# National Fish Habitat Board Meeting

October 7-8, 2008

Arlington, Virginia

NATIONAL FISH HABITAT ACTION PLAN

Meeting Location

Board Members and Staff

Draft Agenda

Draft Minutes from May 2008 meeting

Legislation

FWS Funds Allocation

A Framework for Assessing the Nation's Fish Habitat

Communications Committee Materials

WAFWA letter

Candidate FHP Materials

Revised Guidance for Fish Habitat Partnerships

Strategic Planning Guidance for Fish Habitat Partnerships

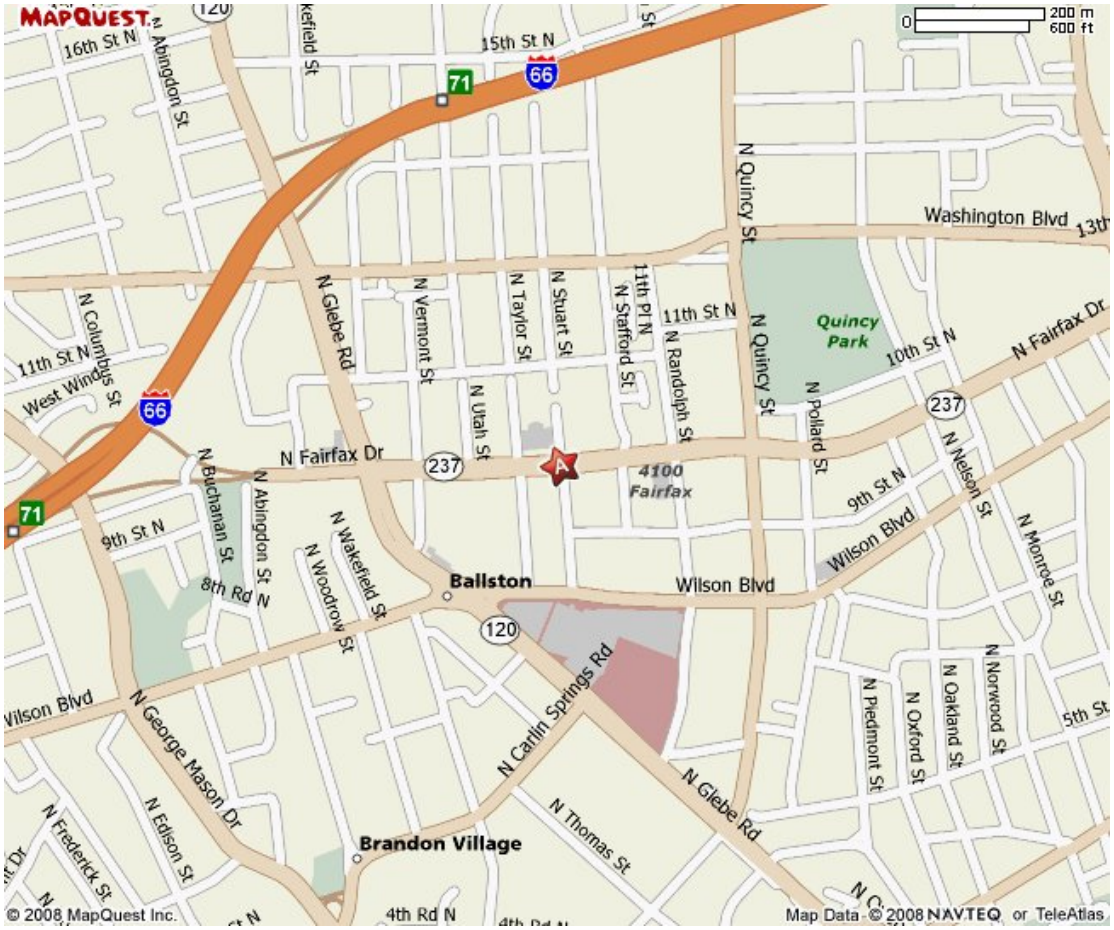
Proposal for 1-year-out Workshop

Duties of Vice-chair

Future Meetings

National Fish Habitat Board meeting October 7-8, 2008

**Location: The Nature Conservancy**
4245 North Fairfax Drive , Suite 100
Arlington,Virginia 22203




**Metro Accessible**

Take the Orange line in the direction of Vienna to the Ballston metro station. Exit and cross North Fairfax Drive, TNC will be on your left.

**National Fish Habitat Board Members**

| | |
|---|---|
| Kelly Hepler, *Chair* | Alaska |
| Gary Myers | Southeast AFWA |
| Ed Parker | Northeast AFWA |
| Marion Conover *for* Rich Leopold | Midwest AFWA |
| Jeff Koenings | Western AFWA |
| Matt Hogan | AFWA |
| Jim Balsiger | NOAA/NMFS |
| Gary Frazer *for* Dale Hall | DOI/FWS |
| Jason Stark *for* Michael (Mic) J. Isham, Jr. | Tribal, GLIFWC |
| Jim Sedell *for* Krystyna Wolniakowski | NFWF |
| Charles Gauvin | Conservation/Academic, TU |
| Michael Andrews | Conservation/Academic, TNC |
| William W. Taylor | Conservation/Academic, SFBPC |
| Stan Moberly | Conservation/Academic, AFS |
| Stan Allen *for* Randy Fisher | At large/Interstate Fishery Commission, PSMFC |
| Bob Mahood | At large/Fishery Management Council, SAFMC |
| Gordon Robertson | At large, ASA |
| Chris Horton | At large, BASS/ESPN |
| Pat Murray | Conservation/Academic, CCA |

<u>Also participating:</u>

| | |
|---|---|
| Anne Zimmermann *for* Gail Kimbell | Federal, USDA FS |
| Anthony Moore *for* Ben Grumbles | Federal, US EPA |

## National Fish Habitat Board staff

Ron Regan
Association of Fish and Wildlife Agencies

Ryan Roberts, Communications Director
Association of Fish and Wildlife Agencies

Christopher Estes
AK Department of Fish and Game

Susan-Marie Stedman
NOAA Fisheries Service

Tom Busiahn
US Fish and Wildlife Service

Janet Cushing
US Geological Survey

## Committee Chairs

### Science and Data Committee:
Gary Whelan, MI Department of Natural Resources
Doug Beard, US Geological Survey

**Pro-bono counsel:**
Thomas Jensen, Sonnenschein Nath & Rosenthal

**National Fish Habitat Board meeting Oct 7-8, 2008**
The Nature Conservancy
4245 North Fairfax Drive – Suite 100
Arlington, VA 22203-1606

Tuesday October 7

**1:00 - 2:00** **Welcome and Introductions** Kelly Hepler, Board Chair
Welcome from Mike Andrews, TNC
Introductions - Board (and proxies), staff, and attendees
Agenda and proposed amendments - Tab 3
Approve draft minutes from May 2008 meeting - Tab 4
Update on NFHAP Executive Order
Update on MSCG for NFHAP NCN
Update on state funding for NFHAP

**2:00 – 3:00** **Update on legislation** Gordon Robertson
Tab 5 - INFORMATION David Anderson

**3:00 – 3:30** **Update on allocations of FWS funds** Gary Frazer
Tab 6 - INFORMATION

**3:30 – 4:15** **Science and Data**

Adopt "Framework for a National Fish Habitat Assessment" Gary Whelan
Tab 7 – ACTION/ADOPTION Doug Beard

Update on 2010 national assessment Dana Infante
INFORMATION

**4:15 – 4:30** **BREAK**

**4:30 – 5:30** **Short-term and long-term goals for Board** Kelly Hepler
DISCUSSION
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**6:00 – 8:00** **Happy Hour ☺ at TNC**

Wednesday October 8

| | | |
|---|---|---|
| **8:30 – 9:30** | **Adopt short-term and long-term term goals**<br>ACTION/ADOPTION | Kelly Hepler |
| **9:30 – 10:00** | **Communications update**<br>Tab 8 - INFORMATION | Ryan Roberts |
| **10:00 – 10:15** | **WAFWA letter**<br>Tab 9 - INFORMATION | Jeff Koenings |
| **10:15 – 10:30** | **BREAK** | |
| **10:30 – 11:00** | **Strategic Planning Guidance for FHPs**<br>Tab 12 – ACTION/ADOPTION | Margaret Connelly |
| **11:00 – 11:30** | **Great Lakes Basin Candidate FHP**<br>Tab 10 - INFORMATION | Mark Brouder |
| **11:30 – 12:00** | **Fishers and Farmers Candidate FHP**<br>Tab 10 - INFORMATION | Roger Wolf |
| **12:00 – 1:00** | **LUNCH** | |
| **1:00 – 2:30** | **Revisions to FHP Guidance**<br>Tab 11 – ACTION/APPROVAL | Tom Busiahn |
| **2:30 - 3:00** | **1-year-out workshop**<br>Tab 13 – ACTION/ENDORSEMENT | Kelly Hepler |
| **3:00 – 3:30** | **Election of Vice-chair**<br>Tab 14 - ACTION | Kelly Hepler |
| **3:30 – 4:00** | **Future meetings, final business**<br>Tab 15 - ACTION | Susan-Marie Stedman |

# National Fish Habitat Board meeting

May 13 - 14, 2008
The Nature Conservancy
4245 North Fairfax Drive – Suite 100
Arlington, VA 22203-1606

**Tuesday, May 13**

The Board meeting commenced at 1 PM. After a welcome from Mike Andrews of The Nature Conservancy, attendees introduced themselves. See attachment for attendees in addition to those below.

Board Members Present:

- John Cooper, Chair
- Kelly Hepler, Vice-chair
- Gary Myers
- Doug Austen
- Jeff Koenings
- Matt Hogan
- Mike Andrews
- Krystyna Wolniakowski
- Bob Mahood
- Bill Taylor
- Chris Horton
- Stan Moberly
- Gordon Robertson
- Charles Gauvin

Proxies:

- Sam Rauch, for Jim Balsiger
- Gary Frazer, for Dale Hall
- Marion Conover, for Richard Leopold
- Steve Moyer, for Charles Gauvin during parts of the meeting
- Mary Beth Charles, for Gordon Robertson during parts of the meeting

Board members not present and not represented:

- Mic Isham
- Randy Fisher

Also participating:

- Anne Zimmerman

Board staff:
Ron Regan
Christopher Estes
Tom Busiahn
Susan-Marie Stedman
Janet Cushing

Science and Data Committee Co-chair
Doug Beard

Facilitator:
Cheryl Amrani

**Approval of Minutes**
Stan Moberly moved to approve the minutes from the Feb 20-21, 2008 meeting. The motion was seconded by Bill Taylor and approved unanimously.

**Update on NFHAP Executive Order**
Gary Frazer reported that John Cooper and Gary Frazer met with DOI Assistant Secretary Lyle Laverty to discuss the EO. They discussed a possible amendment to the existing EO, or other guidance from CEQ that might be less onerous or easier to move than an EO. The issue has been handed to a new Deputy Assistant Secretary, and is in discussion in DOI. It should be clear before the election whether this Administration will approve an EO.

**Update on NFHAP legislation**
Gordon Robertson reported that since the last Board meeting the legislative sub-committee has taken a draft to the Hill and are incorporating suggestions from Congressional staff. Sen. Lieberman and Sen. Bond continue to be interested in sponsorship, and Gordon expects to see a "serious draft if not introduced bill" by July or August. Kelly Hepler requested regular updates to Board through so they can start to enlist support at the appropriate time.

**State funding for NFHAP**
Chair Cooper explained that an account has been set up at the National Fish and Wildlife Foundation where states can transfer funds to be used for NFHAP. There was some discussion about how current economic conditions are making it difficult for states to contribute funds. Gary Myers mentioned that participants at the SEAFWA meeting seemed more supportive after Scott Robinson of SARP talked about the money SARP has brought into the states through grants. It was decided that the next steps would be: 1) send a letter to state directors explaining that the account has been set up and that any contribution they can make to support the commitment that was made in 2004 would be appreciated, 2) follow-up with the regional association coordinators in the NE and SE, 3) let the Board know how things go at the upcoming meeting of the Western Association.

**Teaming With Wildlife**
Ron Regan briefed the Board on S. 2670, a wildlife funding bill introduced by Senator Johnson of South Dakota, that would direct oil & gas receipts (offshore & onshore) to wildlife conservation. AFWA's interpretation is that fish is included in "wildlife", and water is included as habitat.

**Application for Board Recognition of the Southwest Alaska Salmon Habitat Partnership as a Fish Habitat Partnership**

The Southwest Alaska Salmon Habitat Partnership submitted supplemental material to the Board to address the deficiencies in their application submitted to the Board at their February 2008 meeting. Board staff reviewed the material and recommended to the Board that the partnership be recognized and that the Board require 1) a rigorous, inclusive strategic planning process to be completed in 3 years, 2) follow through on re-activating technical committee and invite USGS to participate, and 3) communicate with other FHPs in AK.

Bob Mahood asked what will happen if SWASHP does not follow through on the Board's requirements. Tom Busiahn explained that if the Board approves changes to the Guidance that allow review of FHPs at intervals of less than 5 years, the Board can re-evaluate SWASHP at any time. Anne Zimmermann suggested that the Board ask for some mid-point milestones towards completing the strategic plan in 3 years. John Cooper agreed that the Board should ask for that in the letter to the SWASHP.

Kelly Hepler moved to accept staff recommendation including points in letter, Stan Moberly seconded. The motion passed with Mike Andrews abstaining.

Krystyna Wolniakowski suggested that the Board ask for annual progress reports from all FHPs in developing and implementing their strategic plans.

**Structure and Function of Fish Habitat Partnerships**

Chairman John Cooper explained the importance of this topic and the structure of the two days of Board discussions and actions. He thanked Doug Austen and Laurel Anders for putting on the meeting in Pennsylvania that resulted in the white paper provided to the Board, and thanked Tom Busiahn for putting together the various drafts of the white paper and for including the comments and responses in the briefing books for the Board.

Coop then asked the Board to consider the two models for organizing FHPs discussed in the white paper – either bottom up or top down. He stated that he himself has vacillated on the best approach, but that the success of the pilot partnerships speaks to the need to allow the FHPs to develop as they see best, even if it looks "messy".

Tom Busiahn reviewed the recommendations in the white paper and then representatives of FHPs were asked to comment.

Jeanne Hanson and John DeLapp at the Mat-Su FHP talked about the strong local support in each of the partnerships and how consolidating FHPs in AK right now would be a distraction to the development of the partnerships, especially since habitat impact issues between various partnerships are different (urban development vs protection of pristine habitat). Doug Austen asked how the situation in AK is any different from other areas like the SE, where there are urban and pristine areas. Jeanne replied that there isn't a difference except in timing – that the AK partnerships need time to figure out their own organization before they try to combine. Coop asked if each AK partnership is prepared to undertake all the administrative requirements the Board will require. Jeanne and John said they were open to the concept of a combined administrative entity, which was also suggested by Mike Andrews.

Robin Knox of WNTI reiterated his suggestion that there be 7 regional umbrella organizing entities to coordinate FHPs within the boundaries of those entities. He also expressed concern about the data collection requirements. Gary Myers asked if WNTI would be willing to expand its current data effort to include reservoirs and lakes. Robin indicated that WNTI's interests were broader than habitat, so it might be difficult to expand just the habitat components.

Steve Perry of the EBTJV talked about the name recognition the partnership has as a JV, but said he supported the recommendation that they add a tag line identifying themselves as a FHP. He also observed that the path the JVs (including the EBTJV) took of establishing themselves before they could get any outside $$ made them stronger partnerships. He also talked about their overlap with SARP, saying that EBTJV works higher in the watershed than SARP or the Candidate ACFHP.

Jeff Hastings of the DARE talked about the recommendation in the draft white paper that DARE and the Fishers and Farmers partnership combine, pointing out that the groups are open to coordinating administratively. Gary Frazer asked about the social science aspects of partnerships – is it a sense of place that creates the partnerships? Jeff agreed that it is.

Scott Robinson of SARP explained that SARP is more of a top-down organizing body that works with a lot of local partnerships like Tampa Baywatch to help them accomplish their goals. In other words, SARP saves the smaller partnerships from having to become a FHP. Scott said it is essential that interest groups know how they fit in so they don't feel like they have to go out and form their own FHP.

The Board then engaged in a discussion of state roles and participation in multiple FHPs. Some state staff expressed concern about stretching their resources, others qualified their concern, saying it would depend on whether the Board expects the states to take a leadership role in organizing the partnerships as well as performing the scientific assessment and data collection, which could be more work than they can handle.

Phil Durocher gave a presentation on behalf of the National Reservoir Partnership. He began by observing that there are 22,000 dams larger than 30ft in the United States, so reservoirs are a national phenomenon.

Gary Myers said he thinks there is some frustration that not enough is being done in reservoirs, but the way to address that is not to fragment reservoirs out of the watershed. He suggested that the fish chiefs identify the top 4 reservoir projects and commit resources to get them done, and not try to stretch the NFHAP structure to meet this need.

The Board adjourned at 5:30

***That evening at the Board social gathering, Chair Cooper was thanked for his hard work on behalf of the Board and presented with a piece of salmon artwork.***

**Wednesday, May 14**

**Recommendations on Structure and Function of FHPs**

There was much discussion about the operation of fish habitat partnerships. Chair Cooper outlined five models for FHP operation:

1. Regional AFWAs provide administrative and operational oversight
2. FWS Regions provide administrative and operational oversight
3. FHPs are responsible for all administrative and operational functions; Board manages all $$
4. Joint Venture model
5. Shared function, multi-layer approach

The Board voted on which model they preferred; 2/3 voted for model #3 and 14 Board members also suggested further discussion of model #5.

Gary Myers moved that the Board reaffirm that FHPs are responsible for all administrative and operational tasks, and the Board recognizes that in the future this issue may be revisited as appropriate. Stan Moberly seconded. The motion passed by consensus.

The Board discussed amending **Recommendation 5** to read as follows:
*The Board ~~should~~ will reaffirm through its FHP Guidance that FHPs should be of a size and partnership diversity that can meet operational responsibilities and address where practicable and possible the causes of and processes behind habitat decline rather than the symptoms. ~~The Board should work with current Candidate FHPs to encourage merger or other form of consolidation where appropriate.~~*

Mike Andrews moved to accept **Recommendation 5** as amended. Gordon Robertson seconded and the motion passed by consensus.

The Board discussed amending **Recommendation 7** to read as follows:
*The Board, in collaboration with existing FHPs, will ~~should~~ develop more detailed operational guidance for FHPs that defines ~~recommended staffing levels to carry out~~ their responsibilities for science, assessment, planning, reporting outputs and outcomes, prioritization of places and issues, and ranking projects. The guidance will encourage*

*FHPs to collaborate with each other where appropriate in carrying out these responsibilities.*

Matt Hogan moved to accept **Recommendation 7** as amended. Gary Myers seconded, and the motion passed by consensus.

Bill Taylor moved to delete **Recommendation 3**. (*The Board should reaffirm through its FHP Guidance the Action Plan's intent that FHPs have geographic boundaries and operate at a regional scale.)* Gary Frazer seconded. The Board discussed the need to establish geographic boundaries and work at a regional scale. The motion failed.

Bob Mahood moved to approve **Recommendation 3** amended to delete "and operate at a regional scale." The motion was seconded by Mike Andrew. The motion failed.

The Board endorsed **Recommendation 9**: *The Board ~~should~~ will monitor the operational performance and needs of FHPs nationwide, and update its guidance to FHPs as needed to address changing conditions. Monitoring ~~should~~ will be at a level that allows the program to operate efficiently, that is not burdensome to FHP staff, and that does not discourage participation or innovation.*

The Board endorsed **Recommendation 10**: *The Board ~~should~~ will modify its Guidance to provide for re-evaluation of FHPs as needed, at an interval of five years or less.*

The Board endorsed **Recommendation 13** with the removal of "(FWS and NOAA)": *The Board ~~should~~ will require FHPs that apply for recognition to seek and encourage involvement by Native American governments in their governance structures, and to document these contacts as part of the application for Board recognition. In the same way, the Board ~~should~~ requires FHPs to seek and encourage involvement in governance structures by State fish and wildlife agencies and federal agencies that manage fish resources ~~(FWS, NOAA)~~. The Guidance ~~should~~ will make clear that FHPs that cannot document such efforts will not be approved.*

The Board endorsed **Recommendation 14** with the change of "program" to "effort": *The Board ~~should~~ will charge its Communications Committee to develop an outreach ~~program~~ effort to encourage Native American government involvement in FHPs and/or projects.*

Kelly Hepler expressed concern that **Recommendation 15** provides a way around the FHPs for the tribes, which may put the Board in an uncomfortable position of having to referee between a FHP and a tribal nation. Jeff Koenings concurred, observing that the Board wouldn't be in a position to evaluate individual projects. Doug Austen concurred. The recommendation was not endorsed.

The Board endorsed **Recommendation 17**: *The Board ~~should~~ will establish a standing Partnerships Committee consisting of Board members, staff, and representatives of Fish*

*Habitat Partnerships to provide information, analysis, and recommendations for Board action on the full range of FHP issues.*

Kelly Hepler expressed concern that **Recommendation 2** would dampen enthusiasm with a moratorium on Candidate FHPs. A number of Board members concurred. The recommendation was not endorsed. (*The Board should adopt a temporary moratorium until September 2010 on acceptance of new Candidate FHPs, and utilize the current pool to meet the objective of 12 or more FHPs across the United States by 2010. Exceptions to the moratorium should be made for FHPs focused on marine/coastal/estuarine systems, which are currently under-represented.)*

The Board endorsed **Recommendation 16**: *The Board ~~should~~ will postpone acceptance of new applications by Candidate FHPs for recognition until revisions to the Guidance are complete. Revisions should be completed for approval at the October 2008 Board meeting or sooner, so that the next scheduled round of FHP applications can take place as scheduled.*

Sam Rauch proposed amending **Recommendation 8** by removing the last phrase "but not by FHPs themselves". The recommendation was endorsed as amended: *The Board's operational guidance to FHPs ~~should~~ will include examples of multiple-scale conservation activities to help all partners understand how on-the-ground projects are "nested" within the FHP's strategic planning framework, and conducted by members of the FHP~~, but not by FHPs themselves~~.*

**Recommendation 4** was amended by adding "good faith effort" before "resolve", "implement operational responsibilities" after "consult with each other", and "and overlapping" after "neighboring". The recommendation was endorsed as amended: *The Board ~~should~~ will amend its Guidance to require FHPs to make good faith efforts to resolve competing or conflicting conservation goals before applying to the Board for recognition or funding. The Board ~~should~~ will require that neighboring and overlapping FHPs consult with each other ~~regarding their boundaries~~ to implement operational responsibilities, maximize geographic coverage and minimize overlap.*

**Recommendation 6** was not endorsed. *(The Board should devote staff time to help the reservoir interests identify appropriate partnership options. These could include separate regional partnerships or being included as a priority focus area within existing or potential FHPs.)*

The Board endorsed **Recommendation 1**: *The Board ~~should~~ will reaffirm through its FHP Guidance that "Fish Habitat Partnership" is the term to be consistently used, and ~~should~~ will encourage FHPs to include "Fish Habitat Partnership" in their names or in an accompanying tagline if another name is already established.*

The Board endorsed **Recommendation 11:** *The Board ~~should~~ will seek solutions to the need for long-term funding support for FHP operations.*

**Science and Data Committee Report:**
Doug Beard reported that the Science and Data Committee is continuing its work on the draft Framework on Assessing the Nation's Fish Habitat report and expects to have a final version of the report ready for the Board's review this summer. Questions were asked about the process for finalizing the report. Doug Beard stated the National Assessment would be peer-reviewed. Work is also progressing on a conservation priorities database.

**USGS Research Plan**
Doug Beard reported on the NFHAP Science and Monitoring Needs Workshop which was sponsored by USGS as proposed by Susan Haseltine at the June 2007 Board meeting and was held on March 4-6, 2008. He also described the USGS research plan for NFHAP and asked for Board endorsement of it, as well as assurance that the results of the research will be used by the Board and FHPs.

Bill Taylor moved to endorse the USGS Research Plan for NFHAP and commit to partner with USGS in implementing the results in an adaptive framework. The motion was seconded by Stan Moberly and passed unanimously.

**Communications Committee report**
Ryan Roberts, Board Communications Director, reported on the communications objectives for 2008: Media Outreach, Partnership Relations, Communications Initiatives, and Message & Branding. He also discussed a strategic communications plan to be unveiled at the next board meeting in October.

Kelly Hepler expressed a desire for active Board involvement in a communications strategy for the legislation. Krystyna Wolniakowski asked that as part of updating the 2006 Communication Strategy that the items be prioritized. Bob Mahood observed that the web site is very important in communicating with the public, and also suggested that a 10-15 minute DVD would be very helpful in explaining NFHAP. Steve Perry suggested that FHP representatives be involved with the national Communications sub-Committee.

**Board review of FWS 2008 NFHAP demonstration projects**
Gary Frazer explained the process for selecting the demonstration projects. FWS set aside $600K of its 2008 appropriation for "demonstration projects" endorsed by Candidate Fish Habitat Partnerships. The process for selecting projects was similar to the process for "regular" projects ranked by FHPs. The lead FWS Region associated with each Candidate FHP submitted 1-2 projects per Candidate FHP that addressed the Board's 4 interim strategies. A total of 23 projects were submitted on behalf of 14 of the 15 Candidate FHPs, requesting nearly $1.7 million. A joint team of Board representatives and FWS managers recommended 7 projects for selection. The FWS Director has concurred with the recommendations, and FWS now seeks concurrence from the Board.

Kelly Hepler moved to concur with the selection of demonstration projects, Matt Hogan seconded. The motion was approved unanimously.

**Election of new Board chair**

Chairman Cooper reiterated the requirement in the charter that the Board Chair be selected from one of the state representatives. Ed Parker, Gary Myers, and Kelly Hepler were nominated in response to an e-mail to Board members in March. Ed and Gary have declined to be considered for Board Chairmanship. Nomination of Kelly was seconded by Gary Myers. No vote was needed and Kelly Hepler was officially named the new Board Chair.

**Next meetings**

In the "Process and Schedule for Recognizing Fish Habitat Partnerships" the Board tentatively approved meeting dates of:

- October 8-9, 2008: Marion Conover said the 7-8 would be better. Meeting moved to October 7-8.
- March 4-5, 2009 – need to confer with GLIFWC on these dates, possibly move back a week.

**Return to FHP Recommendations**

Gary Myers suggested that **Recommendation 6** be amended to substitute "projects" for "partnership" and adopted to get some funding on the ground for reservoir projects. The effect would be to have Board staff work with Reservoir Partnership to identify high-priority reservoir projects that could be identified as "NFHAP projects". Chris Horton said they would welcome help in identifying high-priority reservoir projects and marketing them as NFHAP work, they want to start doing work on the ground and not wait until they are a recognized FHP. Chairman Cooper encouraged Chris Horton to come to the Board with priority projects. Sam Rauch expressed concern about giving special consideration and staff time to a single Candidate FHP. Susan-Marie Stedman suggested that the "Branding Guidance" be used as a way of identifying priority reservoir projects as NFHAP projects. The recommendation remained un-endorsed.

**Recommendation 3** was not endorsed in any of its amended forms so the recommendation was on the table in its original form. There was considerable discussion about the effect of endorsing or not endorsing the recommendation, and what message the Board is sending to the National Reservoir Partnership. Sam Rauch suggested that we have "punted" on this issue before, and can punt again, leaving the issue for when the National Reservoir Partnership comes in for approval. Bob Mahood asked for clarification on whether an up or down vote on the Recommendation was a vote on the National Reservoir Partnership. Chairman Cooper clarified that it was not.

A number of amendments to the recommendation were discussed. Ultimately the recommendation was not endorsed.

Some concern was expressed about **Recommendation 12** that drafting grants procedures is putting the cart before the horse. The recommendation was not endorsed. *(The Board should direct its staff to begin development of grant administration procedures in anticipation of new Action Plan legislation and appropriations, including the responsibility of FHPs to rank grant proposals within their geographic areas.)*

Matt Hogan move to adjourn the meeting. Mike Andrews seconded, and the meeting adjourned at 3:30.

Other Attendees;
Fred Fox
Lars Hedbury
Callie McMunigal
Jeanne Hanson
Pam Thiel
Louise Mauldin
Ron Dunlap
Dave Schmid
Mary Beth Charles
Jessie Thomas
Emily Greene
Naomi Lundberg
Steve Meyers
Steve Krentz
Tom Bigford
Morgan Elmer
Steve Perry
Mike Duval
Phil Durocher
Karl Hess
Mark Smith
Leslie Hartsell
Darren Benjamin
John DeLapp
Maureen Gallagher
Rob Simmonds
Abby Lynch
Robin Knox
Linda Kelsey
Scott Robinson
Vicki Finn
Andrea Ostroff
Christie Plumer
Sara LaBorde
Mark Smith
Mike Stone
Jeff Hastings
Doug McKalip
Howard Hankin
Susan Wells
Clint Riley
Hannibal Bolton

II

110TH CONGRESS
2D SESSION

# S. 3552

To conserve the United States fish and aquatic communities through partnerships that foster fish habitat conservation and improve the quality of life for the people of the United States, and for other purposes.

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IN THE SENATE OF THE UNITED STATES

SEPTEMBER 24 (legislative day, SEPTEMBER 17), 2008

Mr. LIEBERMAN (for himself, Mr. BOND, Mr. VOINOVICH, and Mrs. CLINTON) introduced the following bill; which was read twice and referred to the Committee on Environment and Public Works

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# A BILL

To conserve the United States fish and aquatic communities through partnerships that foster fish habitat conservation and improve the quality of life for the people of the United States, and for other purposes.

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,*

**SECTION 1. SHORT TITLE; TABLE OF CONTENTS.**

(a) SHORT TITLE.—This Act may be cited as the ''National Fish Habitat Conservation Act''.

(b) TABLE OF CONTENTS.—The table of contents for this Act is as follows:

**SEC. 2. FINDINGS; PURPOSES.**

(a) FINDINGS.—Congress makes the following findings:

(1) Healthy populations of fish and other aquatic organisms depend on the conservation, protection, restoration, and enhancement of aquatic habitats in the United States.

(2) Aquatic habitats, including wetlands, streams, rivers, lakes, estuaries, coastal and marine ecosystems, and associated riparian upland habitats that buffer those areas from external factors, perform numerous valuable environmental functions which sustain environmental, social, and cultural values, including recycling nutrients, purifying water, attenuating floods, augmenting and maintaining stream flows, recharging ground water, acting as primary producers in the food chain, and providing essential and significant habitat for plants, fish and wildlife, and other dependent species.

(3) The extensive and diverse aquatic habitat resources of the United States are of enormous significance to the economy of the United States, providing recreation for 44,000,000 anglers, more than 1,000,000 jobs and approximately $125,000,000,000 in economic impact each year related to recreational fishing, and approximately 500,000 jobs and an additional $35,000,000,000 in economic impact from commercial fishing each year.

(4) At least 40 percent of all threatened and endangered species in the United States are directly dependent upon aquatic habitats.

(5) Certain fish species are considered to be ecological indicators of aquatic habitat quality, such that the presence of such species in an aquatic ecosystem reflects high-quality habitat for other fish.

(6) Loss and degradation of aquatic habitat, riparian habitat, water quality, and water volume caused by activities such as alteration of watercourses, stream blockages, water withdrawals and diversions, erosion, pollution, sedimentation, and destruction or modification of wetlands have caused significant declines in fish populations throughout the United States, especially declines in native fish

populations, and result in economic losses to the United States.

(7) Providing for the conservation and sustainability of fish and other aquatic organisms has not been fully realized despite federally funded fish and wildlife restoration programs and other activities intended to conserve aquatic resources. Such conservation and sustainability may be significantly advanced through a renewed commitment and sustained, cooperative efforts that are complementary to existing fish and wildlife restoration programs and clean water programs.

(8) The National Fish Habitat Action Plan provides a framework for maintaining and restoring aquatic habitats to ensure perpetuation of populations of fish and other aquatic organisms.

(9) The United States can achieve significant progress toward providing aquatic habitats for the conservation and restoration of fish and other aquatic organisms through a voluntary, nonregulatory, incentive program that is based on technical and financial assistance provided by the Federal Government.

(10) Creation of partnerships between local citizens, Indian tribes, Alaska Native organizations,

corporations, nongovernmental organizations, and Federal, State, and Indian tribal agencies is critical to the success of activities to restore aquatic habitats and ecosystems.

(11) The Federal Government has numerous regulatory and land and water management agencies, including the United States Fish and Wildlife Service, the Bureau of Land Management, the National Park Service, the Bureau of Reclamation, the Bureau of Indian Affairs, the National Marine Fisheries Service, the Forest Service, the Fishery Management Councils, the Environmental Protection Agency, and the several interjurisdictional fishery commissions that are critical to the implementation of the National Fish Habitat Action Plan.

(12) The United States Fish and Wildlife Service, the Forest Service, and the National Marine Fisheries Service each play a vital role in the protection, restoration, and enhancement of the fish communities and aquatic habitats in the United States and the development, operation, and long-term success of fish habitat partnerships and project implementation.

(13) The United States Geological Survey plays a vital role in scientific evaluation, data collection,

and mapping for fishery resources in the United States.

(14) Many of the programs for conservation on private farmland, ranchland, and forestland that are carried out by the Secretary of Agriculture, including the Natural Resources Conservation Service and the State and Private Forestry programs of the Forest Service, are able to significantly contribute to the implementation of the National Fish Habitat Action Plan through the engagement of private landowners.

(b) PURPOSES.—The purposes of this Act are to encourage partnerships among public agencies and other interests consistent with the mission and goals of the National Fish Habitat Action Plan—

(1) to protect and maintain intact and healthy aquatic habitats;

(2) to prevent further degradation of aquatic habitats that have been adversely affected;

(3) to reverse declines in the quality and quantity of aquatic habitats to improve the overall health of fish and other aquatic organisms;

(4) to increase the quality and quantity of aquatic habitats that support a broad natural diversity of fish and other aquatic species;

(5) to improve fisheries habitat, thereby improving the annual economic output from recreational, subsistence, and commercial fishing;

(6) to ensure coordination and facilitation of activities carried out by agencies or departments of the United States under the leadership of the Director of the United States Fish and Wildlife Service, the Under Secretary for Oceans and Atmosphere of the Department of Commerce, and the Director of the United States Geological Survey; and

(7) to achieve other purposes in accordance with the mission and goals of the National Fish Habitat Action Plan.

**SEC. 3. DEFINITIONS.**

In this Act:

(1) APPROPRIATE CONGRESSIONAL COMMITTEES.—The term ''appropriate congressional committees'' means the Committee on Commerce, Science and Transportation and the Committee on Environment and Public Works of the Senate and the Committee on Natural Resources of the House of Representatives.

(2) AQUATIC HABITAT.—The term ''aquatic habitat''—

(A) means any area upon which aquatic organisms depend, directly or indirectly, to carry out the life processes of such organisms, including an area used by such organisms for spawning, incubation, nursery, rearing, growth to maturity, food supply, or migration; and

(B) includes an area adjacent to an aquatic environment if such adjacent area—

(i) contributes elements, such as the input of detrital material or the promotion of planktonic and insect populations providing food, which make fish life possible;

(ii) protects the quality and quantity of water sources;

(iii) provides public access for the use of fishery resources; or

(iv) serves as a buffer protecting the aquatic environment.

(3) ASSISTANT ADMINISTRATOR.—The term ''Assistant Administrator'' means the Assistant Administrator for Fisheries of the National Marine Fisheries Service.

(4) CONSERVATION; CONSERVE; MANAGE; MANAGEMENT.—The terms ''conservation'', ''conserve'', ''manage'', and ''management'' mean to protect, sus-

tain and, where appropriate, restore and enhance, healthy populations of fish, wildlife, and plant life, as well as the habitats that are required to sustain fish, wildlife, and plant life, as well as the habitats that are required to sustain fish, wildlife, and plant life productivity by utilizing methods and procedures associated with modern scientific resource programs, including protection, research, census, law enforcement, habitat management, propagation, live trapping and transplantation, and regulated taking.

(5) DIRECTOR.—Except as otherwise provided, the term ''Director'' means the Director of the United States Fish and Wildlife Service.

(6) FISH.—The term ''fish'' means any freshwater, diadromous, estuarine, or marine finfish or shellfish, including the egg, spawn, spat, larval, and other juvenile stages of such an organism.

(7) FISH HABITAT CONSERVATION PARTNERSHIP; PARTNERSHIP.—The terms ''Fish Habitat Conservation Partnership'' and ''Partnership'' mean an entity designated by the Board as a Fish Habitat Conservation Partnership pursuant to section 5(c).

(8) FISH HABITAT CONSERVATION PROJECT; PROJECT.—The terms ''fish habitat conservation project'' and ''project'' mean a project submitted to

the Board by a Fish Habitat Conservation Partnership and approved by the Secretary under section 6 that provides for the conservation or management of aquatic habitat and that may include—

(A) the provision of technical assistance to a State, Indian tribe, or local community by the National Fish Habitat Partnerships Office or other agency to facilitate the development of strategies and priorities for the conservation of aquatic habitats; or

(B) the obtaining of a real property interest in land or waters, including water rights, if the obtaining of such interest is subject to terms and conditions that will ensure that the real property will be administered for the long-term conservation of such lands and waters and the fish dependent thereon.

(9) INDIAN TRIBE.—The term ''Indian tribe'' has the meaning given the term in section 4 of the Indian Self-Determination and Education Assistance Act (25 U.S.C. 450b).

(10) NATIONAL FISH HABITAT ACTION PLAN; PLAN.—The terms ''National Fish Habitat Action Plan'' and ''Plan'' mean the National Fish Habitat

Action Plan dated April 24, 2006, and any subsequent revision or amendment to that Plan.

(11) NATIONAL FISH HABITAT BOARD; BOARD.—Except as otherwise provided, the terms ''National Fish Habitat Board'' and ''Board'' mean the National Fish Habitat Board established in section 4(a).

(12) REAL PROPERTY INTEREST.—The term ''real property interest'' means an ownership interest in land or waters, including water rights, or a building or object that is permanently affixed to the land.

(13) SECRETARY.—The term ''Secretary'' means the Secretary of the Interior.

(14) STATE AGENCY.—The term ''State agency'' means the fish and wildlife agency of a State, or any department, or division of a department or agency of a State that is empowered by statute or by the constitution of the State to manage in the public trust the inland or marine fishery resources of the State.

**SEC. 4. NATIONAL FISH HABITAT BOARD.**

(a) ESTABLISHMENT.—

(1) IN GENERAL.—There is established a National Fish Habitat Board—

(A) to promote, oversee, and coordinate the implementation of this Act and the National Fish Habitat Action Plan; and

(B) to review and recommend fish habitat conservation projects.

(2) MEMBERSHIP.—The members of the Board shall be as follows:

(A) The Director.

(B) The Assistant Administrator.

(C) The Chief of the Natural Resources Conservation Service.

(D) The Director of the Watershed, Fish, Wildlife, Air & Rare Plants program of the Forest Service.

(E) The Assistant Administrator for Water of the Environmental Protection Agency.

(F) The President of the Association of Fish and Wildlife Agencies.

(G) The Secretary of the Board of Directors of the National Fish and Wildlife Foundation appointed pursuant to section 3(g)(2)(B) of the National Fish and Wildlife Foundation Establishment Act (16 U.S.C. 3702(g)(2)(B)).

(H) Four representatives of State agencies, each 1 of whom is nominated by 1 of the re-

gions Associations of Fish and Wildlife Agencies (Northeast, Southeast, Midwest, and Western).

(I) One representative of the American Fisheries Society.

(J) Two representatives of Indian tribes, 1 of whom shall represent Indian tribes from Alaska and 1 of whom shall represent Indian tribes from the other States.

(K) One member who represents the Regional Fishery Management Councils established under section 302 of the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1852).

(L) One member who represents the Marine Fisheries Commissions (the Atlantic States Marine Fisheries Commission, the Gulf States Marine Fisheries Commission, and the Pacific States Marine Fisheries Commission).

(M) One representative from the Sportfishing and Boating Partnership Council.

(N) Eleven members each of whom represents the interests of 1 of the following:

(i) The recreational sportfishing industry.

(ii) The commercial sportfishing industry.

(iii) Subsistence fishermen.

(iv) Marine recreational anglers.

(v) Freshwater recreational anglers.

(vi) Terrestrial resource conservation organizations.

(vii) Aquatic resource conservation organizations.

(viii) The livestock and poultry production industry.

(ix) The housing development industry.

(x) The row crop industry.

(xi) Natural resource commodity interests, such as petroleum or mineral extraction.

(3) COMPENSATION.—Members of the Board shall serve without compensation for that service.

(b) APPOINTMENT AND TERMS.—

(1) IN GENERAL.—Except as otherwise provided in this subsection, a member of the Board described in subparagraphs (H) through (N) of subsection (a)(2) shall serve for a term of 3 years.

(2) INITIAL BOARD MEMBERSHIP.—Not later than 6 months after the date of the enactment of this Act, the representatives of the National Fish Habitat Board established by the Plan shall appoint the initial members of the Board described in subparagraphs (H) through (N) of subsection (a)(2).

(3) TRANSITIONAL TERMS.—The initial appointments of the members of the Board described in subparagraph (N) of subsection (a)(2) shall be for terms as follows:

(A) Four shall be appointed for a term of 1 year.

(B) Four shall be appointed for a term of 2 years.

(C) Three shall be appointed for a term of 3 years.

(4) VACANCIES.—A vacancy of a member of the Board described in subparagraphs (H) through (N) of subsection (a)(2) shall be filled by an appointment made by the remaining members of the Board.

(5) CONTINUATION OF SERVICE.—An individual whose term of service as a member of the Board expires may continue to serve on the Board until a successor is appointed.

(6) REMOVAL.—If a member of the Board described in subparagraphs (H) through (N) of subsection (a)(2) misses 3 consecutive regularly scheduled Board meetings, the members of the Board may vote to remove that member and appoint another individual in accordance with paragraph (4).

(c) CHAIR.—

(1) ELECTION.—A Chair of the Board shall be elected by the Board from among its members.

(2) TERM.—The Chair of the Board shall serve for a term of 3 years.

(d) MEETINGS.—

(1) IN GENERAL.—The Board shall meet at the call of the Chair but in no case less often than twice a year.

(2) PUBLIC ACCESS.—All meetings of the Board shall be open to the public.

(e) BOARD PROCEDURES.—

(1) IN GENERAL.—The Board shall establish procedures to carry out the business of the Board that include the following:

(A) A requirement that a quorum of the members of the Board be present to transact business.

(B) A requirement that no recommendations may be adopted by the Board, except by the vote of ⅔ of all members present and voting.

(C) Procedures for setting national goals and priorities for aquatic habitat conservation for the purposes of this Act.

(D) Procedures for designating Fish Habitat Conservation Partnerships under section 5.

(E) Procedures for reviewing, evaluating, and recommending fish habitat conservation projects.

(2) QUORUM.—A majority of the members of the Board shall constitute a quorum.

**SEC. 5. FISH HABITAT CONSERVATION PARTNERSHIPS.**

(a) AUTHORITY TO DESIGNATE.—The Board is authorized to designate Fish Habitat Conservation Partnerships.

(b) APPLICATION.—An entity seeking to be designated as a Fish Habitat Conservation Partnership shall submit an application to the Board at such time and in such manner as the Board may reasonably require.

(c) PURPOSES.—The purposes of a Partnership shall be—

(1) to coordinate implementation of the Plan at a regional level; and

(2) to develop and carry out fish habitat conservation projects.

(d) APPROVAL.—The Board may approve an application for a Partnership submitted under subsection (b) if the Board determines that the applicant—

(1) includes representatives of a diverse group of public and private partners, including Federal, State, or local governments, nonprofit entities, Indian tribes, or private individuals, that are focused on conservation of aquatic habitats to achieve results across jurisdictional boundaries and public and private lands;

(2) is organized to promote the health of important aquatic habitats and distinct geographic areas, keystone fish species, or system types, including reservoirs, natural lakes, or estuaries;

(3) identifies strategic fish and aquatic habitat priorities for the Partnership area in the form of geographic focus areas or key stressors or impairments to facilitate strategic planning and decisionmaking;

(4) is able to address issues and priorities at a nationally significant scale;

(5) includes governance structures that reflect the range of all partners and promotes joint strategic planning and decisionmaking by the applicant;

(6) demonstrates completion of, or significant progress toward the development of, a strategic plan to address the causes of system decline in fish populations rather than simply treating symptoms in accordance with the Plan; and

(7) ensures collaboration in developing a strategic vision and implementation program that is scientifically sound and achievable.

**SEC. 6. FISH HABITAT CONSERVATION PROJECTS.**

(a) SUBMISSION TO THE BOARD.—A Partnership seeking funding for a fish habitat conservation project shall submit an application to the Board for such funding at such time and in such manner as the Board may reasonably require.

(b) RECOMMENDATIONS BY THE BOARD.—Not later than July 1 of each year, the Board shall submit to the Secretary a description, including estimated costs, of each fish habitat conservation project that the Board recommends that the Secretary approve and fund under this Act, in order of priority of the Board's recommendations, for the following fiscal year.

(c) CONSIDERATIONS.—The Board shall select each project to be recommended to the Secretary under subsection (b)—

(1) based on a recommendation of the Partnership that is, or that will be, participating actively in carrying out the project; and

(2) after consideration of—

(A) the extent to which the project fulfills a purpose of this Act or a goal of the Plan;

(B) the extent to which the project addresses the national priorities set by the Board;

(C) the availability of sufficient non-Federal funds to match Federal contributions for the project, as required by subsection (e);

(D) the extent to which the project—

(i) increases fishing opportunities for the public;

(ii) will be carried out through a cooperative agreement among Federal, State, and local governments, Indian tribes, and private entities;

(iii) increases public access to land and waters; and

(iv) advances the conservation of fish and wildlife species that are listed, or are

candidates to be listed, as threatened species and endangered species under the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.); and

(E) the substantiality of the character and design of the project.

(d) LIMITATIONS.—

(1) REQUIREMENTS FOR MONITORING.—No fish habitat conservation project may be recommended by the Board under subsection (b) or provided financial assistance under this Act unless the project includes a monitoring plan designed to—

(A) appropriately assess the results of the habitat protection, restoration, or enhancement activities carried out with such assistance;

(B) recommend appropriate changes to the project if such assessment substantiates that the project objectives are not being met; and

(C) report findings of such assessment to the Board.

(2) ACQUISITION OF REAL PROPERTY INTERESTS.—

(A) IN GENERAL.—No fish habitat conservation project that will result in the acquisition by the Secretary, in whole or in part, of

any real property interest may be recommended by the Board under subsection (b) or provided financial assistance under this Act unless the project meets the requirements of subparagraph (B).

(B) REQUIREMENTS.—

(i) IN GENERAL.—Any real property interest described in subparagraph (A) may not be conveyed to a State, another public agency, or other entity unless—

(I) the Secretary determines that such State, agency, or other entity is obligated to undertake the management of the property being conveyed in accordance with the purposes of this Act; and

(II) the deed or other instrument of transfer contains provisions for the reversion of title to the property to the United States if such State, agency, or other entity fails to manage the property in accordance with the purposes of this Act.

(ii) ADDITIONAL CONVEYANCE CONDITIONS.—Any real property interest de-

scribed in subparagraph (A) conveyed as described in clause (i) shall be subject to such terms and conditions that will ensure that the interest will be administered for the long-term conservation and management of the aquatic ecosystem and the fish and wildlife dependent thereon.

(e) NON-FEDERAL CONTRIBUTION FOR PROJECTS.—

(1) IN GENERAL.—Except as provided in paragraph (2), no fish habitat conservation project may be recommended by the Board under subsection (b) or provided financial assistance under this Act unless at least 50 percent of the cost of the project will be funded with non-Federal funds.

(2) PROJECTS ON FEDERAL LAND OR WATERS.—Notwithstanding paragraph (1), Federal funds may be used for payment of 100 percent of the costs of a project located on Federal land or waters, including the acquisition of inholdings within such land and waters.

(3) NON-FEDERAL SHARE.—The non-Federal share of the cost of a project may not be derived from a Federal grant program, but may include in-kind contributions and cash.

(4) SPECIAL RULE FOR ALASKA NATIVE ORGANIZATIONS.—Notwithstanding paragraph (1) or any other provision of law, any funds made available to an Indian tribe pursuant to this Act may be considered non-Federal funds for the purpose of paragraph (1).

(f) CONSIDERATION BY THE SECRETARY.—

(1) IN GENERAL.—Not later than 180 days after receiving the recommendations of the Board for fish habitat conservation projects under subsection (b), the Secretary shall approve, reject, or reorder the priority of each such recommendation based on, to the greatest extent practicable, the criteria described in subsection (c).

(2) FUNDING.—If the Secretary approves a project, the Secretary shall use amounts made available pursuant to an authorization of appropriations in this Act to provide funds to carry out the project.

(3) NOTIFICATION BY THE SECRETARY.—If the Secretary rejects or reorders the priority of any project recommended by the Board under subsection (b), the Secretary shall provide to the Board and the appropriate Fish Habitat Conservation Partnership a written statement of the reasons that the Sec-

retary rejected or modified the priority of the project.

**SEC. 7. NATIONAL FISH HABITAT CONSERVATION PARTNERSHIP OFFICE.**

(a) REQUIREMENT TO ESTABLISH.—Not later than 1 year after the date of the enactment of this Act, the Director shall create the National Fish Habitat Conservation Partnership Office within the United States Fish and Wildlife Service.

(b) FUNCTIONS.—The National Fish Habitat Conservation Partnership Office shall—

(1) provide funding for the operational needs of the Fish Habitat Conservation Partnerships, including funding for activities such as planning, project development and implementation, coordination, monitoring, communication, and outreach;

(2) facilitate the cooperative development and approval of Partnerships;

(3) support the development and implementation of fish habitat conservation projects that are identified as high priorities by the Board;

(4) assist the Secretary and the Board in carrying out this Act;

(5) assist the Secretary in carrying out the requirements of section 9;

(6) facilitate communication, cohesiveness, and efficient operations for the benefit of the Partnerships and the Board;

(7) facilitate, with assistance from the Director, the Assistant Administrator, and the President of the Association of Fish and Wildlife Agencies, the consideration of projects by the Board;

(8) provide support to the Director in the development and implementation of the interagency operational plan required in subsection (c);

(9) provide technical and scientific assistance pursuant to the technical and scientific assistance program required by subsection (d); and

(10) coordinate and facilitate the resources and activities of the agencies and departments of the United States to carry out this Act in an efficient manner.

(c) INTERAGENCY OPERATIONAL PLAN.—Not later than 1 year after the date of the enactment of this Act and every 5 years thereafter, the Director, in cooperation with the Assistant Administrator and the heads of other appropriate Federal agencies and departments, shall develop an interagency operational plan for the National Fish Habitat Conservation Partnership Office that describes—

(1) the functional, operational, technical, scientific and general staff, administrative, and material needs of the Office; and

(2) any interagency agreements between or among Federal agencies or departments to address such needs.

(d) TECHNICAL AND SCIENTIFIC ASSISTANCE.—The Director, in coordination with the Assistance Administrator and the heads of the United States Geological Survey, the Forest Service, and other appropriate Federal agencies and departments, shall develop a technical and scientific assistance program within the National Fish Habitat Conservation Partnership Office—

(1) to provide scientific and technical assistance to States, Indian tribes, regions, local communities, and nongovernmental organizations in the development and implementation of Fish Habitat Conservation Partnerships; and

(2) to ensure the availability of expertise to conduct scientifically based evaluation and reporting of results of fish habitat conservation projects to meet the reporting requirements described in section 10.

(e) STAFF AND SUPPORT.—

(1) DEPARTMENTS OF THE INTERIOR AND COMMERCE.—The Director and the Assistant Adminis-

trator shall each provide appropriate staff to support the National Fish Habitat Conservation Partnership Office.

(2) STATES.—The States are encouraged to provide staff to support the National Fish Habitat Conservation Partnership Office.

(3) DETAILEES AND CONTRACTORS.—The National Fish Habitat Conservation Partnership Office may accept staff or other administrative support from other entities through interagency details or as contractors.

(4) QUALIFICATIONS.—The members of the staff of the National Fish Habitat Conservation Partnership Office shall have education and experience in the principles of fish, wildlife, and aquatic habitat conservation.

(f) REPORTING.—Not less frequently than once each year, the Director shall provide to the Board a report on the activities of the National Fish Habitat Conservation Partnership Office.

**SEC. 8. CONSERVATION OF AQUATIC HABITAT FOR FISH AND OTHER AQUATIC ORGANISMS ON FEDERAL LAND.**

The head of each Federal agency or department responsible for acquiring, managing, or disposing of Federal

land and waters shall, to the extent consistent with the mission of such agency or department and existing statutory authorities, cooperate with the Assistant Administrator and the Director to conserve the aquatic habitats for fish and other aquatic organisms within the land and waters of each such agency.

**SEC. 9. COORDINATION WITH STATES.**

The Secretary shall notify and coordinate with the State agency of a State not later than 30 days prior to the date that any action is planned or carried out within the State related to the implementation of this Act.

**SEC. 10. ACCOUNTABILITY AND REPORTING.**

(a) IMPLEMENTATION REPORTS.—

(1) REQUIREMENT FOR REPORTS.—Not later than 2 years after the date of the enactment of this Act, and every 2 years thereafter, the Board shall submit to the appropriate congressional committees a report on the implementation of this Act and of the Plan.

(2) CONTENT.—Each report submitted under paragraph (1) shall include—

(A) an estimate of the number of acres, stream miles, or acre feet of aquatic habitat, or other suitable measures of aquatic habitat, that was protected, restored, or enhanced under the

Plan by Federal, State, or local governments, Indian tribes, or other entities in the United States during the previous 2-year period;

(B) a description of the public access to aquatic habitats protected, restored, or created under the Plan during such period;

(C) a description of the opportunities for public fishing created under the Plan during such period; and

(D) an assessment of the status of fish habitat conservation projects carried out with funds provided under this Act, disaggregated by year, including—

(i) a description of the fish habitat conservation projects that the Board recommended under section 6(b);

(ii) a description of each such project approved by the Secretary under section 6(f), in order of priority of receiving such funding;

(iii) a justification for the approval of each such project and for the order of priority for its funding;

(iv) a justification for any rejection or reordering of the priority of each such

project recommended by the Board under section 6(b) that was based on factors other than the criteria set out in section 6(c); and

(v) an accounting of expenditures by Federal, State, or local governments, Indian tribes, or other entities in the United States to carry out such projects.

(b) STATUS AND TRENDS REPORT.—Not later than December 31, 2010, and every 5 years thereafter, the Board shall submit to the appropriate congressional committees a report on the status of aquatic habitats in the United States.

(c) REVISIONS TO THE PLAN.—Not later than December 31, 2011, and every 5 years thereafter, the Board shall undertake to revise the goals and other elements of the Plan after consideration of each report required by subsection (b).

**SEC. 11. REGULATIONS.**

The Secretary may promulgate regulations to carry out this Act.

**SEC. 12. CONSTRUCTION.**

(a) WATER RIGHTS.—

(1) IN GENERAL.—Nothing in this Act may be construed—

(A) to create a reserved water right, expressed or implied, in the United States for any purpose or to affect any water right in existence on the date of the enactment of this Act; or

(B) to affect any Federal or State law in existence on the date of the enactment of the Act regarding water quality or water quantity.

(2) AUTHORITY TO ACQUIRE WATER RIGHTS.—The Secretary may acquire, under State law, water rights that are needed to carry out this Act.

(b) STATE AUTHORITY.—Nothing in this Act may be construed—

(1) to affect the authority, jurisdiction, or responsibility of a State to manage, control, or regulate fish and wildlife under the laws and regulations of the State; or

(2) to authorize the Secretary to control or regulate within a State the fishing or hunting of fish and wildlife within the State.

(c) CONSTRUCTION WITH RESPECT TO RIGHTS OF INDIAN TRIBES.—Nothing in this Act may be construed to abrogate, abridge, affect, modify, supersede, or alter any treaty-reserved right or other right of an Indian tribe as recognized by any other means, including agreements

with the United States, Federal law, Executive orders, statutes, and judicial decrees.

(d) CONSTRUCTION WITH RESPECT TO SUITS FOR ADJUDICATION OF WATER RIGHTS.—Nothing in this Act diminishes or affects the ability of the Secretary to join an adjudication of rights to the use of water pursuant to subsections (a), (b), and (c) of section 208 of the Department of Justice Appropriation Act (43 U.S.C. 666).

(e) CONSTRUCTION WITH RESPECT TO OTHER AUTHORITIES.—

(1) ACQUISITION OF LANDS AND WATERS.—Nothing in this Act may be construed to affect, alter, or modify the authorities, responsibilities, obligations, or powers of the Secretary to acquire land or waters or interests therein under any other provision of law.

(2) PRIVATE PROPERTY PROTECTION.—Nothing in this Act may be construed to permit funds made available to carry out this Act to be used to acquire any real property or any interest in any real property without the written consent of each owner of that property or interest in property.

(3) MITIGATION.—Nothing in this Act may be construed to permit funds made available to carry out this Act to be used for fish and wildlife mitiga-

tion purposes under the Federal Water Pollution Control Act (33 U.S.C. 1251 et seq.), the Fish and Wildlife Coordination Act (16 U.S.C. 661 et seq.), or the Water Resources Development Act of 1986 (Public Law 99–662; 100 Stat. 4082).

**SEC. 13. APPLICABILITY OF FEDERAL ADVISORY COMMITTEE ACT.**

Any action taken to coordinate the carrying out of this Act with the personnel of a State agency shall not be subject to the Federal Advisory Committee Act (5 U.S.C. App).

**SEC. 14. FUNDING.**

(a) AUTHORIZATION OF APPROPRIATIONS.—

(1) FISH HABITAT CONSERVATION PROJECTS.—There are authorized to be appropriated to the Secretary for each of the fiscal years 2009 through 2013, $75,000,000 to provide funds for fish habitat conservation projects approved under section 6(f), of which 5 percent shall be made available each fiscal year for projects carried out by Indian tribes.

(2) NATIONAL FISH HABITAT CONSERVATION PARTNERSHIP OFFICE.—There are authorized to be appropriated to the Secretary for each of the fiscal years 2009 through 2013, $3,000,000 or 25 percent of the amount appropriated for each such fiscal year

pursuant to paragraph (1), whichever is greater, for the National Fish Habitat Conservation Partnership Office.

(3) PLANNING, REPORTING, AND ADMINISTRATIVE EXPENSES.—There are authorized to be appropriated to the Secretary for each of the fiscal years 2009 through 2013, $300,000 or 4 percent of the amount appropriated for each such year under paragraph (1), whichever is greater, for the Board, the Director, and the Assistant Administrator to utilize for planning and administrative expenses, and to carry out section 10.

(4) AVAILABILITY OF FUNDS.—Funds made available pursuant to this subsection shall remain available until expended.

(b) AGREEMENTS AND GRANTS.—The Secretary may—

(1) upon the recommendation of the Board, and notwithstanding sections 6304 and 6305 of title 31, United States Code, or the Federal Financial Assistance Management Improvement Act of 1999 (Public Law 106–107; 31 U.S.C. 6101 note) enter into a cooperative agreement or contract with a Fish Habitat Conservation Partnership for fish habitat conservation, restoration, and enhancement projects;

(2) apply for, accept, and use grants from any person or entity to carry out the purposes of this Act; and

(3) make funds available to any Federal agency or department to be used by that agency or department to award grants for any fish habitat protection, restoration, and enhancement project that the Secretary determines to be consistent with this Act.

(c) DONATIONS.—

(1) IN GENERAL.—The Secretary may—

(A) enter into an agreement with any organization described in section 501(c)(3) of the Internal Revenue Code of 1986 to solicit private donations to carry out the purposes and policies of this Act; and

(B) accept donations of funds, property, and services for use in carrying out the purposes and policies of this Act.

(2) TREATMENT OF DONATIONS.—Donations accepted under this section shall be considered as gifts or bequests to, or for the use of, the United States and may be used directly by the Secretary or provided to other Federal agencies or departments through interagency agreements.

○

**FY 2009 funding allocation for the National Fish Habitat Action Plan**
**U.S. Fish and Wildlife Service**

Background

NFHAP funding in FY 2008 was $5.153 million within the Fisheries Program budget, of which $246,100 was earmarked for the Secretary of the Interior's "Healthy Lands Initiative", targeted to the Green River basin in Wyoming. The President's request for FY 2009 was unchanged from the FY 2008 enacted level.

FY 2008 was a successful year -- NFHAP was advanced through FWS funding support at local, regional, and national levels.

- A total of 72 on-the-ground, cost-share projects were funded for $3.246 million (63% of total funds).
- FWS supported activities of Fish Habitat Partnerships and Candidate FHPs (meeting costs, travel support, strategic planning, etc.).
- FWS supported the national fish habitat assessment with $148,500, leading toward the first-ever national report on fish habitat condition in 2010.
- FWS consulted with the National Fish Habitat Board and the Fish Habitat Partnerships on funding decisions, demonstrating successful collaboration.

Significant progress was made on developing and refining the allocation process.

- FWS reached an understanding with the National Fish Habitat Board on how the Board and FWS will interact with respect to FWS's budget.
- FWS's draft policy on NFHAP implementation is in the final stages of approval.
- A "Joint Project Review Committee" including FWS managers and Board representatives convened to recommend projects to the Director and to the Board.

During FY 2008, the Board officially recognized the first five "Pilot" Fish Habitat Partnerships, all of which had received FWS project funding in 2006-2008. The Board also added the Southwest Alaska Salmon Habitat Partnership, bringing the number of recognized FHPs to six.

In FY 2008, FWS committed to one year of funding for demonstration projects, and provided $600K to support projects identified by Candidate FHPs. FWS Regions submitted 23 projects on behalf of the Candidate FHPs, totaling $1.4 million; seven projects were selected for funding. The exercise stimulated development of Candidate FHP governance structures.

Proposed Allocation of FY 2009 funds

At the Board meeting of February 20-21, 2008, FWS and the Board agreed to consult on recommended allocation priorities at the start of each Fiscal Year. The table below shows FWS's draft allocation for FY 2009. Congress has not yet appropriated funds for the full Fiscal Year; a "continuing resolution" provides funding at the 2008 level through March 6, 2009. Funding levels are not certain until Congress takes final action on the FY 2009 budget, and the potential exists for a rescission. If a rescission does occur, project funding may be less than the target levels reflected below.

Funding amounts in the table below differ from FY 2008 as follows:

- Funds for "FHP development and operations" are increased from $400,000 to $900,000. FWS Regions use these funds to support priority activities of recognized FHPs and development activities of Candidate FHPs.
- $100,000 is provided for projects identified by the Southwest Alaska Salmon Habitat Partnership.
- Candidate FHP demonstration projects are not funded.

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|---|---|---|
| **National** | | |
| Board priorities | $156,900 | To be transferred through Cooperative Agreement to AFWA to support science, communications, or other priorities of the Board |
| Board staff | $170,000 | Full-time senior staff support for Board activities, including travel. Focused on Fish Habitat Partnership coordination and liaison |
| Coordination & Leadership | $180,000 | Includes Federal Caucus coordination, maintenance and development of the NFHAP web site, facilitation for Board meetings, development of Fish Habitat Partnerships, printing NFHAP communications materials, and other Washington Office staff costs. |
| Subtotal National | $506,900 | |
| **Regional** | | |
| FHP development & operations | $900,000 | Supports operation of Fish Habitat Partnerships and development of Candidate FHPs, including meeting and travel expenses, strategic planning, and development of scientific capabilities. |
| Coordination & Leadership | $1,000,000 | Includes staff support for FHP operations, helping FHPs rank and select habitat projects, reporting accomplishments of habitat projects, providing biological expertise and technical assistance to FHPs, and outreach efforts in support of the Action Plan. |
| Subtotal Regional | $1,900,000 | |
| **Local projects** | | |
| | $600,000 | Southeast Aquatic Resources Partnership |
| | $600,000 | Eastern Brook Trout Joint Venture |
| | $846,100 | Western Native Trout Initiative (includes $246,100 for the Secretary of the Interior's "Healthy Lands Initiative" in the Green River basin, Wyoming) |
| | $300,000 | Driftless Area Restoration Effort |
| | $300,000 | Mat-Su Basin Salmon Habitat Partnership |
| | $100,000 | Southwest Alaska Salmon Habitat Partnership |
| Subtotal projects | $2,746,100 | |
| **GRAND TOTAL** | **$5,153,000** | |

For more information:
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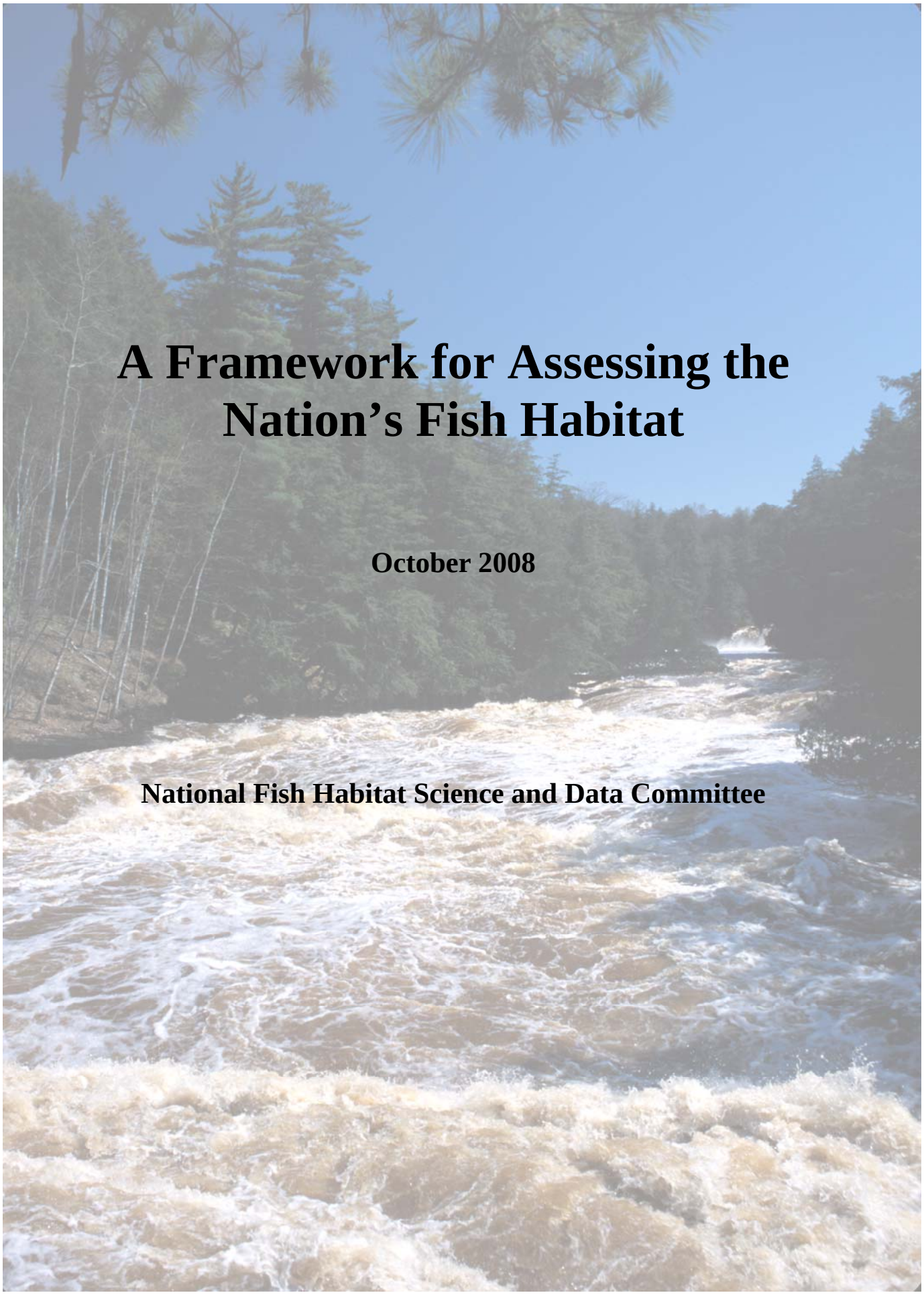

# A Framework for Assessing the Nation's Fish Habitat

**October 2008**

**National Fish Habitat Science and Data Committee**

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Cover photo credit: John Mosesso

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# Preface

In the 1992 report *Restoration of Aquatic Ecosystems,* the National Research Council recommended that a national strategy for management of aquatic ecosystems be developed to establish a national process for ecosystem assessment. Developed by a coalition of federal, state, and non-governmental partners, this proposed strategy would set national restoration goals with the following elements:

1. Restoration goals and assessment strategies for each ecoregion.
2. A prioritization process for restoration proposals.
3. Emphasis on restoration within federal and state management programs.
4. An innovative financing system.
5. Active involvement from all levels of government and a broad range of partners.

In 2004, these elements were again proposed by participants of seven stakeholder meetings, convened to advance ideas of a National Fish Habitat Initiative (NFHI). This process was facilitated by the U.S. Fish and Wildlife Service and the International Association of Fish and Wildlife Agencies, and culminated in a workshop at the 2004 American Fisheries Society Annual Meeting in Madison, Wisconsin. These meetings produced the following specific recommendations:

1. Promote recognition that fisheries resources depend directly on habitat condition and that continued habitat loss is an urgent national problem.
2. Forge new partnerships among organizations that share this concern.
3. Recognize and deal effectively with the multi-scale processes that affect aquatic habitats.
4. Quantify fish habitat by developing a standard national assessment system that uses commonly available data and "grades" all of the following aspects of aquatic habitat: watershed land cover/use, water quantity, water quality, biological indicators, channel and stream network attributes, and socioeconomics. This system should be useful at national, regional, and local scales.
5. Identify national management priorities and highlight this information in national discussions of environmental problems.
6. Track, compile, and share the results of habitat management efforts.
7. Develop an ambitious, science-based national strategy to address aquatic habitat concerns.

During 2005–2008, members of the Science and Data Committee of the National Fish Habitat Action Plan (NFHAP) developed recommendations that would provide a sound scientific foundation for this critical new initiative. Our recommendations build upon and validate those provided in the thoughtful forums summarized above.

Gary Whelan and Doug Beard
Chairs, Science and Data Committee, NFHAP
October 2008

# National Fish Habitat Action Plan
# Executive Summary

## Science and Data Strategy

This report is a companion product to, and science and data strategy for, the National Fish Habitat Action Plan (NFHAP) to achieve NFHAP's science-based goals. Those goals are:

1. Protect and maintain intact and healthy aquatic systems.

2. Prevent further degradation of fish habitats that have been adversely affected.

3. Reverse declines in the quality and quantity of aquatic habitats to improve the overall health of fish and other aquatic organisms.

4. Increase the quality and quantity of fish habitats that support a broad natural diversity of fish and other aquatic species.

*A scientific basis for the NFHAP*

Past strategies to prevent negative impacts to and rehabilitate fisheries habitat have relied on fixing symptoms of much larger scale process impairments and have been generally ineffective in stemming the continuing loss of fisheries habitat. The science and data strategy for the NFHAP focuses on process-level issues that are causative agents for the decline of fish and other aquatic species populations in freshwater and marine systems. The key to success for the plan will be to ensure that impaired and intact processes are clearly defined in each water, the partners understand what the impairments are and the potential methods to address them, and scientifically sound and legally defensible alternatives are developed to effectively protect intact habitat and improve the fisheries and aquatic habitat. These objectives will be accomplished by directly addressing the controlling processes, not just the symptoms, causing the demise of fisheries and aquatic resources in the nation's waters. This plan provides a process to describe all waters and grade their condition; options to address key factors; methods and mechanisms to properly prioritize and evaluate projects; and a process to establish measurable outcomes. This plan will guide the development of the National Fish Habitat Assessment and Action Plan Evaluation Reports.

*The process*

We will use an integrated landscape approach that allows appropriate linkages between inland and marine systems for evaluation of the interconnectedness of aquatic systems and their habitat condition from the headwaters to the ocean. A map-based interactive data system will be built using Geographic Information System (GIS) technology so partners can determine which waters are unimpaired and should be protected; identify impairments in their local waters; plan possible approaches to improving their waters; consider habitat approaches in similar habitats; and monitor progress toward NFHAP goals.

The condition of the nation's waters will be determined by first classifying all waters into similar groups based on published landscape classification systems from The Nature Conservancy (TNC) and the United States Geological Survey's Aquatic GAP Programs for inland systems, and from the National Oceanic and Atmospheric Administration (NOAA), TNC, and NatureServe for coastal systems. Approaches for habitat classification used in this plan are hierarchical, as controlling processes for aquatic systems are nested and integration of actions occurs across scales. The recommended classification system allows for the horizontal summaries of habitat condition and the vertical comparisons between similar systems.

All classified units will have a habitat condition assessment performed. Condition factors will be selected, such as the number of fish passage barriers within inland waters, which are indicators of the impairment of key processes. Classified units within groups will be compared with the best possible and highest existing scores in their classified group to establish goals or targets, allowing all classified units to have target habitat values. Condition factors will have direct linkages to rehabilitation measures, so improvements from project activities will change the score of the system. This method will allow for: 1) the direct and rapid assessment of the condition of the nation's waters; 2) the evaluation of project success using a standardized approach; 3) the ability to compare and learn from activities on similar systems within their classified group; and 4) the ability to integrate data from all levels into one data system. To advance this process, local and regional partnerships will be encouraged to develop condition factors to fit their needs, based on recommendations from the National Assessment Framework.

*Project prioritization*

This assessment tool will allow for the prioritization of projects from a scientific basis. In addition to this tool, the Science and Data Committee recommends that the National Fish Habitat Board and Fish Habitat Partnerships prioritize projects using additional filters that acknowledge the policy and socioeconomic aspects of fisheries and aquatic resources. Projects and systems should be prioritized, whenever possible, to achieve the following goals: 1) protect fully functioning aquatic systems including pristine sites and those that have been "manipulated" but have fully working aquatic processes; 2) rehabilitate aquatic systems that have only a minor number of impairments affecting one or more of the key processes that sustain them; 3) rehabilitate aquatic systems that have a number of impairments of one or more key processes; and 4) re-engineer modified systems to improve them for fisheries and aquatic production.

*Monitoring progress*

The systematic implementation of monitoring and evaluation can help focus actions to directly mitigate threats, increase the precision and value of investments, and assess progress on large scales. We propose a system to monitor and evaluate progress at multiple levels to provide an overarching view of the collective effects of our conservation and rehabilitation actions. Full involvement at all management levels will be necessary to ensure success of the NFHAP. Each project should be evaluated at three levels: 1) the effectiveness of individual projects in relation to clearly defined goals of the partnership; 2) the cumulative effects of individual projects at regional and national levels; and 3) the lessons learned and how they were used to inform conservation and rehabilitation actions elsewhere. Each of these scales should have clear roles and responsibilities with respect to prioritization and evaluation. This system will provide the

crucial learning opportunity to refine and improve our methodologies to effectively measure success at multiple scales.

*NFHAP data system*

Ensuring successful implementation of the above system will require a detailed structural data system. The Science and Data Committee recommends the NFHAP Data System consist of four subsystems: 1) State of Fish Habitat Reporting System; 2) Progress toward NFHAP Goals Tracking System; 3) NFHAP Habitat Projects Priorities Data System; and 4) NFHAP Protection/Restoration/Enhancement Projects Data System. A single central, query-based geographic interface into the NFHAP system will be built to provide access and data/information within each subsystem. For proper operation, a single entity should maintain control over the national interface into the NFHAP system.

The data in the NFHAP system should be populated with data from existing online data systems, partnerships, and other data providers. Initial system development will depend on willing providers and the various entities that have existing conservation priorities databases, such as State Wildlife Action Plans, State Fisheries Management Plans, Marine Fisheries Council or Commission Plans, Watershed Assessments, and TNC Ecoregional Conservation Assessments. The classification data should be housed and maintained centrally for the national scale reporting, and the system should allow for integration of local, regional, and national scale classification data.

To be fully developed, some key challenges will need to be addressed in the database planning for the NFHAP system. These include: 1) identifying key data transfer standards; 2) providing key web services for integration of data into the assessment system from many sources; 3) determining how to efficiently work with different data providers; 4) properly scaling issues for initial development; 5) identifying mechanisms to integrate regional partnership and individual project information systems; and 6) differentiating and providing a weighting process for systems that have different scales or amounts of baseline data or other related information.

*Implementation timeline*

We expect that the initial prototype system, limited to the continental U.S. riverine systems, will be completed by November 2008. The next stage in development will be a second prototype, by January 2010, that includes lakes, coastal areas to the state or territorial boundary, Alaska, and Hawaii. A complete initial assessment will be ready by October 2010 and will include all waters of the United States and its territories. A national assessment should be updated in real time wherever possible. A full analysis should be done every 5 years to properly report changes in the condition of the nation's waters and the effectiveness of NFHAP projects in changing the condition of aquatic habitats.

Similarly, all database planning for existing and new priorities, along with evaluation information for NFHAP projects, should be completed by June 2009. A full prototype should be ready by September 2009 for testing and will be operational by February 2010. The database will be able to produce the first Annual NFHAP Project Evaluation Report by October 2010.

# Introduction and Background Workshops

The idea for a focused effort to improve the nation's aquatic habitat has existed for over a decade, and the scientific basis of the National Fish Habitat Action Plan (NFHAP) employs a foundation of principles detailed in a 1992 report by the National Research Council (1992). This report recommended that federal and state agencies, in collaboration with non-governmental experts, develop a national aquatic ecosystem strategy that sets specific national restoration goals and provides a national assessment process. The report further states that the process must have careful planning, continuing financial support, active involvement from all levels of government, and a broad range of other partners. Many of these concepts have been imbedded into the overall NFHAP strategy and this framework report.

The principles outlined in the National Research Council report were echoed in seven stakeholder meetings, including a symposium at the August 22, 2004, American Fisheries Society (AFS) Meeting in Madison, Wisconsin. This symposium was attended by 130 individuals from 20 states, 16 universities, seven federal agencies, several Canadian agencies, and non-governmental organizations. The symposium provided recommendations for detailed habitat condition analysis, to be considered by the National Fish Habitat Science and Data Team (now Committee). The consensus at the meeting was that any habitat condition matrix must be:

1. Usable at local, regional, and national scales
2. Measurable, quantitative, and repeatable
3. Meaningful in scientific, management, and policy settings

The group consensus was that any system must have a basis in sound science, allow for regular progress measurement, **and** be transferable for use in public communications and policy decisions.

The symposium attendees recommended developing a system that measures the health of watersheds across the nation using a set of common criteria. The variables should include commonly measured conditions for which data are already available and include the following general categories:

1. Watershed characteristics
2. Water quantity
3. Water quality
4. Biological attributes
5. Physical attributes
6. Socioeconomic attributes
7. Miscellaneous

Implying a hierarchical organization to the condition variables, the AFS symposium attendees recommended consideration of the condition variables under each of the general categories in Table 1.

Table 1. Recommended variables for consideration by the AFS National Fish Habitat symposium attendees.

| Classification | Variable |
|---|---|
| Water Quantity | a) Hydrologic flow indicators<br>b) Water volume |
| Water Quality | a) Chemical parameters ($O_2$, pH, temperature, etc.)<br>b) Indices of sediment/turbidity/solids |
| Physical Attributes | a) Geomorphology/channel characteristics<br>b) Cover/woody debris<br>c) Habitat connectivity<br>d) Connectivity with fluvial processes<br>e) Quantity/quality/trends of specific habitat |
| Biological Attributes | a) Fish Stock Assessment<br>b) Fish diversity (including indices)<br>c) Fish community structure (related to recreational fishing)<br>d) Invertebrate index<br>e) Presence/absence of indicator species<br>f) Measurement of biological integrity<br>g) Invasive species |
| Watershed Characteristics | a) Riparian habitat quality (including canopy, land cover, etc.)<br>b) Land use patterns<br>c) Watershed integrity |
| Socioeconomic Parameters | a) Fishing participation<br>b) Risk assessment/public perception of waterbody |
| Miscellaneous | a) Sustainability<br>b) Changes in benchmark indicators<br>c) Absence/presence of outlined conditions |

For each variable, the symposium attendees suggested that numeric values could be assigned that describe an acceptable range, a threatened zone, and an unacceptable range (note that the "acceptable" range would allow some level of imperfection). Using the individual criteria, each watershed would be characterized as green, yellow, or red based upon its performance against the optimum value in each area. A watershed would be characterized based upon the most limiting factor.

Finally, the symposium attendees recommended that:

1. Watersheds should be classified into broad geographic and/or type categories.
2. For each category, specific thresholds would be articulated based upon the best scientific input available.
3. The assignment of threshold criteria for available data should be based specifically on the requirements of fish communities and the combination of multiple data sets that would create a more complete picture of the habitat value and constraints of a given watershed.
4. The system should be scaleable to broader or more discrete geographic levels, based upon scientific, management, and communication needs of partners.

Nearly all of these recommendations have been incorporated in some way into this report and will be incorporated into the science approach for the NFHAP.

# The Problem: Declining Aquatic Populations and Quality of Aquatic Habitat

**Key Points:**

- There are numerous factors for the decline of fish stocks, including physical habitat alteration, invasive species, hybridization, and overharvest.
- The quality and quantity of aquatic habitats globally are declining; in particular, aquatic habitats of nearly all types within the United States have been reduced significantly during the past 100 years, except for reservoirs and impoundments.
- The five major categories of threats to functioning habitats are physical habitat modification, flow alteration, pollution, invasive species, and climate change.

## Fish stocks declining

Many U.S. inland fisheries and their supporting populations are in decline, with about 22% of the biota that rely on waterways being imperiled or critically imperiled (Heinz Center in press). In addition, approximately 37% of the fish fauna are considered at risk or vulnerable (Stein et al. 2000). Thus, nearly four of every 10 native freshwater fishes is at risk of extinction, but population trends for many species are unknown, and these estimates are likely to increase with further studies on the population biology of species. Declining or at-risk species occur throughout the United States, with the highest proportion being in Hawaii and the Southeast (Heinz Center 2002). An analysis by Miller et al. (1989) revealed that physical habitat alteration was the most common cause implicated in the extinction of America's freshwater fishes (73% of extinctions), followed by introduced species effects (68%), chemical alteration of habitat (38%), hybridization (38%) and overharvest (15%). While these kinds of threat analyses are useful, it is often impossible to isolate specific threats in aquatic habitats, as they tend to compound each other.

For coastal commercial fisheries, the largest declines occurred in the Pacific Northwest (excluding Alaska), where 80% of the known fish stocks are declining. In this region, 214 salmon and steelhead stocks representing genetically distinct populations are rare or threatened, and another 106 populations have disappeared (Nehlsen et al. 1991). This decline is in large part due to habitat alteration, dam construction, and landscape-scale deforestation, with contributions from inappropriate hatchery management and poor harvest strategies. In contrast, Mid-Atlantic and North Atlantic fish stocks had the highest increase in biomass, although only 20% of the fish stocks status were known (Heinz Center 2002). Jackson et al. (2001) point out the important linkage of habitat loss and degradation coupled with overfishing that drive many coastal marine and estuarine ecosystems to collapse. For example, on a global level, destruction of oyster reefs is estimated at 91% (Jackson 2008), and oyster production in the Chesapeake Bay is only about 1% of what it was in the 1960s (Wesson et al. 1999). Clearly, conservation of aquatic resources requires management of fishing effort and the mosaic of habitats used by nekton that sustain fisheries production (Botsford et al. 1997; Peterson 2003).

## Other aquatic organisms

The status of aquatic organisms other than fish is less clear because of the lack of long-term monitoring data. However, freshwater mussel species are declining throughout much of the United States. In the United States and Canada, 72% of native mussel taxa are considered endangered, threatened, or of special concern (Williams et al. 1993; Abell et al. 2000). Taylor et al. (2007) summarized the current status of crayfish and found that 47.4% of species in this group are at risk. Other key aquatic taxonomic groups with high proportions of species at risk include stoneflies (43%), amphibians (36%), and dragonflies/damselflies (18%) (Stein et al. 2000). The number and diversity of freshwater gastropods (over 650 different species) is the richest in the world; however, their rate of imperilment exceeds all other major animal groups in North America. Approximately 60 freshwater snail species (9%) are presumed extinct, 20 are on the federal endangered or threatened species list, and another 290 (48%) are of concern (Johnson 2003). The causes of declines in these species are presumed to be similar to those of freshwater fishes.

Coastal benthic invertebrates are also difficult to track due to the lack of long-term data. The limited data currently available suggests that about 3-45% of the benthic invertebrate communities are classified as degraded (depending on region), suggesting poor habitat quality in those areas (Heinz Center 2002, updated 2003, in press). Atlantic Coast estuaries had about 3-35% degraded benthic invertebrate communities (Heinz Center 2002, updated, in press), whereas the Pacific Coast had about 3% (Heinz Center updated, in press). Trends in the percentage of degraded estuaries remained relatively constant over the past 10 years, but will likely become more evident as more long-term data are collected. As with freshwater benthic invertebrates, this data gap is essential to determining the habitat quality of coastal environments (sensu Peterson 2003).

## Aquatic habitats are threatened globally

The 2005 Millennium Ecosystem Assessment (World Health Organization 2005) indicated that over the past 50 to 100 years, rapid human population increases have resulted in large-scale habitat changes and pollution of inland water bodies and coastal areas around the world. Current trends indicate a continued, very rapid increase in human population effects on aquatic production and its supporting biodiversity in the future. The nation's rivers have been extensively modified by dredging, channelization, impoundment, and diking. Freshwater systems seem to be at higher risk than marine systems because of the larger scale of marine systems when compared to smaller freshwater systems. Already 84% of the fish on the International Union for the Conservation of Nature (IUCN) "Redlist" are freshwater species (Harvey 2001). Stressors on the world's aquatic habitats are a serious concern for aquatic life, and extinction rates in freshwater habitats are five times higher than their terrestrial counterparts (Sand-Jensen 2001; Ricciardi and Rasmussen 1999).

The diversity of freshwater species in the United States is unrivaled anywhere in the world, with over 800 freshwater fish species representing 10% of the world's freshwater fishes from very deep evolutionary lineages, as well as some of the most diverse and distinctive assemblages of mussels, gastropods, crayfishes, and amphibians (Abell et al. 2000; Stein et al. 2000).

Aquatic habitats of all types have been substantially reduced over the past 100 years (Johnston 1994; Vitousek et al. 1997; Kennish 2001). Wetlands in the United States have been severely impacted, and wetland acreage today is less than half what it was in Colonial times (Heinz Center 2002). The rate of loss has declined over the past 40 years, and the most recent study by the U.S. Fish and Wildlife Service concluded that the coterminous U.S. gained about 59,000 acres per year of wetlands between 1998 and 2004 (Dahl 2006). The quality of the wetlands gained or remaining is unknown, however. Focusing on maintaining and improving the health of the nation's aquatic habitats may curb the major biodiversity crisis facing the nation's freshwater ecosystems.

The coastal and estuarine areas of the United States provide vital services, such as sustaining commercial, subsistence, and recreational fisheries, supporting waterfowl populations, protecting coastal populations from the effects of storms and floods, and providing numerous recreational opportunities. The health of coastal and estuarine areas is declining, due in part to their enormous appeal as places to live and vacation. During the same time period that the coterminous United States as a whole experienced a net increase of wetlands, the coastal watersheds of the eastern United States (Atlantic and Gulf of Mexico coasts) saw a loss of approximately 385,000 acres of wetlands, the majority of it to coastal development (Stedman and Dahl 2008). The National Coastal Condition Report II (NCCR) (EPA 2004)—released by the U.S. Environmental Protection Agency, NOAA, U.S. Fish and Wildlife Service, and U.S. Geological Survey—reports that the nation's estuarine resources are diminishing and continue to be threatened, receiving a "fair" rating on a scale of good, fair, and poor. Evaluation of sediment quality, water quality, benthic community condition, and coastal habitat loss indices as part of the NCCR II indicates that 28% of estuarine waters are impaired for aquatic life use. According to this report, the overall national coastal habitat condition, based on long-term wetland loss rates, is poor.

## Threats to healthy habitat

Since most of our nation's freshwater, estuarine and marine aquatic habitats have not been fully mapped to date, it is very difficult to precisely determine the extent of degraded aquatic habitat nationally. However, the causes of habitat degradation are generally well known from existing reports and information. Appendix 1 provides an overview of a number of national and regional habitat condition reports that frame many of the problems found to date from a broad range of approaches used to assess national or global habitat quality. We have grouped the various threats into five basic categories:

*Direct habitat modification*

Coastal watersheds represent 13% of the nation's land surface area but they are home to more than half of the human population, and the urban sprawl that covered 14% of America's coastal watersheds in 1997 is predicted to increase to 25% by 2015 (Beach 2002). Humans modify aquatic habitats in many different ways; for example, wetlands are filled in for urban and suburban development or drained for agricultural use. In marine areas, bulkhead construction, shoreline hardening for erosion control, and dredging for marinas (and the associated increase in boating) destroy shallow-water seagrass beds and other shallow-water coastal habitats. Similar effects to those in marine areas have been noted in inland lakes, impoundments, and reservoirs.

In the intensive commercial fisheries of California and New England, any given section of the sea bottom is scraped with trawls more than once per year (Auster et al. 1996; Friedlander et al. 1999). However, sensitive bottom-dwelling communities can take up to five years or more to recover from a single trawl pass and never fully recover from the trawling activity (Peterson and Estes 2001). Stone et al. (2005) reported that bottom trawling produced changes in seafloor fauna, in particular prey fauna for economically important ground fish.

*Flow/Water volume alteration*

The huge demand for water, particularly in arid areas of the United States, has created a crisis for aquatic organisms, and many historically perennial rivers no longer flow to the sea all year round due to excessive water diversion (National Research Council 1999). Dams play a huge role in this flow regulation, particularly in the Great Plains, Rocky Mountains, and arid Southwest, where water stored in large dams is up to 3.8 times the mean annual runoff (Graf 1999). The most rapid large dam-building phase occurred between the 1950s and late 1970s; however, since 1980 the increases in national dam storage capacity have been relatively minor because most of the prime locations have been developed. Even so, 75,000 large dams and 250,000 small dams remain on U.S. rivers (National Research Council 1992). These dams cumulatively fragment the rivers of the United States; alter downstream and upstream flow patterns and within reservoir lentic habitat; eliminate or alter seasonal flooding cycles, water quality, and temperature; reduce sediment supply to estuaries; and prohibit movement of migratory fishes. They replace riverine environments and biota that have adapted to swiftly flowing streams with lacustrine habitats and species (McAllister et al. 1997; Graf 1999; Abell et al. 2000; Harvey 2001).

In addition to dams, poor land practices have resulted in excess sedimentation, filling in of reservoirs, and degraded fish populations.. Consequently, entire native and naturalized fish communities are in danger. For example, every native fish species in the lower Colorado River is either in decline or has been extirpated (Moyle and Leidy 1992). In the Columbia River Basin, more than a third of original salmon habitat is blocked by dams (Levin and Schiewe 2001).

Changes in hydrologic routing that stem from landscape alterations are perhaps the chief environmental effects caused by development (Dunne and Leopold 1978). Increases in development threaten rivers and estuaries, as paved surfaces and canalized rivers alter natural flow regimes, reduce the lag time between storm event discharges and increase peak river flows. These changes in peak flow events have significant implications for sediment movement in watersheds and river channel shape. They also contribute to an increased risk of floods that affect people and property. Additional widespread river and stream habitat alterations on a national scale, such as extensive flow diversions for irrigation and for industrial and municipal water needs, can cause dewatering of habitat.

*Pollution*

Water is a universal solvent and is used to remove millions of gallons of human-generated waste each year through sewage systems, agricultural runoff associated with excessive use of fertilizers, or industrially produced animal waste. Animal feedlots produce about 500 million tons of manure each year, more than three times the amount of sanitary waste produced by the human population (EPA 2002). In assessed waters of the U.S., 47% of rivers/streams, 60% of

lakes/reservoirs/ponds, 100% of open waters of the Great Lakes, and 61% of bays/estuaries are considered impaired (EPA 2008).

The primary pollution concern is nutrient enrichment, which has resulted in 78% of our nation's coastal rivers and estuaries having eutrophic conditions rated as moderate to high, and has contributed to the Gulf of Mexico's anoxic (dead) zone. The mid-Atlantic region is the worst, with over 50% of the estuaries having high levels of eutrophication. Bleak outlooks are predicted for our nation's estuaries, with overall eutrophication conditions predicted to worsen in 65% of the systems assessed (Bricker et al. 2007). The total amount of nitrogen released into coastal waters along the Atlantic seaboard and the Gulf of Mexico from anthropogenic sources has increased about fivefold since the preindustrial era and, if current practices continue, it will increase 30% by 2030 (Howarth et al. 2002).

Urban development has increased non-point source pollution; every year, 16.5 million gallons of oil runs off America's streets into our waterways (Pew Oceans Commission 2003). In addition, point source discharges of contaminants such as polychlorinated biphenyls (PCBs) and heavy metals have contributed to broad-scale impacts on fish populations and other aquatic populations (e.g., mink), and there is a growing concern about endocrine disruptors that can cause intersex in fish.

*Invasive species*

Since the arrival of the first Europeans in North America, the rate of introductions of known exotic aquatic species has increased exponentially. For example, in the San Francisco Bay, between 1961 and 1995, it is estimated that there was one new introduction every 14 weeks from ballast water releases (Cohen and Carlton 1998). These invasive species often compete indirectly with other plants and animals by changing the food webs and energy flow, or directly by modifying habitat in aquatic systems. An example of the former occurred in the Great Lakes, with the invasion by alewives and sea lamprey from the Atlantic Coast; however, direct modification of habitat has resulted from zebra and quagga mussel infestations across the country.

*Climate change*

In addition to these varied threats, climate change over the next century is expected to have profound effects on coastal and marine ecosystems. Global air temperature is expected to warm by 1.4 to 5.8$^{o}$C in the 21st century, affecting sea-surface temperatures and raising the global sea level by 9 to 88 cm (IPCC 2001; Twilley et al. 2001). This sea-level rise, in combination with subsidence on the East Coast, will gradually inundate highly productive coastal wetlands, estuaries, and mangrove forests (Pew Oceans Commission 2003). Higher water temperatures will result in bleaching of coral reefs and the gradual loss of structural complexity and biodiversity in these key biomes. It has been projected that a mean sea-surface temperature rise of just 1$^{o}$C could cause the global destruction of coral reef ecosystems (Goreau and Hayes 1994; Hoegh-Guldberg 1999).

In a warmer climate, cold-water species will be seriously affected and their ranges are expected to shift north. For example, a 2$^{o}$C increase in temperature will reduce freshwater salmon habitat by 35% (Keleher and Rahel 1996). Warmer temperatures will result in the drying of shallow

lakes and a decrease in water depth of the deeper lakes (Meisner et al. 1987), while temperature and rainfall changes will alter migration cues and upset fish reproduction and rearing patterns. Significant shifts in rainfall patterns are expected with climate change, with much of the southern United States becoming drier overall with much more frequent intense storm events. These rainfall changes will increase the severity of floods and droughts that will affect both inland and coastal waters. Fish species that rely on specific and predictable flow patterns will have their overall productivity impaired.

Increases in atmospheric carbon dioxide is also causing ocean acidification (a lowering of pH), which is affecting coral reefs and other organisms. NOAA data collected in 2006 from ocean sampling in the Pacific Ocean from the southern to northern hemispheres confirms that the oceans are becoming more acidic. The field study collected data about the effects of ocean acidification on the water chemistry and marine organisms from Tahiti to Alaska, and found evidence that verifies earlier computer model projections and is consistent with data in other oceans. One result is that shell production in pteropods (free-swimming planktonic mollusks that form a calcium carbonate shell made of aragonite) is affected. They are an important food source for juvenile North Pacific salmon and also are eaten by mackerel, herring, and cod (Feely 2006). Reduction of pH also affects the growth rates and calcification process in coral reefs and could severely reduce the rate of reef formation (Jackson 2008).

Additionally, changes in ocean and atmospheric circulation resulting from climate change could adversely affect coastal upwelling and productivity, causing significant local, regional, and global changes in the distribution and abundance of living marine resources (Pew Oceans Commission 2003). For example, dead zones off the U.S. West Coast in recent years have been attributed to a shift in wind and current patterns that changed the location and intensity of coastal upwellings. The zones ranged at times from California to Washington State and resulted in massive mortalities of benthic organisms. The worst low-oxygen ocean conditions ever observed on the U.S. West Coast were documented off the Oregon coast in 2006. Dead crabs and other decomposing benthic organisms covered the sea floor and fish had apparently abandoned the area (ScienceDaily 2006).

# Habitat Assessment as a Decision Support Tool

**Key Points:**

- The decision support tool would have the following characteristics and capabilities: measure and characterize the condition of fish habitat; assess the efficacy of conservation activities; portray habitat at multiple scales using GIS software; possess flexibility; and be web-based.
- All aquatic systems will be classified to allow for the vertical summarization of habitat condition and the horizontal comparison of similar systems.
- The habitat assessment will have a hierarchical framework.
- The inland and coastal classification and assessment must be integrated to show connectivity of habitats and processes and to fully assess habitat condition.

## Overview of the assessment tool

Protection and rehabilitation of aquatic habitat is a critical need throughout much of the United States. Therefore, managers are faced with deciding where to focus their efforts in order to maximize benefits. To date, no standardized method has been developed that integrates all of the current habitat condition information into a decision support tool. National reports such as the National Coastal Condition Report II (NCCR II) (EPA 2004), the National Estuarine Eutrophication Assessment (NEEA) (Bricker et al. 1999), and the State of the Nation's Ecosystems (Heinz Center 2002) use coarse measurements from which it is difficult to develop useful management tools. Setting up a monitoring program that would allow the tracking of the condition compared to an ideal state is costly; therefore, regional reports are often the only sources of information about conditions.

A national fish habitat assessment is essential as a means to allow decision makers to take advantage of available habitat data and assessments and quickly prioritize habitat types and locations for protection, restoration, or habitat enhancement. The tool will aid in identifying: 1) areas in most need of conservation or protection to benefit the most species or the habitats that are in the highest peril in that region; and 2) areas that offer opportunities to make the largest gains in protection or rehabilitation. Using such an assessment as a decision support tool would also enable rapid and effective feedback on the success of project work, which is not available at this time. In addition, the assessment will allow users to examine potential outcomes of future conditions and predict the likely direction of system changes in response to developmental pressures. Finally, a national assessment would provide a meaningful context to compare information and knowledge between and among partners working on similar systems.

Several large-scale projects have demonstrated methods for developing and applying model tools that assist with estimation of aquatic species distributions. One such project is Aquatic Gap Analysis (AGA), which uses work done by TNC and other groups and was developed to better understand aquatic ecosystem patterns and the biological diversity of aquatic systems, and to identify gaps in their conservation. AGA focuses on aquatic habitats and uses models of associations between observed species occurrences and the landscape-scale features of habitat

conditions to estimate species occurrences for all sampled and unsampled areas of an ecosystem. Pilot Aquatic Gap projects undertaken on a statewide (e.g., Missouri, Ohio, and South Dakota) or regional basis (e.g., Lower Colorado River Basin, Great Lakes Basin, Upper Missouri River Basin, and Puget Sound) have provided an improved understanding of the status of aquatic biological diversity and associations of aquatic organisms with particular habitat conditions for aquatic systems scattered across the nation. The model systems resulting from these projects provide spatial data management and species-specific mapping tools that allow examination of species distributions on any scale from the region (100s to 1,000s km) to metahabitat (~1–2 km). Classification systems are also being developed for these aquatic habitat focus areas.

The "first stage" decision support tool developed here will be largely based on current habitat conditions and theoretical potential for aquatic systems. Lack of sufficient biological data and the relatively short development time-frame prohibit extensive development of species-habitat models for the best projections. However, demonstrations should be developed in focus areas where data are available and such models are developed within the time and resources available to the partnerships, as they strengthen the relationships between fish populations and habitat condition.

## Tool Capabilities

The decision support tool will have the following capabilities:

*Measure and characterize condition*

- Assess changes in habitat conditions over time and predict potential future conditions.
- Evaluate and compare conditions for similar systems in the United States based on geospatial measures of habitat (e.g., basin and channel characteristics).
- Assess how any particular factor (e.g., water quality, connectivity, etc.) influences the overall score of the habitat quality.

*Assess efficacy*

- Assess the efficacy of on-the-ground conservation activities.
- All systems will be scored within their classified group (i.e., Ecological Drainage Unit (EDU) or small headwater stream group) to establish a baseline and develop long-term habitat goals.
- Habitat scores calculated after management actions (i.e., protection, rehabilitation, and enhancement) can be compared to the baseline for signs of improvement (or maintaining high quality).

*Depict habitat at multiple scales*

- The system should be essentially "scale-less" to allow data entry and analysis at any scale.
- View habitat characteristics and biological projections at various desired scales from the finest resolution allowed by the data (e.g., stream segment (1–2 km) or ecological unit) to regional and national scales.
- Data gaps and limitations of the condition indices will be clearly documented.

*Includes Flexibility*

- Incorporate additional data and/or improved metrics and tools as they become available.
- Provide conversions or transfer functions to ensure older metrics can be evaluated in the terms of new metrics.
- Identify high-priority data gaps and then fill those gaps as necessary information becomes available.
- Test the metrics to determine how important a particular metric is in affecting aquatic habitat conditions (i.e., sensitivity analysis).

*Is web-accessible and GIS-based*

- Interface with any public user or partner entity, through an internet map server and appropriate tutorial tools, so that users can identify the particular ecological unit or aquatic habitat of interest.
- The information will be placed on a server within a federal agency or national organization, where information will be updated as new data become available.

## System Classification

### *Habitat Assessment Framework*

Replacement or rehabilitation of degraded aquatic habitats is very costly; so a prerequisite for such actions is a thorough knowledge of the "function" of the aquatic habitat of concern, although this is rarely fully known. For the NFHAP to be successful there must be a clear understanding of aquatic habitat components and processes, and a framework in which to begin addressing habitat problems. This section describes the framework that is used to develop the assessment methodology found later in the document.

The concept of hierarchy theory, where large-scale patterns and processes shape and constrain those at finer scales, has emerged in aquatic ecology as a framework to describe habitat in a hierarchy of abiotic patterns and processes that determine biotic patterns and processes (Allen and Starr 1982; Frissell et al. 1986; Klijn 1994). These hierarchies are geospatial, placing specific aquatic habitats within the zoogeographic, climatic, physiographic, and hydrologic environments that shape them. Frameworks have been defined and refined for a variety of aquatic ecosystem types, across a range of spatial and temporal scales. Hierarchical frameworks of aquatic habitat are not only important for understanding the cross-scale processes that constrain and maintain fine-scale habitat; they are also necessary to understand, quantify, and manage for human impacts to aquatic habitats and subsequent effects on biological structure and productivity. Conservation activities must address effects on driving dynamic and structural processes at the scales at which they originate and operate, in order to best manage for quantity, quality, and linkages of diverse aquatic habitats. This concept is critical to the success of NFHAP projects and partnerships. Table 2 gives examples of the uses of a hierarchical framework:

Table 2. Examples where a hierarchical framework is used.

| **Organization** | **Use** |
|---|---|
| U.S. Geological Survey (USGS) NAQWA program (http://water.usgs.gov/nawqa/) | Sampling designs |
| USGS Aquatic GAP program (http://gapanalysis.nbii.gov/portal/community/GAP_Analysis_Program/Communities/GAP_Projects/Aquatic_Projects/) | Establishing zoogeographic and hydrologic regions in developing regional conservation plans |
| USGS National Hydrography Database-Plus program (http://nhd.usgs.gov/) | Assessment of hydrology and water quality |
| USDA Forest Service and NOAA-NMFS | Inform aquatic ecosystem management |
| The Nature Conservancy (http://www.nature.org/aboutus/howwework/cbd/science/art19226.html#) | Identification of regional conservation priorities |

This multi-scale capability allows users to address questions requiring integration of information from local sources with information at regional and national scales. It is important to recognize the limitations of using the larger scale (e.g., landscape level) to assess habitat condition at smaller scales. In particular, it is very easy to accumulate habitat condition information at increasing scales. One must use caution in extrapolating data at a lower level than the scale at which it was collected. Therefore, assessing local habitat condition or improvements may be limited to landscape-level metrics.

***Classification of fish habitat***

We define aquatic habitat as a hierarchy of different attributes at several spatial and temporal scales corresponding to patterns of dominant ecological processes that affect fish distributions. For this national assessment and synthesis, it is critical that habitats are classified and represented as mapped units at several different spatial scales. They can then be assessed for their condition, and the type and severity of threats to them. These units need to be classified and mapped with relative consistency across the United States, given data limitations. By fulfilling these criteria, the units will then be the basis for regional and national assessment and synthesis.

Identifying the key attributes of each landscape unit will allow a nearly unlimited variety of analyses and comparisons between systems that may not seem to be related but are controlled by the same fundamental processes. For example, on a superficial basis, it may not seem that Rocky Mountain high gradient streams have much in common with Appalachian Mountain high gradient streams; however, they share similar geomorphology, stream powers, and rainfall amounts. This allows for broad exchange and review of rehabilitation strategies in similar systems across the United States to an extent not seen to date.

***Coastal vs. Inland***

For this classification, the first major delineation in habitat is between inland and coastal habitat. In the NFHAP, inland habitats are defined as waters above the head of tide for those directly

linked to marine systems and, in the Great Lakes they are defined as waters above the elevation of backwater effects of the Great Lakes. Coastal systems are defined as those that include all tidal waters, and in the Great Lakes they are the waters below elevation of backwater effects from the Great Lakes. Anadromous and adfluvial waters include all connected waters to either marine or Great Lakes waters to the first natural barrier.

## Inland Habitats

The classification scheme to be used in this decision support tool is described in detail in Higgins et al. (2005) and is summarized here. Freshwater inland habitats will be initially classified within national and regional contexts of zoogeography, climate, and physiography, down to the level of landscape ecosystems. Aquatic landscape ecosystems are interconnected streams, lakes, and wetlands that can be mapped as distinct hydrologic catchment units, and can also be easily depicted as an assemblage of characteristic component streams, lakes, and wetlands. Representing them as catchments is important for three reasons:

1) On a national or regional map, catchments can be represented more easily than all of the individual components.
2) Catchments are critical to assess hydrologic landscape patterns that constrain aquatic ecosystem characteristics.
3) Catchments are critical to assess hydrologic landscape patterns of threats and impacts to aquatic ecosystems.

The approach uses mapped landscape features at varying scales to attribute the dominant characteristics of freshwater habitats associated with each scale. This approach has grown out of a large body of work linking landscape features to freshwater habitat, and incorporates attributes of freshwater ecosystems such as size, drainage network position, and connectivity to characterize distinctions in interconnected lakes, streams, and wetland complexes (Maxwell et al. 1995; Seelbach et al. 1997; Higgins et al. 2005; Sowa et al. 2005, 2007).

Higgins et al. (2005), Sowa et al. (2005), and Seelbach et al. (1997) have implemented detailed approaches to classify freshwater landscape ecosystems down to the stream segment and individual lake level, incorporating attributes of stream and lake size, elevation, stream gradient, local connectivity and landscape network position, catchment and local geology, hydrologic regime, valley morphology, and lake shoreline complexity. The Nature Conservancy and several Aquatic GAP programs have implemented, or are currently implementing, this detailed approach for a majority of the United States.

A simplified, consistent framework for the NFHAP is needed to allow the ranking of classified units and the implementation of the assessment in a timely manner; thus we propose to start the national framework at the landscape ecosystem level. The more detailed macro/meso habitat classifications and additional field data can be further developed and refined, and used by Fish Habitat Partnerships (e.g., Southeast Aquatic Resource Partnership).

The recommended simplified approach is to initially use catchment size, average system gradient, and drainage network position of interconnecting streams, lakes, and wetlands. This differentiates true headwater stream and lake complexes from those that are small but are connected directly to large mainstem rivers. This will establish an initial national framework to characterize freshwater landscape ecosystems by size and stream power. Lake, impoundment, and reservoir classification should initially start with size (both surface acreage and volume) and turnover ratio. Further refinement of size categories and all of the other attributes should be conducted by Fish Habitat Partnerships to better reflect more meaningful ecological breaks. Shoreline habitats of the Great Lakes are being classified by Aquatic Gap using methods similar to those for marine shoreline classification.

Landscape ecosystems of different sizes will be nested within Ecological Drainage Units (EDUs) (Higgins et al. 2005; Sowa et al. 2005, 2007). EDUs are created using 8-digit USGS Hydrologic Unit Codes (HUCs), and 6-digit HUCs in Alaska, and are used to distinguish regional landscape and climate patterns that influence broad ecosystem characteristics such as lake and stream density, morphology, hydrology, temperature, and nutrient regimes. This provides ecological context for the HUCs, aggregating them into meaningful geospatial groups. EDUs have been mapped for the majority of the United States including 40% of Alaska and are nested within Freshwater Ecoregions, which are delineated based on distinct assemblages of aquatic biota, primarily freshwater fishes. Completion of the EDU classification and mapping is moving forward quickly by TNC and these data will be available in 2008 for the entire United States.

## Coastal Habitat Classification

*Overall Approach.* To ensure that the linkages between coastal and inland systems are fully established, the classification and condition analysis process for both systems will be integrated. Coastal habitat classification will follow a similar approach to that of freshwater, using geomorphological, physical, and chemical data to describe and delineate patterns of habitat in a hierarchical approach. The Coastal and Marine Ecological Classification Standard (CMECS), developed by NOAA and NatureServe, will be used to classify habitats. CMECS is relevant to all U.S. coastal and marine environments and can be applied on local, regional, and continental scales. The classification provides a structure for synthesizing data so habitats can be characterized and reported in a standard way, and information can be aggregated and evaluated across the national landscape and seascape. Built on existing classification efforts and informed by a series of technical meetings and workshops, the CMECS standard integrates the current state of knowledge about ecological and habitat classification. The result is an ecosystem-oriented, science-based framework to allow effective identification, monitoring, protection, and restoration of unique biotic assemblages, protected species, critical habitat, and important ecosystem components (Madden et al. 2005, 2008).

CMECS Version III has three distinct components each describing a different aspect of the coastal and marine environment. Taken together, these components provide a structured way to organize information about coastal and marine habitats and a standard terminology for describing them. The Benthic Cover Component (BCC) is a hierarchical system that describes the geomorphologic, physico-chemical, and biological composition of the coastal and marine substrate. The Water Column Component (WCC) describes the structure, patterns, processes,

and biology of the overlying water column. The Geoform Component (GFC) describes the major geomorphic or structural characteristics of the coast and seafloor at various scales. A fourth component for subbenthic habitats is currently being developed. The flexibility of the CMECS classification standard will support a variety of local and regional applications.

Specifically, the Benthic Cover Component (BCC) classifies geologic and biotic cover of the substrate at different spatial scales and places the associated biology in the context of the physical habitat. This component is organized into a branched hierarchy of six nested levels that correspond to both functional and ecological relationships at progressively smaller spatial scales. The BCC branches into five Systems (nearshore, neritic, oceanic, estuarine, and freshwater influenced) at the highest level based on salinity, depth, and enclosure and two Subsystems defined by tidal regime (i.e., intertidal or subtidal). Each Subsystem further divides into Classes (e.g., coral reef, aquatic bed) and then Subclasses (e.g., spur and groove reef, rooted vascular vegetation), largely adopting the values in the FGDC wetland classification standard (Cowardin et al. 1979). Groups are defined within the Subclasses based on factors that reflect the variance in biotic composition of the Biotopes. Biotopes represent broad biological associations identified by dominant or diagnostic species that are fixed to the substrate.

The Water Column Component (WCC) describes the structure, pattern, and processes of the water column. Although the water column is highly variable spatially and temporally, conceptually it is composed of repeating structures and processes that strongly influence the distribution and condition of the biota. This classification component employs multiple classifiers. The WCC classifiers can be used alone or in combination to describe the structure and composition of the water column—the classification of the water column is not strictly hierarchical. The first category, System, is the same as that of the BCC and should always be used to put the water column units into the same context as the BCC. Additional classifiers address features such as depth (vertical zonation), structure (upper and lower water column), hydroform (e.g., major ocean currents, large coastal fronts, waves), dominant lifeforms, and biotopes. Because of its dynamic and three-dimensional nature, the water column can be a challenge to map. The WCC is intended to be mapped independently of the other components of the classification standard to provide information on distinct water column ecological units as necessary. However, it can be overlain on the BCC and GFC components to help users understand the vertical component of the marine environment.

The Geoform Component (GFC) describes the structure of the coastline and sea floor at multiple scales. A Geoform is equivalent in concept to a terrestrial landform (e.g., mountain, butte, moraine, etc.) and likewise varies in scale from very large (e.g., seamount, embayment) to very small (e.g., tidepool, sand ripple). Geoforms shape the large-scale seascape in repeatable and predictable ways by providing structure, channeling energy flows, regulating bioenergetics, and controlling transfer rates of energy, material, and organisms. The morphology of these features controls such processes as water exchange rates and water turnover times, hydrologic transport, energy and nutrient cycling, shelter and exposure, and migration and spawning patterns. The framework for the GFC is based largely on the structure described by Greene et al. (2007), but expands it and re-organizes some options to encompass a larger number of coastal and nearshore features. As with the WCC, the GFC is intended to be mapped as a separate layer from the BCC. When overlain on the BCC, the GFC layer can provide additional insight into how benthic

patterns vary with the structure of the substrate. GFC types may also be used independently when information on structure is required to meet the objectives of a given project.

In addition to the components of CMECS, a list of standard attributes—a consistent set of variables that provide the basis for classification and description of the CMECS units—is provided. When required to define a unit, these standard attributes are called "classifiers" as described under the WCC discussion above. When used to further describe a unit, these standard attributes are called "modifiers." Standard attributes provide a consistent standard for data collection and application.

*Linkage with Inland Systems.* CMECS will be applied within the geographic confinements of NOAA's Coastal Assessment Framework (CAF, http://coastalgeospatial.noaa.gov/). The CAF characterizes coastal watersheds within a nested hierarchy of spatial units for small- and large-scale coastal resource data analyses. For CMECS application, the CAF units of Estuarine Drainage Areas (EDA) and Coastal Drainage Areas (CDA) will be utilized and provide the hydrologic linkage with inland systems. An EDA is that component of an estuary's entire watershed that empties directly into the estuary and is affected by tides and may be composed of all or part of a single or several USGS hydrologic units. A CDA is defined as that component of an entire watershed that meets the following three criteria: 1) it is not part of any EDA; 2) it drains directly into an ocean, an estuary, or the Great Lakes; and 3) it is composed only of the downstream-most HUC in which the head-of-tide is found. The CMECS can be applied independently of the geographical framework provided by the CAF, but for purposes of this assessment—particularly the need to link the coastal assessment to the inland assessment—application of CMECS will occur within the EDAs and CDAs defined by CAF.

# System Condition and the Assessment of the Nation's Habitats

**Key Points:**

- The methodology for scoring habitat condition will consist of the following steps: 1) assign habitat variables; 2) analyze variables; 3) standardize metrics and formulate the degradation index; 4) analyze index properties; 5) conduct a sensitivity analysis of indices; and 6) calculate an overall habitat condition score.
- The key processes upon which habitat variables are based are: connectivity, hydrology/circulation, bottom form complexity, material recruitment, water quality, food webs, and energy flow in communities.
- The overarching assumption is that changes in the large-scale control variables that directly influence local habitat conditions will directly influence the productivity and composition of the fish and aquatic community.

International agreements, national legislation, and reports (e.g., the Great Lakes Water Quality Agreement, the Clean Water Act of 1972, The Heinz Center Report on the Nation's Ecosystems, and the Pew Oceans Report) have all identified the need to restore and maintain physical, chemical, and biological aspects of ecological integrity in our nation's aquatic ecosystems. However, effective measures of integrity have only recently been developed and continue to evolve. This is due partly to lack of availability of data and inadequate technology, and partly to non-standardized definitions.

Karr and Dudley (1981) defined biological integrity as "the capability of supporting and maintaining a balanced, integrated, adaptive community of organisms having a species composition and functional organization comparable to that of natural habitat of the region." The Index of Biotic Integrity (IBI), Habitat Suitability Index (HSI), Hilsenhoff's Index, and other indices have been developed to summarize ecosystem integrity using biological attributes to provide a means of computing values that can be compared. Leonard and Orth (1986) stated that "The IBI is based on the assumption that selected fish community attributes change in a consistent and characteristic fashion with increasing stream degradation." This assumption will be used in this effort.

It would be preferable to use biologically based indices such as fish, which are excellent indicators of habitat quality (e.g., Karr and Dudley 1981). However, this is not possible because fish abundance and community composition data, and statistically significant relationships between these factors and habitat quality, are exceedingly rare and patchy at the present time. This is attributable to the wide annual fluctuation of fish and aquatic community abundance and the difficulty of adequately sampling these communities. Thus, our initial indices will focus on habitat conditions that are definable and measurable, and have clear linkages to fish populations. We recommend that work continue to focus on the long-term development of fish-habitat relationships so they can be used in the future.

Due to the difficulty of scaling process-oriented variables (e.g., trophic interactions), percentage-based (standardized) indices will be used that are easier to define in any given scale. Given a classification of habitat types into potential ecological units, and values of variables that characterize habitat quality, ranked scores can be assigned to indicate level of degradation caused by each factor. Selecting the appropriate process-level condition variables (from within each major category) that are most important, within a given ecological unit, requires knowledge of each system's ecological structure and function, and its unique environmental threats. We expect and recommend that specific knowledge from local and regional partnerships be used to refine proposed indices, or that surrogate indices be used. If other indices are selected, it is critical that the rationale for their selection be fully documented and that they be compatible with the overall process-oriented approach.

## Habitat Condition Scoring Methodology

Minns et al. (1994) used a five-step procedure for their development and application of an Index of Biotic Integrity (IBI) for Great Lakes littoral zone fish assemblages. Their approach provides some important standardization for index development. That general procedure was applied here, with modifications, to develop our Habitat Condition Indices for each classified unit. Those steps are as follows:

1) Habitat variables
2) Analysis of variables
3) Standardization of metrics and formulation of the degradation index
4) Analysis of index properties
5) Sensitivity analysis of indices
6) Overall habitat condition score

The following sections describe these steps.

## Habitat Variables

Habitat variables thought to have significant influence on fish abundance, diversity, and/or distributions as identified by the Science and Data Committee were selected and classified into broad categories of effect by key system processes. The Science and Data Committee will develop a conceptual model that describes the interrelatedness of the variables. The highest levels of organization are the key processes and features, which include connectivity, hydrology and circulation, material recruitment, bottom form complexity, water quality, and food webs and energy flow in the aquatic systems. Many of these processes have been identified as the key controlling variables for inland aquatic habitats, with the most recent descriptions by Annear (2004). Similar processes are used for coastal and marine areas, and are identified and used in, e.g., NCCR report (2002), the Heinz reports, and the NOAA National Status and Trends Program reports (e.g., Bricker et al. 2007). These variables are listed in matrix form in Appendices 4 (Inland) and 6 (Coastal). Below are descriptions of the key processes and features.

1) Connectivity – A wealth of literature points to the importance of having unfragmented reaches of habitat that allow fish and other aquatic organisms to fully exploit all potential habitats to complete their life histories and to maximize their production. Many marine and adfluvial species (e.g. salmon, striped bass, and American eel) require connected riverine and estuary habitat to complete their life cycle. The primary reasons (impairments) for fragmentation are barrier culverts and dams without adequate fish passage, enclosed streams that behaviorally exclude fish passage, rivers and streams in concrete channels without the needed bottom roughness (complexity) or depth to allow fish passage, and causeways that constrict embayments and rivers into small areas that increase water velocities beyond the range that any life stages of fish can pass. Chemical and thermal barriers (e.g., polluted harbors separating marine species from important estuarine habitat, or acidic lakes blocking freshwater fish migration pathways, etc.) also impair connectivity, although they are sometimes overlooked as constituting barriers. In coastal systems, connectivity issues surround the proximity and size of important habitat features (e.g., sea grass beds, oyster reefs, coral reefs) and the connectivity between coastal and inland ecosystems (e.g., flood control structures).

2) Hydrology – Riverine (lotic), lake/reservoir (lentic), and coastal systems in most instances require dynamic flow regimes to transport sediment and woody debris, maintain riparian corridors, maintain channel valley integrity, sufficient water volume and stage variability. All of these components comprise the physical makeup of habitat in our rivers, streams, and lakes. Most aquatic species have specific requirements for depths and flows and are adapted to natural system flow regimes. Changes in flow will cascade into large-scale changes in habitat with resulting effects on fish and aquatic community composition and production. The annual, seasonal, and daily hydrology of a watershed can be altered by human activities through land use change and development. The key reasons (impairments) for hydrologic alteration include changes in stormwater runoff, storage reservoir operation, water withdrawal and diversion, wetland losses and land use that reduce natural system water storage, and hydropower projects that operate in a peaking power mode without any re-regulation.

3) Circulation – In coastal systems, vertical circulation of the water column generally distributes bottom nutrients and sediments throughout the water column, influencing growth of phytoplankton and benthic vegetation. Excessive nutrients may result in Harmful Algal Blooms, i.e., undesirable phytoplankton species or phytoplankton crops in such large numbers that their eventual death and decomposition may lead to degraded habitat conditions such as hypoxia. Tidal influence and large Great Lakes circulation cells also play a significant role in the redistribution of sediments and nutrients, and the energy level associated with tides and currents can influence habitat types significantly. For example, high-energy coastlines are more likely to have less fine sediments such as sand and mud, whereas low-energy coastlines may be dominated by these finer sediments. The substrate texture and grain size is a strong driver of a species' ability to inhabit a particular area. Finally, ocean currents and other types of mass water movements (e.g., gyres and Great Lakes circulation cells) play a crucial role in distribution of many larval species. Alterations of natural circulation patterns can have considerable impacts on coastal habitats and their related biological assemblages.

4) Bottom Form Complexity – The physical heterogeneity of aquatic habitat—such as the pool-riffle ratios in rivers and streams, river channel type, lakebed shape, estuary morphology, and channel shape—provide key patterns and potential limitations to the productivity of aquatic species. The alteration of the hydraulic characteristics of channel and bottom form includes any human-caused activity that has physically changed the contours, shoreline, or shape of our upland waters. Most of our nation's rivers, streams, lakes, estuaries, and nearshore habitats have been physically altered some time in the past 300 years without any regard to the effects on our fish and aquatic resources. The main ways our systems have been altered are by the direct channelization and straightening of our rivers with a resulting direct loss of aquatic habitat; the de-snagging of our rivers and lakes with a large loss in woody debris and associated reduction in three-dimensional complexity; the alteration of bottom contours of our lakes, reservoirs, rivers and estuaries through dredging or filling; sedimentation inputs, and the direct loss of river and stream habitat by impoundment. The key reasons (impairments) for hydraulic alteration include channelization and hardening of rivers, streams, lakes, and coastal shorelines; the de-snagging and removal of woody debris; the alteration of riparian and coastal forests and vegetation that reduces (or eliminates) woody debris recruitment to our rivers, streams, lakes, and coastal marine habitats; dredging, filling, and engineering of the bottoms of our waters (frequently in response to excessive sedimentation from upland areas); and dams that directly impound streams and rivers along with their natural processes that link to and support aquatic systems.

   The physical characteristics of coastal aquatic habitat—such as the channel configuration, bottom type and shape, and overall bottom orientation—influence tidal flow velocities and directions. In addition, wind and waves and other water movement impose key limitations on productivity and distribution of coastal species. The primary ways our coastal systems have been altered are by the direct channelization of tributaries and harbors, filling and hardening of coastal shoreline, resulting in direct loss of coastal habitat; construction of artificial breakwalls, thus altering sediment transport and nearshore energy environments; de-snagging of our coastal systems, causing a large loss in woody debris and habitat; and the alteration of the bottom contours of coastal areas through dredging or filling. Construction of impoundments, or diking of coastal wetland areas, also contributes to losses of marsh habitats and functions.

5) Material Recruitment – Nearly all of the materials (sediment, particulate organic matter, and woody debris) that rivers and streams transport come from the riparian zone. These materials control the habitat matrix in adjacent lakes and coastal areas along with structuring habitat in rivers and streams. The key reasons (impairments) for riparian zone alteration are engineered shorelines, hardened banks, and the loss of woody debris and living riparian buffer zone communities adjacent to lakes, rivers, and coastal marine shorelines.

6) Water Quality – The existence of intact, fully functional aquatic habitats must be accompanied by appropriate water and sediment chemistry to provide appropriate conditions for the production of fish and other aquatic life. Degradation of water quality can be direct (such as low or zero dissolved oxygen concentrations in the Mississippi River) or indirect through the eutrophication of coastal water bodies (e.g., in the Gulf of Mexico) from upland agricultural or urban runoff. There can also be direct human health effects from the consumption of contaminated fish and shellfish from systems with poor water or sediment quality. Water quality is also directly related to maintanence of water volumes, not simply controlling effluent discharges. The areas to examine are those impaired by mining, point (National Pollution Discharge Elimination Permits (NPDES) and non-point pollution where natural filters have been removed. Other areas to examine include those with fish and shellfish consumption advisories.

   The key reasons (impairments) for water quality alteration include in-stream and lake bottom mining (e.g., gravel and gold dredging operations), mine drainage and contamination, and stream and lake relocation. Water withdrawals by mining operations; excessive nutrient, sediment, and toxic inputs from non-point and point sources; low dissolved oxygen; and water temperatures that do not meet standards also impair water quality. Loss of wetlands and their natural filtering functions affects water quality, as well as many of the key factors influencing habitat integrity and species diversity.

7) Food Webs and Biological Energy Flow in Aquatic Communities – While the above abiotic factors will explain most of the habitat conditions of our systems, they can not directly determine the key biological functions governing trophic levels in aquatic communities. Efficient utilization of energy is critical to aquatic systems and can be disrupted by several means. For example, the introduction of Aquatic Nuisance or Invasive Species (ANS and AIS respectively) can interfere with energy transfer in food webs, and overexploitation of key species, or changes in habitat, can affect primary production in systems. Additionally, many efforts to control ANS and AIS create habitat impairments for other species (e.g., the installation of sea lamprey barriers on sea lamprey spawning streams that fragment systems).

   The key indicators or variables we propose to examine are: changes in overall species composition, the occurrence and diversity of native or naturalized fish and mussel communities that are sensitive indicators of habitat conditions, the existence of a complete food web that supports maximum production of the aquatic community, and balance throughout all production levels. We will also assess the occurrence of ANS or AIS that are able to capitalize on impaired aquatic habitat conditions and, in turn, cause problems with fish production. The main variables to assess for biotic alterations are threatened populations and species extirpation or extinction, the rate and number of lost species, reduced diversity and food web simplification, and the number and diversity of ANS.

The matrices shown in Appendices 4 and 6 use overall system information, such as the total river miles or estuarine or lake acreages, as the initial starting point in the analysis. These values are then converted to percentages for each condition variable by dividing the amount of habitat described by condition variables by the overall system variable. For example, the percentage of

anadromous river miles connected to a coastal system would be expressed as the current anadromous river miles divided by the total length of river up to the first natural barrier.

$$\text{Connectivity} = \frac{\text{Current miles of anadromous or adfluvial river to man-made barrier (mi.)}}{\text{Miles of anadromous or adfluvial river to first natural barrier (mi.)}}$$

The scores of the variables, sub-components, and components will be averaged to provide an overall score. This system will allow for analysis and summarization of condition at any level or scale.

We evaluated and considered which underlying agents are reflected in local habitat conditions. These are very large scale variables that directly control the physics and chemical characteristics or drive the biological responses in a classified unit. Initial variable selection was based on "expert" knowledge of aquatic systems throughout the United States. That list was classified into a hierarchy of general effects. Then, as described above, those variables were examined system-by-system for redundancy and reduced to the set of variables to which aquatic communities within the system respond most strongly.

It should be noted that the example matrices provided in Appendices 4 and 6 are long-term target matrices that would be preferred if all of the data were available; but we acknowledge that the data are not available at this time to generate values for each of the condition variables. We also expect that not all of these variables will exactly fit every system, and encourage partnerships to develop their own condition measures as long as the output is consistent with those of other partnerships. However, all variables that are used should have available data, and surrogates should be used to fill in the gaps of knowledge. If surrogates are to be used initially until better data become available, it is important that transfer functions be developed to allow for conversion of information and condition analyses to the new information standards.

It is important that information and condition variables be standardized by systems. We have recommended that condition variables be scaled and scored against the expected range of values for such a system. For example, the authors do not expect a high mountain heavily forested river system to ever have the same productivity as a low elevation agriculture-based river system, and they should not be directly compared with respect to nutrients. However, the systems should be within 25% of the natural variation of a condition variable to be considered healthy, and this scaling can be used regardless of the type of system or its location. A number of tools and models are available to estimate the natural variation in many of the proposed condition variables, and we encourage their use unless empirical data are available, which should be used whenever possible. These include regional water temperature models (Wehrly et al. 2006), universal soil loss models (Foster et al. 2000, 2001), and hydrological analysis tools such as the Index of Hydrologic Alteration (Richter et al. 1996, 1997, 1998).

Two levels of analysis are suggested: 1) at the largest scale; and 2) if detailed data are available, at the lowest possible level of watershed, waterbody, or reach scale. Both of these systems will provide equivalent data at the highest levels and may use slightly different datasets because of the differences in scale for some variables. Appropriately developed transfer functions will allow information to be moved between these scales and properly summed.

We recommend use of all levels for analysis of all major habitat types: large lakes, montane freshwaters, xeric freshwaters and endorheic basins, temperate coastal rivers, temperate upland rivers, and temperate floodplain rivers and wetland complexes (definitions of these major habitat types are found in Appendix 3). The proposed variables would be examined to determine the best fit of indices to a given system. The proposed index set should be used as a long-range goal and, as stated above, we fully expect that many surrogate variables will be used initially, as the data do not exist for some of these variables. We encourage the addition of components and variables at all levels, provided the appropriate documentation is included. By using at least the top two tiers of variables, we expect to see improved consistency between scoring systems used by our partners for project development and evaluation of their individual systems.

We expect that a range of estimates, from professional judgment to exact measurement, are likely to be available for any given component or its elements. It is appropriate to use all available information, as long as the source and reliability of the data for a given variable or index are clearly documented.

## Current Availability of Condition Data

*Inland*. Many of the variables used to calculate the condition of each ecological classification unit are not available nationwide for consistent scales of analysis. Development of many condition variables will need to rely on existing datasets to calculate indices on agreed upon scales, and surrogate variables will need to be used until improved data are available. For example, calculation of the percentage of unfragmented river miles in a system or length of unfragmented reaches in the each classification unit can likely be conducted at the 1:100,000 scale by using the National Hydrography Dataset (NHD) (http://nhd.usgs.gov/index.html) maintained by the USGS and EPA, and the National Inventory of Dams (http://crunch.tec.army.mil/nid/webpages/nid.cfm) maintained by the U.S. Army Corps of Engineers. However, to perform this calculation at smaller scales will require integration of many smaller databases systems and should be a priority for individual partnerships.

Databases containing the proper scale condition indices for use in determining the status of each classification unit, at a consistent national scale, are available for some condition variables. For example, NPDES permit data are widely available within the EPA, as are non-indigenous aquatic species data from the USGS and USFWS. These databases should be incorporated fairly easily into the proposed classification system data and used to determine the condition of each classification unit.

In some instances, no existing databases are available for the calculation of condition indices. Indices such as the location of natural stream channels or the structure of food webs would need further definition and development of tools before they could be incorporated into a database and

integrated into an information system. If these variables prove to be critical in determining the status of fish habitat, then additional data acquisition and further development will be needed, and partnerships are encouraged to develop them. Another approach is to use surrogate variables that indirectly measure the same process or impairment and, when the data are available to fully parameterize the variable, use transfer functions to convert the older data.

Finally, model results may be used to fill in data gaps until empirical data become available. To ensure consistency across the country, it is critical that the use of any modeled output be fully documented and that the Science and Data Committee be consulted on its use.

*Coastal.* When calculating the coastal habitat condition for each classified habitat unit, we recommend using as many of the indices developed for the EPA National Coastal Condition Index Reports (http://www.epa.gov/owow/oceans/nccr/) as possible and working directly with EPA to integrate the data systems into the NFHAP data architecture. Again, we recommend as many of the variables as possible be used in the condition analysis and, as was discussed above for inland systems, fully expect surrogates to be used to fill data gaps.

In many instances the data needed for calculation of the condition indices for marine systems will rely on the same data sources as for inland systems. In these cases, we will simply use one integrated data structure that allows the necessary variables to link inland and coastal systems. For further discussion of these data sources, please see the inland condition data sources paragraphs.

The Heinz Center published an extensive discussion of possible indicators of the condition and uses of freshwater, coastal, and ocean habitats (Heinz Center 2002, updated, in press). Although our goals for reporting the status of fish habitat within ecological classifications are slightly different, the Heinz Center report provides an excellent overview of the types of data that may be available for further analysis and use by the partnerships.

As for inland systems, model results may be used to fill in data gaps until empirical data becomes available. To ensure consistency across the country, it is critical that the use of any modeled output be fully documented, and that the Science and Data Committee be consulted on its use.

## Analysis of variables

This stage identifies redundancy among variables to reduce the effective variable set to a more manageable suite. This must be done on a system-by-system basis. For example, if there is a strong negative relationship between the percent urban area in a watershed and the percent agriculture, only one of those variables will be used, and the decision process must be documented.

## Standardization of metrics and formulation of the degradation index

This step fulfills two important functions: 1) to remove the influence of different measurement units and widely different value ranges for metric values; and 2) to provide a continuous variable that avoids range gaps that arise when using integer scores. There may be some variables that do not lend themselves to being scored on a continuous basis. All scored variables should be standardized and then can be combined in such a way that they are comparable and will yield overall index values of degradation for each spatial unit examined. Each metric is a percentage with values ranging from 0 to 100. Individual metrics can then be summed, and the overall index adjusted for the number of variables used, such that final index values range from 0 to 100. Portions of this range can then be assigned qualitative labels for reporting purposes (e.g., 1–20 = Very Poor, 41–60 = Fair, 81–100 = Excellent, etc.).

## Analysis of index properties

In the above form, the index assigns equal contributions from each metric (thus ensuring a range from 0 to 100). However, the sensitivity of the index to values of any particular metric can be evaluated at this stage. If the influences of any metric conflict and tend to cancel out their effects, they can be replaced by more suitable metrics. In future implementations of this decision support model, unequal weights may be applied to each metric if there are objective indications that it is necessary. To ensure consistency across the country, it is critical that any partnership decisions on weighing variables be fully documented, and that the Science and Data Committee be consulted before they are used

## Sensitivity analysis of indices

Sensitivity analyses should be conducted to determine the amount of change required of any particular variable to have a significant effect on habitat condition. The importance of each individual metric to the overall index value can be evaluated and used to help identify the most influential factors affecting habitat condition.

## Overall habitat condition score

Initially, an overall habitat condition score will be determined using the average of all of the individual higher-level metrics. Averages are sensitive to the extremes and system processes and aquatic community structure often respond to the extremes, either high or low in measurement. After sufficient scoring has been completed, additional statistical analysis is recommended to ensure that this is the appropriate metric.

Habitat quality will be scored by comparing each classified unit's total condition index with the best currently possible and to the theoretically best possible within the classified unit. This will provide all partners with potential targets (scores) for which to strive.

The best possible habitat conditions will be identified by setting the total rank score of each index to its highest quality value, which might include values beyond the range of any system that can be observed today. There are virtually no aquatic systems that do not show signs of

human influence, even in the remote regions of Alaska. The likely potential conditions will be established by adjusting scores to the highest possible quality, given the limitations of anthropogenic influences that cannot, for all practical purposes, be eliminated and the climatic and geological conditions in the classified unit. Present conditions will be based on best available observed data.

To assist in the development of habitat priorities, we propose to use a joint index for each classified unit. The joint index will use habitat scores and a socioeconomic-political index, which is discussed in detail in a later section but is summarized here. The habitat assessment process described above will be used to identify the system process impairments and will be combined with socioeconomic and political variables that account for the "human importance" (i.e., the level of interest) of protecting, restoring, or enhancing a system. This may include, but is not limited to, factors like proximity to human population centers, costs of protection or modification, and likelihood of successful restoration or enhancement. When combined with the habitat assessment index, this should help to classify aquatic systems into those of high or low priority for attention. Thus, an index of *suggested* priorities can be attained using both the system process information and socioeconomic data.

## Assumptions

The primary assumption of the habitat index development process is that habitat quality, habitat quantity, and desirable fish community characteristics are linked, and that improvement of habitat (or at least prevention of degradation) can improve or maintain those biotic conditions that are desirable. The overarching assumption is that changes in the large-scale control variables that directly influence local habitat conditions will directly influence the productivity and composition of the fish and aquatic community. We also assume there is a cascading hierarchical organization of habitat conditions that start at the lowest end with a specific impairment that has the ability to change a specific habitat variable, and that the specific impairment will, in turn, have cumulative effects on an entire class of habitat characteristics. The lowest level of our hierarchy is one that stakeholders can design projects that will directly affect the levels above, and ultimately improve, the classified unit's habitat condition.

As with all assessment and restoration attempts, uncertainties may limit the extent to which predictions can be made. For example, at this time there are insufficient data about relationships between invertebrates and forage fish and vegetation type or water depth, to make accurate predictions regarding benefits (USACE and SFWMD 2004). We strongly recommend that partnerships and other funding agencies focus attention on the development of these habitat-fish relationships to help improve the assessment process.

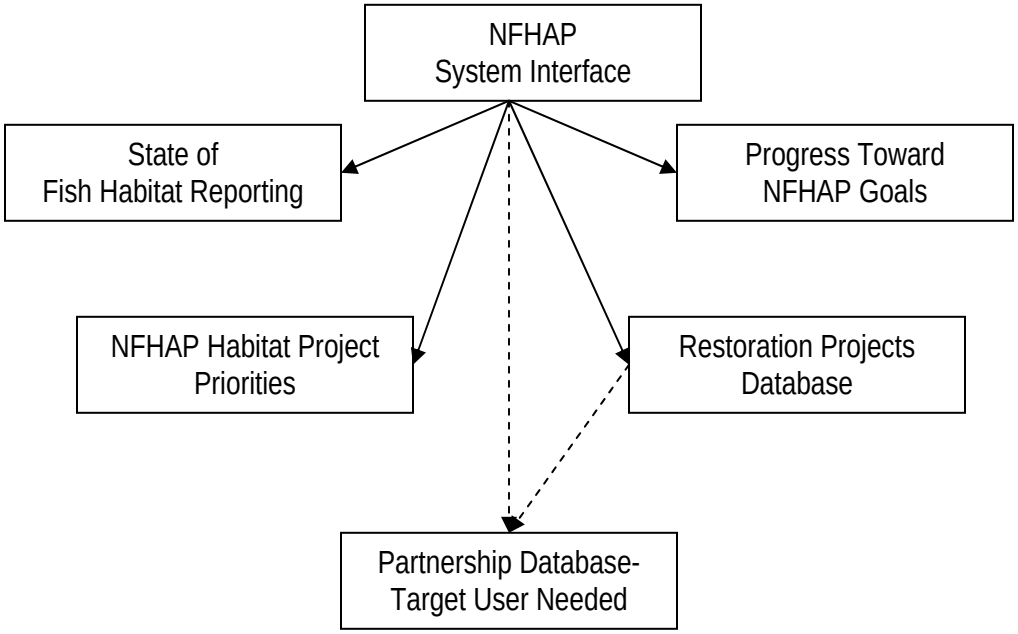
# The Data and Information Technology to Make the Action Plan Work

**Key Points:**

- The NFHAP Decision Support System will consist of four subsystems:
  a. State of Fish Habitat Reporting System
  b. Progress toward NFHAP Goals Tracking System
  c. NFHAP Habitat Projects Priorities Data System
  d. NFHAP Restoration Projects Data System.
- Data to complete the initial development of this system will come from ongoing data projects, primarily those with a national or extensive regional dataset.
- To make this tool useful for aquatic resources managers, a national web-based GIS database will be developed to store conservation and habitat priorities. Conservation priorities would be developed from the individual regional, local, and state-based priorities, as well as from the NFH Board.

The NFHAP data management system will consist of four major information systems (State of Fish Habitat Reporting, Progress toward NFHAP goals, NFHAP Habitat Project Priorities, and Restoration Projects Database) that are accessed through a single ArcIMS© or other open-source GIS geographic interface (Figure 1). Each individual subsystem would serve different needs of the NFHAP and will be developed separately to meet these individual needs. The entire system will not have a single data warehouse, but would be distributed among integrated systems with data that can be combined to meet different needs. Development of such a system will be contingent on the development of partner applications, such as the Multistate Aquatic Resources Information System (MARIS), Streamnet, and other consortia.

**Figure 1. Basic Conceptual Model of the NFHAP Data System.**




## Proposed Approach for State of Fish Habitat Reporting and Progress Toward NFHAP Goals Tracking Systems

Data for assessing the status of fish habitat units within ecoregional classification units and for monitoring progress toward NFHAP goals will come from the same general data sources. Therefore, these systems will be developed using similar approaches and similar data sources. To complete these systems, we will rely on a number of projects that have been funded or will be funded by the USGS National Biological Information Infrastructure (USGS/NBII ) program, AFWA Multi-State Conservation Grants program, and other entities that, if properly coordinated, would form the basis of an integrated NFHAP data reporting and progress tracking system. Many of these projects have started collating/collecting data for specific purposes, but by themselves will not be able to address the broad information needs of the NFHAP. Integrating data resulting from at least some of these efforts will result in a better information network that could be used to guide and demonstrate the impact of the NFHAP.

## Classification Data - System Architecture

The ecological classification used for freshwater and marine ecoregions form the basic reporting unit for reporting status and tracking progress toward NFHAP goals. These data form the basic backbone of the system and, as such, the national-level ecological classification units are the only dataset that should reside centrally on the NFHAP server. These data will be fixed and delivered through a standard ArcIMS© interface. However, integration of regional and local classification units will be done through web services interactions with local or regional servers.

This approach ensures that the basic national classification units are standard, but allow for smaller scale regional classification units to be integrated into the system.

## Inland Waters Condition Data System Architecture

Data to complete the initial development of this system will come from ongoing data projects that reside in three fairly broad groups (note these lists are not inclusive; please see Appendix 5 for list of data sources for each condition variable):

1. **Species-specific or system-specific projects that use indicator species or habitat health as a measure of aquatic ecosystem health**. These projects generally occur at a national or regional scale, and the data collected generally focus on biological parameters. Examples of projects include:
   - Development of an integrated Sturgeon Information System, funded by the USGS/NBII and conducted through Michigan State University.
   - The Eastern Brook Trout Joint Venture, funded through the Multi-State Conservation Grants program, USGS/NBII, and U.S. Fish and Wildlife Service.
   - Numerous smaller scale efforts such as Colorado River Cutthroat Trout project, funded by USGS/NBII.

2. **Watershed-based projects that collect information on a number of different categories, including physical habitat, biological parameters, water quality and quantity, and watershed characteristics**. However, no single regional watershed project will have all the data available to meet the needs of the NFHAP benchmarks of success. We fully expect that groups of variables will be applicable from these sources and increase in utility when combined with external data sources. These projects include:
   - A number of projects funded under the USGS Aquatic GAP program, such as in the Lower Missouri River, Lower Colorado River, Puget Sound, and Great Lakes Drainages. The emphases within these projects are on species presence data, watershed characteristics, and physical habitat. In addition, USGS/NBII is funding projects to collate biological parameter data in the Rio Grande and Delaware River Basins.
   - The Multi-State Aquatic Resources Information System (MARIS) project, funded by numerous agencies and the AFWA Multi-State Conservation Grants program. This provides a system through which quantitative biological and water quality data are shared among several Great Lakes, midwest, and mountain states, and relies on state maintenance and ownership of their data.

3. **National projects that bring together information on status and trends of fish populations and habitats**. Federal fisheries agencies have developed national databases to gauge the total need for restoration or management activities, to prioritize their activities, and to track performance. These databases may focus only on resources where there is a federal role, but they do provide a national-scale indicator of fisheries and aquatic habitat health. Additionally, other very broad based data systems such as FishBase (http://www.fishbase.org/), the NOAA National Status and Trends Program

(www.ccma.nos.noaa.gov), and those held by NatureServe will also provide key datasets for the decision support system.

- FWS has developed a Populations Module in its Fisheries Information System (FIS) to record status and trends, management plans, assessment status, and location for species of federal management concern. In 2005, FWS transformed the FIS to a web-based system with public access of data through the FWS Environmental Conservation Online System (http://ecos.fws.gov).
- The Fish Passage Decision Support System (FPDSS) is an internet-based, geographically referenced comprehensive database of barriers preventing fish movement that is complemented by mapping and modeling analytical tools. The database includes barrier information such as location, type, size, owner, etc., as well as information on associated fish species and local habitat information (http://fpdss.fws.gov). The FPDSS can also be used to locate and manage reservoirs with high fisheries potential.
- The U.S. Army Corps of Engineers has identified and included over 79,000 dams in the National Inventory of Dams (NID) at http://crunch.tec.army.mil/nidpublic/webpages/nid.cfm. Patrick (2005) used the NID database to map all terminal dams for the Atlantic, Pacific, and Gulf coasts, and developed an evaluation tool to assist in the recovery and rebuilding of diadromous fish populations. This database has georeferenced locations for many dams in the coastal system.
- The NOAA Fisheries Toolbox (NFT) at http://nft.nefsc.noaa.gov/ is a suite of biological modeling software programs that can be used in fisheries stock assessments.

The NFHAP decision support tool will facilitate the integration of these projects via web services in into an ArcIMS© information system that should be used for assessments of the success of the plan across large watersheds at the regional and national scales. Note that the current focus of most of these efforts is to provide data accessibility and decision support, not to conduct detailed biological assessments. Although some of these efforts contain the components necessary to conduct basic evaluations of aquatic habitat, additional resources will be needed to build improved tools to evaluate relationships between habitat parameters and fish populations.

## Coastal Condition Data System Architecture

Data for performing coastal condition analyses will follow a similar approach as the inland freshwater condition analysis. The marine condition data system architecture will be developed to integrate with existing systems such as the Integrated Ocean Observing System (IOOS) and associated datastreams such as the Global Ocean Observing System (GOOS). In the United States, a national office was established to coordinate development of IOOS, "a system of systems that routinely and continuously provides quality controlled data and information on current and future states of the oceans and Great Lakes from the global scale of ocean basins to local scales of coastal ecosystems" (http://www.ocean.us/what_is_ioos). IOOS is the U.S. contribution to GOOS, "a permanent global system for observations, modeling and analysis of marine and ocean variables to support operational ocean services worldwide. GOOS provides accurate descriptions of the present state of the oceans, including living resources; continuous

forecasts of the future conditions of the sea for as far ahead as possible, and the basis for forecasts of climate change" (http://www.ioc-goos.org/). Each region of the United States has a regional association to oversee and promote IOOS coordination. The Southeast Coastal Ocean Observing Regional Association (SECOORA), among others, is a good example and a source for the process of creating a distributed system via government, academic, and private entities. Other data sources such as NOAA's Regional Ecosystem Data Management portal will be valuable assets in the development of the coastal data system architecture.

## Action Plan Habitat Projects Priorities Database

A variety of national, regional, state, and other scales of priority setting have been conducted for aquatic habitat conservation (protection, restoration, and enhancement) from such sources as the State Wildlife Action Plans, State Fish and Wildlife Agency Fisheries/River/Watershed Planning Documents, The Nature Conservancy Ecoregional Conservation Plans, Trout Unlimited Planning Documents, USFWS Endangered Species Recovery and Wildlife Refuge Plans, NOAA-NMFS Coastal Rehabilitation Plans, and USFS Forest Plans, to name a few. These priorities, along with the supporting documentation, evidence, and decision processes, provide extremely valuable information for aquatic habitat planning work. Together they have far-reaching consequences and could increase the efficiency of our partners in protecting and rehabilitating aquatic habitat. It is important that the NFHAP capitalize on these existing planning investments and use them to speed up the delivery of critical habitat protection and rehabilitation on priorities agreed upon by multiple assessments. Unfortunately, little of this information is available to our partners because it is fragmented and often inaccessible. Rolling these disparate priorities and approaches into a consistent national coverage online will greatly improve partnerships' abilities to rapidly provide improvements to our aquatic habitat. Priorities identified by this work may serve as initial starting points from which partners may determine their own priorities and develop active projects.

We recommend that a National GIS Database be established that captures all existing and future conservation and habitat priorities into an easily accessible web-based system. This database should geo-reference all priorities and use the same classification system as discussed in this report to allow for rapid reporting, summarization, and evaluation. The system should provide for a simple web-based data entry method to allow for rapid updates as new planning processes and devices develop additional priorities. The database should be public and provide all associated information and documents for each priority. In the future, information on fine-scale habitat classification, maps, and comprehensive suites of aquatic biodiversity—along with information on condition, threats, current efforts, and links to the NFHAP Project Assessment—should be incorporated into the database.

### *Habitat Prioritization*

We recognize that selecting a small set from the large number of existing priorities, and those identified from the National or Regional Assessments, is a significant challenge. We suggest a two-pronged approach. First, it is our opinion that providing all of the possible and available aquatic conservation and habitat rehabilitation priorities is important as guiding information for our NFHAP projects. This will inform any regional or local partnership interested in identifying a focal project and gathering information to generate support for their work. It is clear that a

national listing is also needed that would be accomplished by merging all of the data and defining a suite of 100 national priorities for congressional funding focus.

We propose that national roll-up of information on these priorities proceed by:

1) Aggregating existing priorities and classified unit habitat scores linked to spatial coverages into one centralized database.

2) Obtaining the top 10 geo-referenced conservation/habitat priorities from all of the Nation's Fisheries Agency Chiefs for state and territorial managed waters that are based on state and territory watershed or waterbody planning documents. This step was added to help reduce the potentially thousands of individual state and territorial fisheries and aquatic habitat priorities into a smaller set and to ensure that the public trust responsibilities are properly represented.

3) Obtaining the top 10 geo-referenced conservation/habitat priorities from the Exclusive Economic Zone (EEZ), each tribal reservation, and the Alaska subsistence areas from the appropriate federal agencies and tribal authorities.

4) All priorities should be moved into the NFHAP habitat classification system to create a consistent spatial-unit map of priorities.

5) Two ranking processes should be used: one based on individual key priorities and one based on classified units (e.g., those units having the most priorities). The index for each individual priority would include scores for the number of times it has been identified as a priority, the likely investment return of the priority, the number of groups identifying them as priorities, and whether the state fisheries agency has ranked it as a priority. The index for each classified unit would include scores for the number of priorities in the unit, number of groups involved in identifying them as priorities, the likely total investment return of all priorities, and the number of state fisheries agency priorities in the classified unit.

6) The index would identify the top 100 national priorities by individual conservation/habitat priority and would provide information on which classified units have the most needs. Additional and similar analyses should be conducted to provide priorities by state, region, and ecoregion to assist regional and local partners' project planning.

The use of these existing data and investments will provide our NFHAP partners with many potential habitat project options. There are likely many more projects than there will be available funding, all of which would be considered worthy choices; however, some may not be feasible, and others may be more desirable and cost-effective. To improve the probability of success, we strongly recommend that a final modifier be included that scores projects: 1) higher scores for protecting fully functioning systems and lower scores for re-engineering highly modified systems; and 2) the likely feasibility of project. This last filter will provide some

guidance as to which of the options will provide the best return for our aquatic resources, be the most cost-effective, and provide the highest likelihood for success.

Currently, there is no data system that houses conservation priorities. Conservation priorities need to be developed from the individual regional, local, and state-based priorities. This system will integrate data from the State Wildlife Action Plans, joint venture conservation priorities, and other conservation priorities into a centralized data system that will need to be maintained, updated, and housed by a single entity. The habitat projects priorities database will consist of a data entry system (both with batch loading and single entry capabilities) and data reporting interface. Access to projects will initially come through the NFHAP ArcIMS© geographic interface.

## Action Plan Habitat Projects Database

One of the efforts of the NFHAP Data Team was to assess fish habitat restoration, rehabilitation, enhancement, and protection efforts across the United States. The state fish and wildlife agencies were surveyed to collect information on fish habitat projects they identified as successful. The data submitted provides project information including factors such as resource issues addressed, methodology, protocols, project plans, and project partners, as well as metrics used to indicate project success. The information will be used to implement the NFHAP by delineating locations of fish habitat restoration projects and highlighting their project objectives and measures of success. Additionally, it provides a test bed to develop the project assessment database that will be critical to future NFHAP efforts. Similar databases already exist (e.g., NOAA's National Estuaries Restoration Inventory and the Mississippi-Alabama Sea Grant Restoration databases) that can be used as models for creating the NFHAP projects database.

The Aquatic Habitat Restoration Information Survey and Database was designed to collect data from state agencies with established databases of project information (see Appendix 7). A submission form was created and distributed to assist other states in submitting project information in a systematic format. The database structure is the foundation from which a web-based searchable interface will be developed. The interface will provide management agencies a reference for information on fish habitat restoration projects, including contacts and links to individual projects. The restoration projects are geo-referenced to enable integration with the ArcIMS© web tool being developed to display the nation's fish habitat assessment and priorities.

## Action Plan Data System Functionality

Once complete, the NFHAP decision support and information system would provide the following functionality:

1. **Continued updating and reporting on the state of fish habitat throughout the United States.** Functionality would consist of queries, integration, and data that could be developed to produce the state of the fish habitat report at multiple scales. A query-based interface into the NFHAP ArcIMS© system will allow for ease of access to data and preformatted reports for users. An expert system with more flexibility and functionality

will also be available for those users who have an intimate working knowledge of ArcIMS systems.

Examples of websites created to assist resource managers and researchers query existing research projects are: the Eastern Brook Trout Joint Venture mapping application (http://sain.nbii.org/EBTJV); Calfish information system (http://www.calfish.org/DesktopDefault.aspx); Florida Seagrass Conservation Information system (http://research.myfwc.com/features/category_sub.asp?id=4978 ); Big Cypress Basin–Estero Bay Regional Research Database (http://ocean.floridamarine.org/bcb/); and the National Estuaries Restoration Inventory Database (NERI) (http://neri.noaa.gov). These are examples of various query tools that allow users to search by agency, region, and subject for conservation efforts.

2. **Continual evaluation of progress toward NFHAP goals.** Progress toward NFHAP goals will rely on the same set of classification and condition data that will be used to report the status of fish habitat. Queries into this system would call on independent data (indicators) that evaluate progress toward these goals.

3. **Viewing NFHAP Habitat Project Priorities**. Conservation priorities will come from multiple sources including a stakeholder survey that could result in three tiered results: 1) national priorities, 2) regional priorities, and 3) local priorities. Data will be accessed and presented from regional priorities developed from national and regional input. Additional prioritization tools and reports will be developed using the methods discussed elsewhere in this report. All of this data will be created through NFHAP efforts and supplied through a searchable website and reports. Clicking on the region type map would then allow analysis to the highest resolution available.

4. **Habitat Projects Database**. As results become available from NFHAP projects, a database will be developed to capture all aspects of the project from funding to administration to evaluation results. Currently, there is a similar project funded by USGS that could be used a template, as well as the previously mentioned NERI and Mississippi-Alabama Sea Grant Restoration databases Initially the database will be a single centralized data system, but eventually it is recommended to use a distributed, integrated approach.

## Action Plan System Standards and Integration Issues

The decision support system interface will address the following questions and meet the following conditions:

1. What is the appropriate scale at which the data should be available (and is the system built such that multiple scale data can be observed?)

   The decision support tool should be as flexible as possible without excluding any information. The degree of flexibility depends on time and funding. The shell should be

multi-scalable, but leave missing data where data are not available. The first phase should work at one state (at current classification) resolution and the second phase would have multiple scale items.

Providing information at the highest resolution will be required to fully implement the decision support tool. Scaling up to a consistent level should be avoided in the design. It is likely that different regions may have different levels of scale, but care will have to be taken to avoid losing resolution at the national level. The State of Fish Habitat Report can focus at lower resolutions, but the website database should attempt to include data to the highest resolution available within the limits of available storage.

2. What are the necessary data standards that need to be used to get the core data (conditions and classification) integrated?

   Successful implementation of the NFHAP information system will depend on information transfer standards. We can strongly encourage individual partners to incorporate standards into existing data systems, but we recognize that not all key data partners will have the flexibility to change reporting standards. At a minimum we recommend the use of the Integrated Taxonomic Information Systems (ITIS) for taxonomic naming and the use of Federal Geographic Data Committee (FGDC) standards for geospatial identification of data. In addition, the ArcIMS© interface will be built using the standard 1:100,000 National Hydrography Dataset (NHD+).

   However, a number of reporting standards—including descriptions of habitat, water quality, and other key variables—will need to be agreed upon before the transfer tool can be developed. The National Fish Habitat Board should develop such standards in collaboration with the Science and Data Committee and in consultation with the regional partnerships. Once standards are developed, it will be possible to develop a number of web services transfer tools that will mine distributed databases for data that meet users' needs. This transfer tool will be provided in a recommended user format that can be sent out to each data partner.

3. Is it easier to build interfaces between existing species, watershed, and national approaches, or should we start new?

   To find the most efficient way to build the decision support system, we will need to determine the easiest way to access existing information systems and databases. Discussions about how to integrate existing data will require involvement of GIS and database programmers. It is critical to have programmers involved in these recommendations, while being mindful that their input may restrict the effort by tailoring the products to the strengths and experiences of these staff members.

The decision support system will need to identify and list the appropriate web services and GIS tools that will be necessary to properly integrate data from distributed systems. FGDC compliant metadata will be the first necessary step to integrate data from existing sources. The system

must be developed to meet not only the needs of the NFHAP, but also the needs of local, regional, and other NFHAP-related activities.

## Recommendations

1. The NFHAP Decision Support System should consist of four subsystems:
    a. State of Fish Habitat Reporting System
    b. Progress toward NFHAP Goals Tracking System
    c. NFHAP Habitat Projects Priorities Data System
    d. NFHAP Restoration Projects Data System.

2. A single central query-based geographic interface into the decision support system should be built that will access data/information within each subsystem.

3. A single entity should operate and maintain control over the national interface of the NFHAP system.

4. The ecoregion classification data should be housed and centrally maintained to allow for the national scale reporting and integration of local and regional scale classification data from distributed servers.

5. Data to populate the Decision Support System should come from a number of existing online data systems and providers. Initial system development will depend on willing providers and NFHAP grantees.

6. A standing data subteam should be developed as part of the Board's Science and Data Committee, consisting of representatives from each data provider (see list of condition data for providers) and regional partnerships. Members of the data subteam should have expertise in data structures and user needs.

7. Additionally, professional GIS, web services, and database experts should be assigned to the data subteam in order to fully develop the user requirements and NFHAP system architecture.

8. Key milestones that need to be addressed to allow the system to be fully developed include identifying:

    a. Key data transfer standards
    b. Key web services for integration
    c. Plan for working with distributed providers of data
    d. Scaling issues for initial development
    e. Mechanisms to integrate regional joint partnership information systems

9. A centralized conservation priorities database will need to be developed to provide user access to these data via the geographic Decision Support System interface or through tabular means.

10. Similarly, the habitat projects database will need to be developed to provide user access to project data via the geographic Decision Support System interface, or through tabular means. This data system should be housed and maintained by a single entity.

# Prioritization of National Fish Habitat Action Plan Projects

**Key points:**

- A system to help score priorities for classified units, waters, and projects is needed.
- The prioritization system should use data from the National Fish Habitat Assessment scores, information on the type of intervention, existing priorities, and socioeconomic information.

We recognize that selecting systems and projects from the vast number of existing priorities, and those identified from the National or Partnership Fish Habitat Assessments, is a significant challenge. There are likely many more projects than there will be available funding, all of which would be considered worthy choices; however, some may not feasible, and others may be more desirable and cost effective. We suggest an approach that includes the system/water/project condition scoring, weighting systems/waters/projects by the type of intervention (protection, rehabilitation, or improvement), available priority consideration, and weighting by a set of socioeconomic factors. A scoring matrix using the steps below should provide the needed decision support tool for Board and Partnership prioritization.

We propose that national roll-up of information on these priorities proceed by:

1) Incorporating the National and Partnership Fish Habitat Assessment scores into the prioritization efforts and aggregating available aquatic conservation and fisheries habitat priorities and classified unit habitat assessment scores linked to spatial coverage into one centralized geo-referenced database. There should be a determination of whether the project will focus on the protection of intact systems/waters, rehabilitation of degraded systems/waters, or the improvement of engineered systems/water, with the scoring of projects in that order.

2) Obtaining the top 10 geo-referenced conservation/habitat priorities from all of the nation's fisheries agency chiefs for state and territorial managed waters that are based on state and territory watershed or waterbody planning documents (i.e., State Wildlife Action Plans). This step will reduce the potentially thousands of individual state and territorial fisheries and aquatic habitat priorities into a smaller set and ensure that the public trust responsibilities are properly represented. A system or water with a large number of listed priorities and interested parties should be given higher priority than one with few listed priorities or partners.

3) Obtaining the top 10 geo-referenced conservation/habitat priorities from the Exclusive Economic Zone (EEZ), each tribal reservation, and the Alaska subsistence areas from the appropriate federal agencies and tribal authorities. This information, along with information from Step 2 above, will inform any regional or local partnerships interested in identifying focal projects and focusing opportunities to generate support for the needed work.

4) Given the differences in scale, two socioeconomic measures should be developed: one based on individual waters, and one based on classified units (e.g., those units that have the most priorities). The index for each individual water or project should include scores for the number of times it has been identified as a priority, the likely investment return of the priority, the number of groups identifying them as priorities, proximity to population centers, and whether it is a top-ranked priority. The index for each classified unit should include scores for the number of priorities in the unit, number of groups involved in identifying them as priorities, the likely total investment return of all priorities, an estimate of the cost-benefit ratio of work on a system or on an individual project, proximity to population centers, the number of top-ranked priorities in the classified unit, and other key factors that may be unique to that system/water.

We envision a potential prioritization scoring system as follows:

> Prioritization Score = (NFH Assessment Score) x (Type of Intervention) x (Classified Unit or Water or Project Priority Score/Total Number of Priorities) x (Socioeconomic Index)

where the type of intervention is scored in a simple linear scale with a score of 3 given to protection efforts, a score of 2 given to efforts to rehabilitate systems or waters, and 1 to efforts to improve engineered systems; and the socioeconomic index uses the following equation:

> Socioeconomic Index = (Probability of success) x (Estimated cost:benefit ratio) x (Distance to population centers score) x (Other key factors)

The use of these existing data and investments will provide our NFHAP partners with many potential habitat project options. To further narrow these options for decision-makers, we recommend developing a list of the top 100 priorities by classified units, individual waters, and, ultimately, projects for both the nation and for each partnership. Additional and similar analyses should be conducted to provide priorities by state, region, congressional district, federal lands, and ecoregions to assist regional and local partners' project planning.

# The Evaluation of National Fish Habitat Action Plan Projects

**Key Points:**

- Many agencies and organizations have put significant financial resources toward conservation activities, but very little monitoring has occurred to measure the long-term success of individual projects or the collective conservation success on a regional or national scale.
- The Science and Data Committee will develop a fish habitat condition report for the nation every five years, to measure progress toward NFHAP goals.
- The NFHAP activities should be evaluated at three scales: 1) the local project level; 2) the regional Fish Habitat Partnership level; and 3) the National Fish Habitat Board level.
- Conducting these evaluations provides the opportunity for adaptive management on multiple scales.

There are many river "improvement" projects in the United States that have collectively straightened, dredged, re-routed, landscaped, and covered hundreds of miles of river bank in synthetic products, very often under the banner of river restoration (Leopold 1994). But more often than not, these physical alterations conflict with natural geomorphologic processes and are at best temporary cosmetic changes to rivers; at worst, they do more harm than good (Leopold 1994).

Unfortunately, many restoration projects have failed to produce sufficient evidence that they have restored "normal function" of the lost aquatic habitat. Since 1990, it is conservatively estimated that $14 to $15 billion has been spent on restoration of streams and rivers in the United States, with an average cost of over $1 billion per year (Bernhardt et al. 2005). Evaluating the cumulative effect of this spending has been nearly impossible, as only 10% of project records indicated that any form of assessment or monitoring occurred (Bernhardt et al. 2005). Learning from these programs, it is essential to ensure that existing high-quality habitats do not become further degraded, and careful evaluation mechanisms need to be in place for future habitat restoration activities.

## Defining Success

Truly successful fish habitat projects should not focus on individual rock-log and riprap projects. They should tackle problems from a system and process perspective and incorporate landscape and policy-level approaches to conservation and rehabilitation. For example, if lack of woody debris is identified as a limiting factor in a stream, rather than throwing individual bundles of wood into the river to be washed away during the next high-flow period, an action should be identified to provide a long-term solution—such as restoration and protection of riparian forests, which produce woody debris, higher up in the catchment. Appendix 7 is a table drawn up from the analysis of 138 state river-restoration projects and shows a variety of completed activities. Each activity is ranked in its importance to sustainable, landscape-level fish-habitat, with 1 being the most important and 3 being the least important. More than half of the activities undertaken were ranked 3. This analysis illustrates a difficult lesson that must be learned and shared widely. We simply cannot afford to continue pouring limited resources into activities that will not have long-term, large-scale, and self-sustaining biologically meaningful results for the nation's aquatic

life. Moving forward with the NFHAP will require stringent quality-control checks by panels of regional experts working at a systems and process scale with clear criteria to reduce the likelihood of funding projects that will not meet these criteria.

## Measuring Success

Many reactive spending programs in the United States have funneled financial resources toward important aquatic problems, but when it comes to analyzing our progress little work has been done to measure the collective conservation impact beyond the scale of individual projects. Since 1990, we have poured $14 to $15 billion into river restoration projects in the United States, but there is only piecemeal information available on the performance of these projects, making a comprehensive assessment of progress at a national or even regional level virtually impossible (Bernhardt 2005). In a database of 3,700 river restoration projects, only 10% indicated that any form of assessment or monitoring took place (Bernhardt 2005). In a separate analysis of 138 fish-habitat projects undertaken by various state agencies, 44% had defined success standards prior to implementation and 34% attained those standards as shown in Appendix 7.

One of the key activities of the NFHAP will be to establish a system of evaluation that measures conservation success at regional and national scales. One suggested approach has been to emulate the National Waterfowl Management Plan, which defined specific species and habitat targets in relation to clearly defined baselines (Canadian Wildlife Service and U.S. Fish and Wildlife Service 2004). However, fish populations cannot be assessed in the same way as waterfowl because most are r-selected* organisms and their populations fluctuate greatly from year to year, making fish abundance a less meaningful indicator than bird numbers. In order to define a clear baseline against which to measure change, the Science and Data Committee recommends using the National Fish Habitat Assessment for the nation, which will be an invaluable tool to measure progress at any scale and an important product of the NFHAP.

If changes in fish habitat condition are clearly measurable over the next 10 years, this will be reflected in the State of the Nation's Fish Habitat Assessment report, but it will be difficult to specifically identify which changes occurring at a national level were directly attributable to the National Fish Habitat Action Plan and which were caused by other large-scale efforts. Thus, a second more specific analysis of individual projects will be required. This meta-analysis should assess: 1) the effectiveness of individual projects in relation to clearly defined goals; 2) the cumulative effects of individual projects at various scales, including partnership and national levels; and 3) the lessons learned and how they were used to inform conservation actions elsewhere.

## Evaluation Measures

Many different, but broadly similar, evaluation approaches are taken by different conservation groups (Stem et al. 2005). The basic principles of evaluation are described below. The details of the particular prescriptive framework will be determined by the Science and Data Committee.

* Typically have many small offspring, fast rates of population growth, and relatively short generations (e.g., bacteria, some insects, and plants, e.g., dandelions) (Raven and Johnson 1992).

*1) Effectiveness* – The key to measuring effectiveness is to set clearly defined and measurable goals before starting any activities. This may seem obvious to most people, but it is a step that has been omitted in about half of all state-run fish habitat projects examined by Ostroff (USGS unpublished data). If goals are clearly and quantifiably established in advance, then the actual performance can be qualitatively assessed and scored based on how effective the actions were at achieving the original goals (e.g., 1 = unsatisfactory, 2 = less than satisfactory, 3 = satisfactory, 4 = more than satisfactory, 5 = exceeded expectations). All projects under the NFHAP should be evaluated on this kind of scale. This is a consistent performance measure of the "bang for the conservation buck" that could be scaled up to a national level across a diverse range of project types, assuming that project activities lead to meaningful positive biological responses or to important lessons learned.

Another possible approach is to generate actual cost/benefit estimates of monetary improvements in fisheries accruing from the investments in fish habitat, but currently this approach is unlikely to have sufficient data. If this approach is taken, a similar scale could be developed as discussed in the previous paragraph.

*2) Cumulative Effects* – The sheer scope of different activities and indicators that could potentially fall under the banner of the NFHAP is overwhelming, and the types of conservation interventions will vary widely from place to place. Thus, identifying a limited set of universal biological indicators that should be measured at the national level is a particularly challenging task. This is further compounded by the fact that many projects measure their success using goals or indicators that are biologically meaningless (e.g., number of volunteers assisting with a culvert removal, amount of money invested in a particular activity). Nonetheless, it will be important for the NFHAP to quantitatively assess its progress toward the national goal. Thus, a limited set of indicators could be selected, using the input of the regional experts and, upon completion, each project should report progress towards these goals (if any) so the information can be incorporated into a national meta-analysis.

The first set of indicators relate to the first three goals of the NFHAP. The first indicator should quantify the amount of habitat protected or restored and should always be expressed as a percentage of the National total to give an indication of the scale. The second set of indicators should be the percent change in the overall National Fish Habitat condition scores that results from the actions taken. This change can be documented at any relevant scale. The third set of indicators should be species-focused and related to the final two goals of the NFHAP. Individual project managers would identify individual fish species targeted for conservation actions, and express the population(s) they are working with as an approximate percentage of its natural range. The projects should identify simple, directional population changes (increasing/stable/ decreasing) in relation to a predefined baseline.

*3) Lessons Learned* – A wealth of high-quality, peer-reviewed information has been published on the costs and benefits of various conservation activities. It is critical that all decisions and actions undertaken by the NFHAP are informed by the best available information, and that lessons learned are widely disseminated. This can be done by encouraging the publication of results in peer-reviewed journals, facilitating seminars and conferences, and commissioning meta-analyses of multiple small-scale projects to shed light on best practices.

There is also a need to identify what is known and not known regarding the successes and failures of various conservation activities, as well as their uncertainties. This will allow well-informed decisions regarding possible restoration and/or monitoring projects, and avoid repeating mistakes.

## Scaling Issues

The NFHAP Core Workgroup has been mindful that fish habitats in the United States are extremely heterogeneous, ranging from the xeric springs and rivers of the Sonoran Desert to the salt marsh ecosystems on the East Coast and the Arctic islands, representing the most northerly extent of freshwater in North America (Abell et al. 2000). Recognizing that each distinctive geographical area has its own unique set of threats and the need for a comprehensive national approach to the issue, a set of broad National Goals were established in the NFHAP that should guide partnerships. Partnerships are geographically or species-focused groups involving many stakeholders, and are the equivalent of "Joint Ventures" of the National Waterfowl Management Plan. They conduct threats analyses, develop regional measurement protocols in consultation with the National Board, and establish local priorities in consultation with a wide array of stakeholders that fit broadly into the overall goals of the NFHAP. A pilot example of a partnership is currently being implemented and is known as the South East Aquatic Resources Partnership (SARP) http://www.sarpaquatic.org/. Thus the system has three distinct scales around which priorities and strategies are developed: projects, partnerships, and the National Fish Habitat Board. The system is flexible enough to allow for other scales, ranging from each classified unit of water to congressional or political boundaries that may be of interest to specific partners within a partnership; however, the three-level scale should be required for evaluation.

## Evaluation Implementation

The NFHAP should be implemented at three distinct scales: 1) the Project level that conducts the actual habitat activities, 2) the Partnership level that establishes regional-scale priorities; and 3) the National level that establishes national priorities. We strongly recommend that each of these organizations have clear roles and responsibilities within the monitoring and evaluation framework, as follows:

1) *Project Level*
    a. Define project goals within the framework of regional partnerships and the NFHAP after conducting specific threats analyses.
    b. Identify appropriate, quantifiable indicators that link activities to meaningful biological and fish habitat responses (short-term and long-term) that can be related to Fish Habitat Assessment scoring.
    c. Measure baseline information to gauge biological responses.
    d. Monitor progress towards goal and adaptive management to ensure that goals are achieved.
    e. Conduct post-project evaluation to assess success in relation to original goals, determining changes in Fish Habitat Assessment scores, and feeding data and reports up to the partnership level.

2) *Partnership Level*
    a. Establish priorities and goals after conducting threats, situational, and viability analyses.
    b. Maintain database for tracking projects and goals in relation to the regional or partnership plan.
    c. Ensure peer-review of individual project proposals and provide quality control to include a recommendation letter to funding agencies.
    d. Provide quality control with final evaluation that assesses the grantees self-assessment of progress to initial goals.
    e. Ensure the availability of post-project evaluation information and deliver such data to the National Board.
    f. Ensure all data can be assimilated into the National Fish Habitat Assessment.
    g. Compile evaluation, lessons learned, and best practices; conduct a regional meta-analysis of the project portfolio; and deliver results up to the National Board.

3) *National Board Level*
    a. Establish national goals, scope, and targets.
    b. Broadly oversee grant-making from appropriations.
    c. Issue guidelines for the establishment and formalization of regional partnerships.
    d. Ensure development and implementation of national database and tracking system.
    e. Coordinate regional partnerships and ensure compatibility of project tracking databases, terminology, and evaluation metrics among all partnerships.
    f. Coordinate and synthesize evaluation at a national level.
    g. Disseminate lessons learned and best practices and commission third-party evaluations of activities when required.
    h. Produce an independent State of the Nation's Fish Habitat report to verify and track progress toward national goals.
    i. Learn from results and respond appropriately to improve operations.

## Evaluation – A tool to improvement

Many resource mangers are struggling to determine the best methods to achieve improvements in fish habitat and to measure conservation success in order to justify the investment of hundreds of millions of dollars in conservation funds around the world. But the ability to measure conservation impact has not greatly improved (Parrish et al. 2003). A wide range of approaches with different mechanisms achieve the basic principles outlined here, and a number of useful online resources are available to provide guidance to a wide range of audiences. Regardless of the method ultimately employed, the systematic implementation of monitoring and evaluation is a tool that can help focus actions to directly mitigate threats, increase the efficiency and value of investments, and assess progress at large scales. Application of monitoring and evaluation at multiple levels will provide us with an unprecedented glimpse of the collective effects of our conservation actions, and is a crucial learning opportunity to refine and improve our understanding of how to effectively measure conservation success at many different scales.

We strongly recommend that the National Fish Habitat Assessment classification system be used to compare systems that are similar to each other and learn from the lessons of others as the information becomes available. The classification system recommended in this document may be analyzed in almost unlimited ways. Initially, we recommend some simple horizontal classifications for comparisons be set up to allow for lessons learned to be transferred based on water size. For example, streams and rivers can be classified as follows:

- Headwaters: $\leq 10$ km$^2$
- Creeks: $10 \sim 100$ km$^2$
- Small Rivers: $100 \sim 1{,}000$ km$^2$
- Medium Rivers: $1{,}000 \sim 10{,}000$ km$^2$
- Large Rivers: $10{,}000 \sim 25{,}000$ km$^2$
- Great Rivers: $> 25{,}000$ km$^2$

Size and location in the watershed are important characteristics that control the available physical energy of the systems. Similar initial systems should be developed for lakes and coastal systems. As stated above, the potential number of horizontal comparison classifications is huge, and will depend on the question of interest. But size is a good starting place. The overall intent of this effort is to allow for knowledge transfer among all partnerships participating in the NFHAP.

## Initiative Science Schedule

To fully implement the National Fish Habitat Assessment and NFHAP supporting databases, a phased approach should be taken to ensure sufficient development and testing of each module of the system. The following schedule should be considered for the NFHAP:

1. October 2008
    a. Deliverable
        i. Prototype system to include classification system and base condition factor database
    b. Systems
        i. Rivers and streams – Continental US

2. December 2008
    a. Deliverable
        i. Complete testing of prototype system
        ii. Include all possible condition factors into database
    b. Systems
        i. Rivers and streams – Continental US

3. September 2009
    a. Deliverable
        i. Incorporation of additional systems and geographic areas into assessment
    b. Systems
        i. Rivers and Streams – Alaska and Hawaii
        ii. Lakes – Continental US
        iii. Inshore coastal waters – Continental US

4. March 2010
    a. Deliverable
        i. Extent system to all possible habitats
    b. Systems
        i. Lakes – Alaska
        ii. Inshore coastal waters – Alaska and Hawaii

5. July 2010
    a. Deliverable
        i. Prototype National Fish Habitat Assessment

6. October 2010
    a. Deliverable
        i. First National Fish Habitat Assessment

7. September 2015
    a. Deliverable
        i. Second National Fish Habitat Assessment

The National Fish Habitat Priorities and Project Database should consider the following schedule:

1. June 2009
    a. Deliverable
        i. Database design completed

2. September 2009
    b. Deliverable
        i. Prototype database completed
        ii. Begin database testing

3. February 2010
    c. Deliverable
        i. Complete testing
        ii. Implement web-based system for partner use

3. October 2010
    a. Deliverable
        i. NFHAP Project Report

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# Appendices

## Appendix 1 - How much is affected based on current information?

### Regional Coastal Comparison using the National Coastal Condition Report II and the National Estuarine Eutrophication Assessment

A number of national and regional assessments were reviewed to determine the condition of fisheries habitat in the United States. Where information was available to define the condition in reference to a desired state, percentage scores were calculated (with 100% representing the desired condition) in order to summarize and compare between broad-scale regions identified by such reports as the National Coastal Condition Report II (NCCR II; U.S. EPA 2004), the National Estuarine Eutrophication Assessment (NEEA; Bricker et al 1999), and the State of the Nation's Ecosystems (Heinz Center 2002). In reviewing a variety of reports, there were many instances where there were conditions without an indicator of the ideal state, and these values were not included in the analysis. Overall percentage scores were compared to the NCCR II and the NEEA values since they represented the most comprehensive, scored assessment available (Table 1). In the assessments analyzed, only two regions (West Coast and Northeast U.S.) were found to have a significant number of indicators to compare with the NCCR II assessment – these were the West Coast and the Northeast United States.

**Table 1. Summary and Comparison of Habitat Condition Assessments by Region** (all applicable scores from each report have been converted to a 100-point scale for comparibility)

| Region of U.S. | NCCR II Condition Scores | NEEA Condition Scores | Mean of Other Reported Condition Scores | Variance of Other Reported Conditions Scores | Number of Sample Indicators Evaluated by Other Reports |
|---|---|---|---|---|---|
| Northeast | 36 | 65 | 45 | 4 | 151 |
| Southeast | 76 | 45 | 53 | (too few samples) | 6 |
| Puerto Rico | 34 | - | 10 | (too few samples) | 1 |
| Gulf of Mexico | 48 | 84 | 42 | (too few samples) | 3 |
| West Coast | 40 | 68 | 63 | 8 | 84 |
| Great Lakes | 44 | - | 40 | (too few samples) | 2 |
| Alaska/Hawai'i | - | - | 50 | (too few samples) | 2 |
| National | 46 | 33 | 51 | 6 | 26 |

While the Heinz Center (2002) report (hereafter referred to as the Heinz report) has suites of indicators, they are often "snapshot" views of the current condition of the system and the report generally does not try to assess the condition in terms of a desired state. Additionally, the Heinz report describes conditions based on ecosystem types as opposed to regions. There were a few inland indicators that the Heinz report possessed, which are discussed below, while the NCCR II focused on the coastal ecosystems.

### Wetland and Other Physical Habitats Losses/Open Water Gain -

According to the Heinz report and the U.S. Fish and Wildlife Service's Wetland Status and Trends program, wetlands in the lower 48 states declined from approximately 210 million acres in 1780 to approximately 108 million acres in 2004. Conversely, pond, lake (excluding the Great Lakes), and reservoir acreage has increased from17 to 21 million acres between the1950s and the mid 1990s. The following summary findings are from "Status and Trends of Wetlands in the Conterminous United States 1998 – 2004" (Dahl 2006) and a new study summarized in "Coastal Wetlands of the Eastern United States: Status and Trends from 1998 to 2004" (Stedman and Dahl, 2008).

- In 2004, there were an estimated 107.7 million acres of wetlands in the conterminous United States. Of this total, 95 percent were freshwater wetlands and five percent were saltwater wetlands. Approximately 38 percent were in the coastal watersheds of the Atlantic Ocean, Gulf of Mexico, and Great Lakes.

- Between 1998 and 2004, wetland acreage increased by an annual average of 32,000 acres nationally. In contrast, the coastal watersheds of the eastern U.S. lost approximately 60,000 acres annually during that same time period.

- Freshwater vegetated wetlands continued to decline, while freshwater ponds continued to increase by nearly 13% in the last decade. Trends indicate that the acreage of ponds is now about equal to that of all estuarine wetlands.

- Estuarine emergent wetlands continued to decline, losing almost 65,000 acres between 1998 and 2004. Most of these wetlands were lost to deepwater habitats through erosion, inundation, or other processes. The loss was greatest in the mid-Atlantic region.

- The analysis during this study period attributed causes of wetland losses nationally to: Urban Development (30%), Agriculture (26%), Silviculture (23%), and Rural Development (21%). For the coastal watersheds of the eastern U.S. the causes were more heavily weighted toward development (71 %) and loss to deepwater habitats (25%). Only 3% of the loss was due to agriculture.

Recent loss in wetlands is concentrated in coastal areas, where development is affecting the freshwater wetlands in the upper parts of the coastal watersheds. For the Gulf Coast, it was estimated that the loss of mangroves were 5-10% from 1957-2004, which was attributed to commercial and residential development (NOAA 2005). From this same report and over the same entire historic time period investigated (1937-57 to 2004), aquatic beds lost 5-10%, and oyster reefs in the Mid Atlantic lost up to 5% of their area due to heavy port and harbor development. Over the last 10 to 15 years, it was postulated that increased regulatory oversight in these open-water areas has lead to an overall reduction in loss for these habitats, but the results of the 1998-2004 study (Stedman and Dahl, 2008) show that wetland loss in coastal areas is still occurring at an alarming rate.

As detailed in the Heinz report, EPA performed an analysis integrating the National Hydrologic Dataset and their own National Land Cover Dataset to determine that 77% of the riparian areas (defined as 100 feet from river/stream edge) in the lower 48 states was in an "unaltered" state. This state is more accurately defined as non-agricultural and non-urban riparian areas, since it is likely that some alteration of the shoreline may have taken place in the past. In a NOAA (2005) report looking at the *coastal* shoreline, it was estimated that there had been a 3-8% loss of natural (non-armored) shorelines. There was an estimated loss of 7-32% of natural shorelines between 1938 and 2004, with the Pacific Coast dramatically losing an estimated 22-60%, most likely due to increased waterfront development.

In addition, the Heinz report outlined some benthic community indicators from the EPA's Environmental Monitoring and Assessment Program for estuaries occurring in the Mid Atlantic, South Atlantic, and Gulf of Mexico. From these regions, the percent of estuarine bottom area that was un-degraded was roughly 65, 70, and 47 respectively. For sediment contamination combined over these three regions, only 40% of these estuary areas had no exceedances of any sediment contaminant guideline.

### Assumptions and Problems with Working with These Reports -

There is a great deal of difficulty in attempting to summarize aquatic habitat condition based on the available reports. Regional reports are often snapshots of conditions, due to the time and cost of setting up a monitoring program that would allow the tracking of condition compared to an ideal state. Values are collected on what parameters are a regional priority or generally attainable. A great deal of water quality data are available, and these data are the suite of parameters that are most commonly compared between regions or assessed nationally. However, water quality data do not consistently correlate to the overall habitat quality. Additionally, most habitat parameters will vary greatly within a region, such that the better and worse areas cancel each others' effects when assessed over larger geographic scales. Determining the effective habitat condition may require a focus on temporally important windows in critical habitats that have the greatest impact on populations. While many national condition assessments may be ecosystem based, in some cases, there may have to be species-specific assessments of condition (e.g. species that are flow and/or temperature sensitive).

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## Appendix 2 – Ecoregions and Nested Zoogeographic Units

*General Ecoregion Definition*: There are many definitions of ecoregions. However, they all combine patterns of climate, landforms and biota to delineate and organize them at multiple scales. For this report, we are defining an ecoregion as a large area of land or water containing a distinct assemblage of natural communities and species, whose boundaries approximate the original extent of natural communities before major land use change. These communities share most of their species, dynamics and environmental conditions and function together effectively as a conservation unit (Dinerstein et al. 1995).

More specifically, freshwater ecoregions are part of a hierarchy of aquatic zoogeographic units (in some parts of the world this hierarchical classification is further developed than others). The highest level of organization is the biogeographical realm (ie, Neotropical, Nearctic, Afrotropical, Palearctic, Indo-Malay, Austral-Asia, Oceania, and Antarctic), defined as *continental or subcontinental-sized areas* having unifying features of geography and fauna/flora/vegetation (Udvardy 1975).

The Coastal and Marine Ecological Classification Standard (CMECS) also utilizes ecoregions to define large areas of the coasts and oceans that are relatively homogeneous with regard to physical and biological variables and reflect ecological boundaries determined by climate (temperate, tropical, polar), physical structure, such as major currents or ocean basins, and the characteristics of the biological associations, such as isolation or endemism. Spalding et al. (2007) recently published an article defining marine ecoregions for the world based on extensive literature review and workshops. CMECS will adopt these ecoregions.

The next level in the hierarchy is the subzone. Subzones are subcontinental zoogeographic strata with unique aquatic communities, created in large part by plate tectonics and mountain building. Subzones typically cover *millions of square kilometers*. Broad patterns of fish communities and unique aquatic communities define subzones (e.g., the Pacific, Arctic-Atlantic, and Mexican Transition subzones cover North America) (Maxwell et al. 1995).

Bioregions are the next level of organization and portray refinements of fish distributions resulting from changes in routes of dispersal and isolation within subzones caused by geoclimatic factors. Barriers to dispersal caused by glaciers, or changes in flow patterns caused by uplift after and subsidiary to that separating subzones, are the major agents for this delineation. Bioregions typically cover *hundreds of thousands of square kilometers*. Patterns of unique communities, endemism, and dispersal within fish families define bioregions (there are 11 of these in Africa and 10 in North America) (Abell et al. 2000; Maxwell et al. 1995; Thieme et al. 2005).

Historic mixing and isolation of stream faunas within bioregions have created the patterns that define freshwater ecoregions, which occupy the next level of organization. Freshwater ecoregions comprise the drainage basins containing shared species assemblages. The freshwater fish fauna within each ecoregion shows some common ancestry to other ecoregions within the same bioregion, and ecoregions within a bioregion will normally share some species.

Ecoregions typically, though not always, maintain hydrographic integrity (i.e., follow drainage divides) and cover *tens of thousands to hundreds of thousands of square kilometers*. Basins may be split between two or more ecoregions where distinct biogeographic breaks occur. Systems that harbor paleoendemics (basal clades) rather than neoendemics (recent derivatives) are distinguished as separate ecoregions.

Although ecoregions are intended to represent broad biogeographic patterns rather than localized endemism, they provide the potential for several levels of subdivision to capture finer patterns (Higgins et al. 2005). Biodiversity hot-spots, such as small lakes with numerous endemic species, may be highlighted at lower levels of organization than ecoregions.

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## Appendix 3. Major Habitat Types (MHTs) of Freshwater Ecoregions

Following are the descriptions of the MHTs that occur in the United States:

*1. Large Lakes* are freshwater ecoregions that are dominated and defined by large lentic systems. Freshwater ecosystems in these ecoregions may include in-flowing and out-flowing rivers and various peripheral wetlands in addition to the lakes themselves. This MHT includes large tropical, temperate, and polar lakes. In the United States, the Laurentian Great Lakes are components of this MHT.

2.. *Montane Freshwaters* are freshwater ecoregions comprising small streams, rivers, lakes or wetlands at higher elevations, regardless of latitude. These ecoregions include either high gradient, relatively shallow, fast-flowing streams, with rapids or complexes of high-altitude wetlands and lakes, and montane climatic conditions.

*3. Xeric Freshwaters and Endorheic (Closed) Basins* are freshwater ecoregions dominated by endorheic aquatic systems or freshwaters that are found in arid, semi-arid, or dry sub-humid environments. These ecosystems tend to have specific fauna adapted to ephemeral and intermittent flooding regimes or lower waters levels during certain times of the year. An example in the US is the Death Valley ecoregion.

*4. Temperate Coastal Rivers* are freshwater ecoregions dominated by several small to medium coastal basins in mid-latitudes (temperate). These ecoregions are characterized by riverine ecosystems, but may also contain small lakes, coastal lagoons, and other wetlands. Migratory species that spend part of their life cycles within marine environments may inhabit these ecoregions. Although floodplains may occur along rivers within this MHT, the dominant features are numerous, small to medium-sized basins that drain to the ocean, instead of one large river predominating with an extensive fringing floodplain. This MHT also encompasses island ecoregions with these characteristics. Examples in the US include the North Pacific Coastal and South Atlantic ecoregions.

*5. Temperate Upland Rivers* are freshwater ecoregions that are dominated and defined by mid-latitude non-floodplain rivers, including headwater drainages and tributaries of large river systems. These rivers are characterized by moderate gradients and the absence of a cyclically flooded, fringing floodplain. Examples in the US include the Ozark Highlands and Ouachita Highlands.

*6. Temperate Floodplain Rivers and Wetland Complexes* are freshwater ecoregions that are dominated by a single mid-latitude large river system, including the main stem river drainage and associated sub-basins, which are either currently or were historically characterized by a cyclically flooded, fringing floodplain. These ecoregions may also contain wetland complexes composed of internal deltas, marshes, and/or swamps, associated with the main river system. Examples include the Mississippi and Middle Missouri Rivers.

*7. Polar Freshwaters* are freshwater ecoregions comprising entire drainages; from the headwaters to mouth, and found in high latitudes. Examples in the US include theYukon in Alaska.

## Appendix 4 – Inland Condition Variable Matrix

See separate file attachment.

## Appendix 5 – Data Sources for Inland Condition Variables

| Process | Data Need | Data Source | Scale | Easy of Use | Data Location |
|---|---|---|---|---|---|
| Connectivity | Fragmentation | National Hydrography Data | National, 1-100K National Water Layer | Both variables could be calculated from existing datasets with relative ease at the 1-100K scale. Smaller scale calculations would rely on numerous regional databases and would take significant time to implement | http://nhd.usgs.gov/data.html |
| Connectivity | Fragmentation | Fish Passage Decision Support System | National, but not all areas | | crunch.tec.army.mil/nid/webpages/nid.cfm |
| Connectivity | Fragmentation | National Inventory of Dams | National, but higher level scale | | http://fpdss.fws.gov/index.jsp |
| Connectivity | Fragmentation | CA Passage Assessment Database (PAD) | California | | http://www.calfish.org/downloads/PAD_Metadata.htm |
| Connectivity | Fragmentation | Interagency Restoration Database | Pacific Northwest | | http://www.reo.gov/restoration/ |
| Connectivity | Fragmentation | National River Restoration Science Synthesis | National, but not all areas | | http://nrrss.nbii.gov/ |
| Hydrology | Daily Hydrograph | USGS Gauging Station Data | National, but localized | Hydrograph variables would be hard to calculate consistently across a similar scale. Although the data is avaiable nationally, it is come from highly localized gauging stations and would be hard to scale properly. Analysis would need to be developed using TNC Index of Hydrologic Alteration | http://waterdata.usgs.gov/nwis |

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| Hydrology | Annual Hydrograph | USGS Gauging Station Data | National, but localized | Hydrograph variables would be hard to calculate consistently across a similar scale. Although the data is avaiable nationally, it is come from highly localized gauging stations and would be hard to scale properly. Analysis would need to be developed using TNC Index of Hydrologic Alteration and many watershed will be analysed as part of TNC national analysis. | http://waterdata.usgs.gov/nwis |
| Channel and Bottom Form | Channel Modification | | | Generally not available within any databases, could be calculated (possibly) from NHD data if a proper algorithm could be developed. Lakes and many river systems have bottom contour data available. | |
| Channel and Bottom Form and Material Recruitment | Woody Debris | USGS GAP | National | No national database for these variables exists. It may be possible to calculate these indices from existing sources, however it would be time consuming and likely not be possible nationwide. | http://www.gap.uidaho.edu/ |
| Channel and Bottom Form | Wetlands | National Wetlands Inventory | National | | http://www.fws.gov/nwi/ |
| Channel and Bottom Form | Channel Configuration | USGS EROS Data Center | National | | http://edc.usgs.gov/geodata/ |
| Water Quality | Mining | USGS Mineral Resources Spatial Data | National, where USGS regulates | The location of mines in the United States actively monitored by USGS is readily available online. This could be easily used as an indicator, however determing impairment length would be more difficult and would be dependend on flow models and the NHD. | http://mrdata.usgs.gov/ |

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|---|---|---|---|---|---|
| Water Quality and Material Recruitment | Non-Point Source Pollution | EPA 303(d) List | National | Data for designation of EPA 303(d) lists are readily available and use the NHD for river reach identification. Would be easy to integrate data into system. | http://www.epa.gov/waters/data/downloads.html |
| Water Quality | NPDES Sources | EPA NPDES regulated facilities | National | Location of active NPDES permits managed by EPA is readily available through an enviromapper interface. NPDES permit data appears to be mapped to the 1-100K Hydro layer. Determing the effect of these discharges does not appear to be readily available, but could be calculated from flow models and the NHD. | http://www.epa.gov/enviro/index_java.html |
| Water Quality | Fish Consumption Advisories | EPA National Listing of Fish Advisories | National | Data is available nationally for fish consumption warnings, based on state and federal consumption data. | http://epa.gov/waterscience/fish/advisories/ |
| Energy Flow | Native Fish and Mussel Communities | | | Numerous data systems with locations and distribution of fish and mussel across multiple scales exist for possible use. However, they are not integrated into one usuable format for completion of national level analyses. Preliminary analyses would have to occur around regions in which data sharing consortium have completed. It would take some effort to integrate the numerous regional and national databases to generate coherent ecoregional scale fish and mussel distributions. | |
| Energy Flow | Native Fish and Mussel | NatureServe | National | | http://www.natureserve.org/explorer/ |

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|---|---|---|---|---|---|
| | Communities | | | | |
| Energy Flow | Native Fish Communites | US Fish Explorer | National by 8 digit HUCS | | http://far.nbii.gov/ |
| Energy Flow | Native Fish and Mussel Communities | MARIS | Upper Midwest States & Wyoming | | http://www.gis.uiuc.edu/maris/ |
| Energy Flow | Native Fish Communites | StreamNet | Pacific Northwest States | | http://www.streamnet.org/ |
| Energy Flow | Native Fish and Mussel Communities | CalFish | California | | http://www.calfish.org/DesktopDefault.aspx |
| Energy Flow | Energy Web | | | Fish trophic structure could be potentially calculated from the type of databases mentioned above, however it would be dependent on definitions of the energy web. | |
| Energy Flow | Aquatic Nuisance Species | USGS Nonindigenous Aquatic Species | National | Non-indigneous aquatic species locations are available at a variety of different scales and can be easily integrated into a system. | http://nas.er.usgs.gov/ |

## Appendix 6. Coastal Condition Variable Matrix and Data Sources

Appendix 6 proposes a set of twenty indicator variables which may be useful in assessing coastal (estuarine and marine) fish habitat on a National scale. This list is based on several preceding efforts, and narrowed further by applying selective criteria. As a starting point, we used a set of common regional indicator variables developed by NOAA's Ecosystem Goal Team (NOAA/EGT 2006), taking into account pre-existing efforts by EPA's National Coastal Condition Reports (EPA 2001, 2004, 2006) and the Heinz Center (2002, 2008). Additional indicator variables were considered from other synoptic sources (CSO 2007, Bricker et al. 2007, Kimbrough et al. 2008, Waddell and Clarke 2008). Four additional criteria were applied to narrow the field of indicator variables:

1. Is the parameter clearly relevant to fish populations?
2. Can it help to distinguish "good" versus "bad" habitat quality for fish?
3. Can it demonstrate the effects of habitat conservation activities?
4. Are there data available to support it on a National scale?

The twenty proposed indicators are arranged into five categories: Living Marine Resources, Biotic Habitats, Water Quality, Environmental Contamination, and Hydrology. For each indicator, possible measurement units are suggested, mostly based on methods in previous assessments. Potential data sources and earlier efforts where the indicator has been used are cited in the table, and identified in the reference list below. Although many of the measurement units and data sources are regional in scope, these indicators are intended to provide a common understanding of ecosystem status both within and among regions.

Prerequisite to the completion of a National coastal fish habitat assessment is the development of a spatial framework to organize and display the scores and rankings at an appropriate scale. NOAA's Coastal Asessment Framework (NOAA/NOS 2007) provides an excellent starting point, with spatial resolution approximately to the level of an individual estuarine waterbody. The Coastal Assessment Framework is based on USGS' hydrologic units (8-digit HUCs), and therefore should be compatible with the inland freshwater fish habitat assessment framework which uses the same watershed units (Seaber et al. 1987, USGS 2008a). However, the Coastal Assessment Framework (CAF) does not provide useful units in marine waters, so a spatial scheme will need to be developed considering biogeographic regions and jurisdictional boundaries offshore (NOAA 2004, Burgess et al. 2005, NOAA/CSC 2008a, Spalding et al. 2007). One of the challenges in completing a National-scale assessment is ensuring that the indicator variables and their spatial framework are compatible.

## Appendix 6, continued. Coastal Condition Variable Matrix and Data Sources

| Category and ID | Indicator | Measurement Units | Precedents and Data Sources |
|---|---|---|---|
| **Living Marine Resources** | | | |
| 1 | Status of Fishery Species | Status of fishery stocks with habitat identified as a factor for decline, or with a habitat component of recovery plan. | NOAA/EGT 2006; Heinz Center 2002, 2008; CSO 2007; NOAA/NMFS 1999, 2008a; ASMFC 2008 ; NEFMC 1998, 2007; SAFMC 1998, 2007; PFMC 2005; PaCOOS 2008. |
| 2 | Status of Indicator Species | Status of individual key species (indicator, protected, sentinel, concern, keystone). | NOAA/EGT 2006; Heinz Center 2002, 2008; CSO 2007; NOAA/NMFS 2008b; Nelson and Monaco 2000. |
| 3 | Non-indigenous and Invasive Species | Number or dominance of non-indiginous species (all taxa), measured separately for invasive species. | NOAA/EGT 2006; Heinz Center 2002, 2008; CSO 2007; NISC 2008; USDA 2008; USGS 2008b. |
| **Biotic Habitats** | | | |
| 4 | Status of Coastal Wetlands | Instantaneous rate of loss ("Z") of coastal wetlands (regional), total loss of coastal wetlands (regional or per estuary). | NOAA/EGT 2006; Heinz Center 2002, 2008; CSO 2007; EPA 2001,2004; Dahl 2005; UNEP 2001; Stedman and Dahl 2008; CCAP 2008; USFWS 2008; USACE 2008. |
| 5 | Status of Submerged Aquatic Vegetation (SAV) | Instantaneous rate of loss ("Z") of seagrass, kelp, or other regional SAV. | NOAA/EGT 2006; Heinz Center 2002, 2008; CSO 2007; NOAA/CSC 2008b. |
| 6 | Status of Hard Bottom Habitats | Reef rugosity, coral bleaching (degree heating weeks), percent live coral cover, status of live oysters on mapped oyster reefs. | NOAA/EGT 2006; Waddell 2005; Waddell and Clarke 2008; Lumsden et al. 2007; Coen et al. 2007; UNEP 2001; BRT 2007; CORIS 2008. |
| 7 | Benthic Invertebrate Index | Benthic Index Score = good-fair-poor | NOAA/EGT 2006; EPA 2001, 2004; NBI 2008. |
| **Water Quality** | | | |
| 8 | Eutrophication - Nutrient levels | Eutrophication Index (low to high), dissolved inorganic nitrogen (DIN); dissolved inorganic phosphorus (DIP). | NOAA/EGT 2006; Bricker et al. 2007; Heinz Center 2002, 2008; EPA 2001, 2004, 2006, 2008; UNEP 2001; CSO 2007. |
| 9 | Eutrophication - Chlorophyll a | Eutrophication Index (low to high) - chlorophyll-a | NOAA/EGT 2006; Bricker et al. 2007; Heinz Center 2002, 2008; EPA 2001, 2004, 2006, 2008; UNEP 2001; CSO 2007. |
| 10 | Eutrophication - Water clarity | Eutrophication Index (low to high) - water clarity. | NOAA/EGT 2006; Bricker et al. 2007; Heinz Center 2002,2008; EPA 2001, 2004, 2006, 2008; UNEP 2001; CSO 2007. |
| 11 | Eutrophication - Dissolved oxygen | Occurrence of hypoxia and anoxia - historic, real-time, and forecast. | NOAA/EGT 2006; Bricker et al. 2007; Heinz Center 2002, 2008; EPA 2001, 2004, 2006, 2008; CSO 2007; UNEP 2001; NOAA/NCDDC 2008. |
| 12 | Harmful Algal Blooms (HABs) | Occurrence of HAB events - historic, real-time, and forecast. | NOAA/EGT 2006; Heinz Center 2002, 2008; FWRI 2008; WHOI 2008; UNEP 2001; NOAA/CSCOR 2008. |

## Appendix 6, continued. Coastal Condition Variable Matrix and Data Sources

| Category and ID | Indicator | Measurement Units | Precedents and Data Sources |
|---|---|---|---|
| **Environmental Contamination** | | | |
| 13 | Chemical contamination of sediments | Contamination status ranked low to high - trend increasing, decreasing, or stable. | NOAA/EGT 2006; Kimbrough et al. 2008; Heinz Center 2002, 2008; UNEP 2001; CSO 2007; EPA 2001, 2004, 2006, 2008. |
| 14 | Chemical contamination in fish and mollusks | Metal and organic contamination status ranked low to high - trend increasing, decreasing, or stable. | NOAA/EGT 2006; Kimbrough et al. 2008; Heinz Center 2002,2008; EPA 2001,2004; UNEP 2001; CSO 2007; EPA 2001, 2004, 2006, 2008. |
| **Hydrology** | | | |
| 15 | Degree of alteration of freshwater inflow | Freshwater withdrawals and hydrologic alterations | NOAA/NOS 2007; USACE 2008; USGS 2008c; Orlando et al. 1993, 1994; USGS 2008d. |
| 16 | Degree of alteration of tidal flow | Hydrologic alteration of tidal flow | NOAA/NOS 2007; USACE 2008; Orlando et al. 1993, 1994; USGS 2008c. |
| 17 | Degree of estuarine channelization | Degree of channelization and dredging in estuaries. | NOAA/NOS 2007; USACE 2008; USGS 2008c. |
| 18 | Extent of shoreline armoring | Miles of shoreline armored or percent of total length of shoreline armored (regional) | NOAA/EGT 2006; Heinz Center 2002,2008; Surfrider Foundation 2008; NOAA/NOS 2008. |
| 19 | Fish-accessible stream miles | Number of barriers to fish passage from coast into tributary rivers. | NOAA/EGT 2006; USACE 2008; USFWS 2008b. |
| 20 | Percent change in impervious surfaces in watershed | Percent of watershed land area covered by impervious surfaces, or total land area of impervious surfaces, or rate of land conversion | CCAP 2008; NBII 2008. |

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## Appendix 7 – Rehabilitation Project Database

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| Overall Objective | Objective | Activity | Activity outcome | Biological Response | Indicators |
|---|---|---|---|---|---|
| **Overall Habitat Protection** | Land Acquisition | Purchase of land or easements | Protect threatened and endangered species<br>Allow easement for restoration activities<br>Allow public access<br>Ability to alter land use regulations | Allow for ecological repair | Number of acres protected<br>Number of stream miles protected |
| **Instream Habitat Improvement** | Bank Stabilization | | Prevent failure at toe of streambank | Reduce sedimentation and erosion | Longitudinal profile<br>Channel cross-sections<br>Aerial photography interpretation<br>Photo point comparison<br>Vegetation plot monitoring<br>Life/integrity of structures<br>Stream profile - pools, riffles<br>Pebble counts |
| | | Brush bundles added | Stream flow energy dissipated | Reduce sedimentation and erosion | |
| | | Channel reconfiguration activities | Redirect streamflow energy | Reduce sedimentation and erosion | |
| | | Coir or coconut fiber logs/matting | Traps sediment | Reduce sedimentation and erosion | |
| | | Flow modification activities | Stream flow energy dissipated | Reduce sedimentation and erosion | |
| | | Grade control | Reduces bank heights | Improves bank stability | |
| | | Install sediment-trap dam | Traps sediment | Reduce sedimentation and erosion | |
| | | J-hook installed | Stream flow energy dissipated away from banks | Reduce sedimentation and erosion | |
| | | Large woody debris added | Stream flow energy dissipated away from banks | Reduce sedimentation and erosion | |
| | | Livestock exclusion | Reduce bank destruction | Reduce sedimentation and erosion | |
| | | Lunkers/skyhooks installed | Stabilize undercut banks | Reduce sedimentation and erosion | |
| | | Planting | Secure riparian soils | Reduce sedimentation and erosion | |
| | | Reslope streambank | Obtain stable slope | Enhances conditions for plant establishment | |
| | | Rip rap installed | Secure near-vertical streambanks | Reduce sedimentation and erosion | |
| | | Road drainage system improvements | Reduce runoff | Reduce sedimentation and erosion | |
| | | Road obliteration | Reduce runoff | Reduce sedimentation and erosion | |
| | | Road upgrade/maintenance | Reduce runoff | Reduce sedimentation and erosion | |
| | | Rock gabions installed | Stream flow energy dissipated away from banks | Reduce sedimentation and erosion | |
| | | Rock/log vanes installed | Stream flow energy dissipated | Reduce sedimentation and erosion | |

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|---|---|---|---|---|---|
| | | | away from banks | | |
| | | Rock/log weirs installed | Control streambed erosion | Reduce sedimentation and erosion | Large woody debris counts/unit length |
| | | Root wad revetments | Reduce erosion | Scour pools, create cover | |
| | | Stream pool construction | Stream flow energy dissipated | Reduce sedimentation and erosion | |
| | | Terracing | Allow for soil absorption of rainfall runoff | Reduce sedimentation and erosion | |
| | Channel Reconfiguration | Channel realignment | Reconnection to main channel | Allow connectivity for habitat utilization | Water flow/velocity<br>Channel cross-sections<br>Aerial photography interpretation<br>Stream profile - pools, riffles |
| | | Channel relocation | Avoid development disturbance | Ensure connectivity for habitat utilization | |
| | | Construct aggraded braided channel | Restore channel complexity | Allow juvenile fish species to utilize rearing habitat | |
| | | Dechannelization | Stream flow energy dissipated | Reduce sedimentation and erosion | |
| | | | Restore pools and riffles | Spawning and rearing habitat created | |
| | | Flow modification activities | Redirect streamflow energy | Regain natural water flow | |
| | | Grade control | Reduce headcutting | Reduce streambank erosion | |
| **Instream Habitat Improvement continued** | Fish Passage<br>Fish Passage continued | Baffles on culvert installed | Allow fish passage | Allow connectivity to spawning habitat | Egg and larval fish sampling<br>Video monitoring of fish passage<br>Species diversity indices |
| | | Channel reconfiguration activities | Allow upstream migration | Allow connectivity to spawning habitat | |
| | | Culvert removal | Remove blockage of main channel | Allow connectivity to spawning habitat | |
| | | Culvert modification | Remove blockage of main channel | Allow connectivity to spawning habitat | |
| | | Dam removal | Remove blockage of main channel | Allow connectivity to spawning habitat | |
| | | Deflectors/barbs | Scour pools | Spawning habitat created | |
| | | Remove or modify tidegates | Allow fish passage to estuarine channels | Allow adjustment to salinity for anadromous or catadromous fishes | |
| | | Fish exclusion screens installed | Prevent entrapment mortality of juvenile fish species | Improve survivability of spawning fish | |
| | | Fish ladder improvement | Allow upstream migration | Allow connectivity for spawning and habitat utilization | |
| | | Fish ladder installed | Allow upstream migration | Allow connectivity for spawning and habitat utilization | |
| | | Install span-type structure for stream crossing | Allow upstream migration<br>Allow downstream sediment transfer | Allow connectivity for spawning and habitat utilization<br>Nutrient transport | |

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|---|---|---|---|---|---|
| | | Instream habitat creation activities | Reduce shelter deficit | Provide feeding and resting areas for spawning fish | |
| | | Large woody debris removed | Remove blockage to main channel | Allow connectivity for spawning and habitat utilization | |
| | | Large woody debris added | Reduce shelter deficit | Spawning habitat created | |
| | | Provide suitable migration flows in regulated streams | Facilitate and expedite upstream or downstream migration | Allow connectivity for spawning and habitat utilization | Streamflow gage records |
| | | Stream pool construction | Stream flow energy dissipated<br>Create areas of reduced velocity | Allow connectivity for spawning and habitat utilization | |
| | Instream / Lake Habitat Creation | Artificial structures installed | Create habitat for fluctuating impoundment | Provide cover for warmwater species | Fish population estimates |
| | | Boulder clusters | Create areas of reduced velocity | Provide feeding and resting areas for fish | Pool habitats stable |
| | | | Reduce pool deficit | Spawning and rearing habitat created | Rapid bioassessment protocols |
| | | Brush bundles added | Reduce shelter deficit | Encourage food web dynamics | Embeddedness of riffle rock |
| | | | Provide shading | Spawning and rearing habitat created | Egg and larval fish sampling |
| | | Deflectors/barbs | Scour pools | Spawning and rearing habitat created | |
| | | Half-log installed | Reduce shelter deficit | Provide feeding and resting areas for fish | |
| | | Island creation | Provide shoreline habitat | Encourage food web dynamics | Egg ribbon counts |
| | | J-hook installed | Create pool habitat | Provide feeding and resting areas for fish | |
| | | Large woody debris added | Reduce shelter deficit | Spawning and rearing habitat created | Young-of-year presence |
| | | Lunkers/skyhooks installed | Create overhead bank cover | Provide feeding and resting areas for fish | Age class distribution |
| | | Riffles created | Provide unavailable gravel for spawning substrate | Spawning and rearing habitat created | Fish abundance |
| | | Rock/log weirs installed | Create pool habitat | Provide feeding and resting areas for fish | Fish growth data |
| | | Root wad revetments | Promote formation of pool habitat<br>Provide overhead cover | Spawning and rearing habitat created | Life/integrity of structures<br>Aquatic invertebrate IBI |
| | | Sediment trap dam | Maintenance of pool habitat | Spawning and rearing habitat maintained | |
| | | Spawning gravel placement | Provide spawning substrate | Spawning and rearing habitat created | |

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|---|---|---|---|---|---|
| | | Streampool construction | Reduce shelter deficit | Spawning and rearing habitat created | |
| | Flow Modification | Boulder clusters | Create areas of reduced velocity | Provide feeding and resting areas for fish | Water flow/velocity/gage data<br>Channel cross-sections |
| | | Berm/dike modification | Stop overland sheetwater from floods | Reduce colonization of invasive species | |
| | | Culvert removal/modification | Allow water flow | Restore natural water levels | |
| | | Dam modification/removal | Reduce water supply deficit | Restore natural water levels | |
| | | Modify flow releases from dam | Mimic natural hydrograph | Restore natural riparian vegetation and behavioral stimuli | |
| | | Dechannelization | Stream flow energy dissipated | Reduce sedimentation and erosion | |
| | | Deflectors/barbs | Constrict channel, accelerate streamflow | Provide water depth diversity | |
| | | Grade control structures | Reduce upstream energy slope | Prevent streambed scouring | |
| | | Irrigation practice improvement | Reduce water supply deficit | Restore natural water levels | |
| | | Large woody debris removed - very special case | Remove blockage of main channel | Allow connectivity for habitat utilization | |
| | | Large woody debris added | Stream flow energy dissipated | Spawning and rearing habitat created | |
| | | Off-stream storage pond construction | Improve late summer surface flows | Enhance anadromous salmonid habitat and availability | |
| | | Road obliteration | Reduce runoff | Restore natural water levels | |
| | | Stream pool construction | Stream flow energy dissipated | Restore width/depth ratio | |
| **Faunal Species Management** | Fish Reintroduction | Fish exclusion screens installed | Prevent entrapment mortality of juvenile fish species | Improve survivability of reintroduced fish | Young-of-year presence |
| | | Fish passage activities | Remove blockages | Allow connectivity to spawning habitat | Fish growth data |
| | | Fish trapped for rearing | Collect brood stock | Allow for rearing of fish for population establishment | |
| | | Instream habitat creation activities | Create suitable habitat for fish population establishment | Improve survivability of reintroduced fish | |
| | Faunal Removal | Invasive faunal removal | Remove competition for native fish species | Native fish populations establish/stabilize | Fish species composition<br>Native fish species condition |
| **Riparian Habitat Improvement** | Riparian Management | Bank stabilization activities | Reduce erosion | Reduce sedimentation | Percent plant survival |
| | | Off-channel habitat wetland creation | Provide low-flow areas with warmer temperatures | Increase suitable overwintering habitat | Vegetation plot monitoring |
| | | Off-channel ponds created | Provide no-flow pools with | Increase suitable overwintering | Aerial photography |

| | | | | | |
|---|---|---|---|---|---|
| | | | warmer temperatures | habitat | interpretation |
| | | Road drainage system improvements<br>Mimic natural hydrograph | Reduce sedimentation<br>Restore riparian community recruitment | Reduce non-point pollution levels<br>Restore LWD input source and control sediment input & transport | Water transparency<br>Dissolved oxygen levels<br>Water levels/flow |
| | Floral Species Management | Planting | Reduce shelter deficit<br>Bank stabilization | Improve water quality<br>Reduce erosion | Water transparency<br>Longitudinal cross-sections |
| | | Invasive vegetation removal | Allow native vegetation species to dominate | Regain local ecological balance | Aerial photgraph comparisons |
| | | Livestock exclusion | Allow establishment of floral species | Reduce sedimentation and erosion | Vegetation plot monitoring |
| | Land Use Regulations | Boating restrictions | Reduce erosion from wake disturbance | Reduce sedimentation | Water transparency |
| | | Conservation grazing management | Protect existing high quality habitat | Maintain local ecological balance | Nutrient levels - nitrogen |
| | | Livestock exclusion | Reduce erosion<br>Reduce establishment of invasive plants | Repair riparian dysfunction<br>Improve water quality | Vegetation plot monitoring |
| | | Livestock water access area development | Prevents need for livestock to enter habitat | Improve water quality | |
| **Water Quality Improvement** | Water Quality Management | Bank stabilization activities | Reduce erosion | Reduce sedimentation | Water transparency |
| | | Dredging | Reduce sediment levels<br>Reduce non-point pollution build-up | Reduce vegetation growth<br>Stabilizes nutrient and oxygen levels | Dissolved oxygen levels<br>Overwintering fish surveys |
| | | Invasive faunal removal | Allow native species to dominate | Increase water clarity | Lake volume-bathymetry monitoring |
| | | Invasive vegetation removal | Reduce eutrophication | Increase oxygen levels | Aquatic vegetation density |
| | | Lake shoreline deepening | Reduce siltation | Decrease eutrophication | Nutrient levels - phosphorus, nitrogen |
| | | Livestock exclusion | Eliminate livestock use of habitat | Reduce nutrient loading and sedimentation | Conductivity |
| | | Livestock water access area development | Prevents need for livestock to enter habitat | Reduce nutrient loading and sedimentation | Sediment loading rates |
| | | Off-channel wetland habitat creation | Provide low-flow areas with warmer temperatures | Increase suitable overwintering habitat | Fish age/growth |
| | | Sediment trap dam installed | Reduce sedimentation | Decrease eutrophication | Fish condition |

| | | | | | |
|---|---|---|---|---|---|
| | | Stormwater/runoff control | Reduce sedimentation | Stabilize nutrient levels | Fish species composition |
| | | Upland erosion control | Reduce non-point pollution | Stabilize nutrient levels | Fish species abundance |
| **Recreational Opportunity Improvement** | Aesthetics/ Recreation | Faunal species management activities | Improve fish habitat | Increase fish populations | Tourism/visitor/use hours/days |
| | | Instream habitat improvement activities | Improve fish habitat | Increase fish populations | Angler success/CPUE |
| | | Riparian habitat Improvement activities | Improve fish habitat | Increase fish populations | Angler satisfaction |
| | | Water quality improvement activities | Improve fish habitat | Increase fish populations | |
| | | Fishing jetties installed | Provide angler access | Increase angler satisfaction | |

# Communications Strategy
# National Fish Habitat Action Plan
# June 2008

## Introduction

This framework guides the activities of the National Fish Habitat Action Plan Communications Committee, a team of professionals convened in June 2008 to carry forward on communications that were previously focused on the final Action Plan roll-out in March 2006 and public unveiling in April 2006.

The Communications strategy for the National Fish Habitat Action Plan is critical to promoting synergy among the Board, state agencies, Federal Caucus, Fish Habitat Partnerships and developing "candidate" Fish Habitat Partnerships.

This helps minimize common roadblocks that can befall large, coordinated efforts and maximizes the benefits of sharing diverse perspectives and resources.

Communications also improves our appeal to additional partners—as well as policy-makers—fueling the further growth of the Partners Coalition and the expansion of Fish Habitat Partnerships.

In this sense, current communications are more than just information-sharing. The team recognizes the value of communications as a tool for fostering lasting, productive relationships among diverse partners. These relationships are what makes all our efforts to revive fisheries and waterways effective and builds credibility with policy-makers.

The team considers the following as its primary functions:

- **Serving in an advisory capacity to the National Fish Habitat Board and its staff, particularly in identifying opportunities and potential challenges related to policy decisions.** For example, team members have expertise in developing marketable elements of broad partnerships to expand their appeal,

**National Fish Habitat Action Plan Communications Committee**

Ryan Roberts, NFHAP Communications Coordinator (Chair)

Laura MacLean, Director of Communications and Marketing, Association of Fish & Wildlife Agencies (Vice Chair)

Josh Winchell, Public Affairs, U.S. Fish and Wildlife Service

Susan Wells, Habitat Projects Coordinator, U.S. Fish and Wildlife Service

Joe Starinchak, Outreach Coordinator, U.S. Fish and Wildlife Service

Beth Beard, Managing Editor, Fisheries, American Fisheries Society

Dianne Timmins, Cold Water Fisheries Biologist, EBTJV, N. Hampshire Fish & Game Department

Abigail Lynch, Sea Grant Fellow, U.S. Fish and Wildlife Service

Rachel Brittin, Senior Communications Specialist, NOAA Restoration Center

Doug Hobbs, Sport Fishing and Boating Partnership Council Coordinator, U.S. Fish and Wildlife Service

**Liaison**

Susan-Marie Stedman, National Fish Habitat Board staff, NOAA Fisheries

Tom Busiahn, NFHAP Coordinator, U.S. Fish and Wildlife Service

**Board Oversight**

Mike Andrews, Chief Conservation Officer, The Nature Conservancy

Krystyna Wolniakowski, Director, National Fish and Wildlife Foundation-NW

designing strategic communications to support Congressional relations, and tailoring activities and events to garner coverage in major media markets. The team also recognizes that its best efforts—as collective collateral duties—may not be enough to overcome the challenge of fully developing communications in the long-term without more focus and investment.

- **Developing professional communications materials to keep Action Plan partners fully informed, foster mutually beneficial relationships, and expand Fish Habitat Partnerships.** The team is developing communications materials that are cohesive and complementary in message, design, and delivery to have the greatest impact. Materials will be versatile so that they can be customized for a variety of uses. In addition, they will include elements that promote coordination at every level and information flow in every direction.

- **Generating and monitoring news and feature media coverage for the Action Plan and Fish Habitat Partnerships.** The team recognizes that broader media exposure offers great potential to fuel the growth in Fish Habitat Partnerships, help attain additional resources, and influence future policy.

## Goals

- ***Stay Connected*:** Ensure partners are fully informed on a timely basis on current Action Plan activities and significant developments. Provide multiple means of sharing among partners to facilitate more effective collaboration. Strive for a two-way communication path between staff and Fish Habitat Partnerships.

- ***Keep the Message Universal:*** Equip partners with versatile communications tools that support an ambassador role to advance partner recruitment and advocacy for the Action Plan. This will help ensure all our efforts will resonate more clearly and with more impact.

- ***Invest Wisely:*** Develop versatile communications materials with broad usage potential. Take advantage of event venues that involve or reach large numbers of partners and potential partners to promote awareness and support for the Action Plan.

- ***Focus on Fish*:** Align all communications toward the broader goals of the National Fish Habitat Action Plan: Securing adequate resources for grassroots partners to carry out Fish Habitat Partnership projects successfully, per board recommendations.

- ***Tribal Ties:*** One important aspect of the communications effort will be to create and coordinate tribal interest in the National Fish Habitat Action Plan, to further enhance the Plan's status.

## Primary Networks (The "Who")

National Fish Habitat Action Plan communications target the following primary networks to build awareness, support, engagement, advocacy, and action in various forms. The team will facilitate secondary communications for these networks as well; for example, by encouraging national organizations to share information with their local chapters.

**National Fish Habitat Action Plan**
**Primary Networks**

- National Fish Habitat Board
- Association of Fish and Wildlife Agencies and State Agencies
- Federal Caucus (both leaders and staff coordinators)
- Partners Coalition
- Fish Habitat Partnerships
- Media
- Congress

As previously noted, there are a number of communications goals that apply to every primary network. However, there are some notable differences in the roles and types of support various partners bring to the table. Therefore, some elements of our communications strategy will be tailored to support certain primary networks in specific ways. For example:

**National Fish Habitat Board**

Communications will promote the Board's leadership, coordination, and facilitation role, and support the Board in serving as ambassadors and influential advocates for the Action Plan in policy arenas.

**Association of Fish and Wildlife Agencies and State Agencies**

Communications will support the Association of Fish and Wildlife Agencies in serving as the main conduit for two-way communications with state agencies and encourage secondary communications by state agencies as a critical part of the Action Plan's success. Communications also will support the association's role in helping states align priorities and resources for Fish Habitat Partnerships.

**Federal Caucus**

Communications will also benefit the cohesiveness of the National Fish Habitat Federal Caucus, by informing the Caucus of communications initiatives and outreach efforts of the committee at scheduled meetings.

**Partners Coalition**

The Partners Coalition can serve as tool when applicable by the committee as an outlet for information sharing as well as spreading the word of NFHAP in a grass roots manner. The Partners Coalition is a group of people that share a common objective, that being a wide and diverse interest in NFHAP developments and news. Through a voluntary sign-up on NFHAP's website fishhabitat.org this group has pledged their support for NFHAP

and its objectives. Targeted communications will be developed to strategically recruit additional members where representation is currently lacking.

**Fish Habitat Partnerships**

Developing communications that creatively illustrate what the Action Plan is all about in compelling ways is one of the most important contributions the team can make. The projects themselves are the marketable force for communications, rather than the Action Plan. More visibility and emphasis on Fish Habitat Partnerships through website updates and media outreach will be a key to growing support for future projects.

**Media**

Broader visibility through the media can help grow support for the Action Plan and involvement in Fish Habitat Partnerships, as well as influence future policy and investments significantly. Arranging "10 Waters to Watch" site visits, coordinated with media outlet exposure, will help push the efforts of the National Fish Habitat Action Plan.

## Core Messages (The "What" and the "Why")

The team developed the following "boilerplate language" for universal use in briefly describing the Action Plan:

*The National Fish Habitat Action Plan is an investment strategy to protect and restore our waterways and make conservation dollars go farther. This science-based plan will leverage federal and privately raised funds to build regional partnerships aimed at fixing the nation's biggest fisheries problems. This is the most comprehensive effort ever attempted to treat the causes of fish habitat decline, not just the symptoms. For more information, visit www.fishhabitat.org. To donate, visit www.morefish.org.*

**NFHAP FACT LIST FOR UNIVERSAL COMMUNICATIONS/CHECKLIST**

- A group of nearly 500 partners representing government, non-profit, corporate, and tribal interests have come together to carry out a National Fish Habitat Action Plan to protect and restore America's fisheries and waterways to healthy and sustainable levels. This is the largest and broadest array of public and private partners ever united for such an effort.

- The National Fish Habitat Action Plan is modeled after the tremendously successful North American Waterfowl Management Plan, begun 20 years ago to recover plummeting waterfowl populations. The foundation of this model is a focus on "joint venture" habitat centers to leverage partners' resources and effort.

- The National Fish Habitat Action Plan provides a framework to foster more effective networking among local and regional partners so that resources can be aligned more strategically, progress can be evaluated, and conservation approaches can be continually refined.

- "Fish Habitat Partnerships" are the application of the National Fish Habitat Action Plan. They are established voluntarily at the local and regional level and based on the consolidation of the best scientific expertise on fisheries and habitat management.

- Fish Habitat Partnerships are coordinated nationally but are voluntary and non-regulatory. Nationwide coordination ensures efforts are sustainable and accountable, recognizing the need for long-term investments and demonstrable results.

- The Action Plan's initial Fish Habitat Partnerships, focused on fisheries considered especially vulnerable to further habitat destruction and population declines, have shown potential to leverage the resources of diverse partners effectively.

- Significant investments have been provided through federal appropriations and multi-state grants.

## Communications Toolkit (The "How")

**Web Site**

The newly re-done Website, www.fishhabitat.org, has always been a critical component of Action Plan communications as the main source of information (the website is the newspaper), and because all other communications (such as e-blasts, fact sheets, etc.) point people to the Web site as a resource. The Website has been updated to include these basic elements:

- Clarify fundamental elements of the Action Plan, such as the relationship between the National Fish Habitat Initiative and the Action Plan, as well as the relationship to the "More Fish" campaign, given the importance of this effort to the future growth of Fish Habitat Partnerships;

- Update information to reflect the Action Plan's current and future direction;

- Expanded and improved information on Fish Habitat Partnerships;

- Inclusion of Candidate Fish Habitat Partnerships on the website

- Promote broader communications flow and interaction among partners.

- Website can also be changed to reflect on-going projects on the bottom of each page with a rotating profile for different projects.

Another especially notable effort has been the "Top 10 Waters to Watch" feature based on existing Fish Habitat Partnership projects, a staple in illustrating what the Action Plan is all about. This will be featured prominently on the Web site and continually updated. It will also be used in press kits, and the Partners Toolkit. Another notable effort of NFHAP was the establishment of the National Fish Habitat Action Plan awards in 2008. The NFHAP awards ceremony ran concurrently with the National Casting Call event in April. Awards were given for, Outreach and Education, Scientific Achievement, and Exceptional Vision.

## Habitat Partnerships and the Web

The National Fish Habitat Partnerships will be incorporated on the National Fish Habitat Action Plan's website on a page, listing a brief description about the partnership as well as listing a link for the partnership's website. Also, candidate partnerships will all have a spot on the website for informational purposes, per the board's discretion. It has also been determined that Fish Habitat partnerships, will use the moniker "Fish Habitat Partnership" at the end of the partnership name (example: Eastern Brook Trout Joint Venture: a Fish Habitat Partnership.) Partnerships should also include a link back to the National Fish Habitat Action Plan website.

**E-Blasts**

Monthly electronic updates are one of the primary communications tools for the Action Plan (these are also posted on the Web site after distribution). This is the main route for communicating with all partners at once. Future "e-blasts" will be conducive to collateral usage so that their impact can be even broader. The National Fish Habitat Action Plan's website has over 1,400 registered subscribers who have signed up to receive monthly e-mails as of August 2008.

To promote information flow in every direction (as opposed to just national – regional – local), e-blasts will more consistently feature Fish Habitat Partnership developments. For example, they will give prominence to partners' perspectives and efforts through "Partner Profiles," "Project Profiles," and other means, such as testimonials and guest-editorials.

**Fact Sheet Series/Media Kit**, including:

- National Fish Habitat Action Plan ("one-pager")

- Milestones in the Development of the National Fish Habitat Action Plan
- Q's and A's
- [Each of the six Fish Habitat Partnerships]
- Top 10 Waters to Watch
- National Fish Habitat Award Winners

These fact sheets are the most versatile communications tools that can be tailored for a variety of media, including the Web site, press kits, the Partners Coalition recruitment package, and the Partners Toolkit. They will be made available to all partners via the Web site.

**Partners Toolkit**

A comprehensive and versatile communications toolkit will support grassroots partners in promoting awareness and support for Fish Habitat Partnerships. In addition to the fact sheet series, this will include:

- Talking Points
- NFHAP PowerPoint Presentation
- How to: Create a strong list of local fish habitat "expert" contacts

**PowerPoint Presentation**

A basic and versatile PowerPoint presentation on the core elements of the Action Plan will be updated and refined. This will be a key element for briefing potential members of the Partners Coalition and growing awareness and support for Fish Habitat Partnerships.

**Traveling Display**

A traveling display describing core elements of the Action Plan will be updated and refined. This will assist partners in establishing a prominent presence at major conferences and other venues with potential to expand awareness and support for the Action Plan and Fish Habitat Partnerships.

**Events**

A calendar of major conferences and other events that lend themselves to strategic outreach—targeting existing and potential new partners—will be developed. These venues can be a key part of building awareness and support for the Action Plan and Fish Habitat Partnerships, as well as influencing future policy and investments. Evaluating the full spectrum of potential outreach venues will allow for better planning and decision-making about where to focus our investments.

**October 2008**

- American Sportfishing Association, Sportfishing Summit October 29-31, 2008 Galveston, TX

**January 2009**

- Nation's Outdoor Sportsmen's Show, Dulles Expo Center, Chantilly, VA January 23-25

**February 2009**

- Eastern Sports & Outdoors show, Harrisburg, PA. Feb. 7-15
- ESPN BASS Master Classic, Red River South Marina, Shreveport, LA. Feb. 20-22

**April 2009**

- AFFTA National Casting Call Event & Outdoors show, Washington DC April 26-27

**June 2009**

- National Fishing & Boating Week, June 6-14

## Addenda

### Addendum 1: Short-Term Media Outreach Targets

A few notes upfront:

--To date, some partners have included coverage on the Action Plan in their publications, but the full potential of this media placement has not been maximized. (The same goes for a dozen or so individual outdoor writers.) The most practical way to approach outreach is to first establish and reach out to contacts within the media and then re-visit old contacts that have written about the initiative, prior to 2008.

--Ideally, communications will support lead partners in including coverage of the Action Plan and Fish Habitat Partnerships in respective publications on a regular basis—not just once.

**--This short-term listing does not address television or radio media**, just (magazines & Trade Publications) print. Efforts to garner print media coverage, however, are also conducive to collateral placement on Web sites, which can be extremely valuable, and may be the best place to start.

- State magazines (and Web sites) through the Association of Fish and Wildlife Agencies (and special ongoing communications with State I&E Chiefs).

- Federal agency publications (and Web sites) through the Federal Caucus agency coordinators

- Lead partner publications (and Web sites for each organization; see note re "Proud Supporter" icon above), such as:

  *Fisheries*, American Fisheries Society
  *B.A.S.S. Times*, *Bassmaster*, and *Fishing Tackle Retailer* magazines, B.A.S.S./ESPN
  *Trout*, Trout Unlimited
  *Outdoor America*, Izaak Walton League of America
  *Tide*, Coastal Conservation Association
  *Nature*, The Nature Conservancy
  *American Rivers*, American Rivers
  *Tackle Trade World* magazine
  *American Sportfishing* newsletter, American Sportfishing Association
  *AFFTA Connects* e-newsletter, American Fly Fishing Trade Association
  *Interport* newsletter and *Soundings* magazine, National Marine Manufacturers Association

- Other major Fishing/Fisheries/Outdoors publications, such as:

  *Crappie*
  *Field & Stream*
  *Fishing and Hunting News*
  *Florida Sportsman*
  *Fly Fisherman*
  *Fly Rod & Reel*
  *Fur-Fish-Game*
  *Game and Fish magazines*
  *In-Fisherman*
  *North American Fisherman*
  *Outdoor Life*
  *Outside*
  *Salt Water Sportsman*
  *Sport Fishing*

Newspaper coverage, has included the local media market and has had an impact in 2008. Contact lists derived from web research made this effort possible.

# NFHAP Communications Update

October 8, 2008

NATIONAL FISH HABITAT ACTION PLAN

# NFHAP Communications Committee

| | |
|---|---|
| • Ryan Roberts | • NFHAP Communications |
| • Laura MacLean | • AFWA Communications |
| • Josh Winchell | • USFWS Public Affairs |
| • Joe Starinchak | • USFWS Outreach Coordinator |
| • Susan Wells | • Habitat Projects Coordinator |
| • Beth Beard | • AFS Managing Editor |
| • Dianne Timmins | • EBTJV, NH Fish & Game |
| • Abigail Lynch | • USFWS Sea Grant Fellow |
| • Rachel Brittin | • NOAA Comm Specialist |
| • Doug Hobbs | • USFWS, Sport Fishing and Boating Partnership Council |

# NFHAP Communications Strategy

## Primary Functions:

- Serving in an advisory capacity
- Developing new communications materials
- Generating and Monitoring Media Coverage

NATIONAL FISH HABITAT ACTION PLAN

# NFHAP Communications Strategy

Goals:

- Stay connected
- Keep the message universal
- Invest wisely
- Focus on fish
- Tribal Ties

NATIONAL FISH HABITAT ACTION PLAN

# NFHAP Communications Strategy

## Primary Networks:

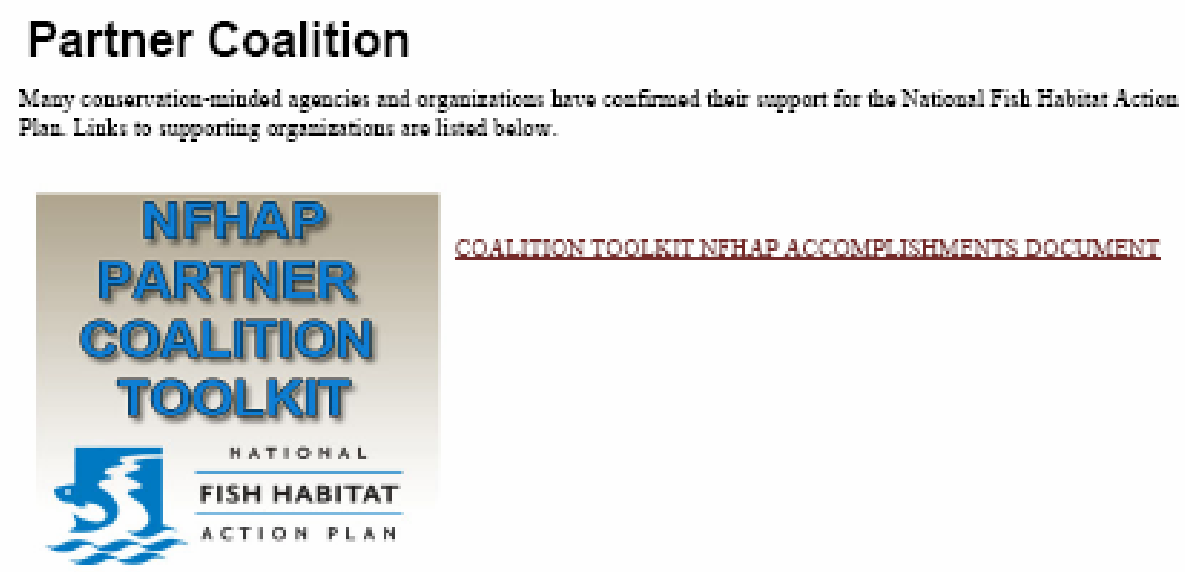
- National Fish Habitat Board
- Association of Fish and Wildlife Agencies (States)
- NFHAP Federal Caucus
- Fish Habitat Partnerships
- Partner Coalition

NATIONAL FISH HABITAT ACTION PLAN

# NFHAP Communications Strategy

## Partner Coalition:

- Partner Toolkit webpage
  - Talking points
  - NFHAP PowerPoint presentation
  - Listing of "expert" fish habitat contacts
  - NFHAP Literature



# NFHAP Communications Strategy

## Coalition Database:

- Captured grouping
- Potential project involvement
- Advocates for “the cause”
- Benefits for all

NATIONAL FISH HABITAT ACTION PLAN

# NFHAP Communications Strategy

## Core Messages:

- NFHAP "Boilerplate"
- Partners
- North American Waterfowl Management Plan
- Fish Habitat Partnerships

NATIONAL FISH HABITAT ACTION PLAN

# NFHAP "In The News"

- Google News Alert for: **National Fish Habitat Action Plan**

- Trout Run on list of 'Waters to Watch'
  Post-Bulletin - Rochester,MN,USA
  The list is put out by the **National Fish Habitat Action Plan**, a coalition of regional projects to improve **fish habitat** in streams, rivers, lakes and the **...**
  See all stories on this topic

- Brook Trout Ecology Study Under Way
  By admin
  It's part of the **National Fish Habitat Action Plan** to restore native brook trout **habitat** from Maine to Georgia. The method being studied - dubbed "chop and drop" - involves adding large woody debris at strategic locations along a stream **...**
  Watersaver-Geomembrane Liners... - http://www.watersaver.com/geomembrane-liners-erosion-control-products

# NFHAP Media Outreach

Targets:

- National
- Local
- Blogs
- Newsletters

NATIONAL FISH HABITAT ACTION PLAN

The Patriot-News

## Promise of help for native brookies grows

Sunday, July 06, 2008

**Special to The Patriot-News**

The Eastern brook trout, already the focus of a multi-state effort to restore lost and degraded habitat, has been added to the Pennsylvania Wildlife Action Plan.


## Volunteers work to restore Valley creek

Catherine Inman with the Wasilla Soil and Water Conservation District (Dan Carpenter/KTUU-TV)

by Lori Tipton
Thursday, July 10, 2008

WASILLA, Alaska -- Low salmon stocks in Mat-Su streams is attracting the attention of a non-profit group.

The Nature Conservancy has been working to restore habitat to one Valley creek in hopes of improving the low salmon runs.

The project is to restore Colter Creek in Wasilla and it was just completed Thursday thanks to help from two other organizations.

Cumberland Times-News

Serving Western Maryland and the Potomac Highlands of W

## $1.2 million project could breathe life into Aaron Run

**Michael A. Sawyers**
Cumberland Times-News

Thu, Jun 05 2008

— BLOOMINGTON - If everything works as planned and as hoped for, a $1.2 million project directed by the Maryland Bureau of Mines will change Aaron Run from a four-mile sluice for acid mine drainage into the clear-water stream it was in days of yore.
And, if the leach bed leaches, the lime doser doses and the SAP cell (successive alkaline producing cell) does its job, maybe, just maybe, native brook trout will be returned to the Garrett County stream.
"That's the goal," said Alan Heft, a biologist with the Maryland Inland Fisheries Division "Aaron Run has been dead because of acid mine drainage, for what, 40 or 50 years, and

OUTDOOR LIFE

THE SOURCE FOR HUNTING AND FISHING ADVENTURE



## Stinky Creek one of '10 Waters to Watch'

**Iowa County Stream on "Watch List"**

## A Tale of 20 American Rivers

# Cleaning Up For Trout

## Trout Run is a 'Water to Watch'

**In some ways, the history of America can be told by our waterways...**

Sep 4, 2008

In some ways, the history of America can be told by our waterways. By the mills and tow paths along New England's streams and canals, by the rivers of empire – the Cumberland, Ohio, Missouri, Columbia – that led to new and valuable territory. By the great industrial rivers – the Detroit, the Maumee, the Monongahela – that powered our Iron Belt.

"America is a great story," wrote the journalist Charles Kuralt, "and there is a river on every page."

But if rivers have been good for America, Americans haven't always been good to our rivers. Think of the industrial-scale pollution we've spewed into them, the diverting and channalizing we've inflicted on their courses and the neglect we've shown – or not shown – to these life-giving, nation-building streams.

It's understandable. It's the nature of a river to go somewhere else, around the bend and out of sight. So it's easy to assume that someone else will care for the waterway.

But a couple of groups in modern America have taken an active role in caring for our waterways, and they deserve some attention for the attention and care they've shown our rivers. They have very different approaches, even though their outcome is the same: To heal impaired rivers around the country.

The first group, American Rivers (www.americanrivers.org), is well known for its annual report card that lists the ten most imperiled American waterways. The group, based in Washington, DC, is a tenacious environmental watchdog, and its Most Endangered Rivers report typically has a topical agenda. Rivers that make the list are threatened by mines or logging at their headwaters, power plants along their course, industrial or residential development in their floodplains.

Post-Bulletin

If it matters to you, it matters to us

Outdoors

## Trout Run on list of 'Waters to Watch'

7/31/2008 8:35:02 AM
**Comments (0)**
Post-Bulletin, Rochester MN

Trout Run Creek, which begins in Winona County and flows into northern Fillmore County where it joins the Root River, is on the national 2008 list of "10 Waters to Watch."

adn.com
Anchorage Daily News

## Nine teens help restore habitat

**8-WEEK PROGRAM: Students are taught conservation skills.**

By RINDI WHITE
rwhite@adn.com
*(08/01/08 01:30:15)*

WASILLA -- The Upper Susitna Youth Conservation Corps last week celebrated the en its 2008 season of trail and restoration work.

## LOCAL STREAM GETS MAJOR CLEANUP

**Williams Run in Southern Venango County is named to the "10 Waters to Watch" List**

Oil City Derrick
5/9/08

A southern Venango County Stream has been selected for the "10 Waters to Watch" list, a collection of waterways and shores where efforts are underway to create cleaner and healthier habitats for fish and wildlife.

# FISHHABITAT.ORG WEBSTATS

www.fishhabitat.org
## Dashboard

**May 1, 2008 - May 31, 2008**
Comparing to: Apr 1, 2008 - Apr 30, 2008


### Site Usage

**2,063** Visits
Previous: 1,757 (17.42%)

**47.79%** Bounce Rate
Previous: 47.24% (1.17%)

**7,946** Pageviews
Previous: 4,773 (66.48%)

**00:03:13** Avg. Time on Site
Previous: 00:01:59 (62.60%)

**3.85** Pages/Visit
Previous: 2.72 (41.78%)

**61.66%** % New Visits
Previous: 73.71% (-16.35%)

### Visitors Overview


Visitors
1,464

### Content Overview

| Pages | Pageviews | % Pageviews |
|---|---|---|
| / | | |
| Apr 1, 2008 - Apr 30, 2008 | 527 | 11.04% |
| May 1, 2008 - May 31, 2008 | 2,323 | 29.23% |
| % Change | 340.80% | 340.80% |
| /index.php?option=com_content&view=article&id=124:may- | | |

# On the Horizon

- NFHAP Legislation
- 2009 “10 Waters To Watch”
- Project Updates/ Coalition Development

NATIONAL FISH HABITAT ACTION PLAN

5400 Bishop Blvd., Cheyenne, Wyoming 82006, 307-777- 4569, www.wafwa.org

July 28, 2008

Kelly Hepler, Chair
National Fish Habitat Action Plan Board
Alaska Department of Fish and Game
333 Raspberry Rd.
Anchorage, AK 99518-1599

Dear Kelly:

The Western Association of Fish and Wildlife Agencies (WAFWA) supports the concept of the Reservoir Fisheries Habitat Partnership (RFHP). WAFWA urges the National Board to work with the candidate RFHP to assure their timely approval as an official National Fish Habitat Partnership. We believe this Partnership is critically important to the future of the National Fish Habitat Initiative.

WAFWA recognizes the importance of the RFHP to the continued well being of our fisheries and the funding support we need to maintain our conservation efforts. We have asked the WAFWA Fish Chiefs to support the development of the RFHP and to participate in the upcoming Reservoir Assessment Workshop at the National Conservation Training Center. This workshop is being planned by the RFHP to move this effort forward.

Sincerely,

Donald Koch
President

DK/VM:cc

cc: WAFWA Directors
Tom Busiahn, NFHAP Coordinator

National Fish Habitat Action Plan
Hall of the States
444 North Capitol Street, NW,
Suite725, Washington, DC 20001
Tel: 202/624-7890 ♦ F: 202/624-7891

Web www.fishhabitat.org

To: National Fish Habitat Board
From: Staff
Date: October 7, 2008
Subject: Revised guidance for Fish Habitat Partnerships for Board approval

## Background

Guidance for establishing Fish Habitat Partnerships – the primary work units of the National Fish Habitat Action Plan – has been a subject of debate for 2 ½ years. Under guidance that the Board approved in early 2007, six Fish Habitat Partnerships have been recognized by the Board, and 14 Candidate Fish Habitat Partnerships have written to the Board signaling their intention to seek recognition in the future.

At its last meeting on May 13-14, 2008, the Board heard 17 recommendations from an *ad hoc* work group that examined the structure and function of Fish Habitat Partnerships. The Board endorsed 6 recommendations presented by the work group, endorsed 6 others with amendments, and did not endorse 5 others.

One of the recommendations endorsed by the Board was to establish a standing *Partnerships Committee* consisting of Board members, staff, and representatives of Fish Habitat Partnerships to provide information, analysis, and recommendations for Board action on the full range of Fish Habitat Partnership issues.

The 15-member Partnerships Committee was organized and convened in August 2008 to help revise the guidance for Fish Habitat Partnerships to incorporate Board decisions. Based on input received through a conference call and three rounds of document review, the attached *Policies and Guidance for Fish Habitat Partnerships* was prepared for the Board's consideration.

## Recommendations

By consensus, the Partnerships Committee recommends that the Board adopt and implement the attached *Policies and Guidance for Fish Habitat Partnerships*.

The Board should direct its staff to modify the application form for Fish Habitat Partnership recognition to reflect the revised guidance, and to initiate the next round of Fish Habitat Partnership applications.

Policies and Guidance for

# FISH HABITAT PARTNERSHIPS

National Fish Habitat Board

## Introduction

Fish Habitat Partnerships (FHPs) recognized by the National Fish Habitat Board (Board) are the primary work units of the National Fish Habitat Action Plan (Action Plan). The Board has adopted these policies as guidance for three distinct phases in FHP development.

- **Section 1 (The Roles of Partners and Partnerships under the Action Plan)** is targeted toward groups and individuals who want to become involved in the Action Plan, and may be thinking about establishing a Fish Habitat Partnership.
- **Section 2 (Requirements for Establishing a Fish Habitat Partnership)** describes the mandatory requirements for recognition of Fish Habitat Partnerships by the Board.
- **Section 3 (Operational Requirements for Fish Habitat Partnerships)** describes the functions that Fish Habitat Partnerships are expected to fulfill after they are recognized by the Board.

The primary guidance for establishing FHPs is the Action Plan itself. The policies provided here supplement the broad guidelines in the Action Plan, and are intended to be fully consistent with the Action Plan.

**From the *National Fish Habitat Action Plan*:**

Page 5
**Objectives**

- Identify priority fish habitats and establish Fish Habitat Partnerships targeting these habitats by 2010.
- Establish 12 or more Fish Habitat Partnerships throughout the United States by 2010.

Page 8
**Fish Habitat Partnerships**
Fish Habitat Partnerships are the primary work units of the National Fish Habitat Action Plan. These partnerships are formed around important aquatic habitats and distinct geographic areas (e.g., Southeast Aquatic Resources Partnership), "keystone" fish species (e.g. eastern brook trout and western native trout) or system types (e.g. large lakes, impoundments, estuaries).

Page 9
… Roles of the [National Fish Habitat] Board include: …

- Develop appropriate policies and guidance for recognizing partnerships and criteria for allocating national funding and related resources.

## Section 1: The Roles of Partners and Partnerships in the Action Plan

During the first two years of Action Plan implementation, many new coalitions have organized or strengthened in support of the Action Plan, indicating a high level of interest across the nation. To maintain this momentum, the Board seeks to clarify the roles of partners and partnerships under the Action Plan.

The Board encourages all entities with an interest in fish habitat conservation to become involved with existing FHPs wherever possible, whether those FHPs have gained recognition by the Board or are still organizing. For geographic areas, fish species or system types that are not represented in existing FHPs, the Board may encourage an FHP to expand its scope, or it may recruit individual jurisdictions or other partnership-based entities to organize new FHPs to address these gaps.

### Candidate Fish Habitat Partnerships

Emerging or established partnerships that intend to seek Board recognition as FHPs may request "Candidate" Fish Habitat Partnership status. The Candidate category creates a linkage with the Action Plan and avails the partnership of technical assistance from the Board and its staff. Candidate status may be requested by sending a letter of intent to the Board describing the important fish habitat that the partnership is focusing on and how the partnership is working toward meeting the requirements in Section 2. Requests for Candidate status will be acknowledged by letter from the Board Chair, providing substantive feedback to improve the likelihood that the recipient will work expeditiously to meet the criteria for recognition. The Board will maintain a database of Candidate Fish Habitat Partnerships to facilitate communication.

### Partners Coalition

The Board also acknowledges the existence and importance of many other ongoing local, regional, and national organizations and projects that protect, restore, and enhance fish habitat across the nation. Although their contributions will assist in achieving the goals of the Action Plan, many of these interests may choose not to seek formal recognition by the Board as a Fish Habitat Partnership. Accordingly, the Board encourages all entities involved in fish habitat conservation efforts to, at a minimum, register as "Coalition Partners" on the Action Plan website (fishhabitat.org). This will provide them an opportunity to highlight their commitments to fish habitat conservation and to ensure they will be informed of ongoing progress made by the Board and the recognized Fish Habitat Partnerships. It will also contribute to networking and sharing of useful information relevant to all of these efforts.

## Section 2: Requirements for Establishing Fish Habitat Partnerships

The Board will recognize Fish Habitat Partnerships based on the following criteria.

### Strong and diverse partnerships

- FHPs are self-identified, self-organized, and self-directed communities of interest formed around geographic areas, keystone species, or system types.
- FHPs will involve diverse groups of public and private partners that are focused on conservation of important fish habitat, which have assembled into a partnership organization capable of meeting the operational responsibilities of FHPs to achieve results across jurisdictional boundaries and land ownership types.
- FHPs must seek and encourage involvement by State fish and wildlife agencies, Native American governments, and federal agencies that manage fish resources within their partnership areas, and document these efforts.
- FHPs will have a high level of commitment from State and federal agencies and other member entities, to ensure development and implementation of strategic plans that are consistent with membership organization priorities. Commitment may be demonstrated through endorsement by regional Associations of Fish and Wildlife Agencies or similar entities, memoranda of understanding among jurisdictions, letters of support from agency directors, or other written evidence.
- FHPs will have governance structures that reflect the range of all partners and promote joint strategic planning and decision-making by the partnership.
- Each FHP will use the term “Fish Habitat Partnership” to describe its organization, either as part of its name or in an accompanying tagline if another name is already established.

### Geographic focus

- In general, FHPs will have geographically defined boundaries that encompass large landscapes, allowing a holistic approach to conserving fish habitats. FHP boundaries should be configured to maximize geographic coverage and minimize overlap among FHPs.
- Alternatively, a limited number of FHPs may be based on system types in those cases where system characteristics transcend geographic boundaries. Examples may include reservoirs, natural lakes, or urban estuaries. System type FHPs will work closely with geographic FHPs to enhance science and conservation for that system type within the areas covered by geographic FHPs.
- The scope of issues and priorities addressed by an FHP should be nationally significant, by virtue of uniqueness, geographic size, or per other criteria identified by the Action Plan Science and Data committee.
- Geographically-defined FHPs may be of any spatial scale, but a minimum size on the order of 50,000 square miles is preferred to allow an FHP to meet its operational responsibilities, to achieve effective prioritization of habitat needs across large landscapes, and to demonstrate success in strategically addressing

those needs. Smaller geographic areas that are ecologically similar and contiguous should be grouped within a single larger FHP.

**Strategic planning**

- Consistent with national goals adopted by the Board, FHPs will identify strategic fish habitat priorities for their partnership area in the form of geographic focus areas, habitat types, or key stressors or impairments to facilitate strategic planning and decision-making.
- Each FHP must have or must demonstrate significant progress toward development of a strategic plan. The plan must focus to the degree practicable on addressing causes of and processes behind system decline rather than simply treating symptoms. Significant progress toward completion shall be demonstrated by an advanced draft and a clear timeline not exceeding one year leading to final approval of the plan through the FHPs governance structure. The Board may provide a recommended framework for strategic planning.
- Each FHP will consult with neighboring and overlapping FHPs to resolve competing or conflicting conservation goals, maximize geographic coverage, and minimize overlap. FHPs must document good faith efforts to reconcile these issues before applying to the Board for recognition or funding.

**Capabilities for scientific assessment**

- Organizations involved in each FHP will have capabilities to measure and demonstrate progress – through existing programs where possible – using science-based resource assessment, project evaluation, and reporting of outcomes in coordination with the Board.

- FHPs will adopt the national science assessment framework established by the Board's Science and Data Committee for resource assessment and project evaluation, and use the framework according to operational guidance in Section 3.

**Application Process**

The Board will periodically invite applications from Candidate Fish Habitat Partnerships with a due date approximately 90 days from the date of invitation. Invitations and application forms will be sent to Candidate FHPs, and informational notices will be sent to the Partners Coalition and posted at www.fishhabitat.org. Additional information may be requested by an e-mail to partner@fishhabitat.org.

Partnerships applying for recognition by the Board are strongly encouraged to coordinate with Board staff in the application process. Early and frequent coordination will save time and enhance the likelihood that an application will be successful.

## Section 3: Operational Guidance for Fish Habitat Partnerships

Fish Habitat Partnerships are responsible for implementing the Action Plan by undertaking the following operational roles:

- Coordinate and compile scientific assessment information on fish habitats within their partnership areas.
- Establish strategic goals and objectives that define desired outcomes for fish species and habitats within their partnership areas.
- Identify priority places and/or issues to focus conservation action, and prioritize fish habitat conservation projects to meet goals and objectives.
- Coordinate and compile information on outputs (conservation activities) and outcomes (changes in habitat condition) for reporting to the Board and stakeholders.
- Collaborate with other FHPs where appropriate to carry out these responsibilities.

The Board has responsibility to oversee and coordinate implementation of the Action Plan through the FHPs.

- The Board will monitor the performance and needs of FHPs nationwide, and will update this Guidance as needed to address changing conditions.
- Monitoring by the Board is intended to be supportive, not burdensome, to FHP operations, participation, and innovation.
- Recognized FHPs will be re-evaluated by the Board as needed, at an interval of five years or less, to confirm that they continue to meet the criteria in this Guidance.

### Strategic planning and assessment

- FHPs will make good faith efforts to ensure that their goals and activities are complementary to the goals and activities of neighboring or overlapping FHPs, Joint Ventures established under the North American Waterfowl Management Plan, and other state, tribal, and regional habitat conservation plans, including State Wildlife Action Plans.
- FHPs will measure progress against goals established in their strategic plans, and utilize adaptive management principles to incorporate assessment results into conservation strategies and projects.
- FHPs will share data and science with all partners and coordinate their information with the Board's Science and Data Committee.
- FHPs will use the national science assessment framework established by the Board's Science and Data Committee. However, FHPs are encouraged to expand the assessment information base beyond the national framework to include additional variables that more fully explain the processes of their systems, or to use surrogate variables to those used in the national science assessment framework that are shown to better measure or classify their systems.

### Implementing fish habitat projects

- FHPs will utilize their strategic priorities and system assessment scores to identify and rank projects that protect, restore, and enhance fish habitats.
- FHPs will leverage funds and capabilities to implement projects that achieve results greater than could be achieved by any partner acting individually.
- FHPs are encouraged to utilize all of the assets of their partners to ensure the success of fish habitat projects.
- FHPs will report accomplishments and outcomes through information channels established by the Board.
- FHPs will designate communication personnel to promote broad understanding of their strategic visions and accomplishments.

**Working at multiple scales**

FHPs establish strategic planning frameworks, within which more localized action plans and fish habitat conservation projects are nested. Following is an example of how FHPs may work at multiples scales:

➔ An FHP develops a strategic plan that describes desired resource outcomes in its partnership area, which may encompass ***500,000 square miles*** and several states. The strategic plan is developed using input from State Wildlife Action Plans, watershed plans, recovery plans, existing assessment reports, and the knowledge of local fish and habitat managers.

➔ The strategic plan identifies a number of geographic focus areas that are high priority for achieving strategic goals. These focus areas may be watersheds on the order of ***1,000-5,000 square miles***.

➔ Within one of the focus areas, a local watershed group is exploring opportunities to restore water quality and improve fishing and other recreational opportunities in a watershed of ***200 square* miles**.

➔ The local group identifies a project to remove an obsolete dam and restore the riparian area. The project aligns with the strategic goals of the FHP and would directly benefit ***one mile of stream***.

➔ The watershed group works with landowners and local, state, and federal agencies to develop specific plans and a funding proposal for the project. Commitments for cash and in-kind contributions are obtained.

➔ An FHP technical committee reviews the project and determines that it will help to achieve desired outcomes within the geographic focus area, and recommends that it be funded.

➔ The FHP ranks the project proposal against others within its geographic area. The project is ranked highly by the FHP.

➔ The project proposal is selected for funding by the funding agency.

➔ Funds for the project are transferred to the local agency office, and/or contracted to the local watershed group.

➔ The project is implemented by the local cooperators. Site-specific results are documented.

➔ Affected fish populations and habitat conditions are evaluated by the state fishery agency at the 200-square-mile watershed scale, as the effects of the project extend beyond the project site itself.

➔ The FHP reports project accomplishments, compiles updated information on habitat conditions, and uses the information when it re-evaluates its strategic priorities.

**Definitions**

Fish Habitat Partnership (FHP) - a National Fish Habitat Board approved group of state, federal, local, nonprofit, tribal, Alaskan Native or private individuals or entities that coordinate to implement the Plan at a regional level. Fish habitat conservation projects proposed by these FHPs are eligible for funding as NFHAP projects.

Candidate Fish Habitat Partnership - a partnership that is working toward recognition by the Board as a Fish Habitat Partnership, and has notified the Board of its intent. Candidate Fish Habitat Partnerships are eligible for coordination and technical assistance from the Board. Fish habitat conservation projects proposed by these Partnerships are eligible for funding as NFHAP projects.

Coalition Partner - a partnership that is not working toward recognition by the Board as a Fish Habitat Partnership, but that is working to achieve the goals of the Action Plan through the conservation of fish habitat. Coalition Partners will share in the coordination and technical assistance provided by the Board.

Fish habitat conservation project

(a) approved actions taken for the conservation or management of aquatic habitat for fish and other aquatic organisms;
(b) the provision of technical assistance to states and local communities to facilitate development of strategies and priorities for aquatic habitat conservation;
(c) the obtaining of a real property interest in lands or waters, including water rights, if the obtaining of such interest is subject to terms and conditions that will ensure that the real property will be administered for the long-term conservation of such lands and waters and the fish dependent thereon. Real property interest means any ownership interest in lands or a building or an object that is permanently affixed to land.

**Address correspondence to:**

National Fish Habitat Board
c/o Association of Fish and Wildlife Agencies
444 North Capitol Street, NW
Suite 725
Washington, DC 20001

**For more information**

www.fishhabitat.org
email: partner@fishhabitat.org

**Board Action on Recommendations from FHP White Paper**

At its meeting of May 13-14, 2008, the National Fish Habitat Board held in-depth discussions on the structure and function of Fish Habitat Partnerships (FHPs). The Board reaffirmed that FHPs are the "primary work units" of the National Fish Habitat Action Plan, with full administrative and operational responsibilities for implementing the Action Plan. The Board recognizes that, in the future, this decision may need to be revisited to ensure efficient and effective implementation of the Action Plan.

The Board agreed to amend its *Guidance for Establishing Fish Habitat Partnerships* to:

- Reaffirm that "Fish Habitat Partnership" is the term to be consistently used, and to encourage FHPs to include "Fish Habitat Partnership" in their names or in an accompanying tagline if another name is already established.
- Require FHPs to make good faith efforts to resolve competing or conflicting conservation goals before applying to the Board for recognition or funding. The Board will require that neighboring and overlapping FHPs consult with each other to implement operational responsibilities, maximize geographic coverage and minimize overlap.
- Reaffirm that FHPs should be of a size and partnership diversity that can meet operational responsibilities and address, where practicable, the causes of habitat decline, not just the symptoms.
- Require applicants for recognition as FHPs to seek and encourage involvement in their governance structures by Native American governments as well as State fish and wildlife agencies and Federal agencies that manage fish resources. FHPs must document these efforts to gain approval by the Board.

The Board also charged its Communications Committee to develop an outreach effort to encourage Native American government to become involved in FHPs and/or projects.

The Board will work with existing FHPs to develop more detailed operational guidance that defines FHP responsibilities for science, assessment, planning, reporting, prioritizing places and issues, and ranking projects. The guidance will encourage FHPs to collaborate where appropriate in carrying out these responsibilities, and will portray examples of multiple-scale conservation activities to help all partners understand how on-the-ground projects are "nested" within the FHP's strategic planning framework, and are conducted by members of the FHP.

The Board agreed to establish a standing Partnerships Committee consisting of Board members, staff, and FHP representatives to provide information, analysis, and recommendations for Board action on FHP issues. The Board will monitor the operational performance and needs of FHPs nationwide, and update its guidance as needed to address changing conditions. Monitoring will be at a level that is not burdensome to FHPs, and does not discourage participation or innovation. The Board will modify its Guidance to provide for re-evaluation of FHPs as needed, at an interval of five years or less.

The Board will postpone inviting Candidate FHPs to apply for recognition until revisions to the Guidance receive Board approval, expected at the October 2008 Board meeting or sooner. The next round of FHP applications is scheduled to begin in October 2008.

The Board strongly endorsed the need to identify long-term funding support for FHP operations to fulfill FHP roles and responsibilities. The Board agreed to seek solutions to resolve this issue.

In a related matter, the Board heard a presentation by the National Reservoir Partnership, a Candidate FHP. The Board discussed options for organizing an effective effort to conserve reservoir habitats and affected river systems.

Finally, the Board approved the application of the Southwest Alaska Salmon Habitat Partnership as a fully-recognized FHP under the Action Plan. This Partnership is focused on protecting habitat for salmon and other fishes in over 62,000 square miles of relatively undeveloped land. Since 2001, they have raised $30 million for conservation, and have protected 70,000 acres through acquisition and easements.

VERTATIM BOARD ACTIONS….

Board reaffirms that FHPs are responsible for all admin and operations, and Board recognizes that in the future this issue may be revisited as appropriate.

## "Fish Habitat Partnerships" vs. "Joint Ventures"

**ENDORSED**

**Recommendation 1:** *The Board ~~should~~ will reaffirm through its FHP Guidance that "Fish Habitat Partnership" is the term to be consistently used, and ~~should~~ will encourage FHPs to include "Fish Habitat Partnership" in their names or in an accompanying tagline if another name is already established.*

## Distribution and Location of Fish Habitat Partnerships

**NOT ENDORSED**

**~~Recommendation 2:~~** *~~The Board should adopt a temporary moratorium until September 2010 on acceptance of new Candidate FHPs, and utilize the current pool to meet the objective of 12 or more FHPs across the United States by 2010. Exceptions to the moratorium should be made for FHPs focused on marine/coastal/estuarine systems, which are currently under-represented.~~*

**NOT ENDORSED**

**~~Recommendation 3:~~** *~~The Board should reaffirm through its FHP Guidance the Action Plan's intent that FHPs have geographic boundaries and operate at a regional scale.~~*

**ENDORSED AS AMENDED**

**Recommendation 4:** *The Board ~~should~~ will amend its Guidance to require FHPs to make good faith efforts to resolve competing or conflicting conservation goals before applying to the Board for recognition or funding. The Board ~~should~~ will require that neighboring and overlapping FHPs consult with each other ~~regarding their boundaries~~ to implement operational responsibilities, maximize geographic coverage and minimize overlap.*

**ENDORSED AS AMENDED**

**Recommendation 5:** *The Board ~~should~~ will reaffirm through its FHP Guidance that FHPs should be of a size and partnership diversity that can meet operational responsibilities and address where practicable and possible the causes of and processes behind habitat decline rather than*

*the symptoms. ~~The Board should work with current Candidate FHPs to encourage merger or other form of consolidation where appropriate.~~*

**NOT ENDORSED**

**Recommendation 6:** ~~*The Board should devote staff time to help the reservoir interests identify appropriate partnership options. These could include separate regional partnerships or being included as a priority focus area within existing or potential FHPs.*~~

## Roles and responsibilities of FHPs

**ENDORSED AS AMENDED**

**Recommendation 7:** *The Board, in collaboration with existing FHPs, will ~~should~~ develop more detailed operational guidance for FHPs that defines ~~recommended staffing levels to carry out~~ their responsibilities for science, assessment, planning, reporting outputs and outcomes, prioritization of places and issues, and ranking projects. The guidance will encourage FHPs to collaborate with each other where appropriate in carrying out these responsibilities.*

**ENDORSED AS AMENDED**

**Recommendation 8:** *The Board's operational guidance to FHPs ~~should~~ will include examples of multiple-scale conservation activities to help all partners understand how on-the-ground projects are "nested" within the FHP's strategic planning framework, and conducted by members of the FHP~~, but not by FHPs themselves~~.*

**ENDORSED**

**Recommendation 9:** *The Board ~~should~~ will monitor the operational performance and needs of FHPs nationwide, and update its guidance to FHPs as needed to address changing conditions. Monitoring ~~should~~ will be at a level that allows the program to operate efficiently, that is not burdensome to FHP staff, and that does not discourage participation or innovation.*

**ENDORSED**

**Recommendation 10:** *The Board ~~should~~ will modify its Guidance to provide for re-evaluation of FHPs as needed, at an interval of five years or less.*

**STRONGLY ENDORSED**

**Recommendation 11:** *The Board ~~should~~ will seek solutions to the need for long-term funding support for FHP operations.*

**NOT ENDORSED**

~~**Recommendation 12:** *The Board should direct its staff to begin development of grant administration procedures in anticipation of new Action Plan legislation and appropriations, including the responsibility of FHPs to rank grant proposals within their geographic areas.*~~

## Tribal role in Fish Habitat Partnerships

**ENDORSED AS AMENDED**

**Recommendation 13:** *The Board ~~should~~ will require FHPs that apply for recognition to seek and encourage involvement by Native American governments in their governance structures, and to document these contacts as part of the application for Board recognition. In the same way, the Board ~~should~~ require FHPs to seek and encourage involvement in governance structures by State fish and wildlife agencies and federal agencies that manage fish resources ~~(FWS, NOAA)~~. The Guidance ~~should~~ will make clear that FHPs that cannot document such efforts will not be approved.*

**ENDORSED AS AMENDED**

**Recommendation 14:** *The Board ~~should~~ will charge its Communications Committee to develop an outreach ~~program~~ effort to encourage Native American government involvement in FHPs and/or projects.*

**NOT ENDORSED**

~~**Recommendation 15:** *The Board should be prepared to work directly with Native American governments in administering grant funds that may be available through future legislation in the event it is mutually determined by the Board and Native American government interests that specific projects cannot be coordinated at the FHP level.*~~

## Next Steps

**ENDORSED**

**Recommendation 16:** *The Board ~~should~~ will postpone acceptance of new applications by Candidate FHPs for recognition until revisions to the Guidance are complete. Revisions should be completed for approval at the October 2008 Board meeting or sooner, so that the next scheduled round of FHP applications can take place as scheduled.*

**ENDORSED**

**Recommendation 17:** *The Board ~~should~~ will establish a standing Partnerships Committee consisting of Board members, staff, and representatives of Fish Habitat Partnerships to provide information, analysis, and recommendations for Board action on the full range of FHP issues.*

# Recommended Strategic Plan Framework for Candidate Fish Habitat Partnerships

## Introduction

The *Policies and Guidance for Establishing Fish Habitat Partnerships* requires that Fish Habitat Partnerships (FHPs) develop a strategic plan. Some Candidate FHPs have requested more guidance about the National Fish Habitat Board's (Board) expectations for a strategic plan, and the Board has concluded some consistency among the FHP strategic plans would be desirable. This planning framework was developed with these considerations in mind. It offers recommendations based on a standard approach to strategic planning – one that relies on assessment, implementation, and evaluation.

Each FHP should determine its own best approach for strategic thinking and planning. The process or journey of developing a strategic plan is important for each FHP's growth and development organizationally. A strategic plan will simply summarize why the FHP exists, what it is trying to accomplish, and how it will go about doing so. It will guide the FHP in achieving its mission, document the strategically planned actions and rationale, help gauge performance, and serve as a communication tool for internal and external audiences.

We suggest FHPs use this framework in conjunction with the *National Fish Habitat Action Plan, Policies and Guidance for Establishing Fish Habitat Partnerships,* and the *Final Interim Strategies and Targets for the National Fish Habitat Plan* (*November 8, 2007)*. All are available on-line at www.fishhabitat.org. Selected information was pulled from these documents for easier reference, but additional details remain in the original documents. In addition, we suggest FHPs reach out to the Board's Science and Data Committee, early in the planning process, for habitat assessment and monitoring guidance.

## National Fish Habitat Action Plan

The mission of the National Fish Habitat Action Plan (Action Plan) is to protect, restore, and enhance the nation's fish and aquatic communities through partnerships that foster fish habitat conservation and improve the quality of life for the American people. Goals, objectives, and interim strategies have been identified at the national level as summarized below.

*Goals*

- Protect and maintain intact healthy aquatic systems.

- Prevent further degradation of fish habitats that have been adversely affected.
- Reverse declines in the quality and quantity of aquatic habitats to improve the overall health of fish and other aquatic organisms.
- Reconnect fragmented river, stream, reservoir, coastal, and lake habitat to allow access to historic spawning, nursery and rearing grounds.
- Reduce and maintain sedimentation, phosphorus and nitrogen runoff to river, stream, reservoir, coastal, and lake habitats to a level within 25% of the expected natural variance in these factors or above numeric State Water Quality Criteria.
- Increase the quality and quantity of fish habitats that support a broad natural diversity of fish and other aquatic species.

*Objectives*

- Conduct a condition analysis of all fish habitats within the United States by 2010.
- Indentify priority fish habitats and establish Fish Habitat Partnerships targeting these habitats by 2010.
- Establish 12 or more Fish Habitat Partnerships throughout the United States by 2010.
- Prepare a "Status of Fish Habitats in the United States" report in 2010 and every five years thereafter.
- Protect all healthy and intact fish habitats by 2015.
- Improve the condition of 90 percent of priority habitats and species targeted by Fish Habitat Partnerships by 2020.

*Final Interim Strategies*

- Identify and protect intact and healthy waters.
- Restore natural variability in river and stream flows and water surface elevations in natural lakes and reservoirs.
- Reconnect fragmented river, stream, reservoir, coastal, and lake habitat to allow access to historic spawning, nursery, and rearing grounds.
- Reduce and maintain sedimentation, phosphorous and nitrogen runoff to river, stream, reservoir, coastal, and lake habitats to a level within 25% of the expected natural variance in these factors or above numeric State water Quality Criteria.

The goals, objectives, and interim strategies of the Action Plan are the umbrella constructs for the FHPs. In other words, ***FHPs should identify strategic fish and aquatic habitat priorities that are consistent with, link to, and support these national goals, objectives, and interim strategies where appropriate.***

The Action Plan and related documents use deliberate terminology. FHPs should carefully use terms with their specific meaning when drafting strategic plans. A list of definitions is provided in the Appendix.

Strategic Planning Considerations

A strategic plan should simply describe the present, look to the future, and propose actions to achieve stated goals and objectives, with concomitant monitoring and evaluation. The strategic plan does not need to be lengthy. Documents such as detailed resource assessments and analyses do not need to be actually contained within the strategic plan. Instead, they can be referenced in the plan or attached as an appendix if deemed appropriate.

One way to begin the process is for a FHP to ask a series of questions, such as these below:

*Where are we now?*

What is currently happening on the landscape?
What is the current condition of priority fish populations and their habitats?
What opportunities exist for change?
What challenges exist?

*Where do we want to be?*

Why is the FHP coming together?
Who needs to be involved in the FHP to address root causes of fish habitat declines?
What does the FHP want to see as the desired future condition of fish habitats?
What goals is the FHP trying to accomplish?
How do the goals fit within the Action Plan?

*How will we get there?*

How can the FHP reach these goals?
What strategies will the FHP formulate?
What is the timeline for achieving intermediate benchmarks and long term goals?

*How do we measure our progress?*

How will the FHP measure success?
What capabilities and resources can partners contribute to assess progress?

How will the measurements link with those of partners and other FHPs?

The process of addressing these questions and the resulting thoughtful dialogue may be as important for each FHP as the strategic plan itself. Certainly answers to such questions are a good jumping-off point for crafting a strategic plan.

Recommended Framework for a Strategic Plan

Recommended elements for a strategic plan, in one possible order of presentation, follow below. We offer a brief narrative, under most headings, to suggest content that is important.

*Title*

*Authors/Contact Information*

*Table of Contents*

*Executive Summary*

*Mission and/or Vision of the Fish Habitat Partnership*

State the mission and/or vision of the FHP in a succinct manner. The mission is the FHP's reason for existence. The vision is a compelling, conceptual image of the desired future.

*Partnership Purpose and Governance*

Identify the community of interest that brings partners together in the proposed FHP. Briefly describe the range of your partners' associations and their interests in conserving fish habitat as well as your governance structure. Describe the need for or problem(s) the FHP is forming to address and indicate how and why the scope of issues and priorities addressed by the FHP are considered to be nationally significant.

*Geographic Scope*

Provide a description of the geographic boundaries of the partnership and include a map to illustrate the geographic scope of the FHP. Identify and comment on connections to adjoining or overlapping FHPs.

*Resource Assessment*

Describe the current conditions of fish habitat and/or fish and aquatic communities in the partnership area. This section should be a general but science-based overview, using specific examples to illustrate general conditions and citing existing reports and databases to support conclusions. One may include the identification of the

major species and/or biological communities that will benefit from fish habitat conservation by the FHP. This section should also identify information gaps, research needs, and opportunities to address them as well as relevance or connections to existing plans (e.g., watershed plans, State Wildlife Action Plans, species recovery plans).

*Goals*

Develop conservation outcomes or goals for fish habitat and/or fish and other aquatic communities in the FHP area. These may be expressed as desired future conditions. This is the opportune place to begin demonstrating how the FHP's work will fit with or support the Action Plan.

*Objectives*

Objectives are measureable, time-based statements of intent for achieving the mission and goals identified above. One helpful rule for developing objectives is the SMART principle – i.e., make objectives **S**pecific, **M**easureable, **A**chievable, **R**esults-Oriented, and **T**ime-Fixed. Here are some examples (in addition to those provided in the Action Plan):

- Three barriers to fish passage, within the Champlain watershed, will be removed by 2020.
- 60% of discrete trout populations within the FHP will meet management goals by 2020.

*Strategies and Priority Conservation Actions*

Identify strategies or conservation actions that will support attainment of the goals and objectives. Where practicable and possible, strategies should focus on addressing causes of ecosystem and habitat decline, rather than simply treating symptoms. They should also establish some relative order of priority in terms of focus areas (e.g.,

watersheds, habitat types), key stressors or impairments, or other considerations. An FHP may want to refer to the information gaps or research needs described in the Resource Assessment when prioritizing their actions.

*Implementation*

Although FHPs will not typically be responsible for conducting on-the-ground-projects, a FHP will assess fish habitat conditions and utilize its strategic priorities to identify and rank projects for funding by members and partners. The strategic plan, therefore, should offer a description of how the FHP will provide coordination services. This section may also include a description of funding needs and sources. FHPs may also identify strategies for effective internal communication among partners, as well as strategies to reach out to targeted external audiences.

*Evaluation and Reporting*

Over time, FHPs will need to demonstrate how well they are achieving stated goals and objectives (i.e., achieving success) as well as account for project-specific accomplishments. This section should identify priorities for monitoring, as well as factors that limit the effectiveness of monitoring and evaluation studies. FHP's should describe their plans for managing assessment information, including how it will be used to influence future decisions (i.e., adaptive management), and the steps they will take to coordinate that information with the Science and Data Committee for the national database.

*Revisions*

Strategic plans should be revised periodically, every five years or as needed. Factors affecting the need for revision include new scientific information, progress in protecting key habitats or remediating key stressors, changes in external conditions affecting the resource (e.g., climate change, land use), and changes in the mix of partners involved in the FHP. The strategic plan should indicate what revision schedule the FHP intends to operate under.

Margaret Connelly
USFS/AFWA

Appendix

Definitions

**Aquatic communities**: organisms living or growing in, on, or near the water and interacting with one another in a specific region under relatively similar environmental conditions.

**Candidate Fish Habitat Partnership***:* a partnership that is working toward recognition by the Board as a Fish Habitat Partnership, and has notified the Board of its intent.

**Coalition Partner**: a partnership that is not working toward recognition by the Board as Fish Habitat Partnership, but that is working to achieve the goals of the Action Plan through the conservation of fish habitat.

**Conserve**: Protect, restore, and enhance the habitats of the nation's marine and freshwater fish populations to support a broad natural diversity of fish and other aquatic species, to promote self-sustaining fish populations, and to provide successful fishing opportunities.

**Enhancement:** The manipulation of the physical, chemical, or biological characteristics of a waterbody that heighten, intensify, or improve specific function(s) or for a purpose such as water quality improvement, flood water retention or increased fish production/habitat.

**Fish habitat**: any area upon which fish depend, directly or indirectly, to carry out their life processes, including an area used by fish for spawning, incubation, nursery, rearing, growth to maturity, food supply, or migration; including an area adjacent to the aquatic environment if such adjacent area: 1) contributes elements, such as the input of detrital material or the promotion of planktonic and insect populations providing food, that make fish life possible; 2) protects water sources, quantity, and quality; 3) provides public access for the use of fishery resources; or 4) serves as a buffer protecting the aquatic environment.

**Fish Habitat Partnership**: a National Fish Habitat Board approved group of state, federal, local, nonprofit, tribal, Alaskan Native or private individuals or entities that coordinate to implement the Plan at a regional level.

**Fish habitat conservation project**: (a) approved actions taken for the conservation of aquatic habitat for fish and other aquatic communities; (b) the provision of technical assistance to states and local communities to facilitate development of strategies and priorities for fish habitat conservation; (c) the obtaining of a real property interest in lands or waters, including water rights, if the obtaining of such interest is subject to terms and conditions that will ensure that the real property will be administered for the long-term conservation of such lands and waters and the fish dependent thereon.

**National Fish Habitat Action Plan:** The April 24, 2006 *National Fish Habitat Action Plan* and any subsequent revisions or amendments to the Action Plan.

**Protection:** The removal of a threat to, or preventing the decline of, fish habitat by an action in or near a waterbody. Protection may include, but is not limited to:

- the purchase and monitoring of land or easement;
- repairing water control structures;
- assisting local units of government in zoning riparian corridors or saltwater marshes for non-development;
- establishing best management practices for agriculture and forestry;
- allocating water to protect ecological stream flows and lake/reservoir surface water elevations;
- acquisition and transfer of water rights;
- riparian zone fencing; and
- maintenance of structures.

**Restoration:** The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic attributes or functions to degraded fish habitat. Habitat restoration includes, but is not limited to:

- practices conducted with the goal of returning a site, to the extent practicable, to the ecological condition that likely existed prior to loss or degradation, such as restoration of riparian area's aquatic vegetation or woody debris, restoration of channel sinuosity, re-creation of reefs and spawning shoals or recreation of freshwater inflows ;
- practices conducted when restoration of a site to its original ecological condition is not practicable, but which will partially repair original habitat functions, such as, dredging to reduce sedimentation or developing of new spawning shoals; and
- removal of the disturbing/degrading element to enable the native habitat to re-establish or become fully functional, such as removal of barriers to flow (such as dams or culverts), control of point and non-point source inputs or removal of breakwaters and bank armoring.

# Proposal for a national "one-year-out" workshop on the National Fish Habitat Action Plan

## Background

The National Fish Habitat Plan has several objectives that point to 2010 as the year when significant milestones will be achieved.[1] They are:

- Conduct a condition analysis of all fish habitats within the United States by 2010.
- Identify priority fish habitats and establish Fish Habitat Partnerships targeting these habitats by 2010.
- Establish 12 or more Fish Habitat Partnerships throughout the United States by 2010.
- Prepare a "Status of Fish Habitats in the United States" report in 2010 and every five years thereafter.

Achievement of these milestones will require many people and organizations to work in concert, expending significant funding and effort. The work is proceeding through voluntary partnerships and contributions of funds and in-kind assistance, coordinated by the National Fish Habitat Board and its committees and staff. No single organization or person (other than the Board and its Chair) is responsible and accountable for the overall effort.

Board staff identified a need for a status check on the separate but related efforts that will culminate in 2010 – to review what has been accomplished, what still needs to be done, and whether course corrections are needed. Meetings of the National Fish Habitat Board can serve this function, but offer limited opportunity for input and interaction by the full spectrum of NFHAP partners and supporters involved in these efforts.

## The Proposal

A national "one-year-out" workshop is proposed to fill the need for a status check. The workshop would bring together the key people involved in implementing the Action Plan to enhance the likelihood that the 2010 milestones will be achieved in a seamless manner.

An event of this scope will require substantial investment of staff time and funds. This proposal is intended to provide the National Fish Habitat Board sufficient information to decide if the benefits of a workshop justify the investment.

A preliminary version of this proposal was circulated among members of the National Fish Habitat Board on July 23, 2008. Responses (included in full in the Attachment) were generally supportive. The U.S. Fish and Wildlife Service supported the purpose and outcomes, but proposed an alternative approach to achieving them.

[1] The proposal assumes that September 30, 2010 (end of Federal fiscal year 2010) is the date for these milestones.

## Purpose of the Workshop

The purpose of the workshop is to provide an opportunity for structured and informal face-to-face communication among partners working to implement the Action Plan, to review progress, renew commitment and enthusiasm, and maximize the likelihood that the objectives with 2010 milestones will be achieved.

## Desired outcomes

### Primary outcomes

- Clear ***understanding of what remains to be done*** to meet 2010 milestones and who will do it.
- Enhanced ***networking and collaboration among participants***, including the identification of human, financial, and technical resources needed to meet 2010 milestones.
- Enhanced ***understanding of the roles*** of the Board and its committees, Fish Habitat Partnerships, Federal Caucus, and other entities in implementing the Action Plan.
- Enhanced ***commitment and enthusiasm*** for implementing the Action Plan and meeting the 2010 milestones.

### Secondary outcomes

The primary desired outcomes are focused within the Action Plan community to ensure that 2010 milestones are achieved. However, the workshop may also provide opportunities to generate external awareness and support.

- Enhanced awareness and support for the Action Plan among political leaders in Congress and the Administration
- News media attention and products focusing on the Action Plan.

## Participants

In general, participants would be individuals who are currently involved in implementing the Action Plan through the Board, its committees and staff, Fish Habitat Partnerships, and conservation agencies and organizations. Following is a list of categories of participants and estimates of numbers for each category. The total number of participants estimated from this list is 120.

- National Fish Habitat Board, including:
    - Board members/proxies – 20
    - Board staff – 5
    - Science & Data Committee members – 8
    - Communications Committee members – 4
    - Legislative team members – 4
- Representatives of all Fish Habitat Partnerships, including Candidate FHPs – 25

Note: People in the following categories would be those who are already involved in NFHAP implementation but do not fit in the above categories, or have defined roles in achieving workshop outcomes.

- Leaders and staff from Federal Caucus agencies – 10
- Directors and/or Fish Chiefs from State fish & wildlife agencies – 20
- Representatives of key national and regional non-governmental organizations – 10
- Representatives of key businesses and industry groups – 10
- Members of the news media, outdoor and environmental journalists, and agency / NGO / industry communications professionals - 4

**Date and Location**

The workshop is proposed to be held during the week of June 22, 2009. The Washington DC area is the preferred location, due to proximity of government (including Congress) and national organization offices. The date is suggested to avoid conflicts with the school year, summer vacations, holidays and other known major meetings (e.g. WAFWA Director's Meeting on July 9-16, American Fisheries Society Annual Meeting on August 30-September 3). Congress is likely to be in session at that time, and June is less hot and humid in Washington DC than later summer dates.

**Format**

The length of the workshop is proposed to be 2½ days, including:

- opening plenary (overview presentations, keynote speaker)
- sessions focused on
  - Science and data
  - FHP operations
  - Legislation
  - Funding
  - Communications
- breakout sessions where participants can be heard and their opinions registered

A 1/2-day Board meeting is proposed to be held following the workshop where the Board can take follow-up action if needed.

The draft schedule that follows provides for 15 hours of meeting time, including 4.5 hours of breakout sessions.

| | | |
|---|---|---|
| **Monday, June 22** | Travel day | |
| **Tuesday, June 23** | | |
| Session 1<br>8:30-10:00 | Plenary | • Board chair<br>• AFWA leadership<br>• NOAA & FWS leadership |

| | | |
|---|---|---|
| Break 10:00-10:30 | | |
| Session 2<br>10:30-12:00 | Plenary | • Keynote speaker<br>• NFHAP legislation – history & status<br>• Review workshop format & breakout instructions |
| Lunch 12:00-1:30 | | On your own |
| Session 3<br>1:30-3:00 | Plenary | • Fish Habitat Partnerships – history & status<br>• Case studies of FHP successes and challenges |
| Break 3:00-3:30 | | |
| Session 4<br>3:30-5:00 | Breakout | Meeting FHP responsibilities |
| Reception | | |
| **Wednesday, June 24** | | |
| Session 5<br>8:30-10:00 | Plenary | • NFHAP Science & Data – history & status<br>• Framework for Assessing Habitat<br>• National fish habitat assessment<br>• Data systems for tracking habitat conditions, projects, and results |
| Break 10:00-10:30 | | |
| Session 6<br>10:30-12:00 | Breakout | Meeting Science & Data needs |
| Lunch speaker<br>12:00-1:30 | Group luncheon | Member of Congress or Department Secretary? |
| Session 7<br>1:30-3:00 | Plenary | • NFHAP funding – history & status<br>• Operational needs – Board priorities<br>• Operational needs – FHPs<br>• Corporate and foundation funding sources |
| Break 3:00-3:30 | | |
| Session 8<br>3:30-5:00 | Breakout | Meeting NFHAP funding needs |
| **Thursday, June 25** | | |
| Session 9<br>8:30-10:00 | Plenary | • NFHAP communications history & status<br>• FHP communications case study<br>• Panel of outdoor / environmental journalists |
| Break 10:00-10:30 | | |
| Session 10<br>10:30-noon | Plenary | • Results of breakout sessions<br>• Recommendations<br>• Closing comments by Board Chair |
| Board luncheon<br>Noon-1:00 | By invitation | |
| Board meeting<br>1:00-5:00 | | • Discuss & act on workshop recommendations |
| **Friday, June 26** | Travel day | |

## Cost and sources of funding

Costs shown in the table below are rough estimates. Sources of funds have not been identified yet. Total costs will be higher if financial assistance is provided for participants' travel. Corporate sponsorships should be sought for breaks & receptions.

| Expense | Method of estimation | Estimated cost | Source of funds |
|---|---|---|---|
| Meeting facilities | 3 days @ $5,000 | $15,000 | |
| Food & refreshments | | | |
| Breaks | 5 breaks @ $500 | $2,500 | Sponsor |
| Reception(s) | Assume 1 @ $5,000 | $5,000 | Sponsor |
| Event planner (e.g. Delaney Meeting & Event Management) | 100 hr @ $150/hr | $15,000 | |
| Meeting facilitators | 4 facilitators needed | $0 | in-kind from agencies |
| Travel for Board, staff, committee members, and other participants | 10 @ $2,500 - limited availability for hardship cases | $25,000 | Most travel costs covered as in-kind by employing organizations |
| Web site | 20 hr at $150/hr | $3,000 | |
| Design & printing | Design: $500<br>250 programs @ $5 | $1,750 | |
| Audio-visual | 3 days @ $300 | $900 | |
| TOTAL | | $68,150 | |

## Workshop planning timeline

- June 2008: Initial planning document drafted and reviewed by NFHAP staff and Board chair. **DONE**
- July 2008: Staff modifies proposal and Chair decides whether to proceed. If YES, proposal is sent to Board, requesting feedback and suggestions for date and location. D**ONE**
- August 2008: Based on Board feedback, Chair decides whether to proceed to full proposal; if YES, staff develops full proposal with dates, location and cost estimates. **DONE**
- September 2008: Full proposal sent to Board.
- October 2008: Board action on proposal at October 7-8 meeting; if approved, retain professional event planner to coordinate work of NFHAP staff.
- Summer 2009: Workshop is held.

## ATTACHMENT

Comments on the proposal for a NFHAP conference

Inquiry sent by Susan-Marie Stedman to Board members on 7/23/08

Board members: On behalf of Chairman Kelly Hepler, I'm sending you the attached 4-page draft proposal for a conference focused on the National Fish Habitat Action Plan. We request your feedback in answers to the following questions:
**1)** Would such a conference be worthwhile; in other words, would the benefits justify the investment of time and funds that would be required?
**2)** What suggestions do you have for improving the conference plan?
**3)** What date and location do you prefer? (The proposal suggests the week of June 22, 2009 in the Washington DC area.)
Please respond to Tom Busiahn at Tom_Busiahn@fws.gov by August 11. Based on your responses, Chairman Hepler will decide whether to proceed with a full proposal for your consideration at the October 7-8 meeting of the Board.

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Responses

Gary Myers (representing SEAFWA), 7/30/08
1) If staff thinks it would be worthwhile, then we should do it. If they don't, we should not.
2) I would really like to see various "higher ups" in federal agencies come and make presentations explaining how they might come to the table and play -- like the mining person did in Florida. I think there is money in a number of federal budgets that could be found on things that advance implementation of the National Fish Habitat Initiative.
3) Washington, D.C., June 22

Stan Moberly (representing AFS), 8/01/08
Wonderful idea! Getting all the best minds and energy together is the best way to help predict the future and assess the present; it'll help a lot. I wonder if one year is enough time prior to 2010? But, if not, we can make adjustments. The dates in July and August work better for me than the June dates.

Sue Haseltine (USGS), 8/08/08
Thank you for the opportunity to comment on the proposed NFHAP "one-year-out" conference. I believe this is a good idea and USGS will be willing to take the lead on working with participants and the Board developing the science and data component of the conference. This effort would give us an opportunity to present and follow up on some of the initial work that USGS has undertaken to support the NFHAP. I believe the proposed outcomes of this conference should link strongly to the goals outlined in the plan and will ask Janet Cushing and Doug Beard to work closely with other NFHAP staff to develop an agenda that allows the NFHAP "one-year-out" conference to achieve these outcomes and any others the Board endorses. Thanks again for asking for USGS input ; I look forward to working closely with you on implementation.

Jim Balsiger (NOAA Fisheries), 8/11/08
I have reviewed Kelly's proposal to convene a "One Year Out" conference for NFHAP in the summer of 2009. I support the idea, and think the conference plan focused on communications and progress is timely, but am concerned about funding given that the Board itself has no funding

and most Federal agencies are likely to be under financial constraints in 2009. I have no preference for any of the six proposed dates or meeting location.

Dave Schmid with concurrence by Anne Zimmerman (USDA Forest Service), 8/12/2008
I would think that this type of conference or workshop would be extremely valuable, and timely given the current status of the action plan. I know that a conference of this magnitude would be costly in both staff time and funds, but with so much at stake for future fish habitat conservation -- I think this effort would be very worthwhile. My recommendation would be that we endorse or support this conference. I know our '09 funds will be extremely tight, but you might consider offering up some of my or Phillip's time to help organize the conference if Hepler is looking for support. DC would be preferred as a location, and the week of June 22 would work.

Gary Frazer (FWS), 8/17/2008
The Fish and Wildlife Service supports the purpose and outcomes of the proposed conference, but would like to suggest an alternative approach that would achieve the same ends and also position NFHAP for a high-profile launch of its products in 2010.

First, we are concerned that 2009 is not the best time to hold a conference on NFHAP. With a new administration in the White House, most Federal agency political leadership will not yet be in place (i.e. appointed by the President and confirmed by the Senate). If one of the objectives is to renew commitment and enthusiasm among Federal agency leadership, holding a conference in spring or summer of 2009 will likely be too early to engage a new political team.

Second, we are concerned that the proposed conference -- in seeking to motivate and guide partners toward achieving the 2010 milestones -- actually substitutes for proper oversight by the National Fish Habitat Board. If the Board is fully functional, it will assure through management oversight that the milestones are achieved, and then focus on communicating the results to the broader public, perhaps through a roll-out conference in 2010.

To ensure that the 2010 milestones are achieved through Board management oversight, the Board needs to ask hard questions, identify impediments early, and be explicit in its direction to its committees and the Fish Habitat Partnerships. The Board needs to hold itself and others accountable for achieving expected results. This is challenging, because Board members and most others associated with NFHAP are volunteers. However, unless we are already far behind on the 2010 milestones, it should be feasible through Board leadership to ensure their completion. If necessary, the Board should consider methods to enhance its effectiveness, such as a facilitated retreat focused on Board function and decisionmaking.

A “roll out” conference in 2010 would fulfill many of the same purposes as the proposed “one year out” conference -- i.e. provide an opportunity for intense, face-to-face communication among partners; renew commitment and enthusiasm; enhance understanding of the roles of NFHAP units. In addition, it would offer an opportunity to profile our successes in achieving the 2010 milestones and engage Administration leadership, agency heads, and Congress.

The Fish and Wildlife Service will support any decision of the Board that helps to achieve the 2010 milestones, whether it be the proposed “one year out” conference, or a Board retreat, or just applying more focus and purpose to Board deliberations. However, we think the Board and staff would more productively invest their time and effort in increasing the effectiveness of the Board oversight function, and looking beyond the current phase of NFHAP to envision a successful roll-out of the 2010 products.

# National Fish Habitat Board Charter

(sections relating to Vice-chair, election and duties)

**D. Procedures**

9. Appointment of Vice-Chair—The Board shall elect a Vice-Chair from among the Board membership. In the absence of the Chair, or in the event of the Chair's inability to act, or a conflict of interest for the Chair, the Vice-Chair shall perform the duties of the Chair, and when so acting, shall have all the powers of and be subject to all the restrictions upon the Chair. The Vice-Chair shall perform such other duties as from time to time may be assigned by the Chair or by the Executive Leadership Team. The term of the Vice-Chair shall be the same as the term of the Chair.

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8. Chair's Responsibilities - In addition to such duties established elsewhere in these bylaws, the Chair shall:
a. Prepare a written agenda of all matters to be considered by the Board at any meeting;
b. Prepare and issue all notices, including notices of meetings, required to be given to the Board and public;
c. Preside at all meetings of the Board and, unless otherwise directed by the Board, present items of business for consideration by the Board in the order listed on the agenda for the meeting;
d. Conduct all meetings in accordance with Robert's Rules of Order and these bylaws;
e. Appoint committees as required; and
f. Perform other duties as requested by the Board.

# National Fish Habitat Board Proposed Meeting Dates 2009-2010

In the "Process and Schedule for Recognizing Fish Habitat Partnerships" the Board tentatively approved meeting dates of:

March 4-5, 2009
October 7-8, 2009
March 3-4, 2010

These dates assure that the Board meets the minimum two times per year required by the charter, and gives Candidate FHPs opportunity to apply for recognition twice a year.

Over the past two years the Board has met three times a year:

2007: January, June, October
2008: February, May, October

Locations have generally been in the D.C area, except for the February 2008 meeting in Tampa.