Allocating FWS funds available for projects under the National Fish Habitat Action Plan

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Background

Legal, regulatory, and political context

The National Fish Habitat Action Plan (http://fishhabitat.org/) was developed by a diverse group convened by the Association of Fish and Wildlife Agencies (AFWA), and was signed by leaders of AFWA, the Department of Interior, and the Department of Commerce in 2006. The Action Plan does not have specific legal authorization, though legislation has been introduced in Congress, but not passed. The National Fish Habitat Partnership is a voluntary framework for public and private partners to improve conservation of fish and aquatic communities by protecting, restoring, and enhancing their habitats. Since signature of the Action Plan, the National Fish Habitat Partnership (NFHP) has promoted a business model of leverage. A key tenant of NFHAP is the concept that Fish and Wildlife Service funds would be leveraged by the FHPs.

The Action Plan has enjoyed strong support of state agencies, major NGOs, federal agencies, and Congress. Congress provided funds to the Fish and Wildlife Service in 2006, and the Administration has requested funds each year since, to a current level of $7.1 million. Fish Habitat Partnerships are the primary work units of NFHP, identifying strategic priorities supported by diverse public and private partners. The National Fish Habitat Board has approved 18 Fish Habitat Partnerships throughout the U.S. FWS provides approximately $3.3 million annually to address strategic priorities of FHPs, and supports FHP operations by funding through FWS Regional Fisheries Programs. Additionally, each of the eight Regions of the Service receives $337,000 (in 2012) to support Regional coordination and support of FHPs. Headquarters received approximately $711,000 (in 2012). The Regions and Headquarters have tremendous leeway in how these funds are expended.

Ecological context

Fish populations in the U.S. have benefited from habitat protection under regulatory approaches such as the Clean Water Act and the Endangered Species Act. However, these measures have not kept pace with changes in land use and population increases. Fish habitats continue to decline in many places across the U.S., and no fish species listed under the Endangered Species Act has been recovered. The Action Plan provides a framework to enlist landowners, local communities, businesses, and other diverse partners to address root causes of fish habitat decline. It is more cost efficient to protect healthy habitat and populations from future degradation than it is to restore habitat once degraded. At this time, however, the funding considered in this allocation methodology cannot be used to purchase fee title or easement ownership of property, mineral, or water rights. Protection is the top priority of NFHP, but this funding mechanism has limited utility toward that end.

The Structured Decision Making Approach

The array of possible approaches to allocate project funds is broad, but has been narrowed by extensive discussion over several years by the FMT and the National Fish Habitat Board. In November 2011, the FMT agreed to a conceptual framework, developed by a team of Regional NFHP Coordinators from Regions 1, 3, 4, and 5, that is structured around three functional tiers: a base allocation, equal across FHPs, to support operations; a proportion of the remaining budget allocated through a competitive process for science and monitoring activities; and a variable allocation to FHPs for conservation projects. Allocation in the third tier should be formula-based, including the following considerations: 1) Strategic Habitat Conservation, 2) protection of high-quality intact habitat, 3) restoration with measurable results and outcomes, 4) complexity of FHP operations, and 5) demonstration of the ability to achieve the intended results. This framework provides the skeleton of a funding allocation formula. The challenge that remains is to identify the optimal levels of operational and science investment, and the formula for allocating project funds among FHPs. In December 2011, the Fisheries Management Team tasked the Regional coordinators with using the Service's structured decision-making process (Figure 1) to provide recommendations for finalizing an allocation methodology. This report is outlined to follow **PrOACT** by first defining the **Pr**oblem, identifying **O**bjectives, developing **A**lternatives, determining the **C**onsequences of those alternatives, and analyzing **T**radeoffs and optimization to come to a final recommendation. The coordinator's group is not the decision-maker and therefore, has provided only a refined list of alternatives for consideration and not a recommendation.

Structured Decision Making Steps:

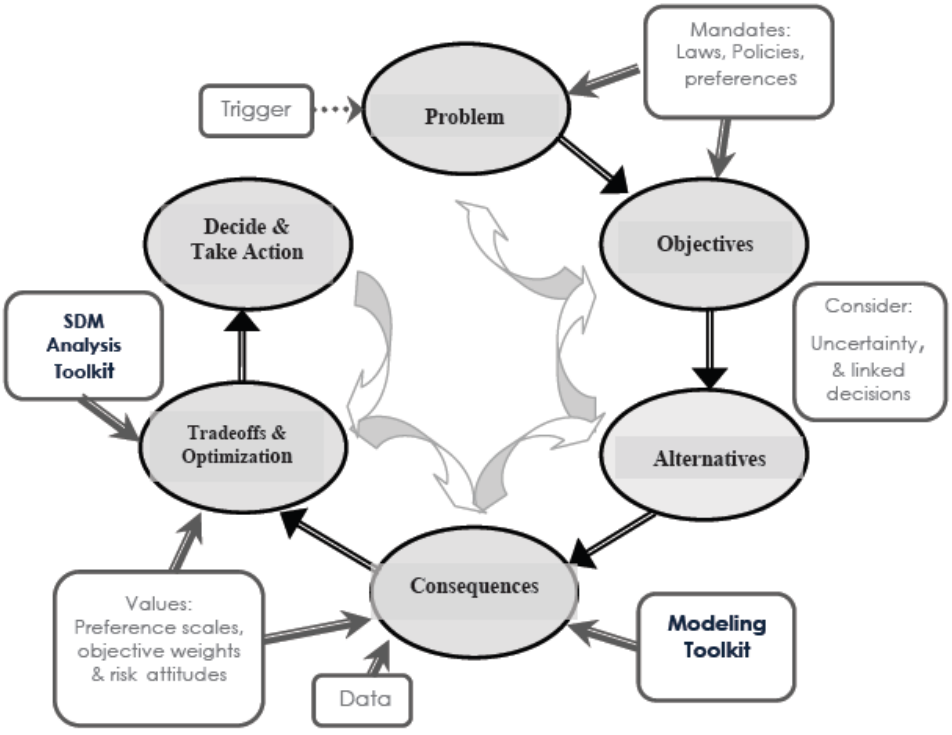

Figure 1: Flow of structured decision making

Decision Problem

Each year in October, the Director of the Service, with advice from the Fisheries Management Team (FMT), allocates funding to address priorities of Fish Habitat Partnerships (FHPs) for the National Fish Habitat Partnership. The Service then distributes the funds to projects that "protect, restore, or enhance fish and aquatic habitats or otherwise directly support habitat-related priorities of Fish Habitat Partnerships" (FWS Manual 717 FW 1). Initially, this allocation was made based on two tiers. Larger FHPs received twice the allocation of smaller FHPs. As the number of partnerships grew (to 18 as of January 2012), funding grew at a slower rate. Older partnerships maintained the status quo while additional funds were dispersed equally among additional FHPs as they were recognized and funds were increased, resulting in an unequal distribution of project funds. The number of FHPs has begun to stabilize; the Service would like to develop a more equitable, transparent, and strategic formula for annual funding allocation.

The allocation formula should help achieve the long-term vision and goals of the Service and NFHP to promote effective fish habitat conservation using sound science and principles of accountability. The FHPs vary widely in geographic scope, in aquatic habitat quality, in the number of trust aquatic species, in the complexity of their operations, and in their fish habitat conservation priorities. The allocation formula should take into account these factors while meeting the Director's guidelines of sound science and incorporation of Strategic Habitat Conservation (SHC). The allocation method should remain stable over time, but the allocations to individual FHPs could change. Changes in allocation could result from the performance of the FHPs, new information gathered from habitat assessments developed by each FHP, and/or from changes in aquatic and landscape conditions, management opportunities, and fish habitat priorities in the FHPs. Given the dynamic nature of the National Fish Habitat Partnership, the allocation method should be flexible to accommodate increases or decreases in the number of FHPs, as well as changes to the total budget allocated for this work.

Thus the decision problem is how to allocate an annual budget to the existing number of FHPs, following the three-tiered framework described above. The *objectives* are multi-faceted and reflect what is necessary to reach our desired future aquatic habitat condition nationally. The *alternatives* represent a spectrum of possible approaches to allocating a fixed budget to eligible FHPs (17 in FY12, 18 in FY13). The allocation method will be founded on a *predictive model* that links each alternative to the long-term outcomes of the program. Ideally, the predictive model will be expressed as a formula that provides an *optimal allocation* to achieve the objectives. The formula would take as input, the total available budget, number of FHPs and proxy descriptors of the FHPs (such as area, aquatic habitat condition, number of trust species, stressors, partnership performance.

Critical challenges to development of this allocation formula will be:

- articulating the long-term objectives of NFHP nationally,
- linking the allocation of funds among FHPs to those national objectives,
- assessing performance of FHPs with respect to those national objectives, and
- within an SHC paradigm, assessing the value of coordination, science, and on-the-ground habitat conservation in achieving those long-term objectives.

In the end, the goal is development of an enduring and efficient allocation process that transparently links FHP funding decisions to the long-term objectives of the Fisheries Program at a national level.

Objectives

The overarching fundamental objective identified in the workshop was to maximize sustainability of aquatic species populations (fish and other species). However, on a national scale, that objective is not controllable within the context of a decision on NFHAP funding allocation. In other words, the Fisheries Program will not measurably affect sustainability of aquatic species by its allocation decisions except over the long term. Therefore the group identified three "means objectives" that could be measured as proxies to reflect progress toward achieving sustainable aquatic species populations. Each of the means objectives represent a contribution of project dollars within the three funding tiers identified in the problem statement.

- Fish Habitat Partnership operations: funds to provide staffing and operational support to ensure effectiveness of FHPs.
- Science investment: biological planning, conservation design, outcome-based monitoring, and assumption-based research (including inventory and monitoring) activities that increase effectiveness and efficiency of conservation delivery.
- Fish habitat conservation projects: on-the-ground, cost-shared projects to protect, restore, and enhance fish habitats or otherwise directly support habitat-related priorities of Fish Habitat Partnerships.

The group identified other objectives that are important to the Service and the Fisheries Program. Details on the measurable attributes can be found in Table 2.

- Maximize FWS capacity to support FHPs
- Maximize the Service's flexibility to cope with short-term (emergency) budget shortfalls
- Maximize transparency
- Maximize cohesiveness of the national fisheries program
- Maintain NFHP structure and maximize dynamic partnerships
- Performance-based feedback
- Maximize ease of implementation

Alternative Actions

The FWS project funding available ($3.3 million in 2012) is not by itself sufficient to make a large difference in fish habitat conservation nationwide. All the funds could be dedicated to the conservation priorities of any one FHP to good effect. Based on our collective knowledge of the function, form and needs of the current FHPs, the group identified 4 highly contrasting alternatives, generalized as follows:

I. Coordinator Alternative: This alternative is driven by the belief that if limited funds were used to pay the salary and operations of a skilled, energetic, driven individual to coordinate the operations, outreach, project management, and other activities of an FHP, that FHP would be far more effective in getting projects completed on the ground

because they would be able to leverage far more resources than in the absence of a coordinator. This philosophy also assumes that there would be an increase in the effectiveness of the partnership through strategic project selection and potentially targeting of projects with a dedicated, well informed and focused coordinator driving decision-making. The FHP would be strategic in completing projects as opposed to opportunistic.

II. Science/Assessment Alternative: This alternative presupposes that using scientific information, such as habitat condition assessments, positions an FHP to make more strategic and targeted decisions with respect to putting habitat projects on the ground. By focusing the use of funds to generate the necessary assessment information, efficiency is gained by in-turn choosing better quality projects (those more likely to help the FHP meet their objectives). It is also anticipated that the partnership will create additional leverage by providing assessments and other scientifically derived tools to partners, local and regional governments and local conservationists to make more informed decisions that could also meet FHP objectives when selecting and completing projects.

III. Projects Alternative: Under this alternative, FHPs would be given funds solely to complete on-the-ground projects using which ever resources they have available. Depending on the FHP they may choose projects completely opportunistically or quite strategically or anywhere in between. The alternative assumes that the only thing an FHP needs to do to be effective and efficient at maximizing on-the-ground conservation is by investing directly in on-the-ground projects.

IV. Regional or Jeffersonian Alternative: This alternative is derived from the belief that FHPs may have many different needs, that they are all unique, and that the Service's Regional coordinators and other local staff are in the best position to decide what and how much to fund in order to maximize effective conservation.

It was obvious to the entire team that likely a mixture of the first three alternatives (outlined above) would be necessary to support effective efficient FHPs. The fourth alternative diverges from what we should fund to how we should fund. Ultimately the first three alternatives became funding tiers for a slate of 10 proposed alternatives (Appendix A) that includes alternative IV above.

Allocation among tiers

Through an iterative process of rapid prototyping, the group reduced our list of alternatives for consideration to 4 (Table 1). Each alternative details how funding would be allocated across the three tiers of I) an allocation to support operations (primarily coordination), II) an allocation for science and monitoring activities, and III) an allocation for conservation projects. These alternatives do not address the critical question of how to allocate funds among FHPs. Each of the first three alternatives places funding priority on the respective tier. Alternative D (Regional Discretion) allocates the money to the Regions and leaves the details for how funding will be allocated across the three tiers largely to those Regions.

Allocation among FHPs

Allocation among FHPs received little attention as part of this process. The results of our limited discussion can be found in Appendix B for reference.

Predictive model

The fundamental objective of NFHP is sustained aquatic populations. Our ability to reach this objective through allocation of funds is a function of the availability of on-the-ground project funds and the efficiency of the FHP. We have identified three primary investment avenues of influence on these two functions, operations (FHP coordination), science (assessment and monitoring), and direct project investment. The level of influence of each of these investments is a function of the degree to which that investment can be leveraged and the extent to which that investment is effective.

Leverage

1. In the context of this model, leverage is defined as the ability to attract additional cash and in-kind resources to advance the objectives of an FHP. Leverage differs greatly across the landscape depending on partners and their available resources. Some regions agreed that investment in full time, stable coordination will result in significant leveraging if the correct person is hired. This assumes that the coordinator writes grant applications, manages them, and actively seeks leveraging from partner agencies. Some Regions felt that an additional outlay in science would produce significant improvements in meeting FHP goals through directing the investment of other partners. This assumption is based on the fact that partners had large sums of money for projects and that we could direct/influence their implementation if we supported the science products.

Alternative	Tier I	Tier II	Tier III
A Coordinator Focus	Up to $140K per FHP for a Coordinator, and using a standard PD	None (i.e., no national competition)	Remainder (~$700K) distributed to Tiers II & III by method A, B, or C.
B Assessment Focus	$90K per FHP (FHP could use for projects)	None (i.e., no national competition)	Remainder (~$1.7M) distributed by method A, B, or C. Initially spend on assessment tool to be completed by 2015. Discretion of FHP between Tier II & III thereafter.
C Project Focus	$50K per FHP that goes to lead region	20% (~$460K), for assessment & monitoring. Seek 1:1 match from LCCs.	80% (~$1.84M) distributed to Tiers II & III by method A, B, or C
D	Allocation by A, B, C to Regions		

Alternative	Tier I	Tier II	Tier III
Regional Discretion	Use A, B, C to generate a score for each FHP Rank FHPs by score into 3 bins (3:2:1) No bonus to lead Region		

Table 1: Alternatives Evaluated using 3-tiered system. Additional detail about funding tiers can be found in Appendix

Effectiveness

In the context of this model, effectiveness is defined as the extent to which the FHP can identify the best projects in the best places and use the best practices to protect and restore habitat to sustain aquatic populations. The team understands that the better informed an FHP, the more effective they are likely to be in making conservation decisions. The team also understands that science and communication with others in the conservation community and those that own and/ or manage the habitat are important factors in increasing the effectiveness of individual habitat projects in meeting the objectives of the FHP.

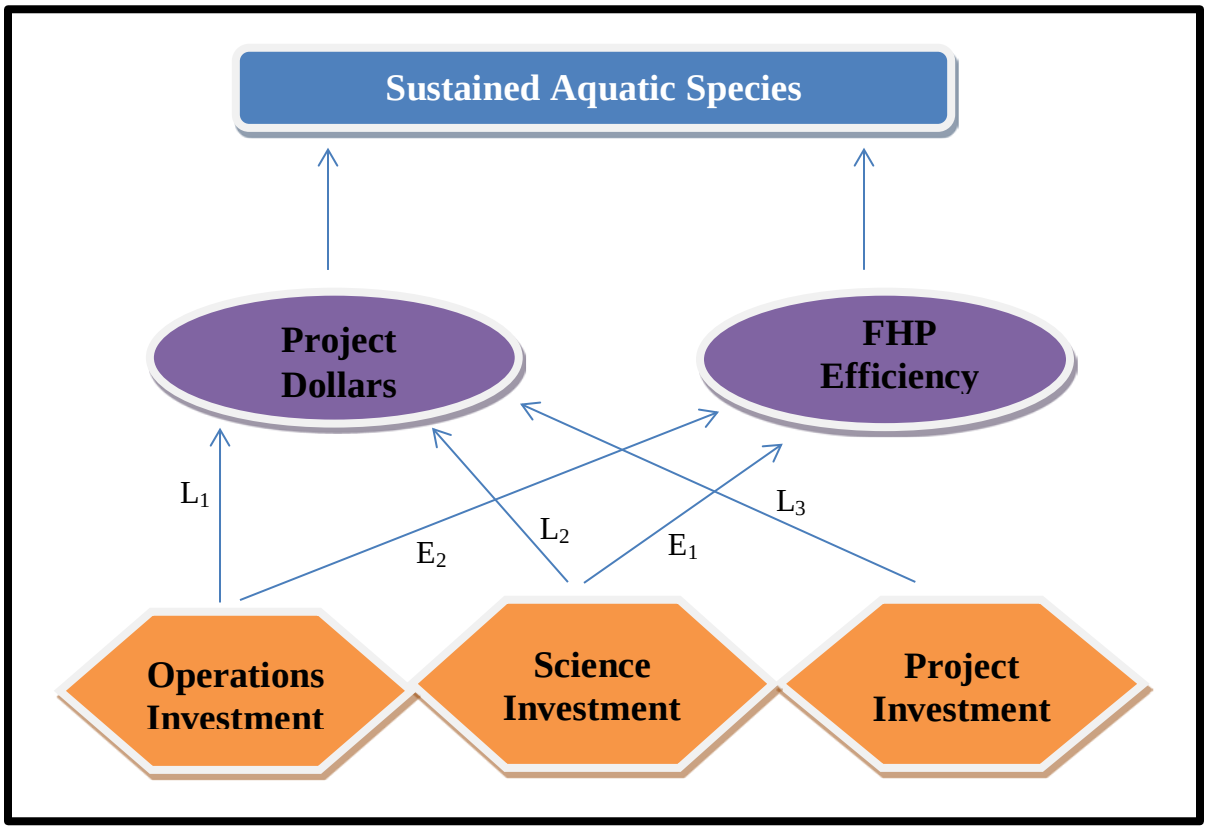

Figure 2: Conceptual model showing how the inputs of money spent on operations, science, and projects can be leveraged (L1, L2, L3) to provide additional money to spend on projects, and how investments in operations and science can increase the efficiency (E1, E2) of how project dollars are spent toward the fundamental objective of maximizing sustainability of aquatic species

Consequences

To deliver a concise transparent account of the consequences of each alternative, a consequences table was developed to compare alternatives, objective by objective, and to provide the initial framework for assessing tradeoffs (Table 3). Table 2 details the measurement used to score each alternative against the seven means objectives. Given we have no direct measures for any of these objectives, we used expert elicitation to score the alternatives. Team members individually determined a score for each means objective under each alternative with an understanding of the basic philosophy of each alternative (pages 5, 6) and tier (Appendix C) within those alternatives. These scores were then averaged (see table 3) in order to compare alternatives. A full breakdown of those scores can be found in Appendix E. The top of the consequences table (Table 3) illustrates the results of our comparison in terms of cash value increase toward meeting the fundamental objective of sustainable aquatic populations. This is a function of the effectiveness of investing in each tier and the degree to which leveraging can be enhanced through investment in each tier. Expert elicitation was again used to determine the predicted effectiveness and leverage resulting from these investments (Appendix D). Table 4 summarizes these results. There should be an increase in effectiveness through investment in coordination and science, but not in making project investments alone. There is also a threshold of effectiveness based on the amount of coordination. This threshold was addressed by applying the elicitation to a full FTE scenario and a .5 FTE scenario.

Means Objective	Description	Measure
Maximize FWS capacity to support FHPs	Maximize the amount of FHP funding that can be kept in house for supporting, building, and engaging in fish habitat partnerships	% of funding easily accessible for FWS use
Maximize flexibility to cope with short-term budget challenges	Amount of funding that's flexible within a region	Scale: -1, 0, 1, where -1: Allocation ties up a substantial amount of the budget in long-term commitments or competitions; 0: Some flexibility exists, but it may not be easy; +1: Regions have full, flexible access to a substantial portion of the budget
Maximize transparency	On a 5 point scale, the degree to which our partners will perceive the approach to be transparent	Scale: {-1, -0.5, 0, 0.5, 1} where -1: No way this can be explained such that people will think it's transparent, 0: acceptable, transparency is not an issue, +1: This will receive high praise for its transparency
Maximize cohesiveness of the National Fisheries Program	On a 5 point scale, the degree to which the process inherently builds cohesiveness in the Fisheries Program	Scale: {-1, -0.5, 0, 0.5, 1} where -1: Detriment to a cohesive fisheries program, creates division, 0: acceptable, not an issue, +1: Process will lead the way toward a harmonious, cohesive program

Means Objective	Description	Measure
Maintain NFHAP structure and maximize dynamic partnerships	Stronger, but not more, FHPs with expanded participation, capabilities, and strategic focus over the long-term	Scale: {-1, -0.5, 0, 0.5, 1} where -1: Some FHPs would cease to exist due to lack of participation, 0: status quo, +1: greater participation, more leveraging, more projects, achieving strategic goals
Performance-based feedback	A mechanism exists to financially reward/penalize partnerships in future years based on past performance, and the mechanism is likely to work	Scale: 0-100 grading scale where 0, no mechanism exists, <75, failing: even if a mechanism exists, it's unlikely to create an incentive to improve performance, 75 just passing, >75, excelling, encouraging feedback, FHPs, motivated to continually improve
Maximize ease of implementation	Degree of difficulty associated with developing a new system, making the transition to the new system, and annual allocation of dollars from an approved Congressional budget down to the FHP	Scale: 0-100 grading scale where <75, failing: cumbersome process, takes forever, requires a lot of resources, 75, just passing, >75, excelling: readily implemented in a timely manner

Table 2: Measurable Attributes Associated With Each Means Objective

			Alternatives			
			A	**B**	**C**	**D**
Fundamental Objectives	**Means Objectives**	**Measureable Attribute**	**Coordinator Focus**	**Assessment Focus**	**Project Focus**	**Regional Discretion**
Conservation (Sustainable Aquatic Populations)	$ spent on Operations & Effectiveness Factor	$ (for projects)	$37.924M	$21.663M	$19.851M	$30.00M
	$ spent on Science & Effectiveness Factor					
	$ spent on Projects					
p	Maximize FWS capacity to support FHPs	% (funding available for FWS use)	62	58	62	94
	Maximize flexibility to cope with short-term budget challenges	-1 to +1 (-1 = low, 1 = high)	-0.44	0.06	0.39	1.00
	Maximize transparency	-1 to +1 (-1 = low, 1 = high)	0.72	0.44	0.50	-0.78
	Maximize cohesiveness of the National fisheries program	-1 to +1 (-1 = low, 1 = high)	0.17	0.33	0.56	-0.44
	Maintain NFHAP structure & maximize dynamic partnerships	-1 to +1 (-1 = low, 1 = high)	-0.11	0	0.72	-0.28
	Performance-based feedback	0-100 (<75 = fail, >75 = pass)	73	80	85	68
	Maximize ease of implementation	0-100 (<75 = fail, >75 = pass)	81	79	77	58

Table 3: Consequences Table

Tier	Leverage Ratio	Effectiveness Increase (.5 FTE/1FTE)
1: Coordination	4.60	(41.11/157.78)
2: Science	3.55	50.5
3: Projects	4.0	NA

Table 4: Mean scores for Leverage and Effectiveness: Tier funding x Leverage Ratio = project funding, effectiveness is the % increase in the effectiveness of the FHP where 100% = a doubling of effectiveness

Tradeoffs

Evaluating the best performing alternative requires the use of decision tools for multiple-objective problems, in order to account for competing objectives and attributes measured on different scales. We used the *simple multi-attribute ranking technique* (SMART) for comparing predicted consequences across objectives on a universal scale to optimize the highest ranking alternative and conduct sensitivity analyses (Clemen 1996). We suggest applying swing weighting, a ratio-based technique used to quantify the relative importance of each objective to a decision maker, to determine weights for the set of means objectives.

Findings

Ability of Alternatives to Address Fundamental and Means Objectives

Generalized observations of the expert elicitation follows;

1. Sustainable Aquatic Populations: The effects of leverage and effectiveness were calculated and translated into an overall value (conservation of sustainable aquatic populations) of the investment made in each tier. This is represented as $M in conservation improvement (see row 4 table 3). Alternative A, focused on investment in dedicated coordination, presumes the greatest increase in value, primarily due to the understanding that an investment in high quality coordination will greatly expand the effectiveness of the partnerships through better quality projects and the ability of the coordinator to attract additional resources to expand the number of projects completed. The accuracy of this calculation is strongly dependent upon the ability of the FHP to attract, recognize and hire a high quality coordinator. Alternative D, allowing for allocation among tiers to be determined by the Regions also equated to a large increase in conservation value. This result is based on the premise that the Regions know how to best maximize the success of the individual FHPs and they will allocate funding to that end. Conversely, alternative C, focusing on projects would deliver the least additional value based on the premise that 80% of funds would be spent on projects, minimizing investment in coordination and science. This in-turn, according to the model, minimizes increase in conservation value gained through leverage and effectiveness.

2. Maximize FWS capacity to support FHPs: This result illustrates that when Regions control the expenditure of NFHP funds the Service's capacity to support FHPs is maximized. Given the variation in FHP goals and needs across the country, one-size does not fit all. The Regions are in the best position to understand those needs. There is no appreciable difference between the other three alternatives.
3. Maximize flexibility to cope with short-term budget challenges: As with the previous objective, the Service retains the greatest flexibility in managing internal budget challenges when the Regions maintain control of these funds. In contrast the Service has the least flexibility when funds are tied up into permanent salary for 18 FHP coordinators.
4. Maximize transparency: Results show that maximum transparency would occur under alternative A. Dedicated full-time coordination allows an FHP to provide more frequent and detailed reporting and personal communication. Conversely, alternative D had a strong negative value for this objective. The more internal the control of funds, the more potential there is for the Regions to be insular and for a loss of accountability.
5. Maximize cohesiveness of the Fisheries Program nationally: As with transparency, program cohesiveness has the lowest value under alternative D. Regional control of funds could jeopardize the ability of the Fisheries program to operate as one cohesive unit as the Regions act as independent actors maximizing the program to Regional benefit as opposed to national benefit.
6. Maintain NFHP structure and maximize dynamic partnerships: This objective is a principle measure of the degree of departure from the status quo. When scored, the team assumed that departure from the status quo would not be fully supported by all FHPs and partners. Going to a Regional model or moving away from funding primarily projects, scored lower than alternative C which maintains the bulk of funding for projects.
7. Performance-based feedback: This objective was measured on a pass/fail basis. Only alternatives B and C passed. We interpret this to indicate that sufficient explicitly measurable metrics can be used to measure performance under these two alternatives. While the others also likely have measures, they are either not sufficient or explicitly measurable.
8. Maximize ease of implementation: As with the performance objective, ease of implementation was also graded on a pass/fail basis. All but alternative D passed. Regional implementation of funding across the tiers is unknown at this time, and therefore it is difficult to predict the ease of that implementation. The level of uncertainty was a factor in this result.

Discussion

A Preferred Alternative

The team was not able to work through the entire trade-offs and optimization process during the SDM session. Table 3 outlines four alternatives, none of which seem to dominate the others. Additional work needs to be done to simplify the decision by reducing objectives and alternatives in an attempt to make this multi-objective problem a single objective analysis.

Uncertainty

There were several uncertainties that challenged the process and our ability to come to conclusion. These need to be acknowledged and considered by the FMT when analyzing our findings

- Only one of the participants was trained in SDM, making it challenging to determine if all the participants were responding from a common understanding of the process and the purpose of each step in the process
- We did not have a sufficient problem statement to direct the process. It was repeatedly revised before and during the workshop, ultimately diverging from the decision we were asked to make
- While team members were asked to "channel" their decision-maker, not all team members were positive they could adequately represent those views, thus we stopped short of providing a single recommendation
- Not all team members were comfortable with the accuracy of the responses they gave during the expert elicitation process
- Likely, not all team members had a similar understanding of many of the aspects of the process nor worked from common definitions
- We were rushed in addressing allocation of funds among FHPs, providing an inadequate set of alternatives for future consideration
- Not all team members are equally familiar with the data available for use in determining allocation among FHPs

Recommendations

The NFHP coordinators did not come to an ultimate decision for reasons already mentioned. Therefore we offer the following recommendations to the FMT.

1. The FMT should continue with facilitated analysis of the trade-offs and optimization of the alternatives to identify the preferred alternative.
2. The Regional coordinators should not continue analysis of this decision problem nor one that addresses allocation among FHPs until the FMT has made a determination on recommendation 1.
3. If the FMT chooses to move forward with this decision analysis and chooses one of the 4 alternatives, the FMT should then consider whether additional consideration of allocation

among FHPs is warranted. For example, if Alternative A is chosen, less than $300,000 remains to be allocated across FHPs. Does that warrant the development of a GIS based allocation methodology?

4. The consequence table (Table 3), outlines the summarized results of the expert elicitation and provides the ground work for the FMT to analyze tradeoffs. This will need to be done to finish the process.

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APPENDIX A: All Alternatives

Alt	Tier I	Tier II	Tier III
1	90K per FHP	50% remaining	50% remaining, using A, B, or C
2	90K (FHP could use for projects)	Provide sideboards (e.g., landscape scale assessments to guide priority setting	Weight 75% protection, 25% restoration
3	$50K per FHP	20%. For assessment & monitoring. Seek 1:1 match from LCCs	80%
4	Up to $140K per FHP for Coordinator, standard PD	Variable. Less than 75% in any one year, less than 50% for 2 consecutive years	Variable. Not less than 25% in any one year, not less than 50% for 2 consecutive years.
5	$75K per FHP to support operations as defined by new FWS policy. Flexibility to use for II or III	None. FHP has flexibility to use Tier III for science needs (not research)	100% of remainder. Distribute using method A.
6	90K for larger, 60K for smaller, single-region FHPs. Combine some AK $.	$300K.	Remainder.
7	Divide Evenly by number of FHPs	0	0
8	$45-90K/FHP	0	100% remainder
9	Money is divided across Service Regions based on some criteria to be defined ($, 3 Regions, lead Region, FHP size, FHP complexity, species, etc.) Regions can distribute funding across tiers and FHPs as they see fit		
10	0	0	100%

APPENDIX B: Allocation Among Fish Habitat Partnerships

Limited time (less than 3 hours) was spent discussing allocation of funds among FHPs. The alternatives are supported by the following model, to varying degrees, to allocate funds among FHPs. The allocation to each FHP would be proportional to its score (S_i). That is, the proportion of funding for FHP i would be:

$$p_i = \frac{s_i}{\sum s_i}.$$

The score would have two components: one reflecting potential; the other reflecting performance. Three proposed options for the potential measure include:

A. Modified Sport Fish Restoration Method
Land and water area (mi^2, 60% weight) + Human population (2010 census, 40% weight)
Measure by FWS region, then apportion as % of FHP area within each Region. This is a modification of the allocation method used by the Wildlife and Sportfish Restoration program to allocate funds to states. This alternative was brought forward for its simplicity in calculation and that it is based on a methodology already understood and accepted by our state partners.

B. Status measure in the 2010 Status of Fish Habitats Report[13]
Use "very low" and "low" degradation criteria for FHP area with *protection* potential
Use "moderate" degradation criteria for FHP area with *restoration* potential
The two categories would have to be weighted (proposal: 75 protection/25 restoration).
There is no consideration of human population, as in option A. This option was derived from a desire to limit our measure of spatial area to only those geographies the FHPs would likely affect. Using the 2010 Status of Fish Habitats Report[14] allows a consistent dataset and bases decisions on the official "assessment" produced by NFHP. This option is offered with the understanding that the measure of habitat degradation is limited in accuracy due to lack of data, especially on hydrology and connectivity.

C. HUC-12 Habitat Assessment.
Calculate area needed to be protected and/or restored. For each FHP, the area of HUC-12 watersheds or delineated lakesheds not already identified as protected by the TNC national conservation areas dataset nor categorized as "high" habitat degradation in the 2010 Status of Fish Habitats Report.[15] It might be possible to break the area into three categories: the area the FHP intends to protect, the area it intends to restore, and the area it intends to walk-away from (weighted as 75/25/0 respectfully). We recognize the limited accuracy of the 2010 Status of Fish Habitats and would seek to use better quality data where available and approved by the respective FHP. This alternative is a refinement of alternative B, trading improved data accuracy for ease of implementation. Further, this alternative seeks to refine the data set to the spatial area to which the FHPs can have actual influence. Those areas already protected cannot be protected. Some habitats are simply too destroyed to recover a self-sustaining population of a desired species. This

[13] National Fish Habitat Board 2010
[14] National Fish Habitat Board 2010
[15] National Fish Habitat Board 2010

alternative also extends the spatial area calculated to the HUC 12 watershed level to include the terrestrially based habitat stressors for which most FHPs will have to address.

APPENDIX C: Detailed Description of Tiers

Tier I: Coordinator

- Renamed from "Operations," which invites interpretation
- Lead Region has the option of hiring no less than one, full-time Coordinator (i.e., duties not spread across multiple FTE's; not 0.5 FTE) for an FHP using up to 140k of "project" funds.
- The coordinator must be a full-time coordinator dedicated to coordination of one FHP with no collateral duties.
- The Regions will work with the National NFHP Coordinator to develop a standardized PD and pay grade structure.

Tier II: Science, Assessment, Monitoring and Evaluation

- Funding of Tier II should not exceed 75% in a single year and should not exceed 50% for more than two consecutive years.
- This funding structure emphasizes local-scale studies and assessments, but allows flexibility for short-term (two years), broad-scale studies or more intensive local-scale studies.
- Funds expended must demonstrate investment in knowledge development that significantly increases certainty of habitat conservation project success. Project proposals should clearly demonstrate that they are applied science in nature.
- Priority should be given to assessment projects that contribute to increased precision of future National Fish Habitat Assessment and make linkages to LCC's.
- Funding should not be expended from Tier II for studies, assessments, etc. that exceed three years. (assumes long-term studies impede dynamism)
- The Fisheries Program should request assistance from Office of Science Authority to develop a science/assessment proposal review process that would be implemented at the Regional level
- Should include pre and post monitoring assessment to measure success, develop improved technologies/protocols (grow in to this) this is to create a more efficient effective FHP
- In 2015, with new national assessment or upgrade of partnership assessment, reallocation of project funds would take place to upgrade conservation delivery based on latest habitat assessments

Tier III: Projects

- Funding for Tier III should not be less than 25% in any year and not be less than 50% for more than two consecutive years.
- This funding structure emphasizes the project-based nature of NFHP while recognizing the important role of science and knowledge development to project success

APPENDIX D: Leverage and efficiency factors used to populate the conceptual model as determined by a panel of 10 experts.

Tier 1 Leverage ratio

Expert	Low Estimate	High Estimate	Best Estimate	Confidence that best is between low and high
1	1	100	10	95
2	1	2	2	100
3	1	10	2	100
4	1	10	5	80
5	0	10	1	80
6	1	4	3	70
7	1	8	5	90
8	0.1	100	8	95
9	5	30	8	75
10	1	8	2	70
Mean			**4.6**	

Tier 2 Leverage ratio

Expert	Low Estimate	High Estimate	Best Estimate	Confidence that best is between low and high
1	1	10	5	50
2	3	7	4	100
3	0	15	10	90
4	1	10	7	80
5	0	2	0	80
6	2	10	4	80
7	2	4	3	80
8	0	1.2	0.5	60
9	0	3	0.5	60
10	0	3	1.5	50
Mean			**3.55**	

Tier 3 Leverage ratio

Expert	Low Estimate	High Estimate	Best Estimate	Confidence that best is between low and high
1	1	10	3	90
2	2	3	2	75
3	1	5	4	90
4	1	5	4	70
5	1	20	10	75
6	2	10	4	80
7	1	4	3	80
8	1	10	4	75
9	1	10	4	100
10	1	8	2	80
Mean			**4.0**	

Tier 1 Effectiveness increase for a half-time (0.5 FTE) operations/coordinator

Expert	Low Estimate	High Estimate	Best Estimate	Confidence that best is between low and high
1	0	100	35	70
2	25	60	50	80
3	0	100	50	80
4	30	80	60	90
5	50	100	75	60
6	25	100	50	80
7	5	25	20	50
8	0	25	10	60
9	5	30	20	90
Mean			**41.11**	

Tier 1 Effectiveness increase for a full-time (1 FTE) coordinator

Expert	Low Estimate	High Estimate	Best Estimate	Confidence that best is between low and high
1	0	200	100	90
2	75	120	100	80
3	100	500	250	90
4	50	300	200	90
5	100	200	150	80
6	50	150	100	80
7	50	500	300	65
8	0	50	20	60
9	50	300	200	90
Mean			**157.78**	

Tier 2 Effectiveness

Expert	Low Estimate	High Estimate	Best Estimate	Confidence that best is between low and high
1	0	100	50	50
2	100	200	150	100
3	0	100	75	60
4	25	75	50	80
5	0	100	25	50
6	5	50	10	80
7	25	100	50	70
8	0	33	10	60
9	50	150	75	60
10	0	50	10	80
Mean			**50.5**	
Nation-wide			**2.81**	

APPENDIX E: Scoring of how alternatives met the objectives as determined by a panel of 10 experts

Alternative 1 – Coordinator focus

Expert	Objective						
	FWS Capacity	Budget	Transparent	Cohesive	FHPs	Performance	Ease
1	80	1	1	0	0	74	95
2	80	-1	0	0	-1	74	75
3	50	0	1	0	0	60	80
4	100	-0.5	1	0.5	0	75	95
5	100	-1	0	-1	-1	75	75
6	20	-1	1	0.5	-0.5	75	60
7	0	-1	1	0	1	67	90
8	80	-1	0.5	0.5	0	85	80
9	50	0.5	1	1	0.5	75	75
Mean	**62.2**	**-0.44**	**0.72**	**0.17**	**-0.11**	**73.3**	**80.6**

Alternative 2 – Assessment focus

Expert	Objective						
	FWS Capacity	Budget	Transparent	Cohesive	FHPs	Performance	Ease
1	70	1	0	0	-1	90	80
2	50	0	0	1	-0.5	80	75
3	60	0	0	0	0	75	70
4	100	0.5	1	0.5	0.5	95	95
5	100	0	1	0	0	80	80
6	50	-1	1	0.5	0.5	80	75
7	0	0	0	0.5	0	50	70
8	50	0.5	0	0	0.5	95	95
9	40	-0.5	1	0.5	0	75	70
Mean	**57.8**	**0.06**	**0.44**	**0.33**	**0**	**80.0**	**78.9**

Alternative 3 – Project focus

Expert	Objective						
	FWS Capacity	Budget	Transparent	Cohesive	FHPs	Performance	Ease
1	90	1	1	1	1	85	85
2	30	0	0	1	1	90	75
3	80	1	1	1	1	80	60
4	80	0	-0.5	0	0	95	75
5	100	0	1	1	1	90	80
6	75	0.5	1	1	1	85	80
7	0	0	0.5	0	1	87	80
8	60	0.5	-0.5	0	0	80	80
9	75	0.5	1	1	1	85	80

Mean	**61.7**	**0.39**	**0.50**	**0.56**	**0.72**	**85.2**	**77.2**

Alternative 4 – Regional discretion

Expert	Objective						
	FWS Capacity	Budget	Transparent	Cohesive	FHPs	Performance	Ease
1	100	1	-1	-1	-1	0	70
2	100	1	-1	-1	0	90	0
3	100	1	-1	-1	-1	50	50
4	100	1	-0.5	-0.5	0.5	90	90
5	100	1	-1	-1	-1	75	80
6	100	1	-0.5	-1	-0.5	90	50
7	100	1	0	1	1	95	80
8	100	1	-1	0.5	-0.5	50	60
9	50	1	-1	0	0	75	41
Mean	**94.4**	**1.00**	**-0.78**	**-0.44**	**-0.28**	**68.3**	**57.9**