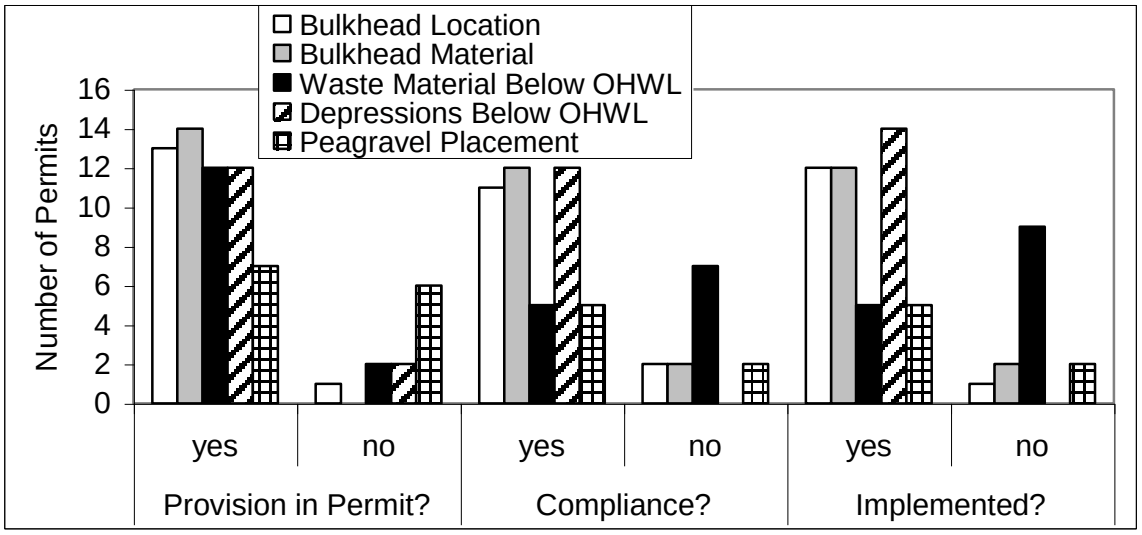

Figure 4. The number of Marine Bank Protection Hydraulic Permits that contained provisions, the number of permitted projects that complied with those provisions, and the number of permitted projects that implemented or met the intent of those provisions regardless of whether those provisions was included in the permit.

Compliance rates were relatively high (compared to other project types) for bulkhead location (85%), bulkhead material (86%) and for filling depressions below the OHWL (100%) but lower for pea gravel placement (54%) and very low for leaving waste material below the OHWL (42%). Implementation rates were equal to or slightly higher than compliance rates (Fig. 4) except for waste material below the OHWL (Fig. 4). Re-vegetation provisions were rare, occurring in only 7% of the marine bank protection permits, and implementation rates for re-vegetation efforts were largely judged as inadequate (Fig. 5).

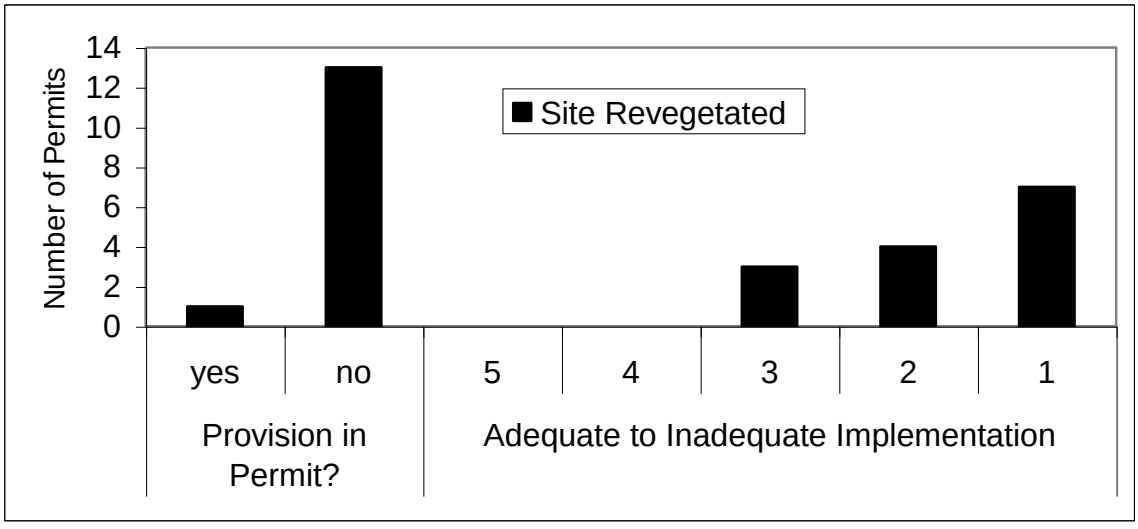

Figure 5. The number of Hydraulic Permits for Marine Bank protection containing re-vegetation provisions and implementation adequacy of re-vegetation as determined by field assessments.

Similar to fresh water bank permits, the overall compliance of marine bank permits was largely judged as highly adequate when measured across all categories for that permit (Fig. 6). However, this overall effectiveness was in sharp contrast to project effectiveness as measured by the three summary effectiveness indicators (Fig.6). Again the most striking finding was the apparent disparity between overall compliance and the ability of the project to meet the no net loss benchmark with over 50% of the projects getting a less than medium adequacy score (Fig. 6).

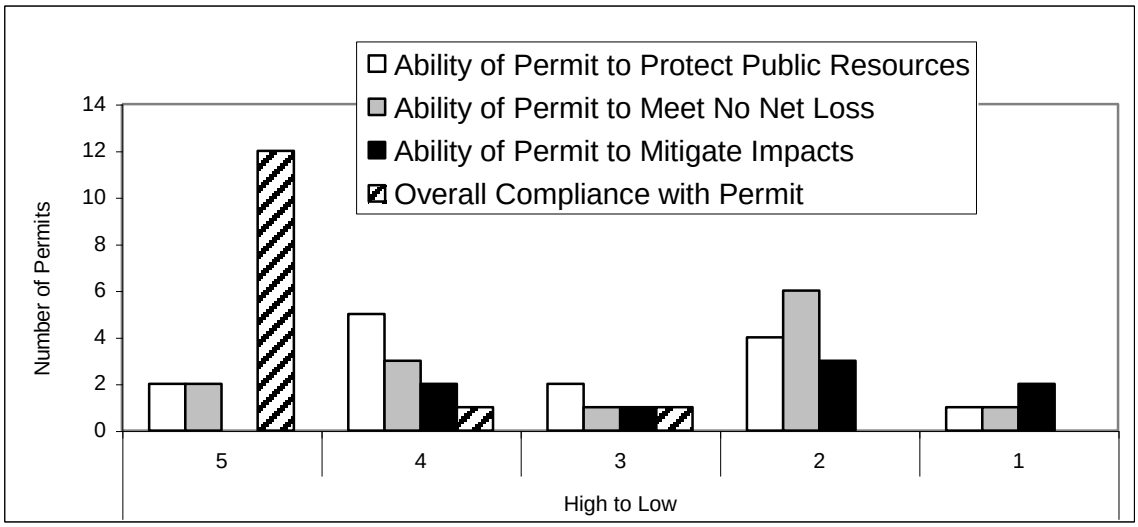

Figure 6. Three measures of permit effectiveness to protect public resources and overall permit compliance for Marine Bank Protection.

Culverts

Culvert permits had relatively high provision rates for *culvert size* (91%), moderate provision rates for the *burial of the culvert outlet* and *culvert slope* (both at 64%), and low provision rates for *substrate in the culvert* (20%; Fig. 7). Compliance rates were 38% for culvert size, 71% for burial of the culvert outlet, 57% for culvert slope, and 100% for substrate in the culvert (Fig. 7). Implementation rates across all culvert projects were approximately 50%.

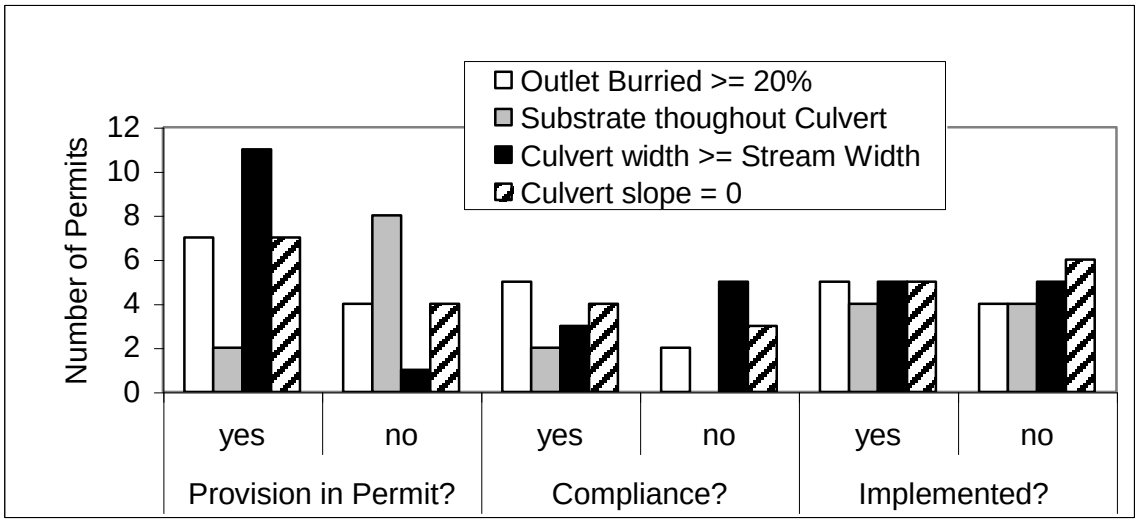

Figure 7. The number of Fish Passage Culverts Hydraulic Permits that contained provisions, the number of permitted projects that complied with those provisions, and the number of permitted projects that implemented or met the intent of those provisions regardless of whether those provisions was included in the permit.

Provision rate for inlet armoring and site revegetation were relatively high but implementation rate was much greater for inlet armoring than for site revegetation (Fig. 8). In addition, the majority of projects for inlet armoring were judged as adequate whereas the majority of revegetation efforts tended to less than adequate (Fig. 8).

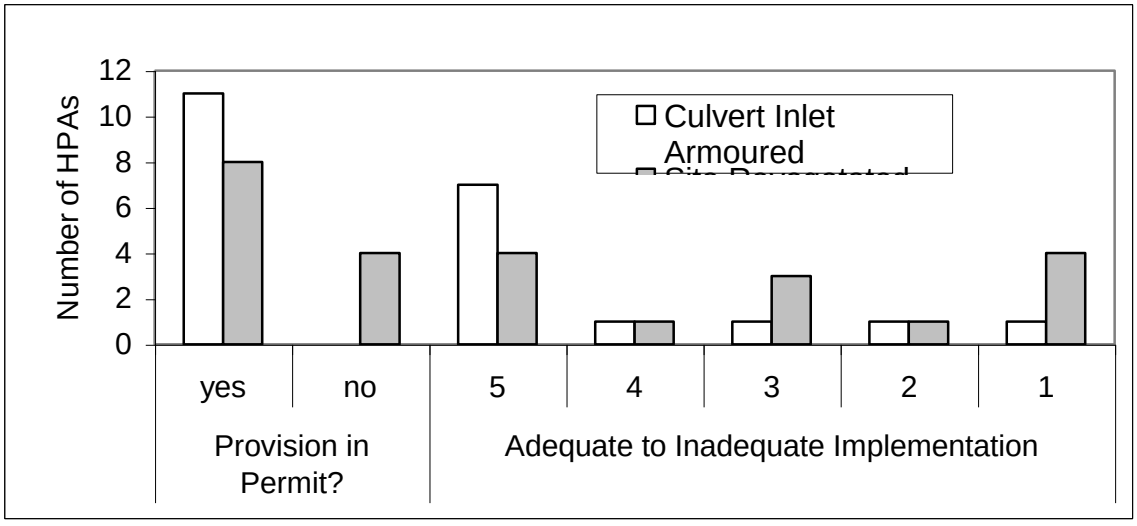

Figure 8. The number of Hydraulic Permits for Fish Passage Culverts containing re-vegetation and inlet armoring provisions, and implementation adequacy of those provisions as determined by field assessments.

Overall compliance scores were distributed more uniformly across ability categories for culverts than other permit types with the highest number of permits (4) receiving the worst rank (Fig. 9). Similar to other permit types, the *ability to culvert permits to protect public resources* was high relative to their *ability to mitigate impacts* or to *achieve no net loss*.

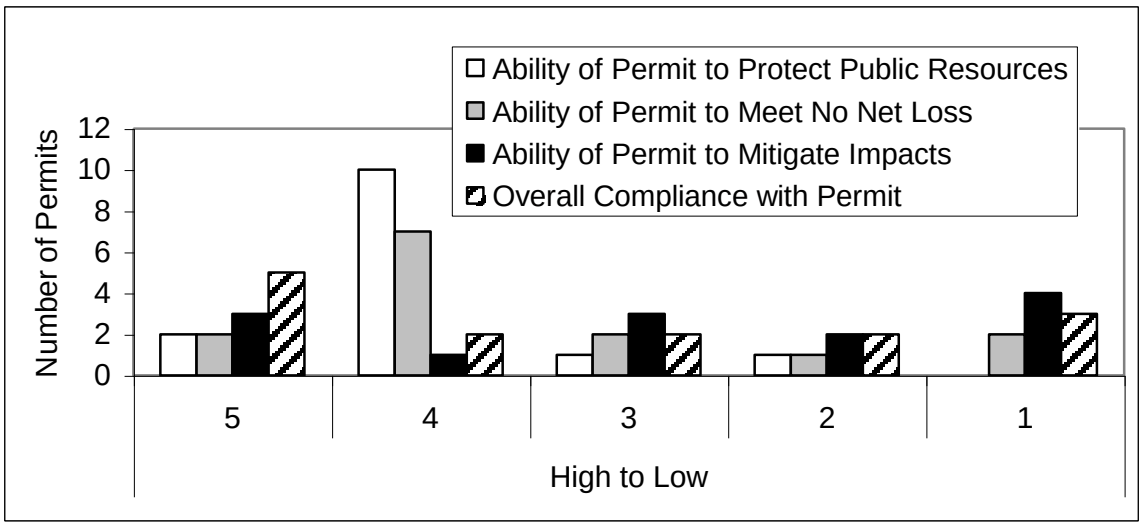

Figure 9. Three measures of permit effectiveness to protect public resources and overall permit compliance for Fish Passage Culverts.

Effectiveness Across All Project Types Combined

The weighted mean score for overall compliance on a scale of 5 (high) to 1 (low) across 58 projects was 4.1, where a score of 3.0 represents a medium ranking. The majority of projects, 34 of 58 (59%), received the highest score possible with the remaining 41% of the projects distributed relatively evenly across the remaining categories (Fig 10).

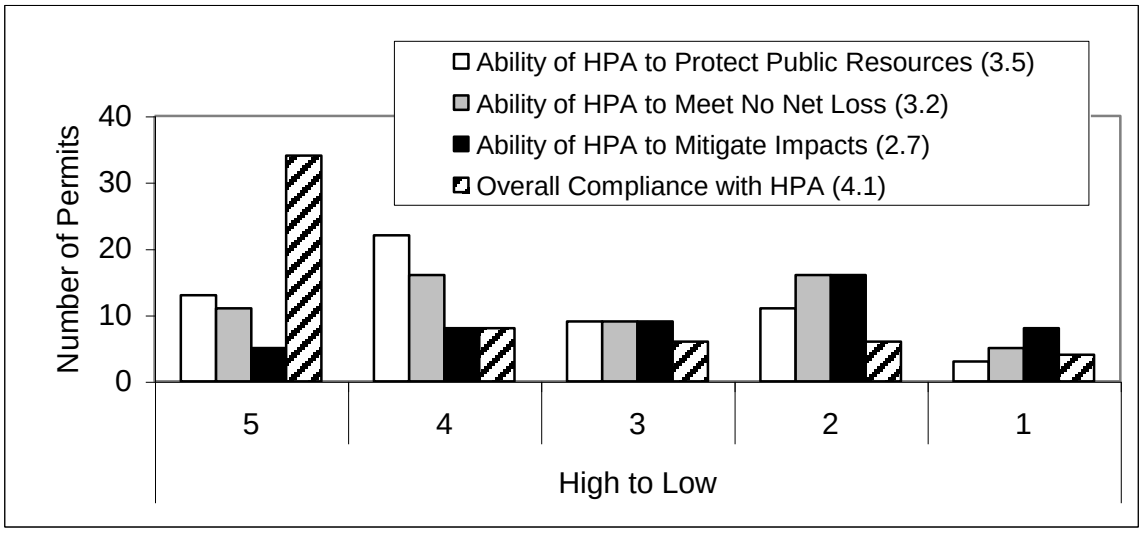

Figure 10. Three measures of permit effectiveness to protect public resources and overall permit compliance for Fresh Water Bank Protection, Marine Bank Protection, Fish Passage Culverts, Bridges, and Marine Over-water Structures. Numbers following the labels in the legend are the weighted mean score for that metric.

The weighted mean scores of effectiveness measures on a scale of 5 (high) to 1 (low) ranged from 2.7 for the ability of the implemented project to mitigate impacts to public resources to a high of 3.5 for the ability of implemented projects to protect public resources (Figure 10). The ability of projects to meet no net loss (3.2) and to mitigate impacts (2.7) was clearly the most difficult effectiveness measure to achieve even when overall compliance was judged relatively highly (4.1). While some projects types were more capable of reaching the highest standards for overall effectiveness than other types, the distribution of scores suggested that high levels of effectiveness for all projects were difficult to attain in practice.

DISCUSSION

We assessed provision, compliance, and implementation rates, and effectiveness of five types of Region 6 hydraulic permits based on an examination of the HPA permit and field visits to completed projects. In general, permits contained approximately 75% of important and applicable provisions for each permit type with marine bank protection tending to have the highest and culvert projects the lowest provision rates. Clearly not all provisions were viewed as equally important or as pertinent to each project type by permitting biologists, although we did not attempt to determine why some provisions that were theoretically applicable were excluded from the permit in this pilot survey.

Compliance rates varied by provision and permit type, with marine bank protection having the highest overall compliance rate for four of five common provisions. Bulkhead location, bulkhead materials, and elimination of depressions below the OHWL, and placement of pea gravel each had a high compliance rate. Removing waste material below the OHWL was a common provision with poor compliance. Culverts tended to have the lowest compliance rate among projects types but again the reason for this is unclear. It appears that the most important provisions (i.e., most important for protection of public resources) for each project type tended to have the highest provision and compliance rates, although this pattern was less apparent for fish passage culverts than other project types. It also appeared that compliance rates and measures of effectiveness were higher for activities that protected the project proponent's investment than activities unrelated to investments. For example, inlet armoring, which protects the culvert from washing away during high water was rated as relatively high in terms of adequacy, whereas vegetation adequacy for culvert permits was low, although a low provision rate for revegetation may also help explain this pattern.

One interesting finding was related to the relationship between provision and implementation rate. On average, implementation rate was higher than compliance rate across all project types. This result may be related to the fact that certain provisions were simply not considered necessary by permitting biologists to protect public resources due to the scope of the project. In these cases, field assessments would not be able to distinguish successful implementation from "unaffected pubic resources". Alternatively, project proponents may have met the intent of provisions despite the fact that those provisions were not explicitly written on the permit. One might expect such behavior with project proponents that have completed similar project in the past, have a vested interest in the feature functioning well (armor at the culvert inlet), or that have some training in aquatic science.

Provision, compliance, and implementation rates are indirect measures of HPA program effectiveness and thus provide only a glimpse of what is occurring on the ground. A better measure of HPA program effectiveness is related to how well public resources are protected during the construction of a project and through time. We measured effectiveness indirectly by asking the evaluation team to rate projects in terms of

their ability to cause *no net loss of fish life, or in the productive capacity of fish and shellfish habitat or functions* (WAC 220). Two findings were notable from this effectiveness assessment. First, the ability of the permit process to protect public resources, to meet the no net loss standard, and to a lesser degree, to mitigate the impacts of HPA projects was relatively low. That is, nearly 50% of all projects received a medium to low score on these measures. Second, despite the low effectiveness scores, field evaluations also indicated that overall compliance with permits was judged as relatively high. These findings seem to suggest that while permits may be doing an adequate job overall, they cannot entirely mitigate the negative effects of a project. In other words, many adequately implemented projects were judged to contribute to a measurable net loss of fish life or habitat.

Clearly marine bank protection projects tended to have higher provision, compliance, and implementation rates than fresh water bank protection or fish passage culverts projects. While it is not entirely clear why this was the case, we believe that it may be related to two issues: 1) Natural resource agencies, including WDFW, and Tribes have highlighted the need for better protection in this environment, which has come under extreme development pressure. This heightened level of scrutiny may result in better overall provision, compliance, and implementation rates form both permit biologists and project proponents, and 2) Construction of marine bank protection is a specialized field limited to relatively few contractors, who complete the majority of these projects. It may be that these contractors better understand and thus better implement important HPA guideline by virtue of their experience. Despite the fact that these rates were relatively high for marine bank permits, measures of effectiveness for marine bank protection were similar to other project types.

Assessments of HPA permits were based on single visits to the project site and thus could not be used to compare condition immediately after project completion against a consistent benchmark (i.e., undisturbed conditions). Some permits were designed to improve an already disturbed site (e.g., an undersized or failing culvert), whereas other permits were located in relatively undisturbed areas. In the case where a permit was issued to repair a failing culvert, the replacement culvert may have been viewed by the evaluation team as a net benefit in terms of effectiveness. Thus, it was not always clear what reference condition the evaluation team

was using to assess effectiveness. Further, because we sampled only recently completed projects, we mostly judged the effectiveness of projects before they were subjected to a major disturbance events, which are relatively common in the Pacific Northwest. If problems associated with the permit surface only after a disturbance event, then we probably overestimated the project effectiveness in this study. It is important to note that these potential problems (inconsistent benchmarks and predisturbance conditions) only serve to inflate effectiveness scores. In other words, effectiveness scores should be considered conservative until we can control for confounding effects.

The ability of projects to meet no net loss and to mitigate impacts is clearly the most difficult to achieve even as the overall compliance (mean weighted score of 4.1) was judged relatively highly. Again, the pattern here could change if we were able to distinguish between permits for new versus repair activities or between projects that have or have not experienced a major storm event.

Survey questionnaires are notoriously subject to personal interpretation and bias and therefore often include multiple questions phrased in different ways that address similar information. The inclusion of three different effectiveness questions, which have similar but slightly different meanings, was our attempt to get an overall impression of HPA project effectiveness. Based on our results, we suggest that the "ability of project to mitigate impacts " was considered the most difficult outcome to achieve, followed by the "ability to meet a no net loss outcome", and then the "ability to protect public resources". Regardless of the way these questions were worded, the pattern of answers appeared to be remarkably similar across project types. While individual projects can achieve very good outcomes by any of our measures of effectiveness, the overall outcomes to protect public resources at the program level are relatively low.

Our results suggest that it is possible to make immediate improvements to the HPA program by ensuring that all pertinent provisions are included on each permit. Judging from survey results of marine bank protection permits, it also appears that we *can* attain high compliance and implementation rates under the right circumstances, although we did not investigate what constitutes the right circumstance in this study. Parenthetically, we suspect that marine bank protection permits were subjected to more scrutiny by the

Department as well as other entities and that this probably contributed to higher compliance rates. Improving levels of success in achieving *no net loss* is a more complex enterprise. Notwithstanding issues of different baseline conditions or subjectivity in effectiveness ratings, it appears that each project type *can* at least meet high standard of resource protection despite the fact the vast majority did not. Even if we come to believe that no project can be completely mitigated during the permitting process, judging from results of the effectiveness questions, there is room for improvement. To that end, it might be useful to study projects that met the highest levels of effectiveness so that we can apply similar processes to other projects.

The HPA survey process requires improvements as well. The HPA database should readily accommodate queries for audits and effectiveness surveys. This means that the Olympia office has copies of all permit documents, all information is included in those documents, and information is readily accessible by query. We need to better define survey questions related to effectiveness so that subjectivity is minimized and better train and equip field staff so that surveys become more accurate and repeatable. Despite the problems we encountered in conducting the pilot study, we learned a good deal about the capabilities of the existing program to accommodate critical review. We can make immediate small-scale improvement to the HPA process based on this study. However, until we institutionalize an adaptive management approach to the HPA program, we will struggle with answering the big question – are public resources adequately protected by the HPA program?

Appendix A

Section 4 Field Review of HPA Project:

Freshwater Bank Protection (073007)

Date of field review: *Date HPA was issued:* *HPA #:* _____

Project GPS verified location: _____

JARPA listed GPS location: _____

Land owner contact: _____

Contact Information: _____

Name(s) of reviewers: _____

Other Participants: _____

NOTE: Evaluate only one project site for multiple site HPAs. Stay within 150 feet of structure when making channel measurements. Take project site photograph and mark view point on HPA plans/map.

1) Was this site exposed to ≥ one high flow event or winter season? Yes ☐ No ☐

2) Does material constrict BFW relative to preproject conditions? Yes ☐ No ☐
If no, what was BFW prior_____; and after_____?
Was this a provision in the HPA? Yes ☐ No ☐

3) Does the HPA or plan have provision for wood or boulder placement for mitigation? Yes ☐ No ☐

4) Will the project withstand a 100 year flow event without impacting habitat? Yes ☐ No ☐

5) Do materials and construction techniques prevent soil from reaching the water? Yes ☐ No ☐
Was this a provision in the HPA or plans? Yes ☐ No ☐

6) At what distance, perpendicular to the OHWL, does the structure prevent riparian tree presence/growth? Actual value: _____

7) Is the site revegetated? Circle for quality: **Very high to very low**

5 4 3 2 1

Was revegetation a provision in the HPA or part of plan? Yes ☐ No ☐

8) Of the assessable provisions not covered above, describe any non-compliance issues in the box below.

9) Does the HPA or plans specify any mitigation actions beyond Avoid and Minimize? Yes ☐ No ☐

If yes, did applicant conduct all these mitigation actions? Yes ☐ No ☐

10) In your opinion, does the HPA or plan provide mitigation provisions resulting in a no-net loss of habitat/function? Yes ☐ No ☐

11) Based on site conditions, what provisions could WDFW have included in the HPA or plans/specifications to improve the protection of fish life/habitat? For example, the approved work window conflicts with Olympic Mud Minnow hibernation life stage. Change window to 7/4 and no work shall occur after sunset.

12) Was the project completed as described in the approved HPA or plans? Yes ☐ No ☐

Describe **all** apparent differences and potential resource effects in the box below.

13) In your opinion did the applicant go beyond the minimum requirements called for in the HPA and plans to protect public resources? Yes ☐ No ☐

Describe activities that go beyond the minimum requirements and potential resource benefits:

Questions 14-18 refer to preproject conditions (please see definitions below). Based on your best professional judgment how would you rate: (Please circle one score for each question).

14) **Preproject condition** (i.e., immediately preceding the current project) of fish habitat at the project site. See definitions of (un)disturbed below.	5 4 3 2 1 (Undisturbed to very disturbed) (see definitions below)
15) Ability of the provisions written in HPA to protect/maintain fish habitat capacity over time relative to **preproject conditions**.	5 4 3 2 1 (Very high to very low)
16) Ability of work as implemented to meet "no net loss" of fish habitat capacity relative to **preproject conditions**.	5 4 3 2 1 (Very high to very low)
17) Ability of mitigation (beyond Avoid and Minimize) to achieve **preproject conditions** in fish habitat capacity.	5 4 3 2 1 (Very high to very low)
18) Ability of the provisions to *improve* fish habitat capacity above and beyond **preproject conditions**.	5 4 3 2 1 (Very high to very low)
19) Ability of work as implemented to meet "no net loss" of fish habitat capacity relative to **undisturbed conditions**.	5 4 3 2 1 (Very high to very low)
20) The applicant's overall compliance with HPA provisions.	5 4 3 2 1 (Very high to very low)

Definitions: Numerical Rating Scale

Very High (5): The project does not reduce habitat capacity anywhere near the project site.

Medium (3): The project moderately reduces habitat capacity at two of three areas at or near the project site (i.e., above the site, at the site, or below the site, **OR** dramatically reduces habitat capacity at one of the areas near the site.

Very Low (1): The project moderately reduces habitat capacity at all three of the areas at or near the site, above the site, at the site, and below the site **OR** dramatically reduces habitat capacity at two or more of the areas near the site.

Habitat Capacity is defined as the ability of a habitat to provide functions (e.g., rearing and spawning habitat) consistent with that sites' potential to provide those same functions.

Undisturbed. This hypothetical state reflects site conditions as you imagine them to be with a minimum of historic human activity at the project site or in the watershed.

Very Disturbed. This state represents dysfunctional habitat at the site (e.g., impassible culvert).

Preproject Conditions are conditions of fish habitat at a site immediately preceding the current project.

Section 4 Field Review of HPA Project:

Over Water Structures (piers, docks, and floats, 073007)

Date of field review: *Date HPA was issued:* *HPA #:* _____

Project GPS verified location: _____

JARPA listed GPS location: _____

Land owner contact: _____

Contact Information: _____

Name(s) of reviewers: _____

Other Participants: _____

NOTE: Evaluate only one project site for multiple site HPAs. Stay within 150 feet of structure when making channel measurements. Take project site photograph and mark view point on HPA plans/map.

1) Was this site exposed to ≥ one high flow event or winter season?	Yes ☐	No ☐
2) Does the length of the structure exceed the maximum allowed under the HPA or plan? List actual length: _____	Yes ☐	No ☐
Was length a provision in the HPA or plan?	Yes ☐	No ☐
3) Does the width of the structure exceed the maximum allowed under the HPA or plan?	Yes ☐	No ☐
Was width a provision in the HPA or plan?	Yes ☐	No ☐
4) Is the structure grated as described in the HPA or plan?	Yes ☐	No ☐
Was grating a provision in the HPA or plan?	Yes ☐	No ☐
5) If grating is used, does stored material block sunlight?	Yes ☐	No ☐
Was this a provision in the HPA or plans?	Yes ☐	No ☐
6) Was the material storage on grating a restriction in the HPA or plan?	Yes ☐	No ☐
7) Does the HPA or plan prohibit grounding of the dock?	Yes ☐	No ☐
Was this a provision in the HPA or plan?	Yes ☐	No ☐
8) Is floatation fully enclosed as to prevent the breakup of material into the water?	Yes ☐	No ☐
Was this a provision in the HPA or plan?	Yes ☐	No ☐

9) Does the HPA or plan include a provision to prevent anchor damage to the bed? Yes ☐ No ☐

10) Does the anchor system prevent damage to the bed beyond the footprint? Yes ☐ No ☐

11) Is the site revegetated? (circle one) 5 4 3 2 1
(Very high to very low)

Was vegetation a provision in the HPA or part of plan? **Yes** ☐ **No** ☐

12) Of the assessable provisions not covered above, describe any non-compliance issues in the box below.

13) Does the HPA specify any mitigation actions beyond Avoid and Minimize? Yes ☐ No ☐
If yes, did applicant conduct the mitigation action? Yes ☐ No ☐

14) In your opinion, does the HPA or plan provide mitigation provisions resulting in a no-net loss of habitat/function? Yes ☐ No ☐

15) Based on site conditions, what provisions could WDFW have included in the HPA or plans/specifications to improve the protection of fish life/habitat?

16) Was the project completed as described in the approved HPA or plan? Yes ☐ No ☐

Describe **all** apparent differences and potential resource effects in the box below.

17) In your opinion did the applicant go beyond the minimum requirements called for in the HPA and plans to protect public resources? Yes ☐ No ☐

Describe activities that go beyond the minimum requirements and potential resource benefits:

Questions 18-22 refer to **preproject conditions** (please see definitions below). Based on your best professional judgment how would you rate: (Please circle one score for each question).

18) **Preproject condition** of fish habitat capacity at the project site. 5 4 3 2 1
(See definitions of (un)disturbed below) **(Undisturbed to very disturbed)**

19) Ability of the provisions written in HPA or plans to protect/maintain fish habitat capacity over time relative to **preproject conditions**. 5 4 3 2 1 (Very high to very low)

20) Ability of work as implemented to meet "no net loss" of habitat capacity relative to **preproject conditions**. 5 4 3 2 1 (Very high to very low)

21) Ability of mitigation (beyond Avoid and Minimize) to achieve **preproject conditions** in fish habitat capacity. 5 4 3 2 1 (Very high to very low)

22) Ability of the provisions to *improve* fish habitat capacity above and beyond **preproject conditions**. 5 4 3 2 1 (Very high to very low)

23) Ability of work as implemented to meet "no net loss" of fish habitat capacity relative to **undisturbed conditions**. 5 4 3 2 1 (Very high to very low)

24) The applicant's overall compliance with HPA provisions. 5 4 3 2 1 (Very high to very low)

Definitions: Numerical Rating Scale

Very High (5): The project does not reduce fish habitat capacity anywhere near the project site.

Medium (3): The project moderately reduces fish habitat capacity at two of three areas at or near the project site (i.e., above the site, at the site, or below the site, **OR** dramatically reduces habitat capacity at one of the areas near the site.

Very Low (1): The project moderately reduces fish habitat capacity at all three of the areas at or near the site, above the site, at the site, and below the site **OR** dramatically reduces habitat capacity at two or more of the areas near the site.

Habitat Capacity is defined as the ability of a fish habitat to provide functions (e.g., rearing and spawning habitat) consistent with that sites' potential to provide those same functions.

Undisturbed. This hypothetical state reflects site conditions as you imagine them to be with a minimum of historic human activity at the project site or in the watershed.

Very Disturbed. This state represents dysfunctional fish habitat at the site (e.g., impassible culvert).

Preproject Conditions are conditions of fish habitat at a site immediately preceding the current project.

Section 4 Field Review of HPA Project:

Fish Passage Projects Culverts

(73007)

Date of field review: *Date HPA was issued:* *HPA #:* _____

Project GPS verified location: _____

JARPA listed GPS location: _____

Land owner contact: _____

Contact Information: _____

Name(s) of reviewers: _____

Other Participants: _____

NOTE: Evaluate only one project site for multiple site HPAs. Stay within 150 feet of structure when making channel measurements. Take project site photograph and mark view point on HPA plans/map.

1) Was this site exposed to ≥ one high flow event or winter season? Yes ☐ No ☐

2) Is ≥ 20% of the culvert at the outlet below the level of the streambed? Yes ☐ No ☐
List actual value: _____%
Was this a provision in the HPA or plans? Yes ☐ No ☐

3) Does substrate covers the entire length of culvert? Yes ☐ No ☐
If no, ocular estimate of length with substrate _____(%):

4) Culvert streambed width ≥ to streambed (toe)width? Yes ☐ No ☐
Culvert streambed width:_____ Actual streambed (toe)width: _____
Was this a provision in the HPA or plans? Yes ☐ No ☐

5) Actual culvert diameter:_____ Actual BFW: _____
Was this a provision in the HPA or plans ? Yes ☐ No ☐

6) Does the culvert length meet HPA specifications? Yes ☐ No ☐
Actual value: _____

Was this a provision in the HPA or plans? Yes ☐ No ☐

7) If not a stream simulation design, is culvert placed at zero slope? Yes ☐ No ☐
Actual slope value: _____in degrees.
Was this a provision in the HPA or plans? Yes ☐ No ☐

8) Ability of inlet armoring to protect against flood scour? (circle one) 5 4 3 2 1
(Very high to very low)

Was this a provision in the HPA or part of plan? Yes ☐ No ☐

9) Is the site revegetated? (circle one) 5 4 3 2 1
(Very high to very low)

Was revegetation a provision in the HPA or part of plan? Yes ☐ No ☐

10) Of the assessable provisions not covered above, describe any non-compliance issues in the box below.

11) Does the HPA specify any mitigation actions beyond Avoid and Minimize? Yes ☐ No ☐

If yes, did applicant conduct the mitigation action? Yes ☐ No ☐

12) In your opinion, does the HPA or plan provide mitigation provisions resulting in a no-net loss of habitat/function? Yes ☐ No ☐

13) Based on site conditions, what provisions could WDFW have included in the HPA or plans/specifications to improve the protection of fish life/habitat?

14) Was the project completed as described in the approved HPA or plans? Yes ☐ No ☐

Describe **all** apparent differences and potential resource effects in the box below.

15) In your opinion did the applicant go beyond the minimum requirements called for in the HPA and plans to protect public resources? Yes ☐ No ☐

Describe activities that go beyond the minimum requirements and potential resource benefits:

Questions 16-21 refer to preproject conditions (please see definitions below). Based on your best professional judgment how would you rate: (Please circle one score for each question).

16) Pre-project condition (i.e., immediately preceding the current project) of fish habitat at the project site. See definitions of (un)disturbed below. 5 4 3 2 1 (Undisturbed to very disturbed)

17) Ability of the provisions written in HPA to protect/maintain fish habitat capacity over time relative to **preproject conditions**. 5 4 3 2 1 (Very high to very low)

18) Ability of work as implemented to meet "no net loss" of habitat/function relative to **preproject conditions**. 5 4 3 2 1 (Very high to very low)

19) Ability of HPA mitigation (beyond Avoid and Minimize) to achieve **preproject conditions** in habitat/function. 5 4 3 2 1 (Very high to very low)

20) Ability of the provisions to *improve* habitat capacity above and beyond **preproject conditions**. 5 4 3 2 1 (Very high to very low)

21) Ability of work as implemented to meet "no net loss" of habitat/function relative to **undisturbed conditions**. 5 4 3 2 1 (Very high to very low)

22) The applicant's overall compliance with HPA provisions. 5 4 3 2 1 (Very high to very low)

Definitions: Numerical Rating Scale

Very High (5): The project does not reduce habitat capacity anywhere near the project site.

Medium (3): The project moderately reduces habitat capacity at two of three areas at or near the project site (i.e., above the site, at the site, or below the site, **OR** dramatically reduces habitat capacity at one of the areas near the site.

Very Low (1): The project moderately reduces habitat capacity at all three of the areas at or near the site, above the site, at the site, and below the site **OR** dramatically reduces habitat capacity at two or more of the areas near the site.

Habitat Capacity is defined as the ability of a habitat to provide functions (e.g., rearing and spawning habitat) consistent with that sites' potential to provide those same functions.

Undisturbed. This hypothetical state reflects site conditions as you imagine them to be with a minimum of historic human activity at the project site or in the watershed.

Very Disturbed. This state represents dysfunctional habitat at the site (e.g., impassible culvert).

Preproject Conditions are conditions of fish habitat at a site immediately preceding the current project.