

## Natural Resource Program Center Inventory & Monitoring FY2012 Annual Work Plan

### 1. Introduction

#### 1.1. Vision, goals, and objectives for the NWRS inventory and monitoring initiative.

##### Vision:

A nationally coordinated program of inventory and monitoring on the National Wildlife Refuge System (Refuge System) will generate information critical to ensuring the Refuge System's ongoing contributions to the conservation of the nation's wildlife and plant resources in the face of climate change and other environmental stressors. Collaboration with other U.S. Fish and Wildlife Service (Service) programs and State, Federal, and private partners will lead to the effective integration of inventory and monitoring data needed to advance conservation at landscape scales.

The inventory and monitoring program will document the status of, assess the condition of, and detect changes in the Refuge System's diverse biotic communities, as well as physical resources including water, air and soils, and ecological processes in order to support science-based conservation planning and management at multiple spatial scales. The information generated will be scientifically credible, relevant, and valued by the Service, its partners in the conservation community, and the public. I&M program protocols and standards provide the basis for consistent data collection and data management throughout the Refuge System, ensuring the timeliness, availability, and long-term integrity of the information collected.

##### Goals:

1. Meet the Refuge System's legal mandate to monitor the status and trends of wildlife and plant populations on refuges, and collect and manage information needed to maintain biological diversity, ecological integrity, and environmental health, and preserve the character of designated wilderness within the System.
2. Advance wildlife conservation at the refuge scale and broader landscape scales in an adaptive management cycle by providing scientific information that supports conservation planning and design, guides learning through evaluation of conservation delivery, and offers a basis for assumption-driven research.
3. Implement monitoring of wildlife and plants; physical resources; and ecological processes to reduce uncertainty related to impacts of climate change and other stressors; provide early warning of changing conditions; and guide development of management actions that facilitate adaptation to climate change.
4. Synthesize, interpret, and report on the condition of wildlife, plants, and habitats conserved by the Refuge System in a manner that documents the contributions of the Refuge System within the context of the larger conservation estate and clearly communicates its value to the American public.
5. Increase effectiveness and save money by coordinating and integrating monitoring of natural resources at landscape scales through collaboration with other Service programs, other federal I&M programs, other government agencies, and organizations.

##### Objectives for FY12:

- Compile and distribute as requested existing abiotic datasets identified in Fulfilling the Promise WH8.1
- Conduct review of USA National Phenology Network database to determine what protocols have been developed and facilitate its use by refuges.
- Collaborate with Ecological Services (and specifically ECOS) to determine status of ESA species on refuges (current, historic or restored); compare with CCP species data and validate with refuges.

- Provide funding and support for reconnaissance-level inventory of water resources to facilitate the completion of final assessments (WRIA).
- Coordinate bird monitoring with Migratory Birds and other partners
- Initiate pilot project on 8 refuges to inventory legacy data and documents (GRAS); summarize and evaluate results for further implementation on refuges in each region.
- Conduct a review of current Refuge I&M activities across the system using PRIMR; continue to implement PRIMR pilot across the NWRS

## **1.2. Organization and Focus**

The national office is directed by the Natural Resource Program Center (Center) Chief and directly supports the science-based management of the Nation's 554 National Wildlife Refuges and 38 Wetland Management Districts that manage more than 150 million acres of public lands and waters across the United States in all 50 States, several Territories, and the marine environment.

The primary purpose of Center is to collect and synthesize information that supports management at multiple geographic scales and informs management decisions at all levels. The Center will streamline and enhance the Refuge System's scientific capacity through the standardization of scientific protocols providing consistency of methodologies that facilitates collaboration and integration with other agencies, states, and the scientific communities. The Center develops and administers a centralized data storage and retrieval system in accordance with the data standards of the federal government, the agency, and the Department of Interior that will streamline data management. The data will be readily available to field station employees, other agencies, the academic community, and the general public when appropriate.

The Center works closely with the I&M regional coordinators ensuring that science is used to inform adaptation strategies to climate change and other environmental stressors at the local, regional, landscape, and national level. We assist local managers through the development of science-based decision support tools along with field and analytical support necessary to inform the production of the Comprehensive Conservation Plan and Habitat Management Plans. Additionally, enabled by standardization of protocols and data management, we will be able to aggregate local data to inform regional, landscape and national assessments which will facilitate the assessment and management of Service lands as an integrated system.

Areas of national interest include standardization of protocols, inventories of abiotic and biotic resources, phenologic monitoring, listed species (Endangered Species Act) reporting and verification, water quality and quantity monitoring, wilderness character monitoring, recording and documenting ongoing surveys, and storage and organization of refuge specific data.

## **1.3. Coordination with Regional Refuge Biological program**

The I&M initiative is designed to address the long-term data needs of the Refuge System, which supports the planning and management of refuges at the local scale. Full realization of the I&M initiative necessitates seamless integration into, and leveraging of, the existing refuge biological program, thus ensuring the adoption of standard operating procedures and data standards along with consistent reporting requirements. This is accomplished through strong communication among national, regional and field level staff.

Specifically, we are working on several efforts that will provide a direct benefit to the refuge. We will expand on the pilot effort begun on 8 refuges creating permanent records that can be readily accessed by NWRS staff. In FY11 we piloted population of the PRIMR database, which is designed to assist the refuge with planning efforts as well as provide a listing of surveys, and associated protocols, currently conducted in the field. Through this effort we will begin to assess which surveys are appropriate for regional, landscape or national standardized

protocol. We also compiled a list of T&E species currently present and historically occurring on refuges both refuge CCP documents and the FWS Environmental Conservation Online System (ECOS) database. After validation by the field, this information will be used to both inform ECOS and provide direct support to refuge management decisions.

#### **1.4. Coordination with other regional FWS programs**

The I&M initiative is designed to support the Service's landscape approach to conservation and assist managers in applying adaptive management to refuges ecosystems responding to changing climate and other stressors. To this end, the Center is highly invested in creating and maintaining avenues for partnering with both internal and external partners.

We are leveraging resources with key partners to ensure sound stewardship of public funds. Science offices for both the National Park Service and the U.S. Geological Survey are located in Fort Collins. Having physical proximity to these offices helps us integrate systems across the federal government and minimize duplication of effort.

We are working closely with the LCC coordinators and regional science advisors, to help ensure coordination of monitoring efforts. Specifically, several staff members participate on LCC teams, such as the Climate Science Center/Science Needs team and the team Monitoring Framework and Coordination team.

As part of the Center, the Inventory and Monitoring initiative (I&M) will assist local managers and staff on National Wildlife Refuges by providing standardized, peer-reviewed scientific protocols and data to evaluate the effects of management actions.

We collaborate with the Migratory Bird Program will work closely with them to coordinate the various national bird monitoring efforts, such as mid-winter waterfowl and breeding bird counts.

We will continue to coordinate with the National Avian Health and Disease Program to ensure that collaboration and cooperation occurs where appropriate.

The NRPC chief coordinates with the Science Application ARD group and coordination of the Office of Science Advisor is routine

## **2. Staffing**

The Natural Resource Program Center (Center) Chief directs an office comprised of 10 employees. The Center staff includes a National I&M Manager, National Data Manager, National Water Resources Coordinator, three GIS Specialists, three Ecologist/Biologists, and an Administrative Officer. The Center is located in Fort Collins in order to leverage resources with key partners and ensure sound stewardship of public funds. Additional positions to address data management needs and survey coordination, where appropriate, will be filled in FY12.

### 3. Planned Activities and Anticipated Products

**Table 1. Summary of National and Regional I&M Activities by Blueprint Objective**

Blueprint Objectives and Tasks	Project or Theme	Task
<b>National I&amp;M Priorities</b>		
1a Priority Task	<i>Compile and distribute on request existing abiotic data sets as identified in Fulfilling the Promise WH8.1</i>	<ol style="list-style-type: none"> <li>1. Design standardized geodatabase structure for distributing existing abiotic datasets.</li> <li>2. Develop documentation to inform field stations how to acquire existing abiotic datasets on their own.</li> <li>3. Review and assemble state-wide oil/gas wellhead datasets.</li> <li>4. Collaborate with the NWRS GIS Coordinator, to determine a cost estimate for acquiring all of the abiotic data layers identified in Fulfilling the Promise WH8.1 that are currently not available.</li> </ol>
4b Priority Task	<i>Partner with the USA National Phenology Network by developing a landing page or portal for the NWRS on the USA-NPN webpage</i>	<ol style="list-style-type: none"> <li>1. Complete FWS node on USA-NPN in conjunction with Kevin Kilcullen (information officer)</li> <li>2. Encourage through outreach and education the use of the USA-NPN database for phenological data currently collected on refuges</li> </ol>
1c Priority Task	<i>ESA Species Reporting to Ecological Services</i>	<ol style="list-style-type: none"> <li>1. Provide current and historic occurrences of ESA species for refuge validation</li> <li>2. Certify ESA species occurrences across NWRS</li> <li>3. Collect trend and data quality information from pilot refuges</li> <li>4. Initiate prototype development of centralized database with ECOS</li> </ol>
2a Priority Task	<i>Water Quality Assessment</i>	<ol style="list-style-type: none"> <li>1. Determine a set of core parameters that will be collected at each refuge</li> <li>2. Identify standard protocols for core parameters</li> <li>3. Identify pilot stations for initial WQ data collection</li> <li>4. National office will facilitate WQ data mgt.</li> </ol>
2a Priority Task	<i>Design of Standardized Water Quantity Assessment</i>	Identify options and standard protocols for water quantity measurement.

Blueprint Objectives and Tasks	Project or Theme	Task
1d	<i>Implementation Strategy for National Core Parameters</i>	<p>Inform discussion regarding core parameter selection.</p> <p>Develop implementation strategies for nationally identified core parameters.</p> <p>At a minimum consider previously identified priority tasks:</p> <ol style="list-style-type: none"> <li>1. Validate status of ESA species with refuges and introduce trend and trend source for refuge populations.</li> <li>2. Investigate the use of phenological monitoring as a rapid assessment tool for climate change</li> <li>3. Identify next wilderness refuges for wilderness character measures development in 2012 season.</li> <li>4. Identify and standardize protocols for water monitoring; implement monitoring efforts at pilot stations</li> <li>5. Abiotic Inventories</li> </ol>
2a	<i>Provide support and funding for reconnaissance-level inventory of water resources as delineated in Water Resource Inventory and Assessments (WRIA)</i>	Assist regions in inventory data collection, and provide GIS support based on national office staff availability.
1d	<i>Develop a systematic approach for baseline inventory of vertebrates, vascular plants and invertebrates (subset)</i>	<p>Work with I&amp;M Coordinators to design an inventory for broad occurrence of species across refuges using an SDM process.</p> <p>Create a species occurrence list from existing refuge reports and other sources.</p>
4c	<i>Coordinate bird monitoring with Migratory Birds and other partners</i>	<p>National office staff will attend the regularly scheduled meetings.</p> <p>Work with Bird Team to expand, standardize and integrate regional monitoring protocols across the Service and between partners.</p> <p>Assess current migratory bird monitoring efforts at the landscape level involving other land management agencies establishing, contact with Joint Ventures and LCCs.</p>

Blueprint Objectives and Tasks	Project or Theme	Task
4a	<i>Climate change vulnerability assessment status on refuges</i>	<p>Begin to evaluate what aspects of the I&amp;M initiative support climate change research and refuge vulnerability.</p> <p>National office staff will continue to support and collaborate on the pilot ecosystem vulnerability assessments at two refuges: Hart Mountain National Antelope NWR and Eastern Shore of Virginia NWR.</p>
1d 1f	<i>Protocol development</i>	<ol style="list-style-type: none"> <li>1. Develop protocol review process and standards via a working group.</li> <li>2. Use PRIMR to learn what I&amp;M refuges are monitoring and insure that their methods are entered into GRAS.</li> <li>3. Compile published I&amp;M literature pertaining to protocol development and methods into a library and support USGS in sustaining interagency protocol library.</li> </ol>
1c Data Mng.-1 Data Mng.-3	<i>GRAS Implementation</i>	<p>Assess pilot results</p> <p>Modify guidance</p> <p>Conduct training in use of GRAS</p> <p>Evaluate on original pilot refuges</p> <p>Deploy on additional pilot refuges</p>
General	<i>Wilderness Character Monitoring</i>	<p>A summary report of wilderness character for the 18 refuge sites where the 2011 Wilderness Fellows worked, and a synthesis of all the wilderness character measures.</p> <p>This will serve a reference for planning the 2012 wilderness character monitoring in the NWRS.</p> <p>For database development, scoping of the effort needed to provide the wilderness character monitoring database as a desktop, SharePoint accessible or an centralized web application for the 2012 field season.</p>

Blueprint Objectives and Tasks	Project or Theme	Task
Data Mng.-2 Data Mng.-7	<i>Design and Development of an Integrated Refuge Information System - IRIS</i>	Deploy GRAS onto ECOS platform. Deploy WRIA database onto ECOS platform. Evaluate PRIMR prototype database and feedback from PRIMR team Assess existing NWRS database applications and/or prototypes for potential integration into IRIS Identify current surveys and associated protocols on all refuges. Develop data management guidelines document. Manage existing databases used by the NRPC.

**Table 2. Summary of National and Regional I&M Planned Symposia, Training, and Workshops**

Blueprint Objectives and Tasks	Symposium, Program Review, Training, or Workshop	Staff
<b>COMMUNICATION - TRAINING</b>		
	<i>Monitoring class workshop</i>	Dratch/Newman/O'Brien/Ward
	<i>Protocol Development and Use Workshop</i>	Ward
	<i>I&amp;M Presentation - Fire Ecologist Meeting</i>	Easterbrook/Sutherland
	<i>Waterbird Monitoring Meeting</i>	O'Brien
	<i>GRAS User Training</i>	Easterbrook/Sutherland/Dratch
	<i>GRAS Presentation – R8 GIS Workshop</i>	Easterbrook
	<i>GRAS Presentation – R4 GIS Workshop</i>	Easterbrook
	<i>I&amp;M Presentation – R3 Project Leader's Meeting</i>	Easterbrook
	<i>2012 ESRI International GIS Conference</i>	Easterbrook/ Padilla/Sutherland
	<i>NCTC Teaching Assignments – Geospatial Courses</i>	Baker/Easterbrook/Sutherland

#### 4. Budget Narrative and Budget

At present, we are on a continuing resolution for FY12 at the FY11 enacted level of 4.125 M. We anticipate level funding in the coming year.

#### 5. Appendix

##### 5.1. Map or list of the Landscape Conservation Cooperatives (LCC) associated with each NWRS region.

Landscape Conservation Cooperatives (LCC) is a nationally and internationally coordinated, member-directed conservation partnerships of governmental and non-governmental entities. The LCCs provide a spatial context for biological planning and conservation design at the landscape scale. The primary goal is to foster scientific collaboration across organizational lines and that will inform resource management actions through the application of adaptive management. The nationally coordinated I&M initiative supports science-based management and planning at multiple spatial scales. As the monitoring component of the Strategic Habitat Conservation model, the I&M is poised to assist with the LCC data and monitoring needs as they develop. Table 5.1 presents a list of LCCs by region with the State, Province and Country associations.

##### 5.1. Table 5. List of National Wildlife Refuge System stations by region, by Landscape Conservation Cooperatives (LCCs), and by state, provinces and country.

Region #	Landscape Conservation Cooperative	States, Provinces, and Country Associations
1	North Pacific	Alaska, Washington, Oregon, CA and British Columbia
1	Pacific Islands	Hawai'i, Commonwealth of the Northern Mariana Islands, Guam and American Samoa
2	Desert	Nevada, California, Arizona, New Mexico, Texas, and Northern Mexico
2	Great Plains	New Mexico, Texas, Oklahoma, Colorado, Kansas, Nebraska, South Dakota, and Wyoming
2	Gulf Coast Prairie	Kansas, Oklahoma, Louisiana, Mississippi, Texas and Northern Mexico
3	Eastern Tallgrass Prairie/Big Rivers	Nebraska, Iowa, Minnesota, Wisconsin, Illinois, Indiana, Ohio, Kansas, Missouri, and Oklahoma
3	Plains and Prairie Potholes	North Dakota, South Dakota, Montana, Wyoming, Nebraska, Minnesota, Iowa, Alberta, and Saskatchewan
3	Upper Midwest and Great Lakes	Minnesota, Iowa, Wisconsin, Illinois, Indiana, Michigan, Ohio, Pennsylvania, New York, Vermont, Manitoba, Ontario, and Quebec
4	Caribbean Islands	Puerto Rico
4	Gulf Coastal Plains and Ozarks	Missouri, Arkansas, Illinois, Kansas and Oklahoma
4	Peninsular Florida	Florida
4	South Atlantic	Virginia, North Carolina, South Carolina, Georgia, Florida, and Alabama
5	Appalachian	New York, Maine, Connecticut, Pennsylvania, New Jersey, Ohio, Indiana, Illinois, Kentucky, Maryland, Virginia, West Virginia, Tennessee , North Carolina, South Carolina, Georgia, and Alabama
5	North Atlantic	Maine, Vermont, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Delaware, Pennsylvania, Washington D.C., and Canada
6	Great Northern	Washington, Oregon, Idaho, Montana, Wyoming, Colorado, and British Columbia



<b>Region #</b>	<b>Landscape Conservation Cooperative</b>	<b>States, Provinces, and Country Associations</b>
6	Southern Rockies	Utah, Colorado, Arizona, New Mexico, Idaho and Wyoming
7	Aleutian/Bering Sea Islands	Alaska
7	Arctic	Alaska and northern Canada
7	Northwestern Interior Forest	Alaska and British Columbia
7	Western Alaska	Alaska
8	California	California
8	Great Basin	Oregon, Idaho, California, Nevada, and Utah