

Inventory and Monitoring (I&M) Initiative FY 2011 Annual Report

1. Introduction

1.1. Vision, Goals and Objectives

Vision:

A nationally coordinated inventory and monitoring (I&M) effort 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.

I&M 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 all 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 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.

FY11 I&M Objectives: In general the annual objectives step down from the *Operational Blueprint for Inventory and Monitoring on National Wildlife Refuges: Adapting to Environmental Change* (I&M Blueprint) and are summarized as follows:

- 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 explore future collaboration.
- 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 (ServCat); 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
- Develop a coordinated effort to monitor water quantity and quality within the Refuge System
- Continue to collaborate with and support regional LCCs.
- Develop, refine, and standardize inventory and monitoring protocols
- Advance the practice of adaptive management by implementing projects focused on high priority management issues identified by refuge managers
- Increased emphasis and attention to linking project site inventory and monitoring efforts to achievement at broader scales, such as landscapes, regional, ecoregions and entire species range

1.2. Organization and Focus

The I&M initiative 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 I&M is to collect and synthesize information that supports management at multiple geographic scales and informs management decisions at all levels in coordination and collaboration with the eight Regional I&M organizations. Implementation of I&M 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. We develop and administer 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.

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

1.3. Integration 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 as well as strategic growth of the System. 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. In FY11, we implemented a pilot effort on 8 refuges that will upload refuge documents into the FWS reference database, ServCat; creating a permanent record that can be readily accessed by NWRS staff. We pilot tested population of the PRIMR database, which was 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 work 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.

I&M assists 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 participate in the Migratory Bird Program annual workshop and will work closely with them to coordinate the various national monitoring efforts, such as mid-winter waterfowl and breeding bird counts.

We partner 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. Public Interest Highlights

- Significant strides are being made in data management capabilities. Investment in data management will ensure increased quality control; improved availability of data and permanence of records; and, clear and regular reporting resulting in increased efficiencies and minimizing the opportunity for needless duplication of effort.
- Wilderness Character Monitoring. Ten Wilderness fellows, recent college graduates hired through the Student Conservation Association came to the National Resource Program Center to be trained on the Wilderness Act and the assessment of wilderness character. They have gone out 18 refuges with wilderness, and working closely with refuge staff have established appropriate measures for the wilderness character of each designated wilderness. A Wilderness Character Database, begun by NPS in 2010 and further developed by FWS this year will hold the measures taken at each refuge. The goal is take this to other refuges and DOI agencies in 2012, so that wilderness character monitoring is a regular part monitoring efforts.
- The Northwest Region initiated refuge specific I&M projects that covered a diverse array of inventory and monitoring needs including sea level rise modeling, biotic inventories, abiotic data layer acquisitions and monitoring of biological response to restoration projects.
- The Southwest Region is developing methodology for using non-invasive camera sampling to estimate density of unmarked fauna. The intent is to use this inventory and monitoring tool for trends of rare and/or elusive species.
- The Great Lakes-Big Rivers Region successfully completed the first full year of the pilot season for the Integrated Waterbird Management and Monitoring Program (IWMM) on 11 stations. IWMM is proving to be a valuable tool for monitoring waterbird migration stopovers across multiple scales, from the refuge level to the flyway model.

- The Southeast Region initiated I&M projects that ranged in scope from single refuge to multi-refuge efforts including aquatic habitat assessment, monitoring of biota, conducting groundwater quality monitoring, and developing biometric and environmental DNA standardized protocols for early detection of aquatic invasive species on refuge lands.
- Northeast Region is developing the Main Seabird Database that will greatly enhance the ability of resource managers to evaluate trends in species abundance and distribution. This information will also be used to help prioritize seabird nesting islands for acquisition by conservation agencies.
- Mountain-Prairie Region has implemented several adaptive management projects across the region including monitoring on native prairies, assessing cattail control, and work with the North Dakota Grazing Coalition.
- Alaska Region is taking the lead in developing regional phenological monitoring projects, especially on Tetlin NWR.
- California and Nevada Region is collaborating with several partners to improve our understanding of how tidal marshes will be impacted by climate change. The project goal is to develop models that depict how and where changes in tidal marshes will occur in response to rising sea levels and extreme flood events.

3. 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.

The regional I&M staff are located both at the regional offices and locally in networks or zones. In general, each Region has an I&M Coordinator and Data Manager. Additionally, six regions have deployed positions in a network or zone system, but beyond this staffing positions quickly diverge.

4. Accomplishments - activities and products

The refuge science leaders in the regions identified five priority areas that will best inform long-term strategies for managing at the landscape scale but will also provide products directly relevant to refuge management decisions. The Center took the lead in implementing the initial phase of these initiatives laying much of the necessary groundwork for full-scale implementation:

- **Abiotic Inventory:** We addressed the abiotic recommendations generated by the *Fulfilling The Promise Baseline Inventory Team WH8.1*. These recommendations have largely been fulfilled and data at the appropriate spatial resolution is being made available to local managers for use in management planning.
- **Phenology:** Monitoring how the timing of seasonal events provides information on spatial and temporal ecosystem dynamics that can help identify effects from climate change and other stressors. This information aids refuge management and planning efforts and is

generally being recorded by most refuges. The Center has identified that USA-NPN has a robust data information system that would serve many of our basic data storage needs. The Center is working closely with USA-NPN to develop a web portal or node that will facilitate refuge data input and output.

- T&E Species: We created a baseline list of endangered, threatened, candidate, and delisted/monitored species on National Wildlife Refuge lands as the first step in assessing current status and trend of each population of endangered, threatened, candidate, and delisted/monitored species on National Wildlife Refuge lands.
- Water Quantity: We created objectives for coordinated monitoring of water quantity; provide data for water rights acquisition; provide status and trends for water quantity and timing at a station/site within a watershed context.
- Water Quality: We have begun to identify and standardize existing protocols that could be used across the Refuge System. We are utilizing the information from the ongoing Water Resource Inventories and Assessments (WRIA) to identify common monitoring activities and needs across the Refuge System.

Significant staff time was allocated to data management efforts and large strides were made in four major efforts:

- IRIS: Established strategic partnership with ECOS to initiate the design and development of an Integrated Refuge Information System.
- ServCat: A collaboration with NPS to modify their “legacy data” storage and retrieval system for use by NWRS, the Geospatially Referenced Archive Service will ultimately make recent and historic resource management documents accessible to the entire Service.
- PRIMR: Desktop database product designed to assist NRPC, regions and field station with the Planning and Review of Inventory & Monitoring activities occurring on Refuges.
- WRIA: Leveraging resources from ECOS and Denver IRTM staff to develop database application to support the Water Resource Inventory and Assessment effort.

A detailed summary of regional and national accomplishments and activities by I&M Blueprint task is presented in Table 1. Regional specific FY11 accomplishments are presented in Tables 2 – 9.

5. Budget Narrative and Budget

FY11 allocation was based upon an expected appropriation of \$18.296M. This includes the continued availability of the \$12M first appropriated in FY10, plus an additional \$6.296M internally reprogrammed within the NWRS. The initial \$12M provided \$3M to the Natural Resource Program Center and \$1.125M per region. The initial appropriation was focused largely on capacity in terms of permanent employees to both initiate and sustain the NWRS Inventory & Monitoring (I&M) effort and on IT investments for data management and storage.

Table 1. Inventory and Monitoring Activities and Accomplishments for FY11.

Blueprint Tasks	Project or Theme	Product/Status
I&M PRIORITIES		
1A	Abiotic Inventory Compile and distribute on request existing abiotic data sets as identified in Fulfilling the Promise WH8.1	Data gaps in the core layers of refuge abiotic resources cited in Fulfilling the Promise WH8.1 have been identified and we are working with the regions to prioritize their acquisition. We are able to distribute available core abiotic layers to any Refuge upon request. These layers are: a. Topography b. Aerial Photography c. Hydrography d. Soils e. Boundaries (refuge easements, right-of-ways, wilderness areas, political, etc.) f. Infrastructure (roads, culverts, dams, water structures, buildings, power lines, underground utilities, NGS survey markers, bench marks Collaborating with NWRS Geospatial Advisory Committee (GAC) and others to develop standards and solutions for acquiring NWRS infrastructure datasets. Funded LiDAR data acquisition across the region to improve digital elevation maps necessary for various models such as SLAMM.

Blueprint Tasks	Project or Theme	Product/Status
1C	T&E ESA Species Reporting to Ecological Services	List of species currently present and historically occurring on refuges was derived from geospatial data currently stored in ECOS and crosschecked with refuge data available in the CCPs. 1. Over 14,000 occurrences noted 2. Presented in spreadsheet by refuge 3. Will be available for validation by refuge Coordinating with Ecological Services to provide an online database for data entry 1. Will be integrated with ECOS 2. Information format similar to what other Agencies use to submit required T&E information
2A	Water Quality and Quantity Assessment	Agree on standard water parameters that would be measured universally across the NWRS Identify standard protocols for measuring quantity and quality, from USGS and EPA Identify/develop data management procedures Identify logistics for field collection (i.e., through the NRPC or through Regions) Identify pilot refuges/refuge complexes to initiate data collection

Blueprint Tasks	Project or Theme	Product/Status
4B	Phenology Partner with the USA National Phenology Network by developing a landing page or portal for the NWRS on the USA-NPN webpage	Completed initial scoping effort Determined species and protocols used by USA-NPN (308 of the 474 species are categorized as plants) Investigate ease of data input and output for refuge specific use (designed for citizen science input) Preliminary assessment of QA/QC procedures in place (includes comprehensive training materials and species profile pages) Initial assessment of number of refuges currently using USA-NPN database to store phenological data (13 stations currently utilizing the USA-NPN database) Initiated discussions to develop FWS node on USA-NPN website
ABIOTIC RESOURCES		
1B	HGM Support and funding for HydroGeomorphic (HGM) analyses	Regions (all except R7) have identified priority refuges for HGM analyses. We have completed 20 HGMs System-wide, with an additional 23 in progress.
2A	WRIA Provide support and funding for reconnaissance-level inventory of water resources as delineated in Water Resource Inventory and Assessments (WRIA)	Regions have identified priority refuges for WRIAs, and in many cases are being coordinated with Hydrogeomorphic analyses, CCPs, and/or HMPs. We have completed 12 WRIAs, with another 26 in progress.
2B	Develop method for assessing shifts in fire regime	Collaborative discussions with the National Fire office staff to determine feasibility of augmenting LANDFIRE data to model reference conditions for NWRS fire-scapes are ongoing.

Blueprint Tasks	Project or Theme	Product/Status
5A	Models and Predictions of Climate Induced Change in Oceanographic Variables	Regional coordination and collaboration with the Climate Science Centers is ongoing.
5B	Coastal Shoreline Change Monitoring	Regions 4 and 5 have implemented Sediment Elevation Tables (SETs) in salt marsh areas in an effort to measure salt marsh elevation changes. This information will also be used to improve coefficients in SLAMM.
5B	Coastal Sea Level Rise Modeling Sea Level Affecting Marshes Model (SLAMM)	69 SLAMM models have been completed for coastal refuges, 20 models are currently being updated with improved digital elevation data.
6A	Arctic and High-latitude Environmental Change Provide management relevance of models and predictions	Region 7 staff are collaborating with the Western Alaska LCC and Alaska CSC to address science and management needs related to application of climate down-scale models.
Data Mng. 1 Data Mng. 5	PRIMR Implementation and Development	Developed and deployed pilot desktop database currently in use. Most regions some base level of implementation. Evaluating and assessing consistency and quality of regional data for Service wide applicability. PRIMR sub-team charged to produce a data dictionary and streamline several input fields.

Blueprint Tasks	Project or Theme	Product/Status
1C Data Mng. 1 Data Mng. 3	ServCat Development and Pilot Implementation	Worked with NPS to create a desktop Access version of the NPS Reference database prior to centralization and migration of the full database Initiated ServCat Implementation Pilot to be conducted on 10 refuges in all eight regions. Created about 250 ServCat records for each pilot refuge.
General	Wilderness Character Monitoring Pilot Implementation	All of the major federal land management agencies using common definitions to collect data on wilderness areas Ten Wilderness Character Monitoring Fellows are currently at refuges to assess wilderness character 18 refuges from six regions are participating First set of measures coming in from half the refuges 18 refuges will be assessed before the end of November 2011
Data Mng. 2 Data Mng. 7	Design and Development of an Integrated Refuge Information System - IRIS	Partnership with ECOS established to initiate the design, development of an Integrated Refuge Information System. Currently designing and developing new I&M funded systems such as ServCat , PRIMR, and WRIA to be hosted on ECOS platform.
BIOTIC RESOURCES		
1D 1F	Aquatic Inventories and Monitoring Support of Adaptive Management Projects	Regions are conducting various types of aquatic inventories that includes surveys or diatoms, macroinvertebrates, fish, riparian and submergent vegetation.
1D 1F	Mammalian Inventories and Monitoring Support of Adaptive Management Projects	Regions are conducting various types of mammalian inventories on local stations.
1E 1F	Vegetation/Habitat Mapping Design a strategic process for completing vegetative inventories and cover maps Support of Adaptive Management Projects	A cross-regional team has been established to address this effort. Most regions have initiated refuge specific projects related to this effort.

Blueprint Tasks	Project or Theme	Product/Status
3A 1F	Invasive Species Inventories and Monitoring Implementation of Invasive Plants Mapping Pilot Support of Adaptive Management Projects	Mapping pilots were initiated on four refuges in priority LCCs. Estimated acres inventoried at each refuge are: Alligator River NWR, 5,500 acres; Quivara NWR, 11,000 acres; and Silvio O. Conte NWR, 1,200 acres. Regional efforts include refuge specific adaptive management projects that include inventories, prioritization, and management.
4A	Ecosystem Vulnerability Assessments (EVA)	Implemented the pilot refuge vulnerability assessments at two refuges: Hart Mountain National Antelope NWR and Eastern Shore of Virginia NWR.
4C	Bird Inventories and Monitoring Coordinate with Migratory Bird Program	Regional participation on the I&M Bird Team facilitates coordination and collaboration across Service programs. Attended the annual ARD Migratory Bird Program meeting to discuss areas of potential collaboration Worked with the Avian Health and Disease Program National Coordinator on collaborative efforts Focus is on standardizing protocols for secretive marsh bird and landbird monitoring efforts.
LCC COLLABORATION		
	Coordination and Collaboration with Landscape Conservation Cooperatives (LCCs)	All regions are coordinating with associated LCCs and have initiated projects in the following LCCs: • Great Basin • Great Northern • North Pacific • Pacific Islands • Great Plains • Plains Prairie Potholes • South Atlantic • Northern Atlantic • Southern Rockies • Western Alaska • Arctic • Northwestern Interior Forest • California

**Regional Specific FY11 Accomplishments
Tables 2-9**

Table 2. Pacific Region, R1, Inventory and Monitoring Program Activities, Staff, Funding, and Status During FY2011. (P=Planned, F=Funded, IP= In Progress, C=Completed, I=I&M, R=Refuge, and O=Other).

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
ASSEMBLE EXISTING ABIOTIC DATA SETS FOR NWRs LANDS					
1A	Worked with contracted GIS specialist (Melanie Wadsworth) to compile and consolidate refuge-specific abiotic data in refuge geodatabases. Coordinated with Water Resource Branch (ENG) to customize RLGIS feature classes to accept water resource inventory data. These data are being integrated into WRIA reports for R1 NWRs.	Abiotic geospatial data added to RLGIS for 13 Region 1 NWRs (water flow, points of diversion, WCS with invert elevations, impaired waters, wetland names)	Erin Stockenberg	I,R	IP
	During refuge I&M reviews, assessed and evaluated completeness of existing data and identified gaps for abiotic data (see Tasks 1F and 3A below).	Started Part 1 of I&M plan for 13 R1 NWRs	All	I,R	IP
	Continued to coordinate on a multiple phased impaired waters projects with USGS-BRD scientists (PIs), R3 representatives, and Michael Higgins	Manuscript published on impaired waters pilot project for refuges in OR and WA. USGS to deliver geospatial datasets for with most current 303d, 305b, and TMDLs for refuges in OR and WA as well as other states including MN, AR, and AZ.	Erin Stockenberg, Kevin Kilbride	I	IP
	Assisted refuge staffs with contract/scope of work for LiDAR acquisition for 2 R1 NWRs plus QA/QC	LiDAR at appropriate contour resolution for resource mgmt at 2 R1 NWRs	Erin Stockenberg	I	IP
CONDUCT REFUGE HGMs					
1B	Coordinated with HGM contractor to prepare a schedule for and start HGMs for 5 R1 NWRs. Coordinated with national I&M team and HGM contractor to integrate WRIA with HGM processes.	Scope of Work for 5 R1 HGMs	Erin Stockenberg, Kevin Kilbirde	I,R	IP
	Coordinated with refuge staffs and participated in site visits for 2 R1 NWR HGM meetings. Conducted data mining needed to support HGMs. Identified refuges to start additional HGMs during this FY.	Phase 1 HGM kick-off reports completed for 2 R1 NWRs. Excel spreadsheet with HGM biotic and abiotic data for each refuge with HGMs started in R1.	All	I,R	IP

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
	Worked with refuge staff to initiate HGMs for 2 R1 NWRs during FY2012.	On-going work to complete HGM spreadsheet for 2 HGMs to start on R1 NWRs during early FY2012. Funded new start HGM on R1 NWRs during FY2012.	Kevin Kilbride, Erin Stockenberg, Brian Root, Jenny Barnett	I,R	IP
LEGACY DATA FOR NWRs					
1C	Coordinated with national I&M team to evaluate use of GRAS pilot to store existing refuge I&M data, reports, and I&M plans for refuges.	Participated on webinars, conference calls, and meetings evaluating the storage of refuge legacy data	All	I	IR
	During refuge I&M needs assessments, collected information about I&M activities that have been conducted on and adjacent to refuges in the past that represent legacy data (see Tasks 1F and 3A below).	Started Part 1 of I&M plan for 14 R1 NWRs	All	I	C
	Identified R1 NWRs to participate in GRAS pilot project	2 R1 NWRs to participate in GRAS pilot.	Erin Stockenberg, Kevin Kilbride	I	IP
	During refuge needs assessment visits, collected information about historic I&M activities that represent legacy data	Populated PRIMR for R1 NWRs	Jared Underwood, Jean Kenyon, Brian Root, Jenny Barnett	I,R	IP
	Assisted refuge staff with analyzing legacy datasets for seabirds, finches, vegetation, brine flies, lake-level for Laysan Island to evaluate current protocols and population trends.	Report provided to refuge staff and results submitted for peer reviewed publication.	Jared Underwood	I	C,IP
	Assisted refuge staff with analyzing legacy datasets for endangered HI waterbirds at James Campbell NWRs to understand long-term population trends and response to habitat management	Report provided to refuge staff and results in preparation for peer review publication	Jared Underwood	I,O	C
	Initiated project to assist refuge staff to analyze legacy datasets for endangered HI waterbirds on all HI NWRs.	Report provided to refuge staff and results in preparation for peer review publication	Jared Underwood	I,O	C
	Analyzed legacy datasets for coral species inventories in federally protected marine waters under US jurisdiction	Peer-reviewed publication in <i>Journal of Marine Biology</i>	Jean Kenyon	I	C
	Analyzed legacy datasets for coral and other benthic surveys conducted at Rose Atoll and Kingman Reef NWRs	Two peer-reviewed publications in <i>Atoll Research Bulletin</i>	Jean Kenyon	I	C
BIOTIC I&M ON NWRs					

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
1D	Prepared a RFP and to solicit refuge I&M projects and prioritize for distribution of available program funding.	45 refuge I&M projects for Region 1 refuges with rankings. Memo prepared that identified 21 projects that were selected for funding. Provided assistance with funding documents such as interagency agreements, contracts, and acquisition requests.	All	I,R	IP
	Coordinated with R1 Pollinator Coordinator to conduct inventories of select invertebrates on refuge lands. Developed Pollinator database (MS Access) to store these data.	Report to be prepared that summarizes results of bee inventories conducted on R1NWRs. Inventory data entered into R1 Pollinator database.	Erin Stockenberg, Kevin Kilbride, Jenny Barnett, Brian Root	I,R	IP
	Coordinated with and assisted refuge staffs to conduct inventory of bat species using select R1 NWRs	Bat inventories started on select refuges in GN and GB LCC.	Jenny Barnett	I,R	IP

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
All	Refuge I&M Projects: Conduct inventory of native fishes at Sheldon Hart Mnt NWRC Conduct range-wide inventory of two federally listed plants on R1 NWRs on the westside of Oregon and Washington Spotted frog inventory at Malheur NWR Bull trout spawning survey at Kootenai NWR Develop inventory protocols for Frogs in GN and GB LCCs Inventory of reptile and amphibians on OR Islands NWR Pearl shell mussel monitoring at Willapa NWR Estuary restoration monitoring handbook Tidal range monitoring and analysis for estuary restoration projects at Nisqually NWR Prairie remnant survey at Blackwater RNA for Ridgefield NWR Monitoring fish response to tidal restoration at Bandon Marsh NWR	1st field season completed during summer 2011. Field survey work completed during summer 2011. Report to be generated from contract work. Report to be completed by FWS Fisheries staff Report to be generated from contract work. Report to be generated by UGSG-BRD PIs Report to be generated by refuge staff Estuary restoration monitoring handbook to be generated by UGSG-BRD PIs Report to be generated by UGSG-BRD PIs Mapping and report to be generated by refuge staff Report to be generated by FWS Fisheries staff	All Note: Role of I&M staff was primarily limited to the funding process: developing RFP; reviewing and selecting proposals; and limited assistance in contracting and/or purchasing. Refuge staffs, who prepared the proposals under the RFP and interfaced with contractors (where applicable), are responsible for final reports and projects.	I,R	IP
4C	See I&M projects listed under the Bird Monitoring section below.				
DEVELOP STANDARDIZED VEG MAPPING FOR REFUGE LANDSCAPES					
1E	Participated on natl I&M team to develop a range of standards and protocols for veg mapping considering refuge-specific needs for resource management	Participated on regular conference calls for natl veg mapping team	Erin Stockenberg	I	IP

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
	Under the RFP for refuge I&M projects, reviewed, selected, and provided administrative support to assist refuge staff at Camas NWR with starting a veg mapping pilot project to integrate/crosswalk with refuge habitat mapping as well as HGM and WRIA efforts	Proposal developed for veg mapping project. Report for veg mapping pilot project to be generated by RO Refuge Information Branch staff	Erin Stockenberg, Jenny Barnett	I,R	IP
SUPPORT ADAPTIVE MANAGEMENT					
1F, 3A	Developed a consistent approach to conduct Refuge I&M reviews (needs assessments) to assist refuge staffs in developing Part I of a Refuge I&M Plan.	Data base, user guidance, and other supporting documentation for storing information about current and needed I&M activities for a refuge (Part 1 of I&M Plan).	All	I	C
	Conducted site visits to assist refuge staffs in conducting I&M needs assessment to develop Part 1 of a Refuge I&M Plan	Started Part 1 of I&M plan for 13 R1 NWRs	Jean Kenyon, Jared Underwood, Brian Root, Jenny Barnett	I	IP
	Throughout the entire FY, coordinated with Alsea Geospatial (contractor) to develop a beta version of the Refuge Habitat Mgmt Database (RHMD). Conduct beta testing with select NWRS staffs in Region 1 and other regions for tracking CCP and HMP habitat objectives. Summarize and present results of the beta testing to identify needed enhancements to the develop version 2 of the database for distribution and use by refuge staffs throughout Region 1.	Beta version of RHMD for regional/natl rollout to refuge staffs to facilitate adaptive resource mgmt. Report summarizing enhancements identified during beta testing by region. Considering the extensiveness of comments during beta testing, potentially deliver the second version of RHMD to the NWRS.	All	I	IP
	Provided ongoing technical assistance and guidance on adaptive management especially in terms of CCP development for refuges.	Provide assistance with development of alternatives chapters for R1 NWR CCPs, especially resource management G&Os as well as I&M strategies.	All	I	IP
	Coordinated with Regional Fire staff to standardize hazardous fuels treatment surveys (smoke, fuels, weather, fire behavior, fuels reduction) for R1 I&M Plans (PRIMR). GIS technician (SWCA contract) assisting R1 NWRs with hazardous fuels perimeter mapping and associated metadata entry into NFPORS	Geodatabase files with implementation information regarding hazardous fuel treatments for R1 NWRs. Shape files with fuel treatments for R1 NWRs	All	I	IP

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
	Under the RFP for refuge I&M projects, reviewed, selected, and provided administrative support to assist the refuge staff for analyzing monitoring data collected for Weather Station Fire Rehabilitation Treatments at Hanford NM	Report to be generated by contractor from data analyses	Jenny Barnett	I,R	IP
	Assisted refuge staff with development of veg survey protocols for Laysan Island NWR	New protocol	Jared Underwood	I	IP
	Assisted refuge staff with development of a photo point protocol for James Campbell NWR	New protocol	Jared Underwood	I	C
	Assisted refuge staff with development of protocol to evaluate herbicide efficacy	Communication	Jared Underwood	I	C
CONDUCT REFUGE WRIAs					
2A	Coordinated with Water Resources Branch (ENG) to schedule and conduct WRIAs on R1 Refuges. See Task 1A (assembling abiotic data sets stored in a geodatabase - RLGIS)	Abiotic geospatial data layers added to RLGIS for 13Region 1 NWRs to start WRIA reports and support HGM work	Erin Stockenberg, Kevin Kilbride	I,R	IP
	Worked with the natl water team developing water quality assessment tools for WRIA process	WRIA database under development	Kevin Kilbride	I	IP
	Worked with National Water Team, WO-DEQ, USGS-BRD to develop a water quality assessment tool/procedure in conjunction with the WRIA process. Tool will evaluate existing and proposed refuge water supplies.	WQ assessment tool and associated handbook for existing refuge water supplies under development by USGS-BRD PIs	Kevin Kilbride, Erin Stockenberg	I	IP
	Coordinated with hydrologists in Water Resources Branch to draft WRIA reports for R1 NWRs	Started development of WRIA reports for 4 R1 NWRs	Kevin Kilbride, Erin Stockenberg	I	IP
PILOT PROJECTS FOR INVASIVE PLANTS					
3A	Reviewed pilot project protocols for the national invasive species pilot I&M project that is developing a range of protocols for invasive species mapping and monitoring.	Reviewed pilot project protocols.	Kevin Kilbride	I	IP
	Administered the Invasive and Volunteers program for distribution of funding to conduct I&M and mapping activities for invasive species.	Reviewed and selected proposals for funding and implementation on R1 NWRs	Kevin Kilbride	R	I
	Assisted refuge staff with design of mapping activities associated with implementing invasive plant mgmt	New protocol for mapping invasive plants	Jared Underwood	I	IP
ECOSYSTEM VULNERABILITY					
4A	Reviewed Sheldon-Hart Mnt. NWRC Vulnerability Assessment Report. Participated on conference call with NatureServe and refuge staff to discuss comments	Reviewed and provided comments on RVA report	Kevin Kilbride	I	C

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
	See Task 5A addressing vulnerability of coastal areas to sea level rise and other stressors.				
	See Task 2A for conducting WRI&As to assess threats to hydrological processes on the refuge.				
PHENOLOGY					
4B	Coordinated with Ridgefield NWR biologist completed the refuge phenological survey developed by natl office	Coordinated with refuge biologist who completed the refuge phenological survey	Kevin Kilbride	I,R	C
BIRD MONITORING					
	Identified a Region 1 representative to participate on natl avian I&M team. Coordinated with landbird monitoring initiative in OR and WA.	Participated on webinars and conference calls. Reviewed documents drafted by team.	Brian Root, Jenny Barnett, Kevin Kilbride	I	C
	Coordinated/participated/supported regionally-based migratory bird inventory and monitoring activities in R1 (e.g., Westside of Cascade coordinated Canada goose survey)	New protocol. Prepared reports summarizing regionally-based migratory bird surveys in R1 on and off refuges on westside of OR and WA.	Brian Root, Kevin Kilbride	I	C
4C	Refuge I&M Projects: Monitor streaked horn lark use of agricultural lands on Willamette Valley NWRC Determine disturbance impacts of fireworks at Coquille Pt seabird colony Monitor population changes within seabird colonies in response to climate change and other stressors at WA Maritime NWRC Population size of endangered HI ducks and prevalence of mallard hybrids at Hanalei NWR Population size of endangered HI ducks and prevalence of mallard hybrids at Hanalei NWR Changes in avian disease and mosquito vector prevalence at Hakalau NWR: 15 year perspective and assessment of future risk to listed forest birds	Report to be generated from contract work. Field data collected and refuge staff preparing report Report to be prepared by refuge biologist Report to be prepared by OSU PI Report to be prepared by OSU PI Report to be prepared by USGS-BRD PI	All Note: Role of I&M staff was primarily limited to the funding process: developing RFP; reviewing and selecting proposals; and limited assistance in contracting and/or purchasing. Refuge staffs, who prepared the proposals under the RFP and interfaced with contractors (where applicable), are responsible for final reports and projects.	I,R	IP
	Participated/supported regionally based migratory bird inventory and monitoring activities in HI	Report for improving the protocol	Jared Underwood	I	IP
	Participated in review of protocol for waterbird and shorebird surveys in HI.	Report for improving the protocol developed and then implemented	Jared Underwood	I	IP

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
	Reviewed seabird monitoring protocol for Papahanamokuakea NM	Report for improving the protocol	Jared Underwood	I	IP
	Coordinated with Mig Bird Division to assess seabird monitoring for albatross and identify future needs	Report for albatross monitoring	Jared Underwood	I	IP
MODELING OF SEA LEVEL RISE ON COASTAL REFUGES					
5A,5B	Assisted with startup of PICCC funded proposal to model sea level rise impact on James Campbell NWR to develop responsive strategies	Sea level rise maps and models. Workshops to train partners in climate change science and assess assets at risk.	Jean Kenyon	O (PICCC)	IP
	Coordinated and conducted sea level rise workshop for North Pacific LCC. Coordinated with scientists developing proposals to collect data necessary to refine better modeling of sea level rise impacts for coastal OR and WA.	SLR Workshop conducted in Newport, OR on Feb 2011. Report summarizing workshop findings.	Erin Stockenberg, Brian Root	I,R	C
	Under the RFP for refuge I&M projects, reviewed, selected, and provided administrative support for project entitled Predicting the impact of storm waves and sea level rise at Papahanamokuakea NM	Report to be prepared by UGSG-BRD PI	Jean Kenyon, Jared Underwood	I,R	IP
	Participated on Regional Climate Board to develop a coastal adaptation strategy proposal to address sea level rise and other stressors for coastal OR and WA.	Review and finalize proposal for the coastal adaptation strategy address sea level rise	Kevin Kilbride, Erin Stockenberg	I	IP
	Provided oversight of contractor for SLAMM analyses completed for 4 R1 NWRs with an additional 3 NWRs planned for FY 2012	SLAMM reports	Erin Stockenberg	I	IP

Table 3. Southwest Region, R2, Inventory and Monitoring Program Activities, Staff, Funding, and Status During FY2011. (P=Planned, F=Funded, IP= In Progress, C=Completed, I=I&M, R=Refuge, and O=Other).

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
STATUS OF STATION HABITAT MANAGEMENT PLANS AND I&M PLANS					
3.1.1.	<i>Status of station Habitat Management Plans</i> In progress for all refuges.		Hughes	I&M, O, R	IP
3.1.2.	<i>Status of station Inventory and Monitoring Plans</i> In progress using new PRIMR Database.	Phase I to be completed for all refuges by end of FY2011. Phase II to be completed by end of FY2012 for all refuges.	All	I&M, O, R	IP
IDENTIFY I&M PRIORITIES					
General A	<i>Information needs assessment</i>	Scoping databases PRIM to be filled out by refuge staff and completed by November, 2011	All	I&M, R	IP
General B	<i>Coordinate with existing NWRS</i>	Ongoing	All	I&M, O	
General C	<i>Collaborate and build partnerships with other Service programs, the LCCs, and other agencies</i>	Ongoing	All	I&M, O	
ABIOTIC RESOURCES - INVENTORIES					
1A	<i>Assemble existing abiotic datasets for NWRS</i> Sequoyah NWR Wetland Review abiotic data package.	Data package.	Tashjian Cullinan Hautzinger Burke	O	C
	<i>South Texas Complex abiotic data package</i>	Data package	Burke	O	IP
1A, 2A	<i>Assemble existing abiotic datasets for NWRS Managers</i> Hydrologic, water quality, climatologic data	Hydrologic data collection at 15 R2 NWRS with over 232 individual monitoring sites. Management of data in database (WISKI).	Kundargi	O	C
1B	<i>Hydrogeomorphic Analysis</i> Sequoyah, Aransas and Lower Rio Grande NWR.	1) Initiated HGMs at Sequoyah NWR and Aransas NWR 2) Conducted Wetland Review at Sequoyah NWR3) Lower Rio Grande Wetland review underway to be completed Feb 2012	Tashjian	O	IP

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
ABIOTIC RESOURCES - MONITORING					
2A	<i>Water Resource Inventory and Assessment (WRIA)</i> Assist with tool development.	1) Draft WRIAs for Muleshoe NWR and Sequoyah NWR	Tashjian Cullinan	O	IP
2A	<i>Water Resource Inventory and Assessment (WRIA)</i> Seeps, springs, and tinajas at Refuges and Parks in Sonora and Chihuahua Deserts.	Working with NPS in data sharing agreement.	NPS and FWS sharing one GS-6 crew leader and 2 SCAs.	O, I&M	F, IP
BIOTIC RESOURCES: INVENTORIES					
1C	<i>Legacy Data Geospatial Referencing and Archiving System (GRAS) pilot program</i>	Aransas NWR to be archived as part of the GRAS pilot program on Oct 31-Nov 4, 2011	Eichhorn Hughes	I&M, R	C, IP
4A	<i>Inventory and status of native grasslands for Sonoran pronghorn in CA and AZ</i>	Potential sites evaluated based on size of area, land status, presence of forage, barriers and past pronghorn use. Chuckwalla bench site in CA looks promising	Harris L. Johnson	I&M	C
4A	<i>Inventory and status of habitat for Masked Bobwhite in Sonora, Mexico</i>	Analysis done by aerial survey, interviews, field visits and remote sensing. Two potential sites identified. Both will receive further ground reconnaissance in 2012	Harris	I&M	IP
4A	<i>Inventory and evaluate genetics of 5 subspecies of C. virginianus, including the Masked bobwhite C. v. ridgwayi.</i>	Samples taken from museums and in the field in southern Mexico. All samples currently being analyzed.	Harris	I&M	IP
4A	<i>Inventory to map the remaining habitat of the Golden-cheeked warbler across its entire range.</i>	This includes 50 counties in the Balconies Canyonlands, from San Antonio, TX to southwest of Dallas/Fort Worth, TX. This project is ongoing.	Mueller Sesnie Harris	I&M	P
1E	<i>Vegetation Mapping</i> As identified and needed.	Vegetation Map	Lindsey	O, I&M	IP

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
1D	<i>Design and implement pilot studies</i> Design and implement at least four pilot studies across the NWRS to contrast approaches for inventorying the occurrence of vertebrates, vascular plants, and a subset of invertebrates.	Use of camera traps as an I&M tool: For faunal presence, occupancy, and activity patterns. The work evaluates the number of cameras necessary and their spatial arrangement. Initial focus on ocelots in southern TX.	Harris Butler Sternberg	I&M	IP
		Project to design and field test methodology for quantifying density and/or abundance estimates of unmarked animals. Focus on large mammals, especially elk at Bosque del Apache NWR.	Harris Butler Vradenberg	I&M	IP
		Whooping crane modeling, timing or arrival and departure, population forecasting.	Butler Harris	I&M	IP

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
BIOTIC RESOURCES: MONITORING					
1F, 4C	<i>Review bird monitoring efforts and tools</i> Waterfowl surveys provide a minimum count of waterfowl presence on a Refuge at a given time. We are re-evaluating these surveys to provide more robust estimates. We are also designing methods to: A) Capture ground data describing vegetation type, structure and composition at the sites where aerial waterfowl counts occur. B) Gain information describing regional patterns of climate (especially precipitation), and forage availability (such as type of agricultural production, location and amount).	This work enables: 1) Evaluating how the above variables - regional climatic patterns, neighboring land use, and the type, amount and timing of Refuge forage production links to presence of various species of waterfowl on Refuge. 2) Greater predictive ability and planning for how we anticipate waterfowl to use Refuges in a given year, which subsequently impacts how Refuges manage their lands (what vegetation to manage for, what cycle of waterfowl biology to emphasize, and which species). 3) Improved integration of Refuge waterfowl management within geographical areas. This would include yearly coordination among Refuges in terms of what vegetation, amount, and location of that vegetation on these Refuges, to maximize for waterfowl benefit.	Harris Mig. Bird Zone Biol. Refuges	I&M	IP
1F	<i>Analysis of avian carcass counts at the Aeroacoustic Research Complex, White Sands Missile Range, Socorro County, New Mexico, 2009–2010.</i>	Modeling indicated avian collisions with towers were greater in the fall than in the spring though data were limited. Contact Bosque del Apache biological staff for more information.	Butler Vradenberg	I&M	C

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
General	<i>Develop a monitoring protocol for black-tailed prairie dogs</i>	Protocol involves both annual mapping of colony perimeter and estimating dog density within colonies. Implemented black-tailed prairie dog monitoring at Buffalo Lake NWR, Muleshoe NWR, and Maxwell NWR	B. Johnson	I&M	C
General	<i>Implemented grassland bird monitoring (breeding season) at Muleshoe NWR</i>		B. Johnson	I&M	C
1D	<i>Using novel technology and methodology to improve quantification of bats leaving caves</i>	Infrared cameras were used in conjunction with visual observation to aid in the identification and enumeration of Ozark big-eared bats leaving caves.	P. Schmidt	I&M	IP
1D	<i>Evaluating use of molted golden eagle feathers collected at nest sites to estimate turnover rates of adult eagles</i>	The eagle genetics work is progressing in collaboration with the genetics lab at the University of Arizona Cooperative Research Unit.	B. Milsap	I&M	IP
General	<i>Determination of unionid mussel dispersal through host fish movement and juvenile drift on the Little River NWR</i>		B. Johnson	I&M	IP
ECOSYSTEM VULNERABILITY					
4A	<i>Vulnerability studies</i> Inventory and evaluation of playa wetlands in western TX and OK	Occurrence of playas was assessed in eight counties in Texas.	Harris B. Johnson	I&M	IP
STRESSORS: CLIMATE CHANGE					
6A	Modeling which climatic variables drive 25 ecological systems across the southwest. Using data downscaling to project these climatic drivers over the next 50 years. Modeling how these ecological systems shift dynamically over time. Evaluate how well faunal species will track these changes.	Modeled 10 of these ecological systems and determined drivers. The remainder will be completed by 12/2012. Retrospective analysis being conducted to now locate vegetation change.	Harris	I&M	IP

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
STRESSORS: FIRE					
2B	Develop benchmarks for assessment of shifts in fire regimes, Fire Atlases.	Fire Atlases are completed for Balcones, Sevilleta and Bosque del Apache NWR. In progress for Texas Mid-Coast Complex and remaining Refuges in New Mexico.	Kaib Gromatsky Lindsey	O	C, IP
STRESSORS: PHENOLOGY					
4B	<i>Phenology</i>	Ongoing In-reach to Refuge Units and or Complex on National Phenology Network opportunities.	All	O, I&M	P
STRESSORS: INVASIVE SPECIES					
3A	<i>Invasive plant control and monitoring</i> Use of remote sensing technology to predict distribution of McCartney Rose at Atwater Prairie Chicken NWR.	Methods are being fine-tuned and models reevaluated to improve initial output.	Lindsey	I&M	C
ADAPTIVE MANAGEMENT PROJECTS					
1F	<i>I&M evaluation of wildlife drinkers</i> Project sets camera traps at artificial drinkers and natural springs in the Mojave, Sonora and Chihuahua deserts to evaluate patterns of use between desert bighorn sheep and mountain lions.	Evaluate efficacy of management technique. Big Horn Sheep, mountain lion and mule deer population being assembled. Half of data collection complete.	Harris L. Johnson	I&M	IP
1F	<i>Evaluating farming practices at Bosque del Apache NWR.</i> Using combinations of traditional farming techniques, heirloom crops, composite planting and conventional farming.	First growing season complete, using results to form plan for next growing season	Vradenberg	I&M, R	IP
DATA MANAGEMENT					
Task A, DM1	<i>Information needs assessment</i> Provide a minimum count of waterfowl presence on a refuge at a given time We are re-evaluating these surveys to provide more robust estimates.	Designing methods to: Capture ground data describing vegetation type, structure and composition at the sites where aerial waterfowl counts occur. Gain information describing regional patterns of climate (especially precipitation), and forage availability (such as type of agricultural production, location and amount).	Harris Vradenberg B. Johnson	I&M, O, R	IP

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
1C	<i>Legacy Data</i> Pilot Geospatial Referencing and Archiving System (GRAS) at Aransas NWR	Capture legacy data	Hughes Eichhorn	I&M	C
DM7	<i>I&M Data Standards and Governance teams</i>	Participate on Team	Eichhorn	I&M	
DM8	<i>Landbird monitoring database</i>	Attend Webinars and Conference Call to determine program effectiveness and expansion	B. Johnson Ostrand Hughes Harris	I&M, R	
DM7	<i>Developing data management plans for current and future projects.</i>	Compared the black tailed prairie dog data standards with the RLGIS. Examining the National Science Foundation's recommended ways to create data management plans. Looking at the DataOne Dryad (the archiving service) for potential guidance for data management and archiving.	Eichhorn	I&M	IP
DM1	<i>Critically evaluating databases used in Natural Resources such as Fire, Hydrology, and Invasive Species to meet I&M needs.</i>	Invasives completed and others in progress	Eichhorn	I&M	C, IP
DM9	<i>Working with counterparts at the NPS I&M Networks to determine data overlaps and data management related to seeps, springs and tinajas.</i>		Eichhorn	I&M	IP
DM9	<i>Develop a data management plan for the inventory of playa wetlands</i>		Eichhorn		IP
DM1	<i>Determine Invasive Species data structure and data management plan, review other 'state-based' Invasive Species database (TX) and provide GIS/GPS training to help the Invasives Strike Team with capturing and using the data and understanding the file structure.</i>		Eichhorn		IP
DM1	<i>Develop a data management plan/geospatial tools for the Ungulate Survey Protocol</i>		Eichhorn		P
DM5	<i>Develop a data management plan for the Camera Trapping Protocol</i>		Eichhorn		IP

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
DM5	<i>Work with Refuge Staff at Laguna Atascosa NWR to develop data standards/geospatial tools and a data management plan for shrub regeneration/regrowth over time in Ocelot habitat. Geospatial tools will assist with determining which time of year and reclamation regime has the best results for restoring Ocelot habitat</i>		Eichhorn		P
DM5	<i>Work with Refuge Staff at Sequoyah NWR to develop data standards/geospatial tools and a data management plan for wetland management/moist soil management related to soil types, mechanical treatments, etc. for waterfowl use and AM strategies. Wetland review was completed for Sequoyah NWR and part of this review included data transfers and GIS information</i>		Eichhorn		IP
DM5	<i>Develop a vegetation data management plan for the inventory and status of subtropical grasslands for masked bobwhites</i>		Eichhorn		IP
DM5	<i>Develop a vegetation data management plan for the inventory and status of native grasslands for Sonoran pronghorn</i>				P
DM3	<i>Develop a data management plans upcoming I&M protocols</i>	Looking at DataOne and Dryad for guidance on data management plans.			IP

Table 4. Great Lakes-Big Rivers Region, R3, Inventory and Monitoring Program Activities, Staff, Funding, and Status During FY2011. (P=Planned, F=Funded, IP= In Progress, C=Completed, I=I&M, R=Refuge, and O=Other).

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
IDENTIFY I&M PRIORITIES					
General A	<i>Status of station Habitat Management Plans (HMP)</i>	7 Final HMPs 20 In-progress 6 Initiating process	Refuge Biologists, Project Leaders, Zone Biologists RRB	R, I	IP
General A	<i>Status of station Inventory and Monitoring Plans</i>	42 stations with at least 50% of Part 1 of the IMP drafted (via conversion from old Survey database). Two completed Inventory and Monitoring Plans (completed prior to new Policy guidance.	Refuge Biologists, Project Leaders, Zone Biologists RRB	R, I	IP
General A	<i>Biological Needs Assessment, including inventory and monitoring priorities</i> Station visits completed in FY11, information will be summarized in FY12	Draft Biological Needs Assessment Report, including a summary of priorities for inventories and monitoring.	All DBR staff	R, I	IP
ABIOTIC RESOURCES – INVENTORIES					
1A	<i>Water Resource Inventory and Assessment (WRIA)</i> 2 completed, 1 in progress, 6 planned	3 new WRIAs initiated. Final reports for 2 stations.	Josh Eash, Brian Newman	R, I	IP
1B	<i>Hydrogeomorphic Analysis</i> 7 completed, 4 in progress, 3-5 proposed	4 new HGMs initiated. Final reports for 7 stations.	Josh Eash,	R, I	IP
ABIOTIC RESOURCES – MONITORING					
2A	<i>Water Monitoring – Refuge Stations</i> 12 stations have some form of water monitoring coordinated by the regional hydrology staff or the station. These 12 stations conduct their own monitoring or rely on monitoring by other agencies (USGS, ACE, States).	Training and consultation to individual stations to address specific needs. Review of reports.	Josh Eash, Jennifer Gruetzman	O	IP
2A	<i>Regional Water Monitoring Network</i>	Draft Surface Water Monitoring Protocols	Josh Eash, Jennifer Gruetzman	R, I	IP
BIOTIC RESOURCES – INVENTORIES					
1D	<i>Forest Inventory</i> The Great Lakes Biology Network (all refuge biologists) are conducting forest inventories on refuge lands within the Network.	Project Record, Fact Sheet, and protocols	Greg Corace	R	IP
1D, 3C	<i>Grassland Bird Inventory of Refuge Stations</i> (See Workshops below.)	Refine proposal, seek funding	Sara Vacek	R, O	IP

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
BIOTIC RESOURCES - MONITORING					
3C	<i>Bird Monitoring</i> National Bird Monitoring Team Provide leadership to National Bird Monitoring Team to address pressing bird monitoring issues shared by multiple Regions.	Schedule monthly conference calls, plan WebEx Seminars as needed.	Melinda Knutson	I	IP
3C	<i>Rank Regional Bird Monitoring Efforts in R3</i> Prioritize regional and national bird monitoring efforts in cooperation with FWS Migratory Bird Management. This info will be used to develop station IMPs.	Regional and national bird surveys ranked, by Region 3 station.	Melinda Knutson	I	P
3C	<i>Marsh bird Data Review</i> Review R3 marsh bird data in the USGS Patuxent WRC database and revise as needed.	10 'clean' data sets in the USGS Patuxent database ready for transfer to the Avian Knowledge Network	Kathy Bibby	R	IP
	<i>Savanna management and monitoring</i> Develop handbook for management of savanna ecosystems	Handbook	Pauline Drobney, Lizzy Berkley	I, R	IP
STRESSORS					
	<i>Climate Change</i> See Biological Needs Assessment (above) and symposium (below)				
4A	<i>SSP (R9 and R3): SHC in the face of climate change: Bridging the research-implementation gap and accounting for interactions among conservation threats</i> Project in Year 2	Examining stressors (like projected changes in climate and housing density over the next 100 years) and their affects on different organisms with different mobility among protected areas. FY11: Housing density and NWRS National-wide assessment completed.	Chris Hamilton, Pat Heglund	R, O	IP
1D	<i>National Pollinator Working Group</i>	Increase refuge awareness of management effects on pollinators	Wedge Watkins	R	IP
4A	<i>SSP (R9 and R3, above) and Federal Highways</i> <i>Funding: Refuge Vulnerability Assessment Handbook</i> Final draft in review	Draft handbook completed	Granholm, Collins, Harris, Adamcik, NatureServe	R, O	IP

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
ADAPTIVE MANAGEMENT PROJECTS					
1F, 3C	<i>Integrated Waterbirds Management and Monitoring Program (IWMM)</i> Multi-region, multi-agency project to manage and monitor migrating and wintering waterbirds, including waterfowl, shorebirds, and marsh birds. Partnership with Migratory Birds, states, NGO's (Agassiz, Clarence Cannon /Great River, Cypress Creek, Mingo, Port Louisa, Rice Lake, Seney, Squaw Creek, Trempealeau, Two Rivers NWR, Morris WMD, Upper Miss NWFR-La Crosse, Savanna, Winona Districts)	Formal Administrative Structure and Team Responsibilities. Project Record. Fact Sheets. Central database. Protocol. Upper Mississippi Regional Waterbird Team (Reg 3). Supplemental moist-soil veg assessment protocol (Reg. 3). 8 biotechs hired through DU contract Regions 3, 4, and 5 (primary funding from migratory birds). Partnership with EPA's national wetland condition to validate habitat assessments. 2 IWMM presentations at Midwest Coordinated Bird Monitoring Conference.	R3 lead - Brian Loges	R, I, O	IP
1F, 3A	<i>Native Prairie Adaptive Management (NPAM)</i> Multi-region project to sustain native plant communities on unplowed prairie. (R3 stations: Windom WMD, Big Stone NWR, Morris WMD, and Detroit Lakes WMD)	Poster presented at <i>Conserving the Future</i> Conference and at the Oct 2010 TWS Annual Conference.	R3 lead - Sara Vacek	R, I, O	IP
1F, 3C	<i>Impoundment management to support migratory waterbird use (RCRP)</i> Multi-region project to maximize waterfowl and shorebird use of refuge impoundments.	Final Report Recommendations to managers	Pat Heglund	R, O	IP
1F, 3A	<i>Cattail control through prescribed fire (RCRP)</i> Multi-region project to test the efficacy of controlled fires to minimize cattail dominance of wetlands.	Final Report Recommendations to managers	Pat Heglund	R, O	IP
1F, 3A	<i>Reed canary grass control and transition to wetland forests and meadows (RCRP)</i> Multi-region project to minimize reed canary grass dominance of forests and meadows. (Upper Mississippi River NWR, Winona, La Crosse, and McGregor Districts, Port Louisa NWR, Minnesota Valley NWR, Squaw Creek NWR, Swan Lake NWR)	Project Record, Fact Sheet, database, Sharepoint Decision Tool, and long-term protocols, Final Report, transition to FWS leadership	R3 - lead Kathy Bibby	R, I, O	IP

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
1F, 3A	<i>Restoring native plant diversity in native grasslands (AM Consultancy)</i> Multi-agency project to restore and maintain high quality native grasslands in Minnesota and the Dakotas. Partnership with The Nature Conservancy and MN DNR. R3 stations collecting data include Morris WMD and Glacial Ridge NWR. Big Stone NWR participated in project design.	Project Record, Fact Sheet, database, and protocols	Sara Vacek, coordinator, Jessica Dowler	R, I, O	IP
1F, 3A	<i>Use of sediment removal in wetland restorations (AM Consultancy)</i> Multi-station project to evaluate alternative strategies for restoring small wetland basins (Minnesota Private Lands Office, Morris WMD, Fergus Falls WMD, Detroit Lakes WMD, Windom WMD, Rydell NWR, Glacial Ridge NWR) Partnering with NRCS and MNDNR	Project Record, Fact Sheet, database, and protocols	Lori Stevenson	R, I, O	IP
1F, 3A	<i>Invasives in Forests (AM Consultancy)</i> Multi-station project to inventory invasive plants in forested stands, prioritize management, and conduct follow-up monitoring. (Big Oaks, Cypress Creek, Mingo, Muscatatuck, Patoka River)	Project Record, draft protocols	Sean Blomquist	R, I, O	IP
1F, 3A	<i>Lakeplain prairie restoration (AM consultancy)</i> Multi-station project to restore and maintain diverse prairie. (Shiawassee, Detroit River, Ottawa NWR)	Project Record, draft protocol	Eric Dunton, Sean Blomquist	R, I, O	IP
DATA MANAGEMENT					
General A	Fill regional database manager/IT position	Position filled	Pat Heglund	I	P
General A	Regional database of surveys revised	Revised database (completed)	Heglund	R	IP
General A	Individual databases are maintained for each AM Project (see above)	Data are verified, summarized, and archived	Database manager	I	IP
General A	Region 3 Time-Series Water Resources Database (WISKI)	Water monitoring data analysis, storage and reporting.	Jennifer Gruetzman	R, I	IP
General A	Data sharing: R3 refuge landbird and marshbird data will be shared from USGS Patuxent Wildlife Research Center to the Avian Knowledge Network. R3 did extensive marshbird database management in FY11 to prepare for this data sharing.	Avian Knowledge Network (AKN) will be updated with landbird and marshbird data	Mark Wimer (USGS) and Katie Koch (Migratory Birds)		IP

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
COMMUNICATION - TRAINING					
General	<i>Designing and Implementing a Biological Monitoring Program</i> , training at the National Conservation Training Center (NCTC)	Skilled Staff	Melinda Knutson (instructor) Sean Blomquist Jessica Dowler Eric Dunton Mick Hanan	I, R	C
1F	<i>Introduction to Structured Decision Making</i> , training at the National Conservation Training Center (NCTC)	Skilled Staff	Melinda Knutson (instructor) Sean Blomquist Brian Loges Pauline Drobney Mick Hanan	I, R	C
3C	<i>Landbird Banding Certification</i> Klamath Bird Observatory-led course offered at Pere Marquette State Park, IL. North American Banding Council Certification (NABC) to band land birds. One biologist was certified as a trainer.	Skilled Staff	Pat Heglund Brian Loges Mick Hanan	R,I	C
General	<i>Refuge Management Academy</i> , training at the National Conservation Training Center (NCTC)	Skilled Staff	Jessica Dowler	R	C
General	<i>The Leadership Institute</i> , leadership course through The Wildlife Society	Skilled Staff	Jessica Dowler	I,R	IP
General	<i>Specialty Tracked Training</i> , FWS training at Sherburne NWR	Skilled Staff	Jessica Dowler	I,R	C
1F	<i>Prairie Reconstruction Training</i> , FWS training at Madison WMD	Skilled Staff	Jessica Dowler	I,R	C
General	<i>USFWS/USGS Structured Decision Making Workshop-observer</i>	Skilled Staff	Pauline Drobney	I,R	C
General	<i>NWRS Biological Program Fundamentals</i> , training at the National Conservation Training Center (NCTC)	Skilled Staff	Pat Heglund Pauline Drobney Rich King (instructors) Sean Blomquist Brian Loges	I,R	C
1E	<i>Ecological Forestry Workshop</i> , training at the Joseph W. Jones Ecological Research Center	Skilled Staff	Sean Blomquist	I, R, O	C
1A	<i>Habitat Management Planning</i> , online training through the National Conservation Training Center (NCTC)	Skilled Staff	Pauline Drobney Pat Heglund (Instructors) Sean Blomquist Brian Loges Eric Dunton	I, R	C
General	<i>Multivariate Statistics</i> , training through The Ohio State University at Seney NWR	Skilled Staff	Sean Blomquist	I, R, O	C

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
1F	<i>Principles of Modeling</i> , training through the National Conservation Training Center (NCTC) held in Lacey, WA	Skilled Staff	Sean Blomquist	I, R	C
3A	<i>Field Techniques for Invasive Plant Management</i> , training through the National Conservation Training Center (NCTC) held at Ding Darling NWR	Skilled Staff	Sean Blomquist	I, R	P
General	<i>Applied Supervision</i> , training at the National Conservation Training Center (NCTC)	Skilled Staff	Josh Eash	R	C
2A	<i>ATV Safety Course</i> , training at the ATV Safety Institute. ATV certification will allow for the collect of topographic survey data on refuges.	Skilled Staff	Vince Capeder	R	C
General	MOCC, Ensure all agency boat operators are knowledgeable in agency policies & updates; ensure understanding of basic mechanics of boats & engines by participating in a practical hands on field test with a license operator; ensure student's understanding of the specific components and importance of float plans.	Skilled Staff	Mick Hanan	I, R	C
General	<i>Agricultural Tractor</i> , completion of the web-based Agricultural Tractor Pre-Class Study course SAF2000-OL and the SAF2000 Agricultural Tractor Safety Training Course.	Skilled Staff	Mick Hanan	I, R	C
General	<i>Skid Steer PRE-CLASS-UDT</i> , Web-based Skid Steer Pre-Class Study course SAF2004-OL is required prior to attending the SAF2004 Skid Steer Safety Training Course.	Skilled Staff	Mick Hanan	I, R	C
1F	<i>Moist Soil Management for Managers and Biologists</i> , Provide information for techniques and strategies for wetland management by manipulating water levels and soil disturbance to provide optimal habitat for waterbirds and other wildlife.	Skilled Staff	Mick Hanan Eric Dunton	I, R	C
General	<i>Environmental compliance</i> , training at Neal Smith NWR	Skilled Staff	Brian Newman	R	C
1B	<i>Basic wetland management</i> , training at Bosque del Apache NWR near Socorro, NM by Wetland management and educational services. HGM approach to wetland assessments.	Skilled Staff	Brian Newman	I, R	C
2A	<i>Real Time Kinematic GPS Training</i> – Training through Frontier Precision. Bloomington, MN.	Skilled Staff	Jennifer Gruetzman	I,R	C

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
2A	<i>Advanced WISKI Training (Time Series Water Resources database) – Training through Kisters North America Inc. Sacramento, CA</i>	Skilled Staff	Jennifer Gruetzman	I,R	C
COMMUNICATION - PROGRAM REVIEWS					
1F	<i>Refuge Cooperative Research Program (RCRP) Review</i> Workshop held to review the first five years of the program and recommend revisions. RCRP is a joint NWRs/USGS Program that employs adaptive management to address difficult resource management problems. Product will be a draft white paper summarizing the recommendations.	13-15 Oct. 2010	Pat Heglund Melinda Knutson	R, I, O	IP
COMMUNICATION - WORKSHOPS					
1F, 3A	<i>Invasive Species Management in Forested Habitats</i> Structured Decision Making workshop to continue to develop a multi-station adaptive management problem focused on reducing invasive species.	1-3 March 2011	Sean Blomquist	I, R	C
1D, 3C	<i>Grassland Bird Inventory of Refuge Stations</i> Planning meeting to revise proposal by The Nature Conservancy to conduct grassland bird inventories on TNC lands and Refuge stations.	7 Feb 2011	Marissa Ahlering, Sara Vacek	O	C
General C	<i>USDA NRCS National Easement Assessment Project</i> Knutson invited to participate in planning meeting for a new monitoring program for NRCS Easements.	14-15 March 2011	Melinda Knutson	I	C
3C	<i>Plains and Prairie Pothole LCC workshop on Setting Direction</i> Heglund facilitated a decision workshop for the PPP LCC to help them develop a working plan for the LCC.	7-9 Feb 2011	Pat Heglund	O	C
1A,B 2A	<i>Midwest Refuges WRIA, HGM, CAP Integration Workshop</i> Joint workshop with R3 Division of Biological Resources and Environmental Contaminants staff. Attendees include representatives from Refuge, Private Lands, DBR and Ecological Services staff from R3, R6 and National office.	27 September 2011	Josh Eash (facilitator) Brian Newman (facilitator)	I, R, O	C
2A	<i>Nutrient Initiative Workshop</i> Joint workshop with R3 Division of Biological Resources and Environmental Contaminants staff.	28 September 2011	Josh Eash (facilitator) Brian Newman (facilitator)	I, R, O	C

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
3C	<i>Midwinter and Spring Waterfowl</i> Workshop organized by Migratory Birds to address waterfowl monitoring during migration and wintering.	3 August 2011	Brian Loges, Eric Dunton, Mick Hanan	I, R, O	C
3C	<i>Grassland Bird Declines in the Midwest</i> Workshop organized by Migratory Birds to address continued population declines for many species of grassland birds. What can conservation partners do?	3 August 2011	Melinda Knutson (facilitator) Tom Will (Migratory Birds)	I, R, O	C
COMMUNICATION - SYMPOSIA					
General	<i>The Wildlife Society Annual Meeting – Symposium</i> <i>‘Helping Resources Managers Cope With Threats and Change’</i> Plan symposium	6-10 Nov 2011	Melinda Knutson, Pat Heglund	I, R	P

Table 5. Southeast Region, R4, Inventory and Monitoring Program Activities, Staff, Funding, and Status During FY2011. (P=Planned, F=Funded, IP= In Progress, C=Completed, I=I&M, R=Refuge, and O=Other).

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
IDENTIFY I&M PRIORITIES					
3.1.1	Status of station Habitat Management Plans The development of HMPs for all refuges is in progress, with anticipated region-wide completion by EOY 2015. Refer to updated S:\RW\RW-RM\Step-down Plans\HMP_Coordination\HMP_Refuge TargetandStatus.xlsx	HMPs in various stages of completion.	Sue Cielinski and Janet Ertel	R	IP
3.1.2	Status of station inventory and monitoring plans	Working with SALCC refuges (28) to input information into PRIMR to complete part 1 of the IMP	Laurel Barnhill, Steve Holzman, Becky Bartel, Nicole Rankin	I, R	IP
3.1.3	Hire biological staff.	Hired 3 ecologists and advertised 1 ecologist for SALCC; working with HR to advertise 6 positions in GCPO.	Chuck Hunter and Laurel Barnhill	I	IP
General	Cross walk existing refuge surveys to determine consistencies and identify needs.	In progress awaiting all SALCC refuges data entered into PRIMR	Laurel Barnhill	I	IP
4.2.1 ABIOTIC RESOURCES - INVENTORIES					
1B	<i>Complete baseline hydrogeomorphic (HGM) analysis at selected stations.</i> HGMs are planned for the following stations: White River NWR - work will begin in April 2011 Cape Romain NWR - we plan to begin work on Project in FY 2012. Work completes by contractor with the assistance of Sue Cielinski and John Faustini, Regional Hydrologist	HGMs were initiated as planned.	Sue Cielinski and John Faustini	R	IP

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
2A	<i>Water Resource Inventory and Assessment (WRIA)</i> Water inventories for the following were planned or initiated as follows: LOWER SUWANNEE NWR - planned for 2012-13 OKEFENOKEE NWR - planned for 2012-13 CACHE RIVER NWR - planned for 2012-13 WHITE RIVER NWR - field work will be conducted in conjunction with the HGM in April 2011 CAHABA RIVER NWR - field work conducted in 2010, data entry and analysis in process (contingent on WRIA database completion) ERWIN NFH - planned for 2012-13.	WRIAs were initiated as planned, some funded support provided by July I&M rfp. Sue and John spent time working with the national water quality team, led by Mike Higgins, to refine the Water Quality Inventory and Assessment (WRIA) process and advise the team on the development of a database.	Sue Cielinski and John Faustini	R	IP
<i>Projects funded by the I&M request for proposals completion in FY12</i>					
1F	Clarks River National Wildlife Refuge LiDAR	Baseline data to assess topographic and hydrological condition	Clarks River NWR	Staff - R; Project - I	IP
1F	LIDAR and Color digital Imagery for Lower Hatchie NWR	Baseline data to monitor topographical changes (water quality)	Lower Hatchie NWR	Staff - R; Project - I	IP
ABIOTIC RESOURCES - MONITORING					
5B	<i>Complete initial sea-level rise modeling for coastal refuges.</i> The purpose of this project will be to organize and understand existing SLAMM projects, role and needs of refuges, and identify if data can be scaled to regional efforts.	Summary on hold due to timing of hiring and planned for FY12	Laurel Barnhill, Sue Cielinski and Nicole Rankin	I, R	P
5A	<i>We plan to work with the SALCC and partners to identify the best protocol to use to identify sea-level rise modeling.</i> The purpose of this project will be to determine the best model to invest in and use for coastal refuges to make better management decisions.	Report on hold			
5B	<i>Determine need for surface evaluation table (SET) stations</i> Identify and compile existing SET station objectives, protocols, and data usage. Nicole Rankin assembling information from Refuges to guide selection of sites for SET proposal.	Table and NWRs selected for SET project	Nicole Rankin with Refuges and partners (USGS, TNC, NPS)	R, I, O	IP

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
5B	<i>Establish a SET station at Alligator River NWR</i> We plan to secure equipment, clarify objectives, identify data collection roles, and establish station. Work with TNC, R5 and SE-NPS to ensure station consistent with others in area and use of data in LCC climate models. The purpose of this project is to establish an additional station at Alligator River NWR to assist with on-going work.	SET station established on Alligator River	Sue Cielinski and Mike Bryant	I	C
<i>Projects funded by the I&M request for proposals completion in FY12</i>					
2A	Groundwater Quality Monitoring at Logan Cave National Wildlife Refuge	Long term ground water quality monitoring program implemented	Logan Cave NWR	Staff - R; Project - I	IP
5B	Sea-level rise monitoring for SALCC Refuges (SET stations)	Implement 50+ SET stations implemented in FY12	Multiple NWRs along South Atlantic Coast	Staff I & R, Project I	IP
BIOTIC RESOURCES - INVENTORIES					
1E	<i>Design, fund and implement a strategic process for completing vegetative inventories and cover mapping, using the National Vegetation Classification Standard</i> Committee formed and working via conference calls. Chuck Hunter and Forbes Boyle represent R4 with representatives from each Region. This project was identified as a national priority in December 2011.	Committee work on-going.	Chuck Hunter and Forbes Boyle	R	IP
<i>Projects funded by the I&M request for proposals completion in FY12</i>					
4	Inventory of frog species in the South Carolina Sandhills with a focus on the pine barrens treefrog and the gopher frog	Baseline inventory, relative abundance, and detection probability	Carolina Sandhills NWR	Staff - R; Project - I	IP
4	Inventory and Monitoring of Vernal Pools on Dahomey National Wildlife Refuge	Baseline inventory	Dahomey NWR	Staff - R; Project - I	IP
4	Herpetofaunal survey of Santee National Wildlife Refuge	Baseline inventory	Santee NWR	Staff - R; Project - I	IP
4	Inventory and Monitoring of the Aquatic Biota of Tallahatchie National Wildlife Refuge	Baseline inventory	Tallahatchie NWR	Staff - R; Project - I	IP
4	Bat Species Occurrence and Long-Term Bat Population Monitoring on Refuges using Acoustical Detection	Baseline inventory, foundation for long-term monitoring	Tensas River NWR and others	Staff - R; Project - I	IP

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
BIOTIC RESOURCES - MONITORING					
4C	<i>Coordinate bird monitoring with migratory birds and other partners</i> The National I&M Bird Monitoring Team is initially charged with identifying national bird monitoring needs. Representatives from each region comprise the committee including other divisions.	Committee work on-going to identify objectives and set priorities. Committee conference call minutes outlining progress on I&M share point site.	Laurel Barnhill	I	IP
4C	Work with NPS Southeast Network, FWS Migratory Birds and other partners to explore need for a consistent protocol for monitoring beach utilization by shorebirds.	Discussion initiated and on hold. Focus shifted to IWMM and implementation within the Region.	Laurel Barnhill with John Stanton, Randy Wilson, and many others	I, R, O	IP
<i>Projects funded by the I&M request for proposals completion in FY12</i>					
4A	Survey and Monitoring of Sea Turtle Index Nesting Beaches on NWRs in the Southeast Region for Landscape Management and Global Conservation - includes NWRS in FL, GA, SC, and St Croix	Data to support management decision	Archie Carr NWR, Blackbeard NWR, Cape Romain NWR, Egmont Key NWR, Hobe Sound NWR, Merrit Island NWR, Sandy Point NWR, and Wassaw NWR	Staff - R; Project - I	IP
4A	Comprehensive Shorebird Surveys on Front Beach Habitat within Cape Romain NWR	Data to support management decisions	Cape Romain NWR	Staff - R; Project - I	IP
4A	Monitoring productivity, dispersal, and habitat restoration/expansion in the Harris Neck NWR wood stork colony.	Data to support future de-listing	Harris Neck NWR	Staff - R; Project - I	IP
ADAPTIVE MANAGEMENT PROJECTS					
1F	Adaptive Resource Management of Florida Scrub Jay Merritt Island	Continue data collection for modeling work	Merritt Island	Staff - R; Project - I	IP
<i>Projects funded by the I&M request for proposals</i>					
1F	Development of biometric and environmental DNA standardized protocols for early detection and population assessment of aquatic invasive species (AIS) for Arthur R. Marshall Loxahatchee National Wildlife Refuge.	eDNA technology and protocols to detect AIS	Arthur R. Marshall Loxahatchee NWR	Staff - R; Project - I	IP
1F	Forest Habitat Evaluation at Atchafalaya NWR		Atchafalaya NWR	Staff - R; Project - I	IP
1F	Pine Savannah restoration monitoring – Tammany Holding Tract	Plot data to evaluate management	Big Branch NWR	Staff - R; Project - I	IP

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
1F	Population dynamics of the king rail <i>Rallus elegans</i>	Genetic markers to examine population structure	Mackay Island and Currituck NWRs	Staff - R; Project - I	IP
1F	Assess Wet Pine Savanna Response to Refuge Management MS Sandhill Crane	Savanna richness index protocol	Mississippi Sandhill Crane NWR	Staff - R; Project - I	IP
1F	Monitoring the Effects of Climate Change on Waterfowl Abundance in the Mississippi Alluvial Valley: optimizing sampling efficacy and efficiency	Aerial survey for waterfowl with visibility correction factor and rapid method to display distribution and abundance	Multiple NWR in MAV	Staff - R; Project - I	IP
1F	Forest Habitat Inventory Equipment for Refuges	Equipment to inventory forest resources	Multiple NWRs Region wide	Staff - R; Project - I	IP
1F	Inventory of Bottomland Hardwood Forests on the Roanoke River NWR and Establishment of Continuous Forest Inventory Plots.	Establish continuous forest monitoring plots, populate desired forest characteristics model	Roanoke River NWR	Staff - R; Project - I	IP
1F	St. Catherine Creek NWR Aquatic Habitat Assessment in Support of Gulf Coastal Plains CPO LCC	Models to forecast ecological changes in a dynamic floodplain	St. Catherine Creek NWR	Staff - R; Project - I	IP
1F	An objective analysis of 21 years of fire history at St. Marks NWR utilizing MTBS mapping protocol.	Parcel specific fire occurrence and fire intensity histories	St. Marks NWR	Staff - R; Project - I	IP
1F	Flood impacts to Forest Habitat plots established on White River NWR	Data to evaluate tree health and condition related to water management	White River NWR	Staff - R; Project - I	IP
1F	Streamline forest data analysis on R4 refuges	Software to process forestry plot data to address desired forest condition	White River NWR	Staff - R; Project - I	IP
DATA MANAGEMENT					
1A	<i>Assemble existing abiotic data sets needed by NWRs managers to set management objectives through the CCP process</i> Geospatial Advisory Committee developed and tasked with compiling WH1.8 layers and identifying additional refuge needs. Steve representing region on the Geospatial Advisory Committee tasked with completing this objective. Task identified by NRLT in May 2011.	Geospatial Advisory Committee assembling layers.	Steve Holzman	I	IP
General	<i>Reconciling the inventory of refuge inventories and monitoring review database.</i> The purpose of this project is to ensure all Regions are using the same database to assemble a list of existing inventory and monitoring efforts.	Three PRIMR subteams formed with representation from each region. Each working on various aspects of definitions and purposes of the database.	Steve Holzman and Laurel Barnhill	I	IP

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
General	<i>Populate inventories and monitoring review database (survey of surveys)</i> Working with refuge biologists to enter survey information into PRIMR	Data entered into PRIMR for 5 refuges, other 23 in SALCC in various stages of completion (site visit, data entry, data proofing, etc)	Steve Holzman, Becky Bartel, and Laurel Barnhill with Refuge Staff	I, R	IP
COMMUNICATION					
General	<i>Produce a regional I&M fact sheet.</i> The purpose of this project is to develop a fact sheet that outlines the purpose and current status of the I&M program that can be distributed to refuges and partners.	Fact sheet produced in July	Laurel Barnhill	I	C
General	<i>Develop a MOU/interagency agreement with NPS SECN</i> The purpose is to integrate operations between FWS Region 4 I&M and the Southeast Coast Network. This document is necessary to outline the relationship between FWS and NPS (e.g., sharing office space).	Draft MOU developed	Joe Devivo, NPS, Chuck Hunter, and Laurel Barnhill	O, I, R	IP
General	<i>Establish a regional inventory and monitoring SharePoint site.</i> The purpose of this site is to provide central storage and collaboration space for Region 4 I&M documents, information and ideas.	Sharepoint developed and fully operational in April	Steve Holzman	I	C
General	<i>Work closely with the SALCC and other regional LCCs</i> serving on committees and working groups as priorities and processes are defined.	Representation on SALCC Steering Committee Representation on SALCC Consulting Team	David Viker Laurel Barnhill	R, I	IP

Table 6. Northeast Region, R5, Inventory and Monitoring Program Activities, Staff, Funding, and Status During FY2011. (P=Planned, F=Funded, IP= In Progress, C=Completed, I=I&M, R=Refuge, and O=Other).

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
IDENTIFY I&M PRIORITIES					
General	<i>I&M Part I of the draft I&M Policy</i> R5 DNR staff hosted workshops at Patuxent Research Refuge, Parker River NWR, and John Heinz NWR to provide additional guidance to staffs from 24 refuges and refuge complexes in attendance for completing their draft Part Is. R5 Data Manager entered Draft Part 1-I&M Plans for 52 refuges in the PRIMR database (in some cases, complexes only entered one plan for all their refuges). DNR staff continues to review Part 1s submitted by refuges.	Refuge staffs are revising their draft Part Is as per additional guidance. Draft Part 1-I&M Plans for 52 refuges/refuge complexes entered into the PRIMR database	Bill Thompson (DNR-I&M) Kelly Chadbourne (DNR-I&M) Other DNR staff: Hal Laskowski (Retired) Jan Taylor Laura Eaton-Poole Jennifer Casey	I, R	IP
1A	<i>Refuge Planning</i> Develop Habitat Management Plans (HMPs) for each refuge.	As of FY11: 13 refuges = Approved HMPs 4 refuges = HMPs >90% complete 8 refuges = HMPs 75-90% complete 7 refuges = HMPs 50-75% complete 3 refuges = HMPs 10-50% complete	Jan Taylor (DNR)	R	IP
General	<i>Regional Goals and Objectives</i> DNR staff are developing regional goals and objectives to be used as their work guidance and to better integrate shared regional biologist positions into DNR and I&M projects.	Draft document outlining regional goals and objectives.	Jan Taylor (DNR; lead) Laura Eaton-Poole (DNR) Jennifer Casey (DNR) Bill Thompson (DNR-I&M) Kelly Chadbourne (DNR-I&M)	R	IP

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
ABIOTIC RESOURCES - INVENTORIES					
2A	<i>Water Resource Inventory and Assessment (WRIA)</i> Regional Hydrologist Fred Wurster initiated a contract to conduct the baseline information gathering for 8 refuges (TBD) during FY11-13; this information will be used to complete the WRIAs. Regional Hydrologist also spent about 3 percent of his time working with the I&M national water quality team, led by Mike Higgins of the Fort Collins I&M Office, to refine the WRIA process and advise the team on the development of a database.	Draft final reports of WRIAs for Patuxent NRR and Cape May NWR. WRIAs initiated at Erie and Moosehorn NWRs.	Fred Wurster (Regional Hydrologist) Jan Taylor (DNR) Bill Thompson (DNR-I&M)	I, R	IP
2A	<i>Hydrogeomorphic Assessment</i> Perform a hydrogeomorphic (HGM) assessment for each refuge.	Initial meeting with contractor in August 2011.	Fred Wurster (Regional Hydrologist)	R	IP
5A	<i>Climate Change/Sea Level Rise</i> Conduct vulnerability assessments at coastal refuges. Provide assessment tool for all refuges. Assist with setting goals and objectives for CCP/HMP.	Vulnerability assessments initiated for Parker River NWR (individual refuge assessment for CCP) and Eastern Shore of VA NWR (Pilot for NWRS).	Jan Taylor (DNR)	I	IP
2A	<i>National Wetlands Inventory</i> Upgrade National Wetlands Inventory information at refuges.	Ongoing projects at S. O. Conte NFWR and Wallops Island NWR	Jan Taylor (DNR)	I	IP
5A	<i>Imagery Needs</i> Purchase imagery for Iroquois NWR.	Used National I&M funds to purchase imagery.	Kelly Chadbourne (DNR-I&M) Jan Taylor (DNR)	I	C
General	<i>Contaminants Assessment Process (CAP)</i> The Contaminants Assessment Process (CAP) is a standardized and comprehensive approach used to assess potential threats posed by environmental contaminants to National Wildlife Refuges as well as other Service lands. CAPs were conducted on 7 refuges/refuge complexes in FY11: Bombay Hook, Canaan Valley, Great Dismal Swamp, Great Swamp, ME Coastal Islands, Parker River and S. B. McKinney.	CAPs reports in progress.	R5 Regional Office	I	IP

General	<i>Carbon Sequestration Potential of Restored/Managed and Natural Tidal Salt Marshes in Region 5</i> The proposed work directly addresses the USFWS Climate Change Strategic Plan goal of increasing biological C sequestration through habitat creation programs, i.e. tidal salt marsh restoration, through direct measurements of standing stocks and rates of C sequestration by tidal salt marshes that were restored. Cooperative agreement finalized August 4, 2011. In consultation with the LMRD Biologist, it was agreed that the project was best postponed until FY12 due to the difficulty of acquiring graduate student assistance at such a late date in the field season.	Project is ongoing.	Sue Adamowicz (LMRD Biologist)	I,O	IP
1E	<i>National Vegetation Mapping Team</i> Regional GIS Specialist joined the National I&M Vegetation Mapping Team. He spent about 2% of his time on this activity, which will likely increase as the Team moves forward.	Team membership.	Les Vilchek (Regional GIS Specialist)	I,R	IP
ABIOTIC RESOURCES - MONITORING					
2A	<i>Hydrologic and Water-Quality Factors Affecting Habitat Restoration and Management</i> The third year of a 3-year study to quantify the interaction of groundwater and surface water between refuge ditches and refuge wetlands at Great Dismal Swamp NWR. Years 1 and 2 covered installation of water monitoring equipment and preliminary data analyses. Year 3 was funded to support more complete data analyses, preparation of a draft manuscript for publication in a peer-reviewed journal, and preparation of a document summarizing the management implications of the 3-year study.	Data collected at 76 groundwater monitoring wells (includes 20 new wells installed in 2011). Information incorporated into management decisions at Great Dismal Swamp NWR. Presentations of project results to refuge staff and at a scientific conference.	Fred Wurster (Regional Hydrologist) Gary Speiran (USGS)	I, R	IP
5A,5B	<i>Coastal shoreline change monitoring</i> Work with cooperators (NPS, Rutgers Univ.) to implement standard protocol for monitoring coastal shoreline change on selected Region 5 refuges.	Natl. I&M funds purchased 3 R8 GNSS packages to obtain survey grade elevation information.	Kelly Chadbourne (DNR-I&M)	I,R	IP
5A	<i>Collect information needed to assess vulnerability of coastal NWRS stations to sea level rise and other stressors</i> Assist with training of refuge staff for establishing	NPS and cooperators are working on a draft protocol.	Sue Adamowicz (LMRD Biologist) Jan Taylor (DNR) Laura Eaton-	I,R	IP

	SETs on cooperating refuges based on a standard protocol developed by cooperators (NOAA, NPS, USGS).		Poole (DNR) Kelly Chadbourn (DNR-I&M) Bill Thompson (DNR-I&M)		
5A	<i>Restoring Diked and Ditched Salt Marshes: Taking Lessons to the Public</i> The LMRD program currently has two cutting edge saltmarsh restoration projects in progress: removal of an old agricultural dike in the middle of the Mousam River salt marsh and restoration of ditched marshes at Goose Rocks (Rachel Carson NWR) and Plum Island (Parker River NWR). Restoration activities are scheduled for Fall 2010 and Winter 2010-2011. The purpose of these restoration activities is to increase salt marsh resilience to offset stresses of accelerated sea level rise. We desire to continue evaluating these sites to determine effects of restoration efforts. We also plan to develop the sites into demonstration areas through interpretive signage, web-site information, visitor contact area material and interaction with resource managers and the public. Field monitoring (water levels, vegetation, elevation) conducted at research locations at Parker River and Rachel Carson NWRs. Submission made for interpretive panels submitted June 27, 2011 Purchase order for panels finalized September 16, 2011.	Project is ongoing.	Sue Adamowicz (LMRD Biologist)	I	IP

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
BIOTIC RESOURCES - INVENTORIES					
General	<i>Cherry Valley NWR Bat Surveys</i> Completed 6 nights of mist netting at 4 locations both on-refuge (3 nights; 2 locations) and off-refuge within the acquisition boundary (3 nights; 2 locations). This is the first time bats have ever been surveyed at this refuge. surveys resulted in the capture of 40 bats of 3 species, including 34 big brown bats (<i>Eptesicus fuscus</i>); 5 northern long-eared bats (<i>Myotis septentrionalis</i>, each banded) and 1 hoary bat (<i>Lasiurus cinereus</i>) scouting sites; making contacts and obtaining permissions from off-refuge landowners; conducting surveys; completing follow-up decontamination of equipment; and collecting, entering, and analyzing GIS data. These temporary personnel also presented a public bat program to community members, followed by an opportunity for participants to observe the refuge's bat research efforts. Purchased acoustic bat detector (Anabat SD2) that was used to conduct 2 nights of acoustic surveys and will be used in future monitoring.	Summary report of survey results. Public presentation.	Marilyn Kitchell (Wallkill River NWR)	I, O	C
General	<i>Wallkill River NWR Bat Surveys</i> Completed 8 nights of mist netting at 6 locations on the refuge, as follow-up to work conducted in 2008, 2009 and 2010. It also funded the purchase of an acoustic bat detector (Anabat SD2) and the completion of 10 nights of acoustic surveys (3 nights monitoring basic activity levels and 7 nights with the new detector facilitating analysis-to-species). The surveys resulted in the capture of 54 bats of 4 species, including 43 big brown bats (<i>Eptesicus fuscus</i>), 6 red bats (<i>Lasiurus borealis</i>), 4 northern long-eared bats (<i>Myotis septentrionalis</i>, banded) and 1 tricolored bat (<i>Perimyotis subflavus</i>, also banded). Three <i>M. septentrionalis</i> were transmittered, leading to the identification of 3 roosts (2 trees on-refuge and 1 house off-refuge). The acoustic surveys additionally facilitated the detection of at least one hoary bat (<i>Lasiurus cinereus</i>), Indiana bat (<i>Myotis</i>	Summary report of survey results Presented a public bat program as a part of a neighboring refuge's (Great Swamp) BioBlitz.	Marilyn Kitchell (Wallkill River NWR)	I, O	C

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
	<i>sodalis</i>) and little brown bat (<i>Myotis lucifugus</i>).				
General	<i>Maine Seabird Atlas</i> Maine Coastal Islands NWR is partnering with Maine Department of Inland Fisheries and Wildlife and the Maine Natural History Observatory to develop a Maine Seabird Atlas. This project includes creating an Access database that summarizes all existing seabird data from the 1970's through the present, including geographic information, data quality, survey method, location, size, and species composition of seabird colonies along the Maine coast. The database has been completed and now supports 13,000 records, and will allow managers, for the first time, to evaluate population trends and query information on the abundance and distribution of seabirds. The contractor is now working on the production of a Seabird Atlas. Currently evaluating maps for the Atlas and are finalizing page layout. Anticipated project completion to be early in 2012. The Atlas will be available as a PDF and a printed document.	Seabird database supporting 13,000 records.	Linda Welch (ME Coastal Islands NWR)	I, O	IP
BIOTIC RESOURCES - MONITORING					
1C	<i>Biometric Assistance to Refuges</i> Hire or contract a biometrician to assist Region 5 refuges with analysis of their legacy I&M data.	CESU Task Agreement with the Univ. of AK – Fairbanks, Post doc hired	Bill Thompson (DNR-I&M)	I	IP
General	<i>Cherry Valley Bog Turtle Telemetry and Habitat Management</i> Conducted extensive survey work that focused on 3 locations within the Cherry Valley NWR acquisition area – the Winery (refuge-owned) and the Crovatan and Christine properties (owned by The Nature Conservancy). Surveys resulted in the twice-weekly radiotracking of 10 turtles (equipment purchased by TNC) and in the additional identification of 12 new turtles that were marked and released. The grant also funded extensive invasive species control (specifically purple loosestrife, Japanese knotweed and Japanese barberry) to improve bog turtle habitat at all 3 locations; and the purchase of herbicides and EZ-ject	Summary report of preliminary results.	Marilyn Kitchell (Wallkill River NWR)	I, O	IP

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
	lances to facilitate the removal of woody vegetation (habitat management to be conducted in October). Extensive habitat restoration was conducted at the Winery, where additional survey and restoration work will continue into the future. Predator removal (mammalian) is ongoing at the Crovatan and Christine properties, where 3 adult turtles were found to have been predated this year. These data will be used to inform habitat management and to serve as a baseline for comparisons of pre- and post-restoration distribution of bog turtles on these properties.				
General	<i>Conservation and Recovery of the Puritan Tiger Beetle (Federally Threatened)</i> Region 5 contains the entire world's population of this federally-listed beetle. They are found only along the Connecticut River (two remaining sites out of 11 historic ones) and the Chesapeake Bay. The objectives of this study are to: 1. Estimate adult population at Deadman's Swamp & Rainbow Beach during the breeding season (late June through early August). 2. Document larval numbers & ages (2-year larval stage) at both sites. 3. Control encroaching vegetation at both sites to enhance potential larval habitat. 4. Monitor & evaluate public uses (funding from Holyoke Gas & Electric to MA Dept of Conservation & Recreation). 5. Maintain Refuge boundary signs at the Deadman's Swamp Unit. 6. Identify landowners with suitable, but unoccupied habitat so that conservation options may be discussed.	Project is ongoing.	Barry Parrish (S. O. Conte NFWR)	I, O	IP
General	<i>Management of Northern Red-bellied Cooters & Blanding's Turtles</i> Habitat enhancement, protection and population management of a federally listed species (northern red-bellied cooter) and another in decline (Blanding's turtle) at four refuges in MA. <u>Northern Redbellied Cooters at Massasoit Refuge:</u> Initiated a northern	Report of preliminary results.	Stephanie Koch (Eastern MA NWR Complex)	I, O	IP

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
	redbellied cooter trapping program at Massasoit Refuge in an effort to determine size, sex ratio and age structure of the population. Caught 1 male and 5 females, all breeding-aged adults) <u>Blanding's Turtles at Assabet River Refuge:</u> Partnered with Bristol County Agricultural High School to headstart 54 Blanding's turtles which originated from Oxbow Refuge. In late May, the high school sophomores came to Assabet River Refuge to release the turtles. This was the 4th year of turtle releases (transplanted turtles now range from hatchling age to 14 years) and all radioed turtles were located weekly to track movement patterns and document habitat preferences. Road surveys were done throughout the summer, and no mortalities occurred. <u>Blanding's Turtles at Great Meadows Refuge:</u> Worked with a local researcher to continue tracking movements and survival (with hoop traps) of Blanding's turtles. Preliminary data suggests turtles are shifting their distribution within the 200 acre impoundments. Only 8 nests were found on neighboring properties, and very low success. Multiple interpretive walks/talks were held on site, as well as in local schools.				
General	<i>Converting Military Bunkers into Bat Hibernacula</i> Great Bay NWR was established in 1992 from lands part of the former Pease Air Force Base, including the area used as the weapons storage area and the associated infrastructure. The plan is to modify two of the 15 former military bunkers to make them more functional for use as hibernacula by bats.	Project is ongoing	Nancy Pau (Parker River NWR) Jan Taylor (DNR) Laura Eaton-Poole (DNR)	I	IP
General	<i>Indiana Bat Distribution and Habitat Use Research and White Nose Syndrome Monitoring</i> Great Swamp NWR contains the only known Indiana bat (endangered) maternity colonies within the NWRs. Intensive field research has been conducted every summer since 2005 resulting in a robust dataset of spatial distribution, habitat use, and	Project is ongoing	Craig Bitler (Great Swamp NWR - Retired)	I, O	IP

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
	demographic information. During the winter of 2008, the hibernacula where the majority of the refuge's Indiana bat population overwinters was exposed to White Nose Syndrome (WNS). Data collected during the summers of 2009 & 2010 indicate a sharp and significant decline in Indiana bat numbers. Other bat species, such as the little brown bat, suffered similar documented declines. In fact, Great Swamp NWR has probably the most detailed pre/post-WNS dataset in the country.				
General	<i>Management and Monitoring of Red Knots and Horseshoe Crabs</i> <u>Horseshoe Crab Surveys:</u> Horseshoe crab surveys were not conducted as originally planned. In past years, horseshoe crab surveys have been coordinated state wide during peak spawning times to provide an overall index of the State's spawning population. This season, many partners decided to not conduct surveys due to lack of funds and staffing, and it was decided that the value of our survey data was going to be greatly diminished without the larger landscape survey effort. Therefore, we directed more money than originally planned towards Red Knot work (see below). We did continue our horseshoe crab tagging effort and tagged 598 crabs on the Refuge. Resight reports are still trickling in. We also had a volunteer visitor services intern who frequently spoke to visitors about the horseshoe crab – shorebird connection and the importance of conservation. <u>Red Knots:</u> Purchased 50 geolocators (instead of the intended 25), which were all placed on juvenile Red Knots trapped in Chatham, MA in September. Recaptured 5 adult Red Knots that were originally outfitted with geolocators in 2009. Post-processing of these data are underway now. Deployed geolocators on 50 birds and unique alpha-numeric flags on an additional 125 Red Knots. Resighting surveys of color-banded Red Knots were conducted on average 3x/week beginning in early July, and will continue through October.	Summary report of preliminary results.	Stephanie Koch (Eastern MA NWR Complex) Kate Jaquinto (Monomoy NWR)	I, O	IP

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
	Thousands of records of resighted birds are being compiled now and will be uploaded to bandedbirds.org and analyzed this winter.				
General	<i>Management of Endangered Roseate Terns</i> Prior to the 2011 nesting season, a Roseate Tern attraction system was installed in the Common Tern colony that was comprised of a sound system borrowed from Mass Audubon's Coastal Waterbird Program and Roseate Tern decoys acquired from the Massachusetts's Division of Fisheries and Wildlife. As a result, seven pairs of Roseate Terns were confirmed to be nesting on South Monomoy and five pairs were confirmed to be nesting on Minimoy. Tern pairs to utilize the provided nesting structures. All confirmed Roseate Tern nests were carefully monitored and chicks were tracked until they were no longer able to be found (15+ days). All chicks were banded with a standard BBL service band and a metal field readable band. Additionally, adults were opportunistically trapped using potter traps: unbanded adults were captured and banded with a standard BBL service band and a metal field readable band and banded adults were recaptured and reported to the BBL. Following the Roseate Tern breeding season, staging counts and resighting were conducted at both South Monomoy and Minimoy, in addition to areas of neighboring South Beach. Visitor center volunteers created a nesting tern display during 2010, which provided valuable information to guests about Roseate Tern ecology and the natural history of Roseate Terns nesting at Monomoy National Wildlife Refuge. This display provided a guide for both interns and volunteers to convey accurate and up-to-date information to visitor center guests about Roseate Terns at Monomoy.	Summary report of results.	Stephanie Koch (Eastern MA NWR Complex) Kate Jaquinto (Monomoy NWR)	I, O	IP
General	<i>Impacts of Mercury on Saltmarsh Sparrow Productivity</i> Completed the 5th year of productivity monitoring on salt marsh sparrows at	Summary report of preliminary results.	Nancy Pau (Parker River NWR)	I, O	IP

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
	Parker River Refuge. In 2011, observed a dramatic decrease in the number of nests found, first noticed last year. From 2007 through 2011, the number of active nests found was 32, 48, 41, 21, and 11, respectively. Conducted a marsh-wide sparrow mistnetting effort, and found a much lower ratio of fledglings to adults compared to other sites in New England. Will be comparing mercury levels and productivity data at the various sites this winter to investigate the cause. Also will be analyzing the 5 years of productivity data and 3 years of nest attentiveness (iButton data) to identify any associations between productivity and female mercury levels.				
General	<i>Saltmarsh and Nelson's Sparrows Management and Monitoring</i> <u>Identifying important areas, or source populations, for saltmarsh passerines to inform long term monitoring protocols and conservation plans.</u> Joined the larger SHARP project and collaborated by adding three additional intensive demographic sites (two in ME, one in NH), as well as provided expertise and experience in conservation genetics. Genetic samples were collected from over 200 adult sparrows in 3 marshes (87 in Chapman's Landing, NH, 91 in Eldridge Marsh, ME, and 32 from Little River Marsh, ME; the latter 2 sites are Rachel Carson NWR marshes in Wells, Maine). Over 600 new samples will contribute to investigations of genetic connectivity and source-sink dynamics across the breeding range. Also conducted intensive demographic work on 3 marshes, including the 2 coastal marshes in Wells, Maine and one inland marsh in Chapman's Landing, NH. <u>Investigate migration connectivity between key wintering and breeding grounds</u> Genotyped 90 samples from Saltmarsh Sparrows captured on the wintering grounds in Virginia, provided by collaborating partners from the Center for Conservation Biology. Population genetic analyses will be conducted this	Summary report of results.	Kate O'Brien (Rachel Carson NWR)	I, O	IP

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
	fall to see if individuals can be assigned to any of our current reference populations on the breeding grounds. <u>Determining the extent of the hybrid zone and inform managers and allow for the identification of remaining "pure" saltmarsh sparrow populations.</u> Samples collected from partners in New Jersey and Connecticut will be incorporated into our population genetic analyses, for our continued research on identifying the extent of the hybrid zone. The genotypes will also be useful in increasing our identification of “pure” Saltmarsh Sparrows, for the purpose of developing reference populations for determining a hybrid index.				
General	<i>Collaborative New England Cottontail Re-introduction Soft-release and Monitoring</i> Live trapping began for Mashpee NWR and surrounding areas in late October and ran through the end of March 2011. 29 rabbits were trapped, 26 were sampled for genetic analysis to determine if they were New England cottontail or Eastern cottontail. DNA results determined that 16 sampled rabbits were New England cottontail while the remaining 10 were Eastern cottontail. Twenty-one rabbits were radio collared, 13 were New England and 8 were Eastern cottontails. Rabbits are tracked several times during the week and at different times of the day to determine home range and habitat use. Vegetation surveys were conducted at three sites during summer of 2011. Vegetation surveys will be conducted again in the winter to determine habitat characteristics during the leaf off period as well. Analysis of the data is currently underway but no results are available at this time. Vegetation data were also collected at Nomans Land Island NWR as part of a study to determine if it is going to be a release site for New England cottontails.	Summary report of preliminary results.	Eileen McGourty (Eastern MA NWR Complex)	I, O	IP
General	<i>Bog Turtle Habitat Management</i> Initiated survey efforts to monitor bog turtle activity within the refuge’s newly acquired Armstrong Bog. This work	Summary report of study results.	Marilyn Kitchell (Wallkill River NWR)	I, O	C

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
	included the repair of 2 telemetry receivers and the purchase of 10 radiotransmitters, 6 of which were used to track 2 male and 2 female bog turtles. This produced roughly 60 point locations where animals were found and began to reveal patterns of behavior that will inform habitat management to be conducted this fall (girdling/herbicidal treatment of encroaching vegetation to open the canopy and enlarge areas of suitable habitat.) It also revealed that turtles are frequently found within 6 feet of a busily-traveled road's edge, probably due to the open canopy that can be found there, and on at least one occasion have crossed the road. This information will strongly influence the habitat management to be conducted in October and will serve as a baseline against which to measure the success of that future management.				
General	<i>Effects of waterfowl impoundments on rails</i> Investigating effects of waterfowl impoundments on the reproduction and ecotoxicology of Sora and Virginia Rail at Moosehorn NWR. During the 2011 season, we were able to find 73 additional nests and, of these, 44 were active and will be used for nest success data analysis. The 2011 season started with high spring water levels but quickly became a fairly dry summer. Most nest failure was due to depredation. During the 2011 season, 3% of nests flooded, 38% were predated, and 59% hatched. A logistic exposure model will be created using nest data from all years to determine factors affecting nest success. In 2011 we captured 56 chicks and 4 adult rails and their blood samples have been sent to Biodiversity Research Institute for mercury analysis. We also doubled our sample size for broadcast survey data and will reanalyze broadcast results to determine factors affecting probability of responding to callback surveys.	Interim report.	Ray Brown (Moosehorn NWR)	I, O	IP
General	<i>Saltmarsh Integrity Index</i> Develop a tool for assessing ecological condition of saltmarshes and evaluate the effectiveness of management	Project is ongoing.	Jan Taylor (DNR) Sue Adamowicz (LMRD)	I,R	IP

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
	actions. Purchased SETs for regional distribution. Held a workshop in May 2011 attended by USFWS, USGS and Univ. of DE partners. Scheduled two workshops to be held in January 2012. Collaborated with NPS on a SET database. Developed a contract for survey quality monument establishment.		Biologist) Laura Eaton-Poole (DNR) Bill Thompson (DNR-I&M) Kelly Chadbourne (DNR-I&M)		
General	<i>Wilderness Character Monitoring</i> Pilot project to develop wilderness character monitoring programs at select refuges across the NWRs. Three R5 refuges - Great Swamp, Forsythe, and Moosehorn - have been identified as candidates for the pilot. Pilot is being funded through the national I&M office in Fort Collins.	Wilderness character monitoring assessment performed at Great Swamp and Forsythe NWRs. Draft final report completed for Great Swamp	Steve Henry (Great Swamp NWR)	I	IP
4B	<i>National Phenology Network</i> Engage in phenology based citizen science; partner with the National Phenology Network (NPN). Serve on the Northeast Phenology Working Group.	Continued phenological activities at Montezuma NWR and partnership with NPN.	Laura Eaton-Poole (DNR)	R	IP
4C	<i>Radar Analysis of Fall Migration Stopover Sites in the Northeastern U.S.</i> The overall objective is to map important stopover sites in Region 5 used by landbirds during the fall migration. Methodological improvements: made several technical refinements to a previously published algorithm that corrects biases in radar reflectivity data when they are to be related to on-the-ground locations that radar targets emerge from. Added the calculation of flight direction to the algorithm that determines the air speeds of radar targets, using radar radial velocity data and radiosonde data of wind speed and direction, measured aloft in weather balloons launched at some radar stations. Software development: developed software to process radar reflectivity data to quantify where migrating birds emerge from. Program BIRDS (Bias Improvement of Radar Data System).	Progress report.	Jan Taylor (DNR)	R	IP
4C	<i>Migrating Fall Landbirds/Shrubland Habitats</i> Purpose of this project was to develop a rapid monitoring protocol suitable for assessing the status and change over	Draft final report.	Jan Taylor (DNR) Laura Eaton-Poole (DNR) Bill Thompson	R	IP

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
	time in populations of fall-migrating landbirds using shrub habitats on refuges. This included methods for both population response and quality of habitat (including vegetation species composition, structure, and productivity of food, especially fruits). Analyzed population and habitat data collected by multiple refuges, and summarized findings and recommendations in a draft final report (currently under review and revision). (Contractor: CJ Ralph). Project is working in conjunction with “ <i>Managing and Monitoring Native Shrublands for New England Cottontail and Thicket-dependent Birds.</i> ”		(DNR-I&M)		
4C	<i>Bird Monitoring Team</i> Served on national Team for coordinating bird monitoring efforts among regions and with partners.	Multiple conference calls to chart a course forward.	Bill Thompson (DNR-I&M) Jan Taylor (DNR)	I,R	IP
General	<i>Northern Forest LMRD</i> The Northern Forest Land Management Research and Demonstration (NF-LMRD) project is a landscape-level alliance between northern forest refuges (Umbagog, Moosehorn, Petit Manan, Silvio O. Conte, and Misisquoui) and their partners that focuses on scientifically based testing and development of best forest management practices for wildlife in the northeast. This project will provide small and large landowners with economically viable management tools for maintaining healthy forest ecosystems in the face of climate change.	Hired a Supervisory Forester (Umbagog NWR), Forester (Moosehorn NWR), and Forestry Tech (S.O. Conte NFWR)	Paul Casey (Umbagog NWR) Jan Taylor (DNR) Bill Thompson (DNR-I&M)	I	IP
STRESSORS					
3A	<i>Strategic Control and Eradication of Invasive Plants</i> Mapping and control plans for perennial pepperweed are being created and implemented by Parker River NWR staff and partnering refuges, organizations and agencies including Rachel Carson NWR, Massachusetts Audubon Society, Mass Bays Initiative, Essex Co. Mosquito Control, and Mass. Department of Conservation and Recreation. In the spring and early summer of 2011, these two species were mapped and the efficacy of previous treatment noted. 2 stands of	Summary report of project results. Mass Audubon Society created a “how-to” handbook on pepperweed control: http://www.massaudubon.org/saltmarsh/resources.php#pepperweed	Nancy Pau (Parker River NWR)	I, O	IP

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	knotweed which have been treated for 5 years are still present but reduced by approximately 75%. A third previously unknown stand was recorded during surveys. All three stands will be treated in fall 2011 during the optimal treatment window.				
1F,3A	<i>Implementing & Evaluating Control Techniques for Phragmites</i> Cooperated with False Cape State Park, Back Bay NWR has an ongoing treatment program. purchase two Trimble GPS units (Nomads) for use with invasive species mapping and herbicides for ground treatment of <i>Phragmites</i> . Using a track-mounted UTV, we sprayed 3 impoundments for <i>Phragmites</i> . Evaluated a new mapping method: technicians used the new GPS units to map all patches of <i>Phragmites</i> as either points or lines , as opposed to polygons, and recorded other information such density estimates and treatment dates and methods. Using the GPS, a compass, and a laser rangefinder, technicians created a center point for each <i>Phragmites</i> patch without having to go into the patch. This represented patch saved a significant amount of time and provided an estimate for the coverage similar to the traditional polygon method. For patches that grew in linear formations (e.g. along ditches), used a buffered line approach instead of a point.	Summary report of results.	David Bishop (Regional Invasive Species Biologist)	I, O	IP
3A	<i>Cutting Back on Phragmites: Implementing and Evaluating Innovative Control Techniques</i> Phragmites does not grow well in soils with elevated sulfide concentrations. This is known from tidal restoration projects and from pilot studies at the Parker River NWR. This project assesses the effectiveness of a new repeated, sharp-cut technique and a new facilitated sulfide treatment. FY11 Accomplishments: Modification to existing Cooperative Agreement finalized August 17, 2011. Sole Source Purchase Order Request submitted July 8, 2011 and approved August 30, 2011. Visit to possible project sites made June	Ongoing project.	Sue Adamowicz (LMRD Biologist)	I,O	IP

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	28, 2011. Planning meeting held September 1, 2011 In agreement with the R5 Saltmarsh LMRD Biologist, implementation of this project was postponed until FY12 due to the lateness in getting financial approvals. The growing season had largely passed even by the time the modification to the cooperative agreement had been finalized. Application of innovative treatments in August would not have been effective from a biological or financial perspective.				
1F,3A	<i>R5 Phragmites Management Project</i> Held a structured decision making (SDM) workshop to assist in development of a tool for effective management of <i>Phragmites</i>. Developed a conceptual model of important influences on <i>Phragmites</i> occurrence; structured approach to identifying monitoring metrics and selecting management options. Held multiple conference calls among cooperators to chart a course forward.	Workshop results report	Jan Taylor (DNR) Laura Eaton-Poole (DNR) Bill Thompson (DNR-I&M)	I, R	IP
1D,3A	<i>Invasive Species Mapping Project</i> An invasive species pilot program is being developed to evaluate inventory and monitoring objectives and methodologies for invasive species at multiple scales. Held two workshops: 1) to involve partners in prioritizing which species to document and at what locations to place special emphasis and 2) to train refuge staff in the inventory protocol using Trimble Nomad GPS units and in the use of RLGIS for storing the data. Preliminary survey results: Total Inventoried Acres: 1358 acres Connecticut: 645 acres Massachusetts: 88 acres New Hampshire: 625 acres Species found: <u>Connecticut (Salmon River Division):</u> Autumn olive, Bull thistle, Burning bush*, Bush honeysuckle, Garlic mustard*, Japanese barberry*, Japanese stiltgrass, Multiflora rose*, Oriental	Preliminary report of results of pilot project.	David Bishop (Regional Invasive Species Biologist) Cynthia Boettner (S.O. Conte NFWR) Bill Thompson (DNR-I&M)	I,O	IP

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	bittersweet*, Purple loosestrife, Tree of heaven*, Wineberry*, Yellow toadflax* (*Indicates found on refuge land within the larger inventory area in Connecticut) <u>Massachusetts (Fort River Division):</u> Autumn olive, Bull thistle, Burning bush, Bush honeysuckle, Garlic mustard, Glossy buckthorn, Japanese barberry, Multiflora rose, Oriental bittersweet <u>New Hampshire (Mohawk Division):</u> Bull thistle, Burdock, Canada thistle, Glossy buckthorn, Orange hawkweed, Oxeye daisy, Purple loosestrife, Reed canarygrass, Sulfur cinquefoil				
ADAPTIVE MANAGEMENT PROJECTS					
1F	<i>Managing and Monitoring Native Shrublands for New England Cottontail and Thicket-dependent Birds</i> Designed, documented and completed the installation of our seeding and planting trials, and developed a written protocol for evaluating habitat response. Initial measurements indicate that direct seeding was much more successful in the forestry cut than the old field. The only species with an initial germination rate greater than 10% occurred in the wet forestry cut plot - red osier dogwood and swamp rose. These trials will need to be monitored for several years to determine if they are ultimately successful, as many species may require two years to germinate. However, the initial results are encouraging and our techniques will be employed across a larger landscape in 2012. Cottontail rabbits were surveyed on Refuge and partner lands in Maine and pellets were submitted to UNH for analysis. A total of 405 pellets were collected from sites in Maine surveyed by partners from USFWS & UNH for 1) a detection study, 2) monitoring purposes, and 3) population estimation. New England	Summary report of results.	Kate O'Brien (Rachel Carson NWR) plus staff from several other refuges. Jan Taylor (DNR) Laura Eaton-Poole (DNR)	I, O	IP

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	cottontail continues to be present in small numbers at Rachel Carson NWR. Ten recently occupied sites (2007-2010) were found to be vacant in 2011 and 3 additional occupied patches in Cape Elizabeth/Scarborough area were identified. UNH expects to provide USFWS results on detection and make recommendations on inventory and monitoring of cottontail rabbits by the end of this year.				
1F	<i>Integrated Waterbird Mgmt & Monitoring Program</i> Multi-region, multi-agency project to manage and monitor migrating and wintering waterbirds, including waterfowl, shorebirds, and marsh birds. Continuation of this multi-region project (Regions 3, 4 & 5) included: collecting waterbird data at refuges throughout the Mississippi and Atlantic Flyways (16 refuges in Region 5); revision of bird and habitat protocols; hired biological technicians to collect data at off-refuge wetlands (2 in Region 5) with funds from the Migratory Bird Office; and continuation of model development.	Project is ongoing.	Hal Laskowski (DNR-Retired) Jennifer Casey (DNR) Bill Thompson (DNR-I&M)	I, R	IP
1F	<i>Coastal Impoundments/Freshwater impoundments</i> Used SDM to evaluate function of coastal impoundments, especially related to sea level rise.	Project is ongoing.	Hal Laskowski (DNR-Retired) Jennifer Casey (DNR)	R	IP
1F	<i>Open Marsh water management (OMWM)</i> Collection of data continued in 2011 to research ecosystem responses of saltmarshes to Open Marsh Water Management (OMWM) practices. Currently analyzing data on the following variables related to saltmarsh monitoring: nekton, saltmarsh vegetation, larval mosquito abundance, groundwater level, and soil salinity.	Project is ongoing.	Jan Taylor (DNR)	R	IP
1F	<i>Effects of Open Marsh Water Management on Saltmarsh Soil and Porewater Chemistry</i> This project comprises additional field measurements to an effort that was already planned and underway. The contractor has made several trips to the 3 refuges involved in this study: Forsythe NWR, Wertheim NWR and	Project is ongoing.	Sue Adamowicz (LMRD Biologist)	I,O	IP

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	Parker River NWR. A preliminary report could be made available end of October 2011, but it would represent only a partial analysis of the data collected to date. The unexpected OMWM treatment of two study plots at Forsythe NWR has led to extended conversations among the refuge and regional staff and refuge partners.				
1F	<i>Prescribed Fire Effects on Marshlands - Delmarva Peninsula habitat management</i> Implement adaptive management into the decision process for habitat restoration burns applied to critical areas on federal, state, and TNC lands. In the second year of a five-year project, surveyed 60 transects with 120 elevation points per transect. Compiled the survey data and sent them to be analyzed by cooperators with the National Geodetic Survey (NGS) and USFWS-Migratory Birds.	Project is ongoing.	Laura Mitchell (R5 Fire Program) Matt Whitbeck (Chesapeake Marshlands NWR Complex)	I, O	IP
1F	<i>Assist in modeling and analysis of data from AM projects</i> Hire a modeler to be shared with Region 3 (half time).	This position is scheduled to be filled in FY12.	Hal Laskowski (DNR-Retired) Jan Taylor (DNR) Bill Thompson (DNR-I&M)	I	IP
DATA MANAGEMENT					
General	<i>Region 5 Goals/Objectives Database</i> Consolidated CCP/HMP goals and objectives from all Region 5 refuges into one database and grouped by representative habitat or plant community to facilitate review of refuge I&M Part 1 submissions, and regional projects such as Water Quality and Quantity, Salt Marsh Integrity, Phragmites Management, Impoundment Management, and Shoreline Surveys.	Access database containing CCP/HMP goals and objectives for R5 refuges	Kelly Chadbourne (DNR-I&M)	I,R	C
1A	<i>WH8 Layers Database:</i> Determining status of GIS data layers (biotic and abiotic) identified in WH-8. Developed database to track status of WH-8 data layers on refuges, specifically to determine which refuges lack information.	Access database to track status of WH-8 data layers on refuges.	Kelly Chadbourne (DNR-I&M)	I	C
5A	<i>Salt Marsh Integrity Project, Sediment Elevation Tables, Coastal Shoreline Projects</i>	Database support	Kelly Chadbourne (DNR-I&M)	I,R	C

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
	Collaborating with National Park Service on review, adoption, and implementation of their Coastal Shoreline Database and Sediment Elevation Table database.				
5A	<i>Coastal Shoreline Project</i> Responsible for ongoing Coastal Shoreline GIS Analysis for refuges participating in the Multi-Agency Coastal Shoreline Study.	Database support	Kelly Chadbourne (DNR-I&M)	I,R	C
1F	<i>Phragmites Project GIS Analysis</i> Developed analysis to determine acres of wetlands and land use/landcover on refuges participating in the Phragmites Management SDM project.	GIS analysis	Kelly Chadbourne (DNR-I&M)	I,R	C
1F	<i>Integrated Waterbird Monitoring and Management (IWMM) Database</i> Integrated refuge CENSUS waterbird records into the newly designed IWMM database for many R5 refuges providing a means for refuges to analyze historic and current waterbird data. Worked with many refuge biologists to complete this process and continue to provide technical support.	Database development and support.	Kelly Chadbourne (DNR-I&M)	I,R	C
1F	<i>Shrublands Adaptive Management Project</i> Worked with the Shrublands Adaptive Management group of refuges and provided database support. Gave a demonstration of the database and metric calculations to the refuge biologists participating in the Shrubland Adaptive Management Project.	Database support.	Kelly Chadbourne (DNR-I&M)	I,R	C
General	<i>Regional Database Support</i> Database support includes, but is not limited to, the following databases: PRIMR, FWINS, SWIM2, Shrubland AMC database, and IWMM.	Database support	Kelly Chadbourne (DNR-I&M)	I,R	IP
General	<i>Fish and Wildlife Information Needs and Studies (FWINS) Database</i> Assisted the Office of the Science Advisor (OSA) with implementation and use of the Fish and Wildlife Information Needs and Studies (FWINS) Database. Briefed OSA on the status of FWINS and potential uses in January 2011.	Provided assistance to national office.	Kelly Chadbourne (DNR-I&M)	R	IP
General	<i>Acoustic Bat Multi-region/Multi-agency Protocols</i> Developed a SharePoint site specifically for the collection and transfer of acoustic bat monitoring surveys data.	SharePoint site	Kelly Chadbourne (DNR-I&M)	R	C

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
	These data are being collected region-wide and this site provides a regional repository for the survey data that other agencies can gain access to gather data for analysis. All data will be archived on our regional Inventory and Monitoring drive. Region 4 has begun using this site for data retrieval and archival.				
1C	<i>GRAS Pilot Effort</i> The national I&M Program is creating a centralized repository for compiling, organizing and making accessible recent and historic information that is important to refuge resource management. It is called Geospatially Referenced Archive Service (GRAS) and compiles documents and organizes datasets, such as reports, surveys, databases, geospatial data and images. In FY11, R5 reviewed the draft guidance document, chose a participating station and scheduled a site visit by interns from the national I&M Office.	Ongoing effort.	Bill Thompson (DNR-I&M) Kelly Chadbourne (DNR-I&M) Jan Taylor (DNR) Laura Eaton-Poole (DNR)	I	IP
General	<i>PRIMR Database Team</i> Served on national Team to develop definitions for the PRIMR database and to develop a consistent process for ranking refuge surveys.	Ongoing effort.	Bill Thompson (DNR-I&M)	I	IP
COMMUNICATION					
	<i>Program Reviews</i> Reviewed draft Part 1s of the Draft I&M Policy submitted by R5 Refuge staffs.	On-site workshops to provide guidance to refuge staff for revising their draft Part 1s. April-September, 2011	Bill Thompson (DNR-I&M) Kelly Chadbourne (DNR-I&M) Other DNR staff: Hal Laskowski (Retired) Jan Taylor Jennifer Casey Laura Eaton-Poole	I,R	IP
	<i>Project Proposal Reviews</i> Reviewed project proposals submitted through the Wildlife-Habitat Grants and Challenge Cost Share programs.	Ranked proposals and gave recommendations to R5's senior leadership. Developed a new guidance document and ranking criteria for these proposals. April-June 2011	Bill Thompson (DNR-I&M) Kelly Chadbourne (DNR-I&M) Other DNR staff: Hal Laskowski	I,R	C

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
			(Retired) Jan Taylor Jennifer Casey Laura Eaton-Poole		
	<i>Chincoteague Beach Parking Lot Workshop – SDM</i> Facilitated a structured decisionmaking workshop of refuge staff and other stakeholders to provide recommendations for the best location for a beach parking lot at Chincoteague NWR.	Final report of workshop findings and recommendations January 20-21, 2011	Hal Laskowski (DNR-Retired) Jennifer Casey (DNR) Bill Thompson (DNR-I&M)	I,R	C
	<i>Instructor: NCTC Course "Designing and Implementing a Biological Monitoring Program"</i>	September 19-23, 2011	Bill Thompson (DNR-I&M)	I	C
	<i>Presentation at Regional Biologists Meeting</i> Introduction to and overview of the new Refuge I&M program to refuge staff in R5 and key partners.	February 14-18, 2011	Hal Laskowski (DNR-Retired) Bill Thompson (DNR-I&M)	I	C
	<i>Presentation to NPS I&M and Regional staffs</i> Discussion of opportunities of project collaboration between Refuge and NPS I&M programs.	April 5-7, 2011	Bill Thompson (DNR-I&M)	I	C
	<i>Presentation at the George Wright Society Meeting – Bayesian methods session.</i> Presentation of Bayesian methods of analysis applied to I&M data. Audience primarily from NPS, especially its I&M program staff.	March 11-15, 2011	Bill Thompson (DNR-I&M)	I	C
	<i>Annual Report and Work Plan Team</i> Served on the National I&M Team that developed the file templates for the Annual Report and Work Plan.	February-March, 2011	Bill Thompson (DNT-I&M)	I	IP
	<i>Instructor: SharePoint 2007 Webinar</i> Training for Refuge biologists unfamiliar with the basics of SharePoint sites and introduced some advanced concepts.	February 2, 2011	Kelly Chadbourne (DNR-I&M)	I	C
	<i>Instructor: SharePoint 2010 Class</i> Training for External SharePoint Site users involved with developing Parker River NWR's CCP, Acoustic Bat Monitoring for Region 4.	January and June 2011	Kelly Chadbourne (DNR-I&M)	I	C
	<i>Instructor: Trimble/ArcPad Class</i> On-site training held at Forsythe and Eastern Shore of Virginia NWRs related to collecting coastal shoreline position data layers.	April 25-29, 2011	Kelly Chadbourne (DNR-I&M)	I	C

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
	<i>Instructor: SharePoint 2010 Class</i> Training for Region 4 and their use of the Acoustic Bat Monitoring SharePoint Site.	July 18, 2011	Kelly Chadbourne (DNR-I&M)	I	C
	<i>Instructor: Access 2007 Class</i> Four hours of training for staff from Chesapeake Marshlands and Eastern Neck NWRs to develop queries and reports for their Integrated Waterbird Management and Monitoring (IWMM) database.	February 2011	Kelly Chadbourne (DNR-I&M)	I	C
	<i>Instructor: Fish and Wildlife Information Needs and Studies Database</i> Webinar demonstration to Refuge I&M Coordinators and Data Managers	September 2011	Kelly Chadbourne (DNT-I&M)	I	C
	<i>Coastal Shoreline Survey Training Workshop</i> Training developed for refuges participating in shoreline positions surveys in collaboration with National Park Service	March 23-24, 2011	Kelly Chadbourne (DNR-I&M)	I	C
	<i>Coordinator: Acoustic Bat Workshop</i> Training developed to increase the level of understanding of acoustic bat monitoring equipment and bat call analysis software, and to go over White Nose Syndrome decontamination protocol. Held at Parker River NWR.	August 15-19, 2011	Kelly Chadbourne (DNR-I&M)	I	C
	<i>Phragmites SDM Workshop</i> Workshop hosted by R5 refuge staff and attended by FWS and other partners to develop an effective and sustainable approach for dealing with invasive Phragmites.	November 30 - December 2, 2011	Jan Taylor (DNR) Laura Eaton (DNR)	R	C
	<i>Peer-reviewed Article</i> “Responses of Saltmarsh Ecosystems to Mosquito Control Management Practices Along the Atlantic Coast (U.S.A.)” by James-Pirri et al (2011)	Peer-reviewed article in <i>Restoration Ecology</i>	Jan Taylor (DNR)	R	C

Table 7. Mountain-Prairie Region, R6, Inventory and Monitoring Program Activities, Staff, Funding, and Status During FY2011. (P=Planned, F=Funded, IP= In Progress, C=Completed, I=I&M, R=Refuge, and O=Other).

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
REGIONAL I&M PRIORITIES					
	Habitat Management Plans (HMPs)	HMPs for Kulm WMD, Fish Springs, Rocky Mountain Arsenal, Flint Hills, LaCreek, Marais de Cygnes	Zone biologists, database managers, and I&M coordinators	I, R	IP
	Inventory and Monitoring Plans (IMPs)	Kulm and Fish Springs will develop draft IMPs simultaneously with HMPs.	Zone biologists and I&M coordinator		P
	Comprehensive Conservation Plans	CCPs for Benton Lake, Lake Andes, San Luis Valley Complex, Quivara, Cokevill Meadows, Charles M. Russell, Ouray	Cami Dixon, Murray Laubhan, Jeff Warren	R, I&M funding for I&M staff time	IP
1b	Hydrogeomorphic assessment	Quivira, Baca, Monte Vista, and Alamosa	Murray Laubhan	I, R	C, IP
	I&M Review/Station Visits	• Field staff prioritized CCP objectives • Assessment of current inventory, monitoring, and studies on the refuge • Assessment of biological information and science needs to inform management decisions • Surveys are entered into the PRIMR database to roll up field station needs to the national level and also to conduct Part I of the draft I&M Policy.	I&M Staff	I	C
Summary of regional I&M priorities	Dakota Zone (Cami Dixon): *Prairie Management *Noxious/invasive plants, *Prairie Reconstruction, *Research, Inventory and Monitoring	Information needs of field stations; rolled up to national priorities	Zone biologist and database managers	I	O

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
Summary of regional I&M priorities	Southern Zone Refuges (Murray Laubhan): *Identification/assessment of monitoring needs (n = 8) *Assistance with CCP/HMP biological objectives (n = 8) *Assistance with inventory/GIS (n = 7) *Management advice (n = 6) *Development of monitoring protocols (n = 5) *Analysis of data (n = 4)	Information needs of field stations	Zone biologist and database managers	I	O
Summary of regional I&M priorities	Northern Zone (Jeff Warren) *Wetland (8 of 12) * Upland (7) * Riparian management (5) *Analyze quality existing or legacy data. *Integrating species surveys with habitat components.	Information needs of field stations	Zone biologist and database managers	I	O
ABIOTIC AND BIOTIC INVENTORIES					
1e	Worked with field stations to conduct vegetation covertype mapping	veg cover	Jen and Jo Ann		
1e	LiDAR: assisted field stations with LiDar mapping assessment - what has been done and not and follow-up work to get these completed for field the field stations (i.e., Bear River, Swan River).	LiDar	Jo Ann		
WATER					
1b	Water Resources Inventory and Assessment (WRIA)	Inventory program: Quivara	Water Resources Division (regional and national), Murray Laubhan	I, R	O
2a	DBR staff met with the R6 Planning and Water Resources division in April to discuss pre-CCP needs in regards to inventory and information needs and data gaps to inform CCP development.	Prioritize tasks related to refuge planning within the Divisions of Biological resources, Planning, and Water.	DBR, Planning, and WRD staff	I, R staff	O

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
1b	Led subteam to assess status of HGM utilization and evaluate needs and ranking method for funding HGM analysis; develop standards for HGM characterization and data usage across regional and national programs and divisions (Refuge, Planning, WRD) and reporting format.	Standard HGM assessments and report; consistency across refuge, regions, and programs that are involved.	Soch	I	O
LEGACY DATA					
1c	Worked with National I&M team to develop guidance document (protocol) for compiling, storing, evaluating the quality of, and reporting of legacy data.	Guidance document	Soch, Mike Artmann (Legacy Data Group member)	I, Other (Refuge Planning Division)	O
1a	Collaborate with National staff to develop GRAS database (to capture legacy data)	Database	JoAnn/Jennifer	I	O
1a	I&M staff working with various refuge staff (Seedskaadee, Bowdoin, National Bison Range, Charles M. Russell, Rocky Mountain Arsenal, etc.) to analyze legacy data to make management decisions	Data analysis	Zone biologists	I	O
ADAPTIVE MANAGEMENT					
1f	Native Prairie Adaptive Management Project * Cooperative effort between USGS and FWS * 19 stations are participating across MN, ND, SD, and MT with 122 management units Field stations are doing the monitoring of individual units, and implementing the recommended management actions	Coordination, database, decision support tool, management recommendations.	Cami, Jennifer, Justin Dupey, Soch	I, O = PPP LCC funds	O
1f	Secured funding to continue database manager position through FY12	database and decision support tool	Soch	I, O=PPP LCC	C
	DBR staff working with North Dakota State University, University of North Dakota, South Dakota State University to assist with research and data analysis	CESU contract completed	Cami, Soch	I	O
1f	• Reed Canary Grass Adaptive Management Project * 3 stations involved across Region * Rachel Laubhan currently doing coordination * Hand-off to FWS will likely take place in 2012	Coordination, decision support tools, data calls, etc.	Rachel Laubhan, Soch		O

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
1f	Cattail control multi-station study	Report, manuscripts, protocols	Murray, Soch	I, R=Refuge, O=USGS Northern Prairie	C
1f	Prairie Reconstruction Adaptive Management Project * 4 stations involved with associated research and monitoring efforts across Zone * Working with North Dakota State University, University of North Dakota, South Dakota State University to assist with research and data analysis * DBR staff provides coordination, data management, and partnership development	Information gained to inform management decisions	Cami	I	O
1f	Work with R1 to test and eval. Refuge Habitat Management Actions Database	Database	Zone biologists, R1 staff		O
	Assisted RRL NWR and Montana Fish, Wildlife and Parks (MFWP) in drafting an adaptive harvest plan for moose. Conducted analyses, designed database. Submitted the 2009 ungulate browse work as a Biological Technical Publication; If published, it will function as our methodology to share with others interested in monitoring browse.	Monitoring protocol	Jeff, Wayne, and Richard Keigley	I, R	O
FIRE					
2b	Collaborateed with USGS NPW RC/Native Prairie AM project/Sean DeKaiser/Caitlin Smith to develop protocol for monitoring effects of fire on habitats	Adaptive Management Study	Cami	I	O
2b	Worked with ND and SD Range Research Pipeline (submitted a proposal for grant to study fire, grazing,etc with a focus on KY blue in the 2 states)	Protocol/report	Cami	I	O
STRESSORS: INVASIVE SPECIES					
3a	Met with Regional Invasive Species coordinator to discuss I&M needs in regards to invasive species.	Protocols	Jeff and Soch	I	O

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
3a	Assisted Regional Invasive Species coordinator with mapping weeds on several field stations.	maps of invasive spp.	Jo Ann and Jen	I	O
WILDLIFE HEALTH					
3b	Worked with Tom Roffe to integrate wildlife health monitoring with I&M program.	meeting with Tom Roffe	Wayne	O	O
3b	Met with Wildlife Health Staff (Diane Borgreen) to discuss possible collaborations between I&M and Wildlife Health programs.		Cami	I	C
3b	Attended meeting with NBR staff, Wildlife Health Office staff, and Montana State University researchers (Clayton Marlow and 2 students) at MSU (Bozeman), to discuss ongoing work regarding bison reproductive performance, habitat selection, and range condition.	information and collaboration/collaboration	Jeff		C
BIRD MONITORING					
4c	Co-led a team of partners from various agencies and NGOs to convene a workshop to develop a framework for grassland bird conservation at multiple landscape scales, spanning across breeding, migration, and wintering grounds.	draft framework	Soch	I, O=Other programs	O
4c	Serves on national Bird Monitoring team to assess status of bird monitoring on field stations, across regions, and develop steps to implement a nationally coordinated bird monitoring program.	Monitoring program and protocols	Soch	I	O
4c	Marsh bird monitoring and database: support database development (Patuxent) and monitoring efforts on field stations; provided suggestions and comments on monitoring questions and issues related to the National Marsh Bird Monitoring Database.	database and monitoring program	Soch	I	O
4c	Provided comments on the proposal for "Monitoring Secretive Marshbirds for Sound Conservation Decisions at Multiple Scales", drafted by regional and national Mig. Bird staff.	Protocol to monitor marshbirds at multiple landscapes	Soch	I	C

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
DATABASE					
7	Developed and maintain SharePoint sites for regional I&M program and for the DBR staff.	Website	Jen	I	C
7	RLGIS: support field stations with installation and assist with training on how to use	database	Jen and Jo Ann	I	O
7	R6 Project and Budget Tracking database	database	Jen and Jo Ann	I	O
7	RFP (Request for Proposal) database	database	Jo Ann and Murray	I	C
7	PRIMR: served on team for development of database and populate the database with station I&M info.	database	Jen and Jo Ann	I	O
7	GRAS: served on team to develop and test	database	Jo Ann	I	O
7	GRAS: provided extensive comments and suggestions on guidance to upload legacy data into GRAS.	database and protocol	All	I	C
7	En Vi veg. classification software: test usage and application at our field station (Fish Springs)	database	Jo Ann	I	O
7	Staff worked with several field stations (Fish Springs, Bowdoin, National Bison Range, Charles M. Russell) to develop station-specific databases.	databases	Jeff and Jo Ann		C
7	Tested and compared RLGIS tool to R1 Refuge Habitat Management Actions Database (RHMAD).	database	Jen	I	C
LANDSCAPE CONSERVATION COOPERATIVES (LCCs)					
	Great Plains Landscape Conservation Cooperative (GPLCC): member of Science Team; reviewed proposals; assisted with development of various informational documents	team member; documents on LCC	Murray	I	O
	Great Northern LCC: Technical Team member; participated in various conference calls and webinar, meetings (Tech team meeting in April 2011; PL meeting Sept. 2011). Provided suggestions and comments on meeting agenda (Tech meeting and Project Leaders meeting)	Team member	Soch	I	O
	Plains and Prairie LCC: "Ad hoc" members: Prepared and submitted list as requested of science needs on field	Team member	Cami and Soch	I	O

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
	stations in R6.				
	Southern Rockies LCC:technical team member and attended Project Leaders meeting in Sept. 2011	Team member	Wayne	I	O
	Coordinator for 2 workshops as part of a series sponsored by NCTC on "Structured Decision Making Workshops for Landscape Conservation Cooperatives" topics. The workshops are 1) Developing a landscape scale framework for integrated grassland bird conservation and monitoring; 2) Developing a decision framework and communications structure to identify conservation priorities and science needs across FWS programs and for delivery to LCCs	Frame work/guidance	Soch	I	O
	• Lead for GNLCC Tri-state trumpeter swan proposal (participants included RRL NWR; Gray's Lake NWR; ; IWJV; HAPET; OMBM; Idaho Department of Fish and Game; Wyoming Fish and Game; Montana Fish, Wildlife and Parks). • Bear River Watershed Conservation Area – assisting BRWCA planning team in selecting focal species and modeling focal species core areas to target conservation actions. • Consulted with The Nature Conservancy and BLM on analysis of survival and habitat selection of radio-marked sage grouse (GNLCC priority species). • Consulted with Missoula Grizzly Bear Recovery Office on analysis of grizzly bear body condition (GNLCC priority species). • Assisted RRL NWR with establishing a graduate project at University of Montana Cooperative Wildlife Research Center.	information and collaboration	Jeff		O
COMMUNICATION-TRAINING					
	Distributed Regional Annual Work Plan to field staff, including the HAPET office, to obtain comments and suggestions and to engage with setting regional biological priorities.				

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
	Conducted 2 webinars to field stations to discuss I&M Program and to obtain input	information sharing	Staff	I, R	
	Dakota Zone Training and Information Sharing Opportunities • Basic Vegetation Monitoring Sessions - South Dakota Session – 50 participants, including biologist, managers, fire staff, maintenance staff, seasonal staff, and TNC staff - North Dakota Session – 30 participants, including biologist, managers, fire staff, seasonal staff • Native Prairie Adaptive Management Project Monitoring Training sessions - South Dakota Session – 20 participants - North Dakota Session - 20 participants • Grazing and Wildlife Workshop, Bismarck, ND - Organized with ND Grazing Coalition - 35 participants, including biologists, managers, fire staff, and seasonal staff, staff of the North Dakota Game and Fish Department, and staff of the Natural Resources Conservation Service (MD and MT) • Prairie Reconstruction Workshop, Madison, SD - 68 participants including FWS staff from R3 and R6, ND Game and Fish Department, South Dakota Game Fish and Parks, TNC, University of North Dakota, North Dakota State University, South Dakota State University, USGS	information sharing and collaboration		I	C
	Communicate I&M activities to the Science Committee to the FWS director and update the regional and national I&M staff about Science Committee activities: data sharing and release, database development and management; provided information to the Science Advisor on how science is being applied in natural resource decision making and example projects to present at two national conferences: Ecological Restoration in July and Ecological Society of America in Aug.	information sharing and collaboration	Soch	I	
	Instructor for "Designing and	Instruction	Soch	I	C

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
	Implementing a Monitoring Program" NCTC course				
	Instructor for "Biological Fundamentals" course at NCTC	Instruction	Cami	I	C
OTHER PARTNERSHIPS					
	Worked with the Director of Northern Prairie Wildlife Research Center to develop research needs that will benefit refuges.	Collaboration	Murray	I	C
	Worked with the Director of the Fort Collins Science Center and staff to develop research needs that would benefit refuges.	Collaboration	Murray	I	C
	Assisted Director of Northern Prairie Wildlife Research Center with technical issues regarding a whooping crane research study that involves trapping adults on Aransas NWR.	Collaboration	Murray	I	C
	• Project leader get together – provided a presentation on DBR program • Migratory Birds and oil and gas development meeting with HAPET, Field staff, ND Game and Fish, LCC, PPJV • Water quality issues related to oil and gas development meeting with Ecological Services, Field Staff, ND Game and Fish Department, ND Department of Health, LCC • Multiple meetings with field staff, USGS, LCC, Ducks Unlimited, Regional Easement Coordinator to develop research projects for tile drainage issues • HAPET staff meeting – provided a presentation on DBR • USGS Coop Unit and Southern Illinois University Carbondale – discussions about future research and monitoring efforts	information sharing and collaboration	Cami	I	C
	• Instructor for biological fundamentals course • Presentations to universities (i.e. Valley City State University) • Provided assistance with the development of Sprague's pipit management strategy and guidelines	information sharing and collaboration	Cami	I	

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
	Sand Lake Station Review		Cami and Soch	I	C
	Rocky Mountain Arsenal Station Review		Murray, Soch, Wayne	I	C
	Coordinated 2 workshops as part of a series sponsored by NCTC on "Structured Decision Making Workshops for Landscape Conservation Cooperatives" topics. The workshops are 1) Developing a landscape scale framework for integrated grassland bird conservation and monitoring; 2) Developing a decision framework and communications structure to identify conservation priorities and science needs across FWS programs and for delivery to LCCs	Framework to identify science needs across FWS programs, to the field stations, and to the LCCs.	Soch	I	O
	Serves on planning committee for the Ecological Society of America's Emerging Issues in Ecology Conference entitled "Developing Ecologically-Based Conservation Targets Under Global Change" to be held at NCTC, March 2012.	Conference/report	Soch	I	O
	Staff collaborating with USGS staff on submergent aquatic vegetation (SAV) analysis and sample design with the ultimate goal of having a workable monitoring protocol for refuges interested in SAV monitoring.	Protocol			C
	Staff attended a meeting with HAPET, IWJV, Mig. Birds, and PFW to discuss information sharing and focal species selection and coordinated bird monitoring.	information sharing and collaboration	Jeff	I	C
	Staff serves on the Montana Tech biology curriculum advisory committee.	Mentorship	Jeff	I	O

Table 8. Alaska Region, R7, Inventory and Monitoring Program Activities, Staff, Funding, and Status During FY2011. (P=Planned, F=Funded, IP= In Progress, C=Completed, I=I&M, R=Refuge, and O=Other).

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
ABIOTIC RESOURCES – INVENTORIES					
2a	<i>Stream gages</i> Completed initial gaging of stream flows at Tetlin (sixth and final year for 4 of 6 gages) and Kanuti (second of 6 years for 7 of 8 gages) Two gages at Tetlin and one gage at Kanuti will continue operating through a cooperative multiagency effort as long term monitoring sites after the initial WRB project. Water chemistry parameters are also measured at a subset of gages and water quality physical parameters are measured at all sites. Continuous water temperature data is recorded at the chemistry collection sites for a 5 year period.	Water Resources Data Report	Alan Peck	R (WRB), O (cooperative agreements)	IP – Tetlin IP - Kanuti
2a	<i>WRIAs</i> Cathy Flanagan participated on the national team coordinating the implementation of WRIAs. WRIAs were initiated on Kanuti and Tetlin NWRs by the WRB.	Data for WRIAs will be entered into the national database.	Cathy Flanagan	I, WRB	IP
1a	<i>Elevation data for coast of Arctic NWR</i> The NRPC provided funds across the NWRs to fill gaps in LiDAR for coastal refuges. Arctic NWR is using these funds to obtain IfSAR data for its coastal areas. Similar to LiDAR, IfSAR data is becoming the standard coverage for Alaska because it provides horizontal and vertical resolution of higher resolution than DEMs but since it lower resolution than LiDAR, it can cover much larger areas for the same cost.	High resolution elevation data to fill gaps in coverage for ongoing work involving several partnerships and the statewide initiative for obtaining adequate elevation data through IfSAR. These data will also assist studies of permafrost and geomorphology, hydrology, and cover-types which are expected to be significantly altered by climate change.	Dave Payer (Arctic NWR Supervisory Biologist)	I	IP

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
1a	<i>Soils Kodiak NWR Glottof RNA</i> Through funding from the NRPC, NRCS was able to complete a soil survey for an area of the Kodiak archipelago.	NRCS visited 76 sites and completed mapping for 151,541 acres, including site characteristics, vegetation descriptions, and species composition. Data is currently being associated with developing ecosite concepts. Full map unit descriptions and State and Transitions models are in preparation.	Bill Pyle (Kodiak NWR Supervisory Biologist)	I	C (survey), IP (reports)
6a	<i>Koyukuk/Nowitna Relict Sand Dunes and Climate Change</i>	GIS map of eolian landforms, a time line of dune activity over the last 18 K years, and a better understanding of the link between dune activity and climate change	Karen Bodony	I, R, O	IP
2a	<i>Izembek Stream Ecosystem Function – whole-stream metabolism, stream channel nutrient storage, and organic matter retention.</i>	A better understanding of whole stream metabolism including nutrient cycling, and its role in salmon management.	Trent Liebich	I, O, R	IP
ABIOTIC RESOURCES – MONITORING					
6a	<i>Snow pack and duration</i> Several Refuges currently monitor snow depth, but there is a need for a more coordinated effort as changes in snow amount and duration will have a great impact on water resources and ecosystem processes. The water resources monitoring work group will address development of standardized methods for monitoring snow.	Work towards a draft protocol will be initiated through conference calls and meetings	Diane Granfors, RNR biometrician, John Trawicki	I, R	IP
BIOTIC RESOURCES – INVENTORY					
1d	<i>Stream Invertebrates</i> Aquatic diatom and benthic macro-invertebrate sampling are conducted at a subset of gage sites in Tetlin (complete) and began in 2011 at Kanuti.	Water Resources Data Report	Alan Peck	R (WRB)	IP

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
1d	<i>Flora and fauna inventories – pilot projects</i> Two Alaska Refuges have conducted (Kenai) or are in the process of conducting (Kanuti) comprehensive flora and fauna surveys on their Refuge. Data were analyzed to determine cost/benefit ratios used to inform development an inventory protocol for all Alaska Refuges, and how such an inventory could be implemented given the enormous size and access constraints.	A report on the information obtained from different sampling schemes and methodologies to inform future flora and faunal inventories.	Anna-Marie Benson	R	IP
1(d,e)	<i>Aleutian Island flora and vegetation inventories</i> Although not a pilot study or necessarily classifying vegetation according to NVCS, these studies are an inventory of the vegetation of the Aleutian Islands and continued on Alaska Maritime and Izembek NWRs.	Reports on the floral composition and vegetation communities of the Aleutian Islands. Also working toward a book on Mosses of the Aleutian Islands. Presentations and publications in peer reviewed journals.	Stephen Talbot	R	IP
1d	<i>Flora and fauna inventories on Alaska Refuges</i> This topic was addressed by a Refuge Inventory team to develop objectives, evaluate different alternatives, and make recommendations to and elicit comments from refuge managers and the RO.	The inventory team has met to discuss objectives and potential methodologies for meeting biotic inventory needs.	Diane Granfors, Dave Payer, John Morton	I, R	IP
1d	<i>Spatially-explicit, unified vegetation/landcover classification for Alaska</i> There is currently no comprehensive remotely-sensed vegetation classification system for Alaska that meets the needs of land managers. I&M and LCC staff are working toward resolving this issue using the SDM process.	An agreed upon hierarchical vegetation classification that can be used by NWR managers and their partners.	Diane Granfors Karen Murphy (Western Alaska LCC)	I, R, O	IP
4a	<i>Identification of key wintering areas for Aleutian Crested Auklets</i>	An assessment of the vulnerability of crested auklets to oil spills during the non-breeding season.	Jeff Williams	I, O	IP
4a	<i>Kodiak Nesting Ecology of Kittlitz's Murrelet</i>	Identification of potential Kittlitz's Murrelet nesting habitat and a better understanding of basic nesting ecology. Kittlitz's Murrelet is a candidate for ESA listing.	Robin Corcoran	I, R, O	IP

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
4a	<i>Izembek Inventory of eelgrass to assess winter carrying capacity for Pacific Brant</i>	Improved winter carrying capacity model reflecting the huge increase in numbers staying at Izembek due to climate change.	Nancy Hoffman	I, R, O	IP
4a	<i>Roles of Alder and Salmon on Togiak</i>	A better understanding of the role salmon and alder play in providing nutrient inputs in lakes.	Pat Walsh	I, R, O	IP
4a	<i>Yukon Delta River Coho Salmon Study</i>	Pilot for potentially larger project aimed at understanding Coho salmon ocean survival and stock specific exploitation rates on the Kwethluk River.	Dan Gillikin	I, R, O	IP
4d	<i>Yukon Delta Survey of Diptera Family of Chironomidae of Western Alaska</i>	A baseline survey of an important juvenile salmon food item. Potential basis for future monitoring.	Tom Doolittle	I, R, O	IP
1e	<i>Kodiak Floristic Survey of Selected Areas of Western Kodiak Island</i>	A plant inventory including a collection of vascular plant specimens, habitat descriptions, and photopoints on four study sites on Kodiak island.	Bill Pyle	I, R, O	IP
6a	<i>Arctic Antlers on the Tundra</i>	Analyses of biogeographical patterns of calving grounds and nutritional value of sheds to mammals and birds.	Eric Wald	I, R, O	IP
3	<i>Kodiak ecology of non-native mountain goats</i>	An understanding of the population dynamics and resource selection of introduced mountain goats on Kodiak island, and their impact to native resources.	McCrea Cobb	I, R, O	IP
3	<i>Kenai exotic earthworms</i>	MS project. Distribution and possible effects of exotic earthworms on the Kenai NWR	John Morton	I, R	IP
3	<i>Relationship between introduced caribou and ecosystem function on Adak Island</i>	Informed management of this introduced herd on Adak (Aleutian Islands, Alaska Maritime)	Jeff Williams	I, R, O	IP

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
BIOTIC RESOURCES – MONITORING					
4b	<i>Phenology monitoring</i> A team has been formed to determine objectives and alternative methods for monitoring phenology on Refuges.	Phenology Team has met to discuss objectives, existing methods, tools on the NPN web site, and current Refuge phenological monitoring in R7 with the goal of developing a phenology plan and node on the NPN web site.	Bud Johnson, Diane Granfors, John Martin	I	IP
6a	<i>Yukon Flats Climate Change on Boreal Wetlands</i> measuring water chemistry, invertebrate composition, and migratory bird use on wetlands.	A better understanding of how wetlands and their biological parameters will be impacted by climate change.	Mark Bertram	I, R, O	IP
4a,c	<i>Arctic Shorebirds Demographics Network</i>	A better understanding of shorebird nesting ecology and population dynamics leading to a better understanding of climate change impacts and reasons for population declines	Arctic NWR	I, O	IP
6a	<i>Arctic Muskoxen Survival in NE Alaska</i>	A better understanding of musk ox population dynamics and reasons for their decline on the Arctic NWR. Cooperative project with ADF&G	Patricia Reynolds	I, O	IP
6a	<i>Kodiak Brown Bears and Climate Change</i>	PhD project – thesis, peer-reviewed papers. A better understanding of bear habitat use.	Bill Leacock	I, O, R	IP
6a	<i>Togiak Monitoring Pacific Walrus Haulouts</i>	Testing a camera system to monitor walrus use of haulouts and potential disturbance events. Pacific Walrus are a candidate for ESA listing.	Michael Winfree	I, R	IP
4a	<i>Togiak Monitoring Mulchatna Caribou</i>	Better understanding of the seasonal distribution, survival, and reproductive status of this herd. Cooperative project with ADF&G.	Andy Aderman	I, R, O	IP
4a,c	<i>Yukon Flats Rusty Blackbird Nesting Ecology</i>	Gain a better understanding of potential causes of population decline by studying foraging ecology, reproduction, and potential limiting factors.	Mark Bertram	I, R, O	IP

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
	<i>Kanuti I&M Team Leader</i>	Assistance with inventories and surveys at an understaffed refuge.	Tim Craig	I, R, O	IP
	<i>Moose Monitoring Protocol</i> Many refuges regularly monitor moose but lack a standard protocol.	Standard moose monitoring protocol used by all refuges engaged in monitoring moose populations.	Tim Craig, Nathan Berg, Nathan Roberts	I, R	IP
	<i>Beaver Monitoring Protocols</i> As above, many refuges monitor beaver but lack a standard protocol.	Standard beaver monitoring protocol used by all refuges engaged in monitoring beaver activity.	Lisa Saperstein, Nathan Roberts, Tim Craig	I, R	IP
	<i>Redesign of Tundra Swan monitoring on the Alaska Peninsula/Becharof NWR</i> Tundra Swans are currently monitored using a stratified sampling scheme that may be unsuitable for long-term monitoring.	An efficient sampling design for monitoring Tundra Swans.	Nathan Roberts, Hilmar Maier, Susan Savage	I, R	IP
DATA MANAGEMENT					
	<i>Refuge project survey database</i> The Planning and Review of Inventory and Monitoring and Monitoring (PRIMR) database is being developed and piloted for use by Refuges to assist with development of a refuge IMP, and to inform other refuges and regional staff of current I&M projects on Refuges.	The PRIMR database was modified to meet R7 needs. The database was populated with CCP goals and objectives from those refuges that have completed their CCP. The database was also populated with data from an Effort Analysis conducted in 2009.	Hilmar Maier, Michael Cunanan	I	IP
	<i>Steller's Eider Banding Database</i> This database for Izembek refuge was redesigned to eliminate redundancies and prepare the data for analysis.	A banding database that will assist in local data analysis but will allow integration with other refuge and regional information systems.	Michael Cunanan	I	IP
	<i>Koyukuk/Nowitna Data Management</i> Refuge staff were given training and assistance on database development and data management.	A data management plan for the refuge and improved database development for specific projects	Hilmar Maier	I	IP
	<i>Geospatial Advisory Committee</i>	This team identified priority geospatial datasets and developed strategies for development of data standards	Hilmar Maier	I	IP

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
	<i>Alaska Database Integration working group (ADIwg)</i> Development of data standards for sharing information on projects across Alaska by multiple agencies, NGOs, and Universities. Project is led by the Alaska Climate Science Center for the Alaska Climate Change Executive Roundtable. Phase 1 is metadata on surveys currently conducted in Alaska.	Implementation of ADIwg metadata standards for projects conducted on the refuge (through population of the PRIMR database).	Michael Cunanan	I	IP
	<i>Water Resource Branch Weather Data</i> Automate download of climate data for use in interpreting stream gauge and temperature data. Will also be useful for other refuge projects.	Scripts for automating data retrieval and formatting of NCDC climate data, SQL Server database containing formatted NCDC climate data for Alaska, and complete documentation.	Michael Cunanan	I	IP
	<i>Global Observation Research Initiative in Alpine Environments (GLORIA)</i> Data collected by Stephen Talbot in 2007 and 2010 was entered by a SCEP student into a database managed at the University of Vienna.	GLORIA is an international project to monitor the impact of climate change on alpine ecosystems and species diversity. Alaska participates through monitoring sites in the Brooks Range on The Arctic and Selawik NWRs.	Stephen Talbot	R	IP
	<i>Alaska Maritime Data Rescue and Regional Database Development</i>	Evaluation of the status of seabird data, increased access by Maritime staff, improved public outreach. Will link to North Pacific Seabird Data Portal.	Nora Rojek	I, R	IP
COMMUNICATION					
	<i>Conservation of Arctic Flora and Fauna (CAFF),</i> The regional I&M coordinator attended a meeting of the newly formed Circumpolar Protected Areas Monitoring (CPAM) group to discuss ways of coordinating data reporting on protected areas in the Arctic.	28-30 March 2011 Granfors presented an introduction of the National and Alaska Region I&M initiative. Plan for developing information sharing capacities among circumpolar countries and agencies to be developed by the CPAM coordinator.	Diane Granfors	I	C

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
	<i>Supervisory/lead Biologist I&M Workshop</i> The workshop was held to introduce the new I&M and Natural Resources staff to the refuge biologists and to develop initial objectives and a plan for moving forward with the Region 7 Refuge I&M program.	5-6 April 2011 Initial objectives for the region 7 I&M plan and a strategy to move forward as outlined briefly in this workplan.	Diane Granfors, Danielle Jerry, John Martin, Hilmar Maier, Anna-Marie Benson, Nathan Roberts, Jerry Hill, Nate Berg	I	C
	<i>Western Alaska LCC Science Workshop</i> The I&M coordinator will attend this first multi-partner, region-wide invitation only workshop that will identify science needs for the Western Alaska LCC for the next five years.	26-27 April 2011	Diane Granfors, Danielle Jerry,	I	C
	<i>Alaska Climate Downscaling Workshop</i> Sponsored by the Western Alaska LCC and the Alaska CSC will be a forum to learn about state-of-the-science climate downscaling models for Alaska, and to discuss current future capacities and science and management needs.	28-29 April 2011 White paper to identify a science action plan is planned.	Diane Granfors	I	C
	<i>Vegetation of the Aleutian Islands</i> Stephen Talbot presented several talks to the staff of Izembek NWR and refuge administrative staff. Stephen is also successfully submitted several papers on his work in peer reviewed journals.	Dissemination of information on the vegetation of the Aleutian Islands to fellow botanists and refuge biology and non-biology staff.	Stephen Talbot	R	IP
	<i>CAFF, Circumboreal Vegetation Mapping (CBVM)</i> As chair of the CAFF Flora group and coordinator of the CBVM, Stephen Talbot presented an update and organized a workshop at the CAFF biennial meeting in Akureyri, Iceland and presented an update at the European Vegetation Survey in Rome.	An internationally accepted classification and map of boreal vegetation communities.	Stephen Talbot	R, O	IP
	<i>R7 I&M briefings</i> were presented to the Regional Director, Deputy Director, Refuge Chief, Deputy Refuge Chief, Refuge Supervisors, Migratory Bird and State Programs Chief, Fisheries and Ecological Services Chief, Science Applications Chief, and External Affairs	Better understanding of the I&M program by the RDT and refuge supervisors.	Diane Granfors, Danielle Jerry	I	C
	<i>Western Arctic Caribou Working Group</i> The regional I&M provided assistance to allow this interagency group to meet for the purposes of management planning of this large, economically and ecologically important herd.	Continued coordinated management planning for the WACH.	Lee Anne Ayers	I, R, O	IP

Table 9. California and Nevada Region, R8, Inventory and Monitoring Program Activities, Staff, Funding, and Status During FY2011. (P=Planned, F=Funded, IP= In Progress, C=Completed, I=I&M, R=Refuge, and O=Other).

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
4.1.1. and 4.1.2. STATUS OF STATION HABITAT MANAGEMENT PLANS AND I&M PLANS					
	<i>Establishment of HMPs and IMPs in Region 8</i> Currently, no refuges in Region 8 have these plans.	Reviewed other region HMP process and products. Information will be used to guide development of R8 HMPs.	Hejl	I	IP
4.1.3. IDENTIFY I&M PRIORITIES					
Task A	<i>Strategic Planning</i> Develop long-term (5 year) strategic plan for the Region 8 I&M program.	Developed Draft 5 Year Strategic Plan	Laing	I	IP
Task B	<i>Communication with Refuge leadership</i> Provide updates to and receive guidance from R8 leadership team	Provided Refuge leadership with reports on I&M activities and projects. Attended meetings, conference calls, contacted all project leaders, visited 13 of the 14 refuge complexes; provided presentations on I&M program at field stations, meetings	Laing Richmond Block Esralew Keller	I	IP

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
4.2 ABIOTIC RESOURCES					
1B	<i>Support Hydrogeomorphologic (HGM) assessment projects on Bitter Creek, Ruby Lake, Ellicott Slough, San Luis, Kern, Pixley, Modoc and Stone Lakes NWRs</i> Hydrogeomorphic (HGM) assessments examine the historical ecology of refuges and help identify restoration and management options.	-Coordinated 6 HGM kick-off meetings with refuge staff and HGM contractors (Stone Lakes NWR kick-off will be in FY 2012) -Developed a 2011-12 HGM Work Plan describing strategies for supporting the completion of 7 HGM reports, integrating HGM data gathering with other I&M projects (e.g., legacy data/data mining and WRIAs) and assessing the utility of the final HGM reports (Figure 3) -Scanned 128 annual narratives and entered them into GRAS database -Scanned 460 historical documents and entered them into GRAS database -Obtained and organized 61 GB of digital data from refuges -Participated in 1 National HGM Team call -Contractor completed 3 HGM status reports (Bitter Creek, Ellicott Slough and Ruby Lake) -Provided comment and review of 3 HGM status reports -Completed Pahrnagat NWR HGM funded by non-I&M Refuge funds.	Richmond Block Esralew Dulava Tapia	I	F IP
2A	<i>WRIA ranking and schedule</i> Develop ranking system and identify schedule for WRIAs for Region 8 refuges. This project fulfills activities identified in the national Climate Change Action Priorities for FY 2011.	-Selected 5 pilot refuges for WRIAs for completion (draft report) by FY2012, based on prioritization/ranking process focused on efficiency -Initiated WRIAs on 4 refuges (See Figure 3) -Developed 2011-2012 Workplan describing strategies for completing pilot WRIAs, prioritizing/ranking future WRIAs, and completing basic level inventories for all refuges in support of WRIAs. -Developed a CESU agreement with University of California Davis to provide resources and expertise to complete WRIAs	Esralew	I	F IP

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
2A	<i>WRIA national project</i> Work with the national water quality team, led by Mike Higgins of the Natural Resource Program Center (NRPC) in Fort Collins, to refine the WRIA process and database.	-Participated in 7 National WRIA Team calls and 2 WRIA Assessment Sub-team calls -Provided comment and review on draft WRIA database schema and subsequent fact sheets, white papers, and documents produced by the National WRIA Team. -Obtained \$25,000 in support funding for WRIAs from National I&M/National Water Team	Esralew	I O	IP
	<i>Water Quality and Quantity</i>	-Developed a contract with WestWater Research to conduct pilot study and proposal development for updating water rights information in support of WRIAs -Obtained \$18,790 in funding from FWS Region 8 Environmental Contaminants for completion of a Contaminant Assessment Process (CAP) for Kern and Pixley Refuges. CAPs are 95% completed through the process of completing a WRIA, so this funding supports WRIA completion. -Active member of planning team for National Association of Service Hydrologists (NASH) Fall Workshop -Active member of the National Water Sub-Team: Standards of Procedure for collection and processing of water quality and water quantity data collected by Regional FWS Water Programs -Initiated communication with the Central Valley Project Improvement Act (CVPIA) Refuge Water Supply staff (USFWS, USBR) to share refuge water supply information and discuss common goals and objectives between programs -Worked actively with Environmental Contaminants in support of water quality data collection/analysis, accessibility of water quality data from EC research, addressing TMDL issues, and long-term strategy for development of a water quality monitoring network for refuges	Esralew	I O	IP

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
		-Worked actively with the Region 1 and 8 Water Resources Branch to and to discuss coordination and communication of refuge water needs (water rights, status and trends, and water quantity data collection) network).			
	<i>I&M Funded Refuge Specific Projects</i> ASH MEADOWS NATIONAL WILDLIFE REFUGE SONNY BONO SALTON SEA NATIONAL WILDLIFE REFUGE	Inventory and Monitoring of Water Quality (Refuge-wide) and Restoration Sites in Ash Meadows National Wildlife Refuge Inventory of moisture and salt distribution in soils and sediments that support threatened and endangered plants in the Ash Meadows National Wildlife Refuge Soil Characterization for Waterfowl Wetlands and Fields	Refuge Staff	I	F, IP
3.3.1. BIOTIC RESOURCES: INVENTORIES					
1E	<i>Vegetation Mapping</i> Assist the Division of Planning to prioritize refuges for vegetation mapping, and subsequently with the development of a contract for conducting vegetation surveys. The surveys will be used in the development of a vegetation map for 2 priority refuges in FY11 and continued in FY12 for a third Refuge. Summarize available regional scale vegetation datasets for refuges.	-Prioritized list of refuges for vegetation mapping assistance -FY11 priority refuges were Anaho Island, Ruby Lake and Stillwater. Mapping and ground truthing of two priority refuge vegetation maps -A CESU agreement with University of Nevada Reno was developed for the vegetation surveys. The surveys will be completed at Anaho Island and Ruby Lake. The results from the surveys will be used to develop the National Vegetation Classification System (NVCS) types used in the maps developed by the Planning Div. -Planning Div. will be a partner on the project and will complete the polygon development and attribution. -Anaho Island and Ruby Lake were funded with FY11 funds. Stillwater is scheduled to be funded in FY12. Vegetation Summary Report -There are many different regional scale vegetation datasets available for California and Nevada. Summary tables were developed for California Central Valley Refuges based on regional data (1874, 1945, 1960, 1990).	Keller Tapia	I O	F IP

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
3.3.2. BIOTIC RESOURCES: MONITORING					
4C	<i>Review bird monitoring efforts and tools</i> Identify national and regional bird monitoring efforts and conservation plans that do or could encompass refuges. Catalog existing bird monitoring protocols (e.g., Marsh Bird Monitoring Framework) in the GRAS database. Participate on national I&M bird monitoring team.	-Developed a database of 55 partner organizations that are involved in bird monitoring in Region 8 -Identified 53 national and regional bird conservation plans that encompass refuges in Region 8 -Identified 16 standardized bird monitoring protocols and entered them in GRAS -Participated in 3 National I&M Bird Team calls	Richmond	I	IP
4C	<i>Improve existing bird monitoring efforts</i> Conduct pilot projects with Refuges and Refuge partners to support and improve ongoing bird monitoring efforts by promoting standardized protocols and up-to-date technology.	-Coordinated 3 meetings of San Francisco Bay partners to develop improved marsh bird monitoring protocol based on North American Marsh Bird Monitoring Protocols (Conway 2009) -Completed draft San Francisco Bay Marsh Bird Monitoring Protocol (pilot year 2012) -Coordinated a meeting of Central Valley and San Francisco Bay waterfowl biologists to develop strategies for improving the Mid-Winter Waterfowl Survey in San Francisco Bay -Tested GPS system for collecting detailed spatial information during Mid-Winter Survey	Richmond	I	IP
4C	<i>Support ongoing biotic monitoring</i> Assist refuges with ongoing biotic monitoring and participate in national or regional monitoring programs.	-Assisted Refuges with ongoing biotic monitoring for the following taxa: amphibians, butterflies, endangered plants, secretive marsh birds, shorebirds, small mammals and vernal pool invertebrates. -Participated in national and regional bird monitoring efforts, including the Breeding Bird Survey (BBS), Mid-Winter Waterfowl Survey, Pacific Flyway Shorebird Survey and Tri-colored Blackbird Survey.	Richmond	I	IP

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
	<i>I&M Funded Refuge Specific Projects</i> -ANAHO ISLAND NATIONAL WILDLIFE REFUGE	Assessing the relative importance of cui-ui (an endangered fish species) to American White Pelican reproductive success on Anaho Island NWR using recovered fish tags.			
	-BITTER CREEK NATIONAL WILDLIFE REFUGE	Development of a Grazing Management Plan			
	-DESERT NATIONAL WILDLIFE RANGE	Augmenting a Study on Survival and Habitat Requirements of Desert Bighorn Sheep in the Sheep Range of the Desert NWR			
	-DON EDWARDS SAN FRANCISCO BAY NATIONAL WILDLIFE REFUGE	Synthesizing Legacy Waterbird Nesting Data to Inform Adaptive Management of Wetlands on the Don Edwards San Francisco Bay National Wildlife Refuge	Refuge Staff	I	F,IP
	-FARALLON NATIONAL WILDLIFE REFUGE	Abundance and Distribution of Arboreal Salamanders (<i>Aneides lugubris</i>) on the Farallon Islands			
	-HUMBOLDT BAY NATIONAL WILDLIFE REFUGE	Waterbird abundance in relation to vegetation characteristics and management regimes at Humboldt Bay National Wildlife Refuge			
	-TULE LAKE NATIONAL WILDLIFE REFUGE	Evaluating migratory wetland bird response to water delivery and habitat management alternatives on Tule Lake and Lower Klamath National Wildlife Refuges			

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
3.4. STRESSORS: CLIMATE CHANGE					
5B	<i>Coastal Sea Level Rise(SLR) Modeling</i> Identify and collaborate with national and regional working groups, LCCs, local, State, and Federal agencies and non-governmental organizations to evaluate the extent of SLR modeling efforts (e.g., SLAMM, SET), their usefulness to refuges, future needs, and potential alternatives.	Report on efforts to predict and measure SLR in Region 8: identification of current state of the technology, field data collection needs, and modeling needs. SLAMM modeling (Sea level Affecting Marshes Model) is complete for all coastal refuges except Humboldt Bay NWR. SLAMM models provide insight into the magnitude of change but lack the resolution needed to inform management decisions at a local scale. High resolution SLR modeling of coastal tidal marsh was coordinated for 3 coastal refuges in the San Diego NWR Complex through partnerships between the R8 I&M Program, San Diego NWR Complex, USFWS Science Division, California LCC, USGS, and the National Estuarine Research Reserve. An additional \$245K was attained for these projects. Previous high resolutions SLR modeling of tidal marsh for San Pablo Bay NWR is being expanded into tidal mudflats and adjacent uplands under same partnerships above. High resolution SLR modeling of a tidal marsh parcel at Humboldt Bay NWR was initiated. This project is a partnership between USGS, the North Pacific LCC, and Humboldt Bay NWR as a result of coordination between I&M and several partners during spring 2011. An additional 28K was attained for this project from the North Pacific LCC. A report summarizing these efforts will be completed in FY12012.	Block	I O	F IP
	<i>I&M Funded Refuge Specific Projects</i> HUMBOLDT BAY NATIONAL WILDLIFE REFUGE	Responding to climate change at a coastal refuge: synthesizing 25 years of historical ecological data and filling data gaps to steer management towards increased ecosystem resiliency.	Refuge Staff	I	F

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
4B	<i>Evaluate the CA Plant Phenology Project</i> In California the National Phenology Network (NPN) is collaborating with the National Park Service to implement and test U.S.A._NPN plant protocols and to test methods for engaging park staff and local communities in phenological monitoring. This is a collaborative effort between NPS, NPN, the National Ecological Observatory Network, UC Santa Barbara, and USGS. The role of the R8 I&M team will be to evaluate the Projects' future applicability to Refuges in R8/	Tracked the progress of the CA Phenology project in R8 -Pilot is being conducted at 6 NPS parks in CA -Attended a meeting where NPS botanists selected focal plant species and developed phenophase descriptions -Attended a workshop for the Golden Gate National Recreation Area during June 2011: overview of plant phenology and significance to climate change, training on use of the NPN protocol, and data management via the NPN Network internet portal. Sites for monitoring were identified -To date NPS units vary widely in the level of participation, resources, and program involvement (e.g., I&M, visitor services). Of concern by park managers is the usefulness of this data to current management. Final products expected in 2013	Block	I, O	IP
3.4. STRESSORS: INVASIVE SPECIES					
3A	<i>Develop Invasive Plant Adaptive Management Process: Pilot Project</i> Conduct a pilot project in a Region 8 refuge in partnership with the National Invasive Species Program, USGS and Utah State University. The pilot is funded by the NRPC. We will develop an invasive plant prioritization process, conduct an inventory of priority species, and model habitat relationships and spread (geospatial niche modeling).	Participated in a national team examining methods for prioritizing and conducting invasive plant inventories on NWRs in four regions. Invasive plant assessment workshops and inventories began in May 2011 and are completed at Quivira NWR, Alligator River NWR, and Silvio O. Conte NFWR. The prioritization workshop for San Diego NWR occurred in September 2011 and inventory of priority species will occur during spring 2012. Risk occurrence modeling for 1-2 priority species at the refuge and larger landscape scale is underway for 3 of the 4 pilot refuges. Modeling will occur for the final pilot refuge (San Diego) during summer 2012. Established a CESU Agreement with Utah State University to develop tools for assessing invasive plant threats on refuge lands. A report summarizing FY2011 efforts will be prepared in FY2012	Block	I O	F IP

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
3A	<i>Early Detection Networks</i> Identify and participate in Early Detection and Rapid Response (EDRR) Networks for invasive plants. EDRR increases the likelihood that localized invasive populations will be found, contained, and eradicated before they become widely established and cause environmental harm. EDRR can slow range expansion and avoid the need for costly long-term control efforts. By keeping current on regional invasive species issues and control techniques, I&M staff will improve our ability to assist refuges. This is an initial step toward refuge participation with EDRR Networks.	Participated in the Bay Area Early Detection Network as a Steering Committee member – funding, products development and review, staff hiring. Provided review of CA Invasive Plant Council draft climate modeling tool for highly invasive plants in CA - “Statewide Risk Mapping for Early Detection in CA!” Collaborated with CA Invasive Plant Council and other federal and state partners to develop "Preventing the Spread of Invasive Plants: Best Management Practices for Land Managers (2011)". Available on-line at http://www.cal-ipc.org/ip/prevention/landmanagers.php. Partnered with the California LCC to support the 20th annual CA Invasive Plant Council Symposium. Provided registrations for refuge staff attendance.	Block	I	IP
	<i>I&M Funded Refuge Specific Projects</i> MODOC NATIONAL WILDLIFE REFUGE	Modoc NWR Invasive Weed Baseline Inventory	Refuge Staff	I	F, IP
3.5. ADAPTIVE MANAGEMENT PROJECTS					
1F	<i>Initiate analysis of existing refuge I&M data to exemplify use of monitoring data to implement adaptive management in a Refuge habitat management program.</i> Initiate an adaptive management pilot: analysis of existing refuge I&M data that supports adaptive management. The pilot will focus on control of <i>Lepidium latifolium</i> in tidal marshes of San Pablo Bay.	Initial analysis of pre-and post-treatment data Develop a CESU agreement to provide biometrician support for analysis of refuge data and design of monitoring activities.	Block Keller	I	F, IP

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
3.6. DATA MANAGEMENT					
Task A	<i>Refuge Data Inventory Plan (RDIP)</i> Develop a plan outlining the steps involved in inventorying refuge resources and developing strategies for tracking the inventory data. This project will incorporate step-down plans for abiotic datasets, priority biological resources, invasive species, WRIA and HGM projects. It will contribute to the development of individual refuge Inventory and Monitoring Plans (IMPs). We will also begin to implement the RDIP by assembling information from Comprehensive Conservation Plans (CCPs), Habitat Management Plans (HMPs) and other priority sources.	First draft of RDIP -Summary tables generated from identified datasets - o Summary tables for Baileys Ecoregions, TNC Ecoregions, Critical Habitat, California Natural Diversity Database (CNDDB), and various CA vegetation datasets have been identified and summarized for each Refuged covered by the dataset. -Testing of the PRIMR database was conducted at Stone Lakes, Ellicot Slough, Antioch Dunes and San Pablo Bay Refuges -Gained valuable insight on data on refuges and will use this information for re-evaluation on the RDIP process. Catalog of CCP and HMP data according to RDIP -CCP goals and Objectives have been entered into PRIMR for 26 of the 50 NWR and WMA sites in R8. 20 of the NWRS did not have final CCP documents. The 4 WMA did not have available management plans	Keller Richmond Block Tapia McDonald	I	IP

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
	<i>Legacy Data Project</i> Catalog existing Refuge data using the GRAS tool developed by the NRPC.	Used existing data gathering efforts to populate GRAS database. -Used HGM and WRIA efforts at Ruby Lake, Bitter Creek, Ellicot Slough, Stone Lakes, Kern, Pixley, Modoc, and Merced to test and capture Refuge data related to historic ecology and water resources. (See HGM and WRIA sections for further details) Developed a pilot project for testing methods of identification of refuge datasets, cataloging and developing long-term archival options -Developed CESU agreement with UC Davis to assist in development and implementation of pilot projects at Modoc and Stone Lakes Participated in National I&M pilot project for the implementation of GRAS at Refuges -Captured 335 documents at Stillwater NWR (3 R8 staff and 2 National program technicians) -Continue project at Don Edwards NWR *As of 10/25/2011 R8 has close to 1000 records entered into GRAS from the various data cataloging efforts (HGM, WRIA, national and regional efforts).	Keller Esralew Richmond	I	IP
	<i>I&M Funded Refuge Specific Projects</i> SAN DIEGO NATIONAL WILDLIFE REFUGE	Digital Inventory and Accessibility of Legacy Data for the San Diego National Wildlife Refuge	Refuge Staff Keller	I	F

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
1A	<i>Assemble Abiotic Data</i> Develop an abiotic data step-down plan as part of the RDIP. The plan will identify existing abiotic datasets to be catalogued, and will prioritize which refuges will be addressed first. We will begin implementation of the step-down plan by assembling abiotic datasets for priority refuges. We will summarize data as it becomes available for each refuge so that it can be used and evaluated by refuges.	First draft of the abiotic data collection plan for RDIP Catalog of identified datasets using GRAS database -Gathered over 600 references during HGM and WRIA visits to Refuges have been entered into the GRAS database. Generated Summary tables from identified datasets -Summary tables for National Hydrography Dataset, Irrigation Districts, Aquifers, CA flood districts, Reclamation Districts, USGS Quad Index and available LiDAR were identified and summarized for each Refuged covered by the dataset. Developed pilot WRIA data storage system (in advance of completion of national database) that intersects water quality, quantity, and water rights data from other state and federal databases as well as FWS databases (ECDMS, WISKI, WREN, Region 1 Project Directory) to improve access to complex hydrologic information from multiple sources that are critical to characterizing refuge water resources.	Keller Dulava McDonald Tapia	I	IP
DM3	<i>Database Development</i> Work with NRPC and other Regional I&M data managers to identify and develop additional databases.	Contributed to national data manager team projects -Reviewed and Test PRIMR database -Reviewed, Tested and implemented GRAS database -Provided NRPC with feedback on database structure	Keller	I	IP
DM5	<i>Refuge I&M Reviews Database (PRIMR)</i> Provide technical support to Region 8 staff in the implementation and evaluation of PRIMR developed by Region 1 to meet the I&M Policy.	Population of PRIMR with information from one refuge as a pilot -Populated PRIMR database with information from 26 CCPs -Tested database with Ellicot Slough, Antioch Dunes, San Pablo Bay and Stone Lakes NWR Comments to NRPC on PRIMR based on pilot -R8 is leading PRIMR Guidance Document Team's review of domains and IMP content	Keller Laing	I	IP

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
DM7	<i>I&M Data Standards and Governance teams</i> Participate on national I&M Data Standards and Data Governance teams.	Contributed to national I&M Data Standards and Data Governance guidelines. -Active participation in the Legacy Data implementation sub-team. Provided information from R8 pilot project efforts. Worked with other team members to develop guidance for legacy data collection. Coordinated with Regional GIS coordinator on issues about data management and data sharing in the Region. -Participated in Regional data sharing efforts -Collected regional datasets to share with other regional staff using data sharing tools -Shared information about national I&M efforts with Regional coordinator.	Keller	I	IP
3.7. COMMUNICATION					
General Task C	<i>Establish dialogue with refuge staff</i> Educate refuge staff about I&M program; include refuges in planning process; learn about refuge needs	Coordinated monthly conference calls with refuge biologists Provided information about I&M program at Project Leader meetings and at field station visits Attended refuge staff presentations to educate I&M staff about refuges Queried Project Leaders re: how to be involved in I&M planning Developed Fact Sheet for R8 I&M Program Visited staff at refuges at 13 of 14 refuge complexes in the region Participated in the development of the BAC Contributed to the development of the R8 Biological Program strategic plan. Two I&M staff stationed at Don Edwards NWR Participated in the Stillwater NWR Refuge Review	Damberg Laing Block Richmond Esralew Keller Hejl McDonald Dulava Tapia	I	IP

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
1F	<i>Pilot "Bio Brown Bag Lunch" at Don Edwards San Francisco Bay Refuge</i> Initiate a pilot biology discussion and speaker series at Don Edwards that will provide support to refuge biologists in designing monitoring and adaptive management studies, analyzing data and interpreting results. Coordinate invited speakers and discuss current and relevant scientific literature.	Five meetings at Don Edwards; broadcast invited speakers via webinar so that staff at other refuges can attend some sessions. -26-Jan-11; Speaker: Brian Alfaro, masters student at Cal State East Bay. Talk: "Perennial pepperweed (<i>Lepidium latifolium</i>) and its seasonal effects on ecotone marshland vegetation in South San Francisco Bay" -23-Feb-11; Speaker: Phil Greer of Wetlands Research Associates; Talk: "2010 biological monitoring results for vernal pools at Pacific Commons" -20-Apr-11; Speaker: David Thomson; Talk: "Strategies for restoring tidal marsh ecosystems in the South San Francisco Bay" -29-Jun-11; Speaker: Cynthia Powell, California Invasive Plant Council; Talk: "Invasive plant species mapping project in California" -14-Sep-11; Speaker: Brian Alfaro, masters student at Cal State East Bay; Talk: "Update on perennial pepperweed mapping project in South San Francisco Bay"	Richmond	I	IP, C
General Task C	<i>Partnerships</i> Work with the California LCC and other USFWS programs, exploring potential partnerships with Universities and conservation organizations within Region 8.	Completed co-location of new offices with California LCC; developed draft agreement to define working relations Initiated joint project with California LCC -Sea level rise project Contributed to the California LCC Informatics Team -Participated in California LCC Informatics Team 2 day Workshop Worked with Great Basin and Desert LCCs as they develop (in FY 2011, these LCCs are still being formed).	Damberg Laing Block Richmond Esralew Keller Hejl	I	IP

Blueprint Task(s)	Project or Theme (Work Activity)	Product(s)	I&M Staff	Funding	Status
DM9	<i>Partnerships</i>	Developed working agreements with USGS -Developed agreement to co-locate with USGS and California LCC and collaborate on projects. -Developed agreement for USGS IT services. Developed partnerships with Universities for collaboration and expertise necessary to support I&M projects in R8 -Developed 5 CESU agreements with 3 Universities. The topics covered include biostatistical analysis, legacy data and archiving, WRIA support , vegetation inventory and mapping, and invasive species inventory Developed working partnership with FWS Region 8 Environmental Contaminants about water quality data analysis for Refuges and field stations. Developed working partnership with FWS Region 1 / Region 8 Water Resources Branch for coordination and communication of refuge water needs. Began multiple partnerships to address migratory bird issues. (See 4.3)	Damberg Laing Block Richmond Esralew Keller Hejl	I	IP
DM9	<i>Work with government agencies and non-profit partners to develop new secretive marsh bird monitoring protocol in San Francisco Bay</i>	-Met with representatives from the California Department of Fish and Game, East Bay Regional Parks District, Invasive Spartina Project, Point Reyes Observatory and U.S. Geological Survey over five months to develop a new secretive marsh bird survey protocol for San Francisco Bay	Richmond	I	IP