A DECISION AND COMMUNICATION STRUCTURE FOR IDENTIFYING CONSERVATION PRIORITIES AND SCIENCE NEEDS ACROSS AGENCY PROGRAMS.

A CASE STUDY FROM THE STRUCTURED DECISION MAKING WORKSHOP

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EXECUTIVE SUMMARY

This report is the result of workshop held in Sacramento, California in October 2011 as part of a training course in Decision Analysis provided by the National Conservation Training Center. Several case studies were selected to the workshops and teams were selected to address each case study. For this problem, a team membership was carefully constructed to provide representation from all natural resource programs within the agency, all regions, and to have participants who were in leadership positions within the agency. Our final report provides guidelines for how regions can develop and address conservation priorities and science needs that cut across programs and reflect the most relevant needs in the field, regional, and national offices. The framework is flexible but yet provides clear guidance on the best process. By setting and addressing our highest conservation priorities as an agency, all areas of the Service, and our partners will benefit. This report details the process we used to create a flexible framework. We suggest that each Region consider adopting and implementing the recommendations in this report and that are highlighted below.

1. The "winning" alternative was Alternative #2: Forum followed closely by Alternative #1: Science Team. Given that they ranked out fairly closely, there may be practical advantages to going with one over the other. Our team recommends that regions look closely at their situations and choose one or the other. There may be practical implementation reasons for going with one alternative for one portion of a region or LCC geography and with the other in another situation. What is important is learning more about how each alternative performs with regard to the fundamental objectives, ease of implementation, transparency of process, and equitable elicitation of needs.
2. Each region and program needs to commit to the identified priorities through assignment of staff, time or funding to priorities (i.e., in performance standards) regardless of whether the priorities are relevant to the specific program or to the greater conservation goal as a whole. This is where the Service would benefit the most from the selected alternative. It is also then conducting business under the new business model – Strategic Habitat Conservation. We cannot stress enough how integral this criterion is to successful implementation of the selected framework.

3. Each program needs to develop and document a fair and unbiased process to identify conservation priorities and science needs. The process could be directed by a regional science team or the SA-ARD. It is important that the elicitation process is comprehensive, fair, unbiased and transparent.
4. The SA-ARD could bring Regional science needs to the National level for consideration across LCCs and for consideration of internal action through the Washington Office.
    a. At the National level there needs to be a similar cross-programmatic science panel to rank National priorities (This could be the existing Science Team that Dr. Gaby Chavarria put together (they come to the table without their programmatic affiliations and let the science speak for itself)) or the Service could create some different entity.
5. The Regional Directors should charge each cross-programmatic science team with developing a scope of work and a prioritization process that further fleshes out the detail of how they will function BEFORE any scoping or prioritization of science needs begins and the process should be reviewed and approved by ARDs (Regional Directorate Teams).
    a. Each program and/or cross-program science team will need a process for eliciting needs from the field and for setting programmatic and cross-programmatic conservation science needs at all levels in the organization. We brainstormed a few but this is the subject for **another structured decision-making workshop**:

Possible criteria for prioritizing conservation priorities and needs within each FWS program:

    b. Conservation issue is a widespread problem.
    c. Benefits multiple programs.
    d. Priority can be alleviated with policy or management.
    e. Priority addresses the most important ecological/anthropogenic driver

6. Information needs should be captured in a regional or national database (e.g. Fish and Wildlife Information Needs System (FWINS)); this task links with Visions Recommendation 9 – Research agenda for the NWRS.
7. Finally, the members of our structured decision making workshop are committed to learning and to conservation success. We have all agreed to serve as a review panel for how the process has worked for each region after 12 to 18 months of implementation. Our team will collate and review each region's scope of work, information elicitation process, prioritization process, and any feedback regions will provide. We will provide results from our review to the Regional Directorate. Contacts: Patricia_Heglund@fws.gov; Socheata_Lor@fws.gov; Steven_Morey@fws.gov

DECISION PROBLEM

The problem: Currently, there is no clear, cohesive mechanism for the different U. S. Fish and Wildlife Service programs (Ecological Services, Fisheries, Migratory Bird Management, and Refuges) to communicate and collaborate cross programmatically to develop common conservation priorities and science needs. Because we lack an integrated process to communicate and collaborate, and a process to reach consensus on decisions across programs, there is no clear pathway for communicating shared conservation priorities and science needs with partners (e.g., Landscape Conservation Cooperatives [LCCs]). Therefore, we risk the inefficiencies inherent in independent, ad hoc collaborations with partners without a unified purpose best serving the agency's needs. We propose to develop guidelines for cross-program identification of conservation priorities and science needs among the field, regional, and national offices. The framework will be flexible but yet provide clear guidance on the best process for identifying and communicating conservation priorities among programs and for collaborating with our conservation partners. By setting and addressing our highest conservation priorities as an agency, all areas of the Service will benefit.

Path to a solution: We employed Structured Decision Making (SDM) to develop a framework for 1) determining how program-specific conservation priority and science needs can be elicited, prioritized and shared across programs and 2) how cross-programmatically priorities and needs can be shared and prioritized within Regions and shared across regions, and 3) how the FWS perspective of conservation priorities and science needs can be conveyed to LCCs or used for other partnership opportunities, and 4) how these priorities and needs can be transmitted back to the field staff. Under this framework, Service employees at all levels will have an opportunity to contribute to and participate in the development of a common understanding of the science needs and priorities of the Service. Each individual should be able to see how the priorities are relevant to them and to our conservation partners. The scope and scale of the problem is at multiple levels, from the local (field station) to the region, to ecoregion or landscape, and, when appropriate, the national level.

The decision to implement the framework is at the Regional Director level and it is a one-time decision.

Once the decision has been made to implement the framework, its application may vary because each Region is organized or operates slightly differently. Our goal is to create a framework with sufficient flexibility for regional adaptation. The framework will provide guidelines or a menu of strategies to meet the specific objectives defined in our initial objectives hierarchy (Figure 1) or new objectives that arise. Modifications made by a region in the application of the framework will be documented, all outcomes of the prioritization process will be collated and outcomes of conservation actions reported on so that the agency can learn what worked and what did not and adjust accordingly. Essentially, the final version of the framework will include features that allow for learning over time.

Other decision-makers will play a role in implementing the framework including:

A. Members of the Regional Directorate are the decision-makers as well as the leads for endorsing and championing implementation of the framework. The Regional Directorate will request conservation priorities and science needs from each of the program directors. Each program director must obtain science needs from their field stations and from their regional office staff and then, using these needs, identify priorities for their program area. The programmatic priorities are then shared with their regional Science Team or their Assistant Regional Director (ARD) for Science Applications, and;

B. Each Regional ARD for Science Applications (SA-ARD), through leadership of Regional cross-programmatic science teams, decides how programmatic priorities are translated into regional conservation priorities and science needs and then transmitted to partners and back to the field. The SA-ARDs would be responsible for communicating the disposition of Service priorities and partner priorities and how they benefit the larger conservation community as well as field stations. SA-ARDs would also be responsible for

coordinating the monitoring of the involvement and commitments of the Service and reporting on the outcomes of landscape scale conservation actions. Additionally, the SA-ARD is responsible for documenting the progress of conservation planning and delivery based on using the framework.

BACKGROUND

Protecting the nation's natural and cultural resources and landscapes is essential to sustaining our quality of life and economy. Native fish and wildlife species depend on healthy rivers, streams, wetlands, forests, grasslands and coastal areas in order to thrive. Managing these natural and cultural resources and landscapes, however, has become increasingly complex. Environmental and land-use change (e.g., soil erosion, poor water quality, increasing human population growth and distribution, climate, etc.) can threaten human populations as well as native species and their habitats. To address these challenges our agency needs to have a firm understanding of our priorities and then reach out to our partners to see where we share common ground and can leverage our collective interests. Below we outline one example of how the Service can reach out to partners once we have a clear understanding of our priorities. We recognize that there are many other partnership opportunities wherein we can share our interests with others and engage in collaborative research and more effective conservation efforts.

CURRENT STRUCTURE:

LCC Organization: Landscape Conservation Cooperatives (LCCs) are regional partnerships of Federal, State, Tribal, International, and Non-governmental organizations working together to sustain natural and cultural resources in the face of accelerating global change. LCCs transcend political and jurisdictional boundaries and are structured to facilitate a collaborative approach to conservation. Generally, an LCC is governed by a Steering Committee that is administratively and logistically supported by a Technical Committee appointed by the Steering Committee. Thus each partner agency may have one representative on the Steering Committee and one

representative appointed to the Technical Committee. The Technical Committee may establish ad hoc Subcommittees to assist with specific tasks. Given that each partner agency is represented by *one individual* it is important that partners have a framework in place to identify information needs and priorities *for their agency* that can be brought forward to the LCC partnership for consideration. The challenge for the USFWS is in how the various programs within the USFWS interact and collaborate to identify and communicate common priorities and science needs to the LCCs or other partners. Without a framework we are at risk of developing independent, ad hoc collaborations with LCCs without a clear purpose best serving the agency's needs.

USFWS Program organization: The USFWS operates in a decentralized manner where each of the eight regions has autonomy. Further, the various programs and divisions under those programs also operate independently. In some instances, programs and divisions do collaborate to serve the needs of the field stations; for example, under the National Wildlife Refuge System Program, the divisions of Conservation Planning and Biological Resources collaborate along with staff from Migratory Bird Management, Fisheries, and Ecological Services to develop quality Comprehensive Conservation Plans. The same USFWS program elements also often collaborate during Federal Energy Regulatory Commission relicensing processes to identify operational effects on trust resources and design adaptive plans to explore and address them (e.g., Gaston-Roanoke Hydropower Project on the Roanoke River in Virginia and North Carolina). Although these efforts are commendable, more collaboration among programs can greatly benefit field stations and regional resources by leveraging staffing talents and financial resources to serve the greatest needs.

USFWS Engagement with Partners: Based on the decentralized management of the different regions and programs, engagement with partners is also a fairly independent endeavor. Notable exceptions include the Upper Mississippi River Restoration – Environmental Management Program and the Great Lakes Restoration Initiative. Additionally, USFWS participation in Interstate Fisheries Management Commissions and federal Fishery

Management Councils, the National Fish Habitat Partnership, and the Eastern North Carolina-Southeastern Virginia Strategic Habitat Conservation Team are endeavors that are fairly well-coordinated activities and reviewed internally prior to engagement with the respective partnerships. As such, we recognize that functional partnerships exist, where conservation priorities and science needs are identified, communicated across partnerships and the partnerships work well to address those needs. This framework is not intended to disrupt or override those partnerships. Rather, this framework is meant to facilitate and improve internal communication and decision-making with the Service.

In summary, there is no formal Service-wide (internal) process for elicitation of needs, setting priorities, coordinating among programs, and for cross-programmatic decision making. As a result, it is often the staff or initiatives with the most persuasive argument, or willingness to step into an opportunistic position, or number of individuals lobbying for an idea, that results in action without context. We believe that developing a formal process for eliciting science needs/concerns from all levels and working cross-programmatically to identify shared needs to help set priorities will result in more effective, coordinated, and efficient conservation actions.

ECOLOGICAL CONTEXT

"At the dawn of the 21st century, we find our commitment and resolve and our passion and creativity being called upon once again as we face what portends to be the greatest challenge to fish and wildlife conservation in the history of the Service: The Earth's climate is changing at an accelerating rate that has the potential to cause abrupt changes in ecosystems and increase the risk of species extinctions. In turn, these changes will adversely affect local, State, Tribal, regional, national and international economies and cultures; and will diminish the goods, services, and social benefits that we Americans are accustomed to receiving, at little cost to ourselves, from ecosystems across our nation. Given the disruption that a changing climate implies for our mission, our nation, and our world, we in the Service and the Department cannot afford to go on about business as usual. We are at a crossroads in our nation's conservation history. We must rise up and respond to a 21st century conservation challenge with 21st century organizational, managerial, and scientific tools and approaches. To address

climate change and its effects, we must position the Service more strategically. We must build shared scientific and technical capabilities with others and work more collaboratively than ever before with the conservation community, in particular, our State and Tribal partners, who share direct responsibility for managing our nation's wildlife resources. To do this, we need to first look inward to evaluate, understand and deploy our internal resources and priorities (based on our Mission) and then bring these to the cooperative table with our partners."

*From **Rising to the Urgent Challenge** (2010)*

DECISION STRUCTURE

Building a framework for arriving at and communicating shared conservation priorities and science needs across programs within the Service and with partners and the LCCs includes numerous Service decision makers at various geographic scales and organizational levels. Developing this framework will involve several decision solutions, all of which will be made under multiple sources of uncertainty.

OBJECTIVES

Our group identified a small set of fundamental objectives that arise from the mission and vision of the Service which state that we will work with partners to conserve, protect, and enhance fish, wildlife and plants and their habitats and that we will be a trusted partner in fish and wildlife conservation. Understanding our internal priorities and having a well-documented process for selecting them will allow us to take a self-organized approach, be forth-coming with our staff and partners, and help us to seek common ground internally and with our external partners. Further, understanding our internal priorities will allow the Service to focus limited resources to affect conservation and will allow us to measure our success. We also present ways to achieve these fundamental objectives. These "ways" are called *means objectives* throughout the rest of this report.

Our fundamental objective is to provide and maintain ***high quality*** habitats for fish, wildlife, and resources by coordinating and implementing ***landscape scale*** conservation to address existing and future challenges. To that end, a second level of fundamental objectives included:

Fundamental Objective 1: select, coordinate, and implement cross-program conservation priorities and science,

Means objectives:

a. Facilitate strategic and science-based management;
b. Establish shared cross-programmatic conservation priorities and actions; and
c. Improve efficient use and leveraging of resources and information;

Fundamental Objective 2: collaborate with and support partners.

Means objectives:

a. Recognize the unique role of FWS,
b. Maximize collaborative opportunities that result in measurable outcomes that transcend regions and LCCs .

We organized these and numerous lower level objectives into a hierarchy (Figure 1).

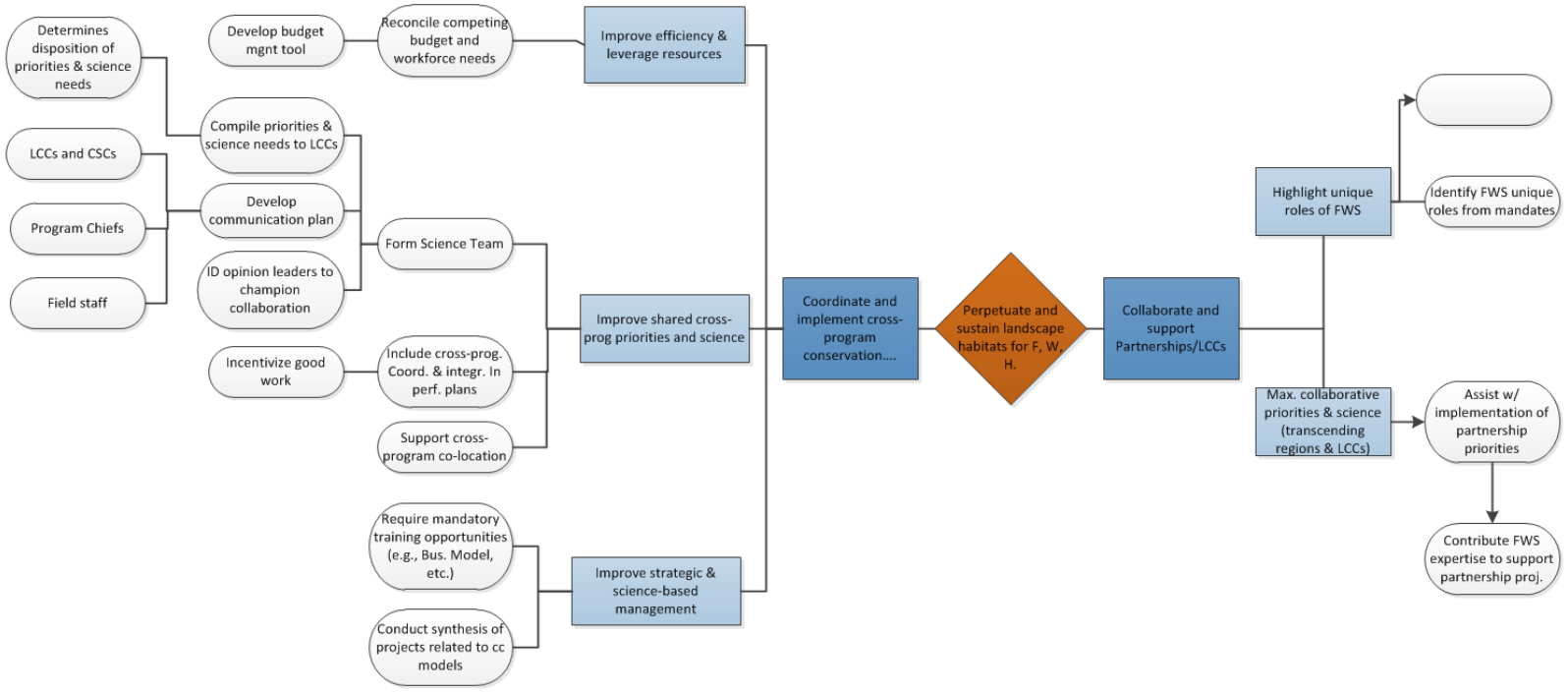

Figure 1. Objectives hierarchy for cross-program collaboration within the U.S. Fish and Wildlife Service and communication with the Landscape Conservation Cooperatives. (NOTE: Orange diamond is the highest level of fundamental objective, dark blue squares are second level fundamental objectives; light blue rectangles are means objectives; white ovals are alternatives or strategies).

ALTERNATIVES

Workshop participants brainstormed a list of actions or strategies that can be taken to meet the objectives and these actions were categorized into themes and included team formation, engagement (with field stations and partners), legitimizing the field station information needs, LCC coordination, and institutional/cultural change. The alternatives arose, in part, from real-life examples of existing efforts but were modified by the group and are as follows:

1. Science Team
2. Forum
3. Broad-based Partners
4. Special Topics Teams

To help us evaluate the performance of the alternatives and choose which one best met our objectives we created a simple model of each one. We then evaluated and scored each alternative based on our objectives. Each alternative performed differently (i.e., had different consequences; Table X).

Finally, the list of actions or strategies for implementation that was brain-stormed for each theme was reformated into a portfolio of actions. Our group felt that the action items were robust to the alternative and could be implemented immediately or used to help engage a region once an alternative was recommended. These action items can be found on page 21 of this document.

The three alternatives are described in greater detail below.

1. **Science Team Alternative** (Figure 2).

Each region forms cross-programmatic regional science team(s) or panels to identify conservation priorities and science needs brought forward from each Service program. The Science Applications ARD works with each Regional Directorate Team (RDT) to establish a Science Applications Team with representatives from each Service program. The Regional cross-program science team members are assigned by programmatic ARDs but work at the

direction of the SA-ARD and once on the team, programmatic affiliation goes away and the science speaks for itself. The program representatives work with their ARD and field staff to identify conservation priorities and science needs as they relate to management decisions (Stations identify science needs. The program representative is responsible for collating information needs and providing those to the programs regional leadership team for prioritization; these priorities are then given to the program representative on the Science Applications Team. In turn, the Science Applications Team (SAT) develops a systematic, transparent process to synthesize the collective priorities and needs, establish regional priorities and determines their disposition among potential partnerships. Assistant Regional Directors work internally to address high priority needs or they may seek outside assistance or collaborations. They receive additional benefits from knowing both programmatic and cross-programmatic information needs. Knowing the full range of needs and how they are prioritized will help them develop internal cross-programmatic and programmatic work plans. Programs can also resolve science needs internally (within the Program or through collaboration with one or more programs) or take their needs to other collaborators (Universities, Ecoregional RFPs, USGS Science Centers, etc., but not LCCs or to other entities where the Service gets one vote).

This alternative capitalizes on opportunities for cross-program collaboration to leverage resources under financial constraints by reconciling competing budget and workforce needs in relation to priorities. FWS programs, identify their contributions to priority needs (e.g. budget and workforce commitments) and can incorporate these contributions in the development of proposals or scopes of work for collaborations. This alternative fully institutionalizes cross-program collaboration. Tasks for cross-program coordination can be integrated into performance plans, as well as recognized and acknowledged through incentives or performance awards.

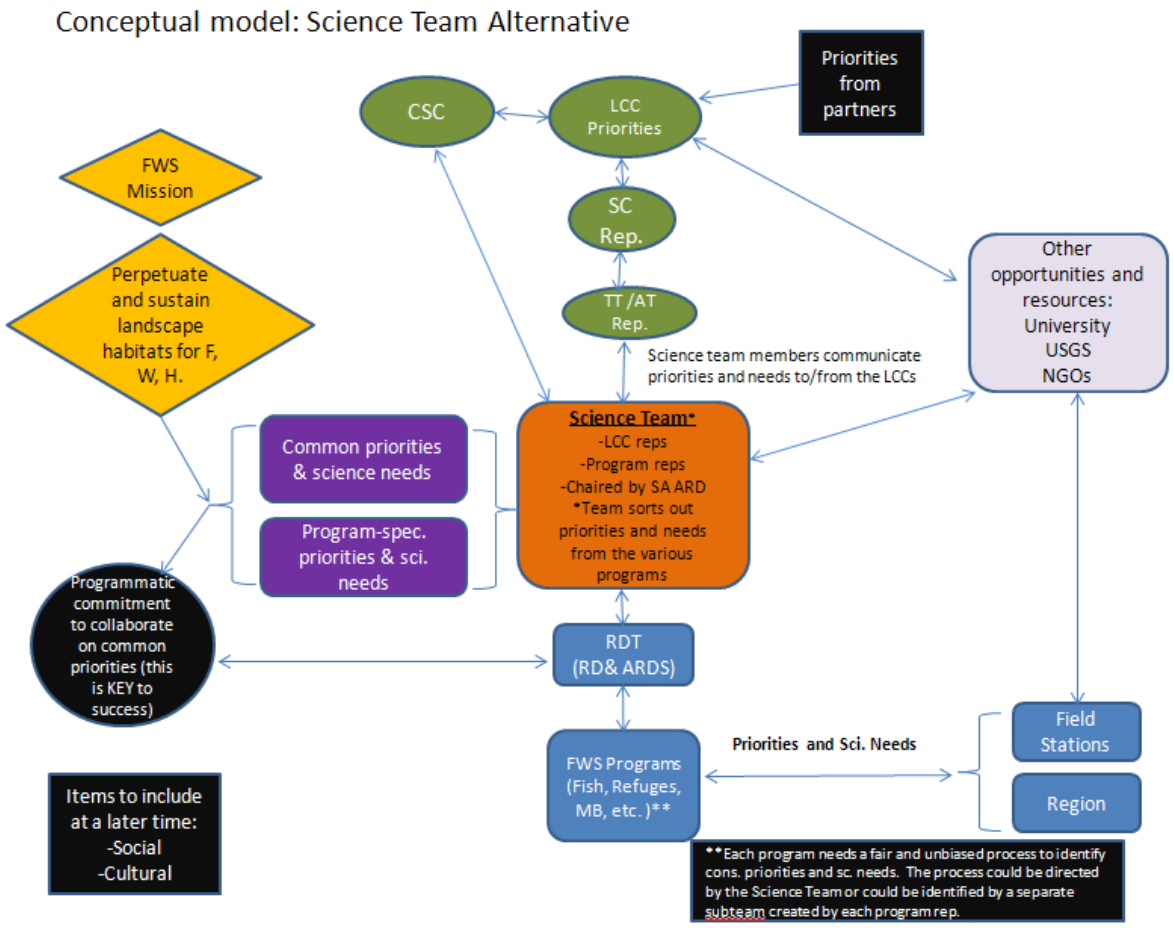

Figure 2. "Science Team" alternative to identify conservation priorities and science needs across FWS programs and communication pathways across FWS and with the LCCs. (NOTE: The gold colored diamonds are the fundamental objectives; blue boxes are internal FWS items; the large orange box depicts the cross-program Science Team; purple boxes indicate common priorities and science needs that are sorted by the Science Team after they are received from each program representative; the green ovals depict LCC/CSC activities; the black boxes are uncertainties that need to be considered and/or defined at a later time; the gray box, upper right, depicts other opportunities and collaboration with partners outside of the LCC network; the black circle on the left contains a point that is the essence of this framework – cross-program collaboration cannot succeed without commitment from each program staff from all levels*). (NOTE: Each region will need a consistent and repeatable process for eliciting science needs and selecting conservation priorities from within program and across programs. The process(es)s may be developed and directed by the Science Team members (program representatives) and could be implemented by the Science Applications Team or by subteams, identified*

by the program ARDs. This elicitation and prioritization of science needs is outside of the scope of this phase of the framework, but needs to be done as the next step in using this framework).

2. **Forum Alternative** (Figure 3):

Generally, program representatives (designated by ARD for each Program) gather information directly from field staff within smaller forums (ecoregions within and LCC). At the field level, field station representatives (Project leader and biologist), regardless of program, provide input at the request of Sub-LCC (ecoregional), cross-programmatic science teams. As noted in alternative 1, the process for eliciting field level input must be worked out by each region but should be similarly applied to all sub-LCC ecoregions. Again, regions want to avoid the loudest voice being heard in favor of hearing from all stations with equal representation.). Ecoregions can also resolve conservation needs internally (within the ecoregion) or take their needs to other collaborators (Universities, Ecoregional RFPs, USGS Science Centers, etc., but not LCCs or to other entities where the Service gets one vote). Conservation priorities and science needs from each "subteam" are reviewed by the ARDs for each Program (the RDT or their designees) and passed along to a regional cross-programmatic Science Team whose role is to take all the sub-LCC (ecoregional) priorities and look for commonalities and put them through a prioritization process (To be determined by each Region The regional Science Team is composed of one representative from each program and selected by the program ARD in consultation with the SA-ARD. Once on the Science Team, programmatic affiliation goes away and the science speaks for itself.

The SA-ARD leads the regional Science Team in prioritizing among the needs presented by the ecoregional teams. SA-ARD leads the RDT in reviewing the priority recommendations of the SA-ARDs Science Team. Regional priorities can be tackled internally (within the Service) or provided to partners for assistance with resolution (LCCs, CSC, Universities, USGS, etc.).

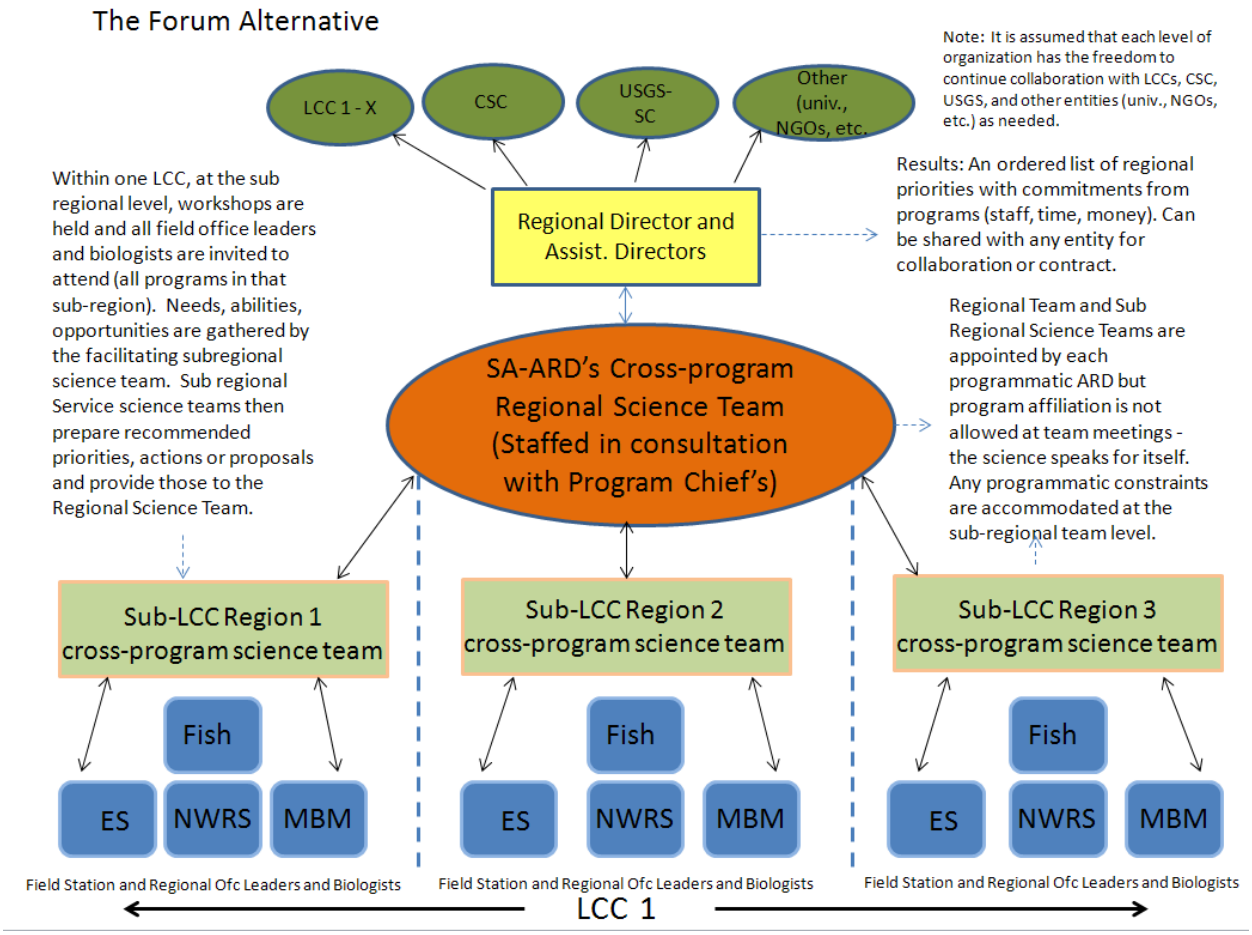

Figure 3. The Forum Alternative: This diagram shows only one LCC geography, as an example, but the effort is not lead by the LCC. This is internal to the Service (at this point but could be grown to include external partners). Each region has more than one LCC geography and so there will be multiple sub-ecoregional science teams feeding information to a cross-program regional Science Team. The blue boxes at the bottom depict all program field offices within an ecoregion providing science or conservation needs to the eco-regional science team who then assemble and rank needs. Elicitation of needs can be done via forums or via surveys etc. At the ecoregional level, programs discuss their constraints and their needs/issues/opportunities among one another through forums or information exchanges facilitated by by the ecoregional science team. The ecoregional science team works with the larger group to establish priorities and then brings those to the SA-ARD's Regional Science Team - at the orange center oval; this is where program representative should come in ready to commit people, time or money to one or more priorities. This diagram illustrates an example of only one LCC but this region may have one or more LCCs and the ecoregional (Green and Blue boxes) science teams would all be

feeding priorities into the orange oval in the center. Once regional priorities are understood then those can be shared with multiple LCCs, with Climate Science Centers, USGS, Universities, etc. Alternatively, there is nothing precluding programs from working together on priorities at any of the levels.

3. **Broad-based Participation Alternative** (Figure 4):

This alternative is similar to the Forum Alternative (#2), but 1) is not broken into Sub-regions, 2) SA-ARD one or more Advisory Groups composed of cross-programmatic staff with expertise in a particular LCC. These people are assigned by their program ARD in consultation with the SA-ARD but once on the cross-program team, they do not advocate for their program but rather let the science speak for itself. The Science ARD can still elevate LCC-Geographic needs to entities other than LCC partnerships. Participation is voluntary for field stations but required at the Advisory Group level. Advisory groups (AGs) correspond to LCC geographies within regions and provide a forum for information sharing, dialogue, priority setting and feedback to FWS LCC steering/technical committee (SC/TC) staff. The AGs prioritize the science needs for their geography and bring those to the LCC steering/technical committees for consideration. All staff working or interested in the LCC geography are welcome to attend AG meetings. Strategically, they should occur prior to LCC meetings (after agendas have been developed and distributed to the entire SC/TC) to prepare FWS SC/TC staff for upcoming meetings. Because AGs cover all geographies within a region (i.e., combined scope is region wide), they could expand foci beyond the scope of individual LCCs and help facilitate discussion and science needs prioritization and implementation for their FWS region.

This alternative supports the direct connection of the field stations and individual staff in the region with each LCC. It is up to the individual or field station whether to engage or not engage with the FWS LCC SC/TC members. As AGs initiate priority setting within their LCC geography, a systematic process is employed to ensure that regional priorities for that geography are identified and vetted through appropriate program leaders and RDTs. In this manner, the Service will have an understanding of priorities for each LCC geography.

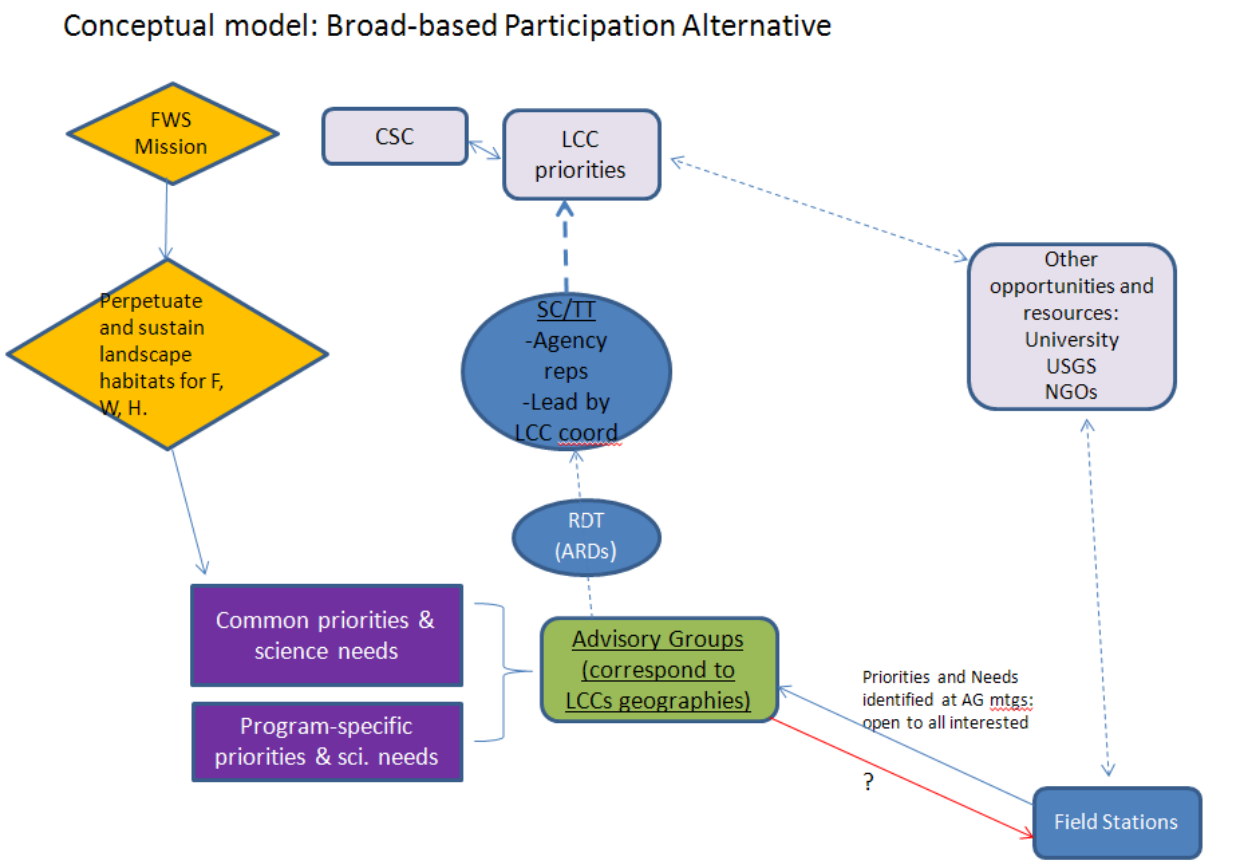

Figure 4. "Broad-based Participation" – a process to identify conservation priorities and science needs across FWS programs and with LCCs.

4. **Special Topics Alternative** (Figure 5).

All FWS staff are encouraged to participate in LCC "special topics teams" (i.e., Inventory and Monitoring Team, Endangered Species Team, Water Team, etc.). The teams are established by an LCC partnership and chaired by the LCC Coordinator or Science Coordinator. Individuals on the respective teams are selected by their program ARD in collaboration with and organized by the SA-ARD. Members are expected to bring the issues that represent their program or agency of interest to the team and can share team priorities with the regions and field stations. As such, conservation priorities and science needs from each "special topics team" are passed on to the ARD for each program (If they have a representative on the team) and to the LCC Coordinator or Science Coordinator.

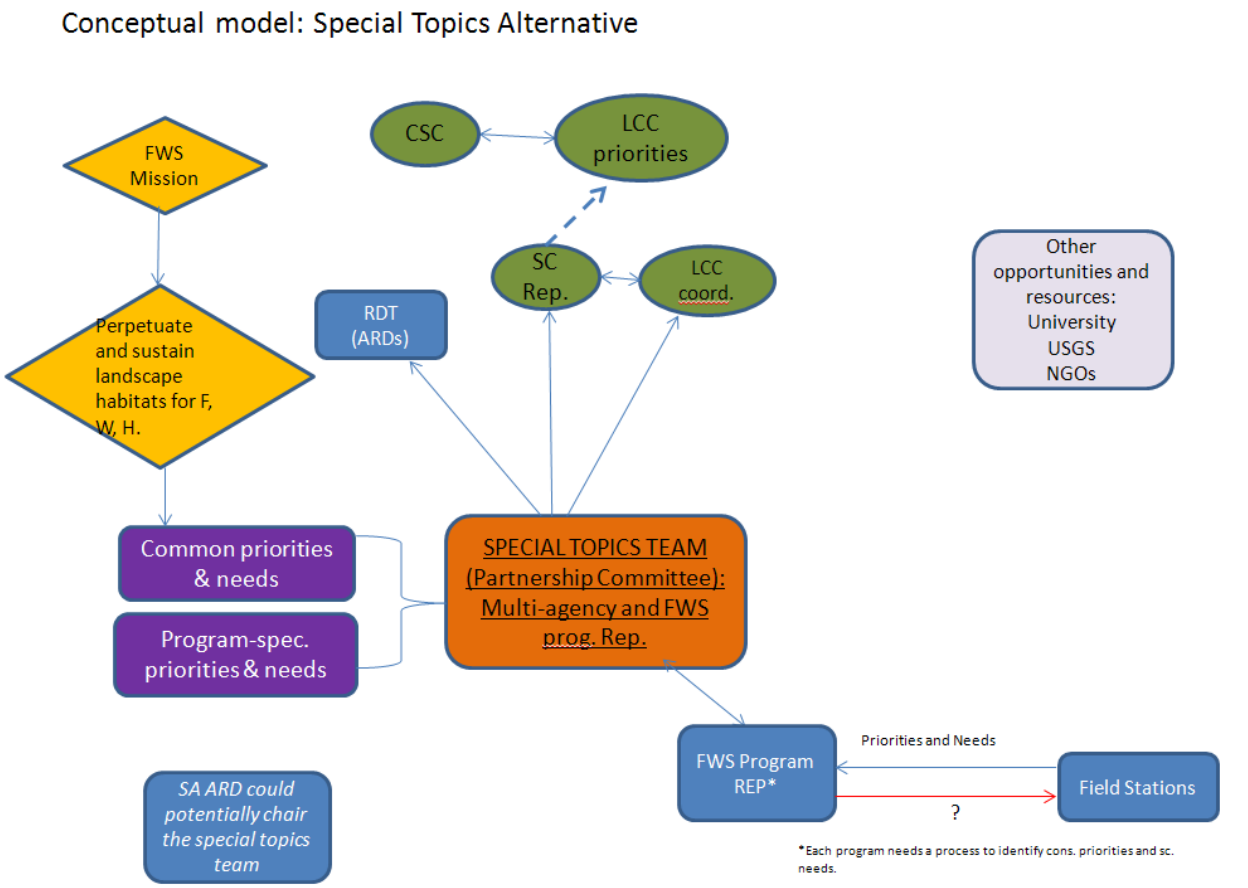

Figure 5. "Special Topics" alternative - a process to identify conservation priorities and science needs across FWS programs and with LCCs.

Evaluation of Alternatives

We built a simple model that allows us to evaluate the four alternatives against our objectives. We a group we performed a scoring exercise that allowed us to compare the four alternatives against the fundamental and means objectives stated above and additional criteria that could potentially be important to the function of the framework:

Modeling Criteria and Their Definitions:

***Unbiased needs**:*

- All Service staff have a chance to provide input; fair (equal opportunity) for all programs to participate:

- minimize the influence of the strongest voice from being dominant; we believe that the more multiple ways or unlimited ways that an individual can provide input, the more biased the process – this prevents the squeaky wheel from getting the grease (1 point)
- Comprehensive survey (threats to resources and science needs) of all programs; All branches within a program has the opportunity to provide input (1 point)

Scale: 0-2.

***Efficient process**:*

- A process that allows the information to be used at multiple scales (1 point),
- Information is gathered once, filtered twice but still retains the quality that can be shared internally and externally at multiple scale (this minimizes redundancy and do-overs; prevent having to go back to field stations or customers to ask about some other aspects) sharing and committing to work on internal problems (e.g., MBO and Refuges working together to inventory birds at a refuge – avoids redundancy) (1 point);
- Has an **overarching body** (i.e., Science Team) that coordinates input from and provides a structured process for prioritizing among programmatic inputs (1 point).

Scale=0-3

Maximizes opportunities for internal collaboration and communication flow: the alternative takes advantage of the potential collaborative opportunities among programs. The alternative provides a forum that promotes consensus building: 1- Regional Director, 2-RD and ARDs, 3-Science Team, 4-Science team with input from and to the field stations; clear pathway that illustrates the line of communication; there are opportunities for the information to be transmitted to external entities: 1-Field station→Program Rep. →, 2- Program Rep. →RDT, 3-Program Rep. →Structured Forum (i.e., Science Team), 4- Structured Forum →TT/AT, 5- TT/AT →SC, 6- SC →back to Program Rep., 7- Program Rep. →Field stations.

Scale 0-7.

Transparent process:

- the process of obtaining input (1 point),
- decision making process (1 point),
- are clearly articulated and documented (1 point)

Scale 0-3

Evaluating a framework or process by using the above criteria is a way to ensure that the process will allow us to identify and prioritize comprehensive conservation priorities and science needs within the Service and also create effective communication pathways within the Service and with our conservation partners. However, regardless of the criteria and which alternative framework ranks out the highest and is selected for implementation, one additional criterion, essentially a fatal flaw if not enacted, is that each region and program needs to commit to the identified priorities through assignment of staff, time or funding to priorities (i.e., in performance standards) regardless of whether the priorities are relevant to the specific program or to the greater conservation goal as a whole. This is where the Service would benefit the most from the selected alternative. It is also then conducting business under the new business model – Strategic Habitat Conservation. We cannot stress enough how integral this criterion is to successful implementation of the selected framework.

DECISION ANALYSIS

Once we identified the criteria, we determined that a constructed scale to rank the criteria would work well on this first prototype and to the best of our abilities. All but one workshop participant scored each alternative against the criteria in his/her own consequence table, as shown in the example in Table 1. To determine which alternative framework maximizes the opportunities to identify conservation priorities and science needs, within the U. S. Fish and Wildlife Service and for effective communication within the Service and with our partners, we applied a simple multi-attribute rating technique (SMART), by first evaluating the utility of each alternative with respect to each objective (consequence table) and then determining the overall weighted average by using individually scored objective weights (example in Table 2). We then pooled the final score (sum of weighted scores/sum of weights) from each participant and took the average score to obtain the final ranking of alternatives (Figure 6).

Table 1. Consequence table with mock scores that evaluate the four alternatives against the objectives for a framework to identify conservation priorities and science needs, and to provide an efficient communication pathway across programs and with conservation partners.

				ALTERNATIVES			
Objectives/Criteria	**Attributes**	**Type of Scale**	**Goal**	**Science Team**	**Forum**	**Broad-based participation**	**Special Topics**
Unbiased needs	0-2	constructed scale	Max	2	1	1	1
Efficient process	0-3	constructed scale	Max	3	2	2	2
Max. Opportunities and communication flow	0-7	constructed scale	Max	7	6	7	6
Transparent process	0-3	constructed scale	Max	3	3	2	1
SUM				**15**	**12**	**12**	**10**

Table 2. An example of the simple multi-attribute rating technique (SMART) table showing scores of alternatives against objectives, normalizing the scores and the weighted scores for each objective and the final score in bold, for one participant.

SMART RANKING (S.M.A.R.T = Simple, Multi-attribute Ranking Technique)

SIMPLIFIED MATRIX			Alternatives			
Objectives/criteria	**Goal**	**Attribute**	**Science Team**	**Forum**	**BB participation**	**Special Topics**
Unbiased needs	Max	0-2	2	2	1	1
Efficient process	Max	0-3	3	3	2	1
Max. Opportunities and communication flow	Max	0-7	6	4	3	1
Transparent process	Max	0-3	2	3	1	1
Sum			13	12	7	4

NORMALIZED SCORES			Alternatives			
Objectives	**Goal**		**Science Team**	**Forum**	**BB participation**	**Special Topics**
Unbiased needs	Max	0-2	1.0	1.0	0.0	0.0
Efficient process	Max	0-3	2.0	2.0	1.0	0.0
Max. Opportunities and communication flow	Max	0-7	1.7	1.0	0.7	0.0
Transparent process	Max	0-3	0.5	1.0	0.0	0.0

WEIGHTED SCORES			Alternatives			
Objectives	**Goal**	**Weight**	**Science Team**	**Forum**	**BB participation**	**Special Topics**
Unbiased needs	Max	25	25.0	25.0	0.0	0.0
Efficient process	Max	10	20.0	20.0	10.0	0.0
Max. Opportunities and communication flow	Max	25	41.7	25.0	16.7	0.0
Transparent process	Max	40	20.0	40.0	0.0	0.0
Sum of Weights (for all objectives)		100				
Sum of weighted scores (for each alternative)			106.67	110.00	26.67	0.00
Final Score (sum of weighted scores/sum of weights)			**1.07**	**1.10**	**0.27**	**0.00**

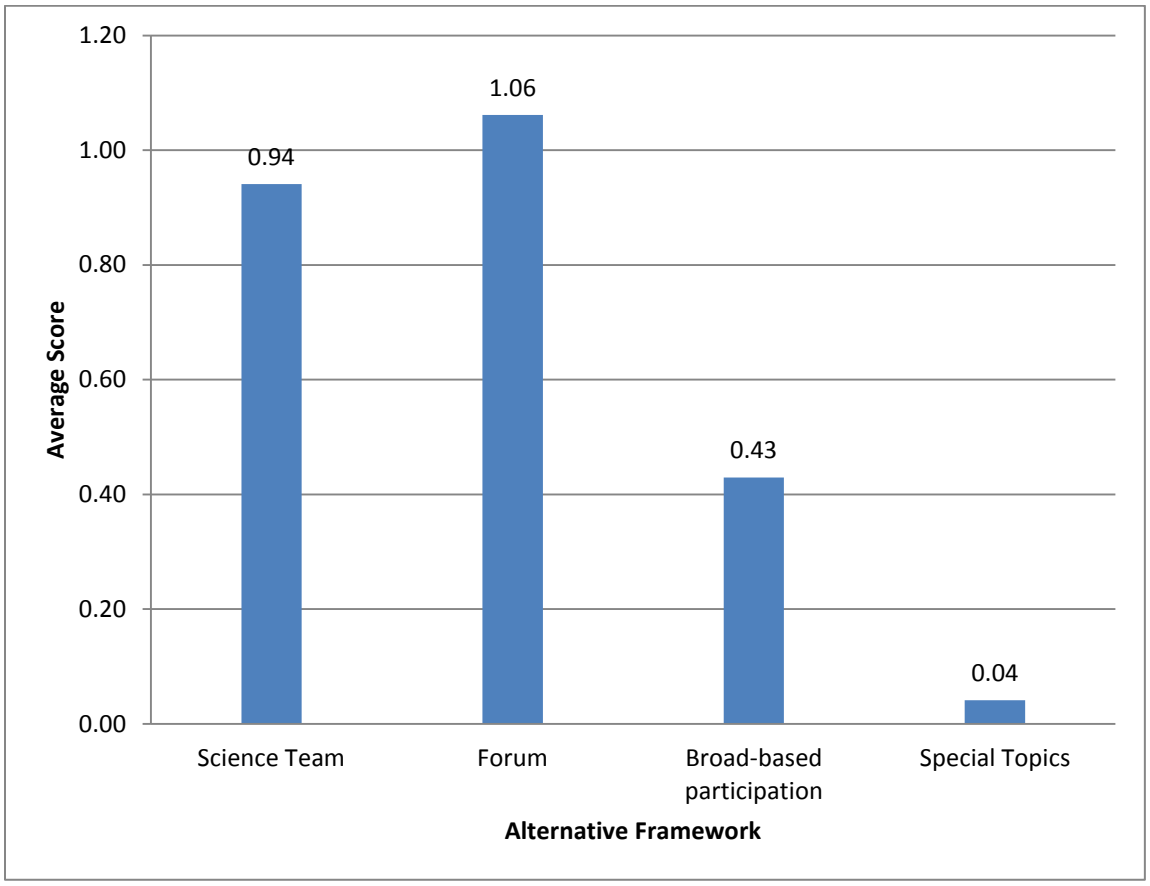

Figure 6. Results of tradeoff analysis between four different alternative frameworks to identify conservation priorities and science needs, and communication pathways within the U. S. Fish and Wildlife Service (see text for details on alternatives).

RESULTS

The Forum alternative received the highest score (1.06), followed closely (0.96) by the Science Team alternative. The Broad-based participation and the Special Topics alternatives were distant third and fourth. Between the Forum and Science Team alternatives differ in that the Forum alternative elicits information from the field in a cross-programmatic fashion via ecoregional forums whereas the Science Team alternative elicits information needs from the field along program lines and then looks for cross-program common ground at the regional Science Team level. The Forum alternative will require establishing and managing multiple ecoregional science teams to lead the forums and a second, regional science panel to collate and prioritize among ecoregional recommendations. The ecoregional science teams will require the development of a standard process for eliciting information from the field. The Science Team alternative requires the establishment of only one cross-programmatic science

team but also requires that elicitation of information from the field be done in a similar fashion across programs. Because of the close scores, our recommendation for implementation is for regions to try one or the other or a hybrid of the two as most appropriate to regional needs. It may be that both alternatives could be used in one region because one may be more suitable for working within an LCC geography than another.

ADDITIONAL ACTIONS (LINKED TO OBJECTIVES)

1. Another set of objectives and alternatives we need to address concerns how each program identifies and priorities internal programmatic conservation priorities and science needs. We brainstormed a few but this is the subject for another structured decision-making workshop:

Potential criteria for prioritizing conservation priorities and needs within each FWS program:

- Conservation priority is a widespread problem.
- Benefits multiple programs.
- Priority can be alleviated with policy or management.
- Priority addresses the most important ecological/anthropogenic driver

2. Present this framework to the Directorate, include program ARDs who serve on LCC steering committees/
3. Request support from the Directorate for this on-going cross-program integration effort; to pilot the selected alternative.
4. When opportunities arise, encourage program managers to co-locate staff among different programs.
5. Form a regional cross-program team comprising field stations and regional programs and also include LCC rep.
6. Synthesize existing climate science and field station projects related to climate change so that the Science Team is informed of past and on-going climate science activities and projects.
7. Develop and require use of a national database that identifies science needs and conservation priorities (e.g., the FWINS database).

8. Science Team prepares clear written description of work or projects that are sent to LCCs and projects that are accepted by LCCs and compiles and catalogues outcomes (using a database such as ServCat, developed and maintained at the Natural Resources Program Center in Ft. Collins, CO.).
9. Implement mandatory training on the new Conservation Business Model (Conservation Management Framework/SHC) for FWS employees.

INFORMATION NEEDS

1. National: Synthesize existing Climate Science Center, LCC, Regional, and field station projects related to climate change so that the Office of Science Advisors (OSA) Science Team is informed of past and on-going climate science activities and projects.
2. OSAs -Science Team prepares clear written description of work or projects that were sent to LCCs and projects that are accepted by LCCs. LCC/Regional: Regional and LCC conservation priorities and science needs. Local: Conservation priorities and science needs to information management decisions – scoped and prioritized within programs.

UNCERTAINTY

ETHOLOGICAL UNCERTAINTY

We don't fully know how our actions, based on the framework, will affect the system or how the system will affect our decisions because of practical, cultural and social issues within the Service.

PARTIAL CONTROLLABILITY OR IMPLEMENTATION UNCERTAINTIES

Uncertainties around partial controllability is related to situations where we believe a decision was made by the decision maker, in this case the decision from a high level post to implement the framework, but the framework may not be implemented by lower level managers unless some controls or guidelines are put in place. Another possibility is that the framework is implemented, but circumstances beyond our control result in the inability to perform a specified action as planned.

PARTIAL OBSERVABILITY

Uncertainties related to partial observability arises because the system being managed is measured or observed indirectly. In implementing the cross-program integration framework, we may miss opportunities to measure, monitor, or learn from the implementation process about what went wrong, what went right, why did the framework work in some situations and not others. This uncertainty is reducible if the framework provides clear guidance on implement strategies, monitoring, and all regions commit to the learning process (follow up) recommended by our team.

CONCLUSION

Workshop participants felt the most important part of the decision structuring was ensuring the problem statement and objectives were clearly defined and agreed upon by all participants before proceeding further into the process. The decision problem was difficult to define because participants were biologists by training and this problem was one that draws heavily on human dimensions, and on social and cultural issues to which biologists are not accustomed. Because of social and cultural differences with the agency, we believed the structured decision making process helped us deconstruct the various components of the problem into smaller, more manageable parts. Therefore, we need to keep in mind that we measure progress and accomplishments by component pieces rather than by the finished product. Furthermore, we believe and have received feedback that the framework will be applicable and valuable beyond the FWS programs. There has been early feedback from partners indicating that they would like to see a similar process in place within their own agency or NGO. We believe the outcome of our process will foster "buy-in" by all Service staff. We also believe that the initial framework provides a transparent process that will encourage constructive criticism and suggestions to refine the framework. We believe that once refined, the framework will transcend programmatic and agency boundaries and help provide sound guidance for collaboration and integration of resources and expertise to achieve our highest priority conservation goals.

NEXT STEPS

1. We will proceed with the goal of piloting the selected alternative (s) in several if not all regions by:
    a. Reaching out to staff of the Office of Science Advisor and to the Regional Directorate.
    b. Send the report to and present an update to the Science Committee at the Oct. 2012 meeting in Arlington, VA.

c. Send report to and present to the Science Application ARDs in each region.
d. Send report to and present to LCC coordinators and LCC science coordinators.
e. Via the Science Application ARDs, present to regional directorate
f. Develop factsheet and distribute along with report to interested entities.
g. Build upon and refine the framework
h. Obtaining feedback from pilot effort.

2. The "winning" alternative was Alternative #2: Forum followed closely by alternative #1: Science Team. Our team recommends that regions look closely at their situations and choose either Alternative 1 or 2 or develop a hybrid of the two. There may be practical reasons related to implementation for going with one alternative or another. A region may see value in using both alternatives for different portions of their region or LCC geography. What is important is learning more about how each alternative performs with regard to the fundamental objectives, ease of implementation, transparency of process, and equitable elicitation of needs.
3. Each region and program needs to commit to the identified priorities through assignment of staff, time or funding to priorities (i.e., in performance standards) regardless of whether the priorities are relevant to the specific program or to the greater conservation goal as a whole. This is where the Service would benefit the most from the selected alternative. It is also then conducting business under the new business model – Strategic Habitat Conservation. We cannot stress enough how integral this criterion is to successful implementation of the selected framework.
4. Each region needs to develop and document a fair and unbiased process to identify conservation priorities and science needs whether the elicitation is done within a program or via a cross-program forum. The process could be directed by a regional science team or the SA-ARD. It is important that the elicitation process is comprehensive, fair, unbiased and transparent.
5. Similarly, each region needs to develop a prioritization process that can be used at multiple levels within the agency and we recommend that this be done using the structured decision-making process.

6. The SA-ARD can bring Regional science needs to the National level for consideration across LCCs and for consideration of internal action through the Washington Office.
    a. At the National level there would need to be a similar cross-programmatic science panel to rank National priorities (This could be the existing Science Team that Dr. Gaby Chavarria put together (they come to the table without their programmatic affiliations and let the science speak for itself)) or the Service could create some different entity.
7. The Regional Directors should charge each cross-programmatic science team with developing a scope of work and a prioritization process that further fleshes out the detail of how they will function BEFORE any scoping or prioritization of science needs begins and the process should be reviewed and approved by ARDs (Regional Directorate Teams).
    a. Each program and/or cross-program science team will need a process for eliciting needs from the field and for setting programmatic and cross-programmatic conservation science needs at all levels in the organization. We brainstormed a few but this is the subject for **another structured decision-making workshop**:

Possible criteria for prioritizing conservation priorities and needs within each FWS program:

    a. Conservation issue is a widespread problem.
    b. Benefits multiple programs.
    c. Priority can be alleviated with policy or management.
    d. Priority addresses the most important ecological/anthropogenic driver
8. Information needs should be captured in a regional or national database (e.g. Fish and Wildlife Information Needs System (FWINS)).
9. Finally, the members of this structured decision making workshop are committed to learning and have agree to serve as a review panel for how the process has worked for each region after a year of implementation. This team will collate and review each regions scope of work, information elicitation process, prioritization process, and any

feedback regions will provide. We will provide results from our review to the Regional Directorate.

LITERATURE CITED

Williams, B. K. 1997. Approaches to the management of waterfowl under uncertainty. Wildlife Society Bulletin 25:714-720.