

NWRS Region 4 Inventory & Monitoring FY2012 Annual Accomplishment Report

1. Introduction

1.1. Present the vision, goals, and objectives for the regional inventory and monitoring initiative.

In the Southeast Region, we have established an Inventory and Monitoring network to address the National Wildlife Refuge System's critical information needs and to help plan and evaluate the effectiveness of conservation strategies in close cooperation with Landscape Conservation Cooperatives. The Southeast I&M network is committed to be a full partner in the national effort with biologists and a database manager in priority geographic areas to help provide long-term data to document the status, assess condition, and detect changes in fish and wildlife communities, physical resources, and ecological processes on National Wildlife Refuges. The vision is to establish an inventory and monitoring network for refuges that provides information to guide future management decisions. The intent is to determine and fulfill the priority information needs and contributions of refuges to decisions that are made at the local, regional and national scales.

1.2. Describe how the regional I&M initiative is organized and planned focus areas.

Region 4 Inventory and Monitoring Network is organized around the Landscape Conservation Cooperatives the Region leads, e.g., South Atlantic, Gulf Coastal Plains and Ozarks, Peninsular Florida, and the Caribbean. The regional coordinator and database manager serve the entire region while field staff focuses their efforts within specific LCC geographies but cross boundaries as expertise is needed. Currently, field staff are co-located at refuges within the South Atlantic and will be in the Gulf Coastal Plains and Ozarks LCC geography, but work as a team to identify local, regional, and national monitoring needs; develop standardized data and data management protocols; and bring together existing and on-going monitoring efforts for the purpose of informing management decisions made at the NWR, LCC, and NWRS scales.

1.3. Explain how the regional I&M initiative integrates with the refuge biological program in the region.

The Southeast Region I&M Network is within the Refuges, Division of Planning and Resource Management. Guidance is provided by the Division Chief as well as the Regional Refuge Management Leadership Team. At the station level, Comprehensive Conservation Plans and Habitat Management Plans serve as the basis to define refuge inventory and monitoring needs. Refuge I&M staff will work very closely with individual refuges' staff to identify inventory and monitoring needs, design consistent surveys for multiple refuges, implement monitoring protocols, and provide timely data analysis. Regional and field staff will work together to identify and prioritize monitoring needs at the refuge and regional scales, i.e., what projects are necessary to inform adaptive management decisions. In addition, regional refuge biologists and I&M staff will work with the respective landscape conservation cooperatives, other Service programs and partner initiatives to identify the roles refuges can play in contributing to larger projects (e.g., collection of data to inform regional climate change models).

1.4. Explain how the regional I&M initiative coordinates with partners via the Landscape Conservation Cooperatives (LCCs). Which LCC's are included in the regional I&M initiative? What role does the regional I&M initiative serve within the LCC?

Within the Southeast Region, there is a strong connection between Refuge I&M and the LCCs. For example, the Regional Refuge Chief David Viker serves on Steering Committee for the South Atlantic LCC (SALCC) and the Refuge I&M Branch Chief Laurel Barnhill serves on the consulting team for the SALCC. The Science Coordinators of the SALCC and Gulf Coastal Plains and Ozarks LCC are working closely with I&M staff to accomplish the following:

- Continue to develop, refine, or adopt inventory and monitoring protocols to capture data on priority species addressed in LCC work plans and refuge CCPs that are expected to be vulnerable to climate change.
- Work to identify refuge's contribution to the information/data needs of LCC questions and priorities (i.e., where can refuges contribute to larger objectives both in formation of questions and data gathering).
- Share technical expertise and technologies to build capacity without redundancy (i.e., new I&M ecologists complement and add to LCC skill sets, share existing technological infrastructure, servers)
- I&M biologists serve on LCC technical committees as they are developed.
- Continue to identify mechanisms to communicate information to increase understanding of climate change effects and data needed to efficiently make decisions at various levels. Working towards an information exchange with outcomes directed at action we need to take to (solve) effects of changes, e.g., rates of accretion and building siting.

It is anticipated that opportunities to work together will continue to strengthen and evolve as LCC and I&M priorities are defined but at a minimum staff will communicate refuge inventory and monitoring needs as linked to biological plans and step down monitoring needs defined by the LCC partnership. I&M staff will provide a monitoring voice for refuges while working with multiple partners to target evaluation of management activities, track changes, etc. across the geography to insure monitoring information can be meaningfully rolled up across the LCC. Also, within the Southeast Region I&M will continue working with Migratory Birds, Fisheries and Ecological Services Divisions on a variety of issues.

2. Staffing

2.1. Provide a list of regional I&M staff and their job type or role, grouped by LCC. Also include a list of key cooperators (with their affiliation and role) who will be actively involved with the region's activities on at least a monthly basis during the coming year. Indicate vacancies and plans for refilling.

In the Southeast Region, we have hired staff in the South Atlantic geography, collocated on refuges, and plan to hire additional positions to be mostly stationed on Gulf Coastal Plains/Ozarks geography refuges. Long-desired staffing capacity -- dating back to several Fulfilling the Promises recommendations and ratified by the recent Conserving the Future vision -- will be realized to support clear monitoring objectives, standardized protocols, centralized data storage, timely data analysis and report generation across all refuges.

Positions, locations and geographic area of responsibility of regional I&M staff within USFWS Southeast Region, NWRS.

Position	Staff Name	Location	LCC	Geographic Area
Regional Chief, Inventory and Monitoring Branch	Laurel Barnhill	Athens, GA	Region-wide	Regional/National
Regional I&M Data Administrator	Steve Holzman	Athens, GA	Region-wide	Regional/National
Terrestrial Ecologist	Rebecca Bartel	Alligator River NWR, Manteo, NC	South Atlantic LCC	Regional
Coastal Ecologist	Nicole Rankin	Cape Romain NWR, Awendaw, SC	South Atlantic LCC	Regional
Botanist	M. Forbes Boyle	Okefenokee NWR, Folkston, GA	South Atlantic LCC	Regional
Freshwater Aquatic Ecologist	Theresa Thom	Savannah NWR, Hardeeville, SC	South Atlantic LCC	Regional

Deputy I&M Branch Chief	Janet Ertel	Mississippi State University, MS	Gulf Coastal Plains-Ozarks LCC	Regional/National
Assistant I&M Data Manager	Kristine Evans	Mississippi State University, MS	Gulf Coastal Plains-Ozarks LCC	Regional
Terrestrial Ecologist	David Richardson	N. Mississippi Refuges Complex, Grenada, MS	Gulf Coastal Plains-Ozarks LCC	Regional
Coastal Ecologist	Meg Goecker	Grand Bay NWR Moss Point, MS	Gulf Coastal Plains-Ozarks LCC	Regional
Botanist	Timothy Fotinos	Red River NWR, Bossier City, LA	Gulf Coastal Plains-Ozarks LCC	Regional
Freshwater Aquatic Ecologist	Lee Holt	Cache River NWR Augusta, AR	Gulf Coastal Plains-Ozarks LCC	Regional
Senior Wildlife Biologist	Mike Chouinard	TWRA, Jackson, TN	Region-wide	Regional/National

Roles and Responsibilities

Laurel Barnhill, Regional and South Atlantic LCC I&M Coordinator (co-located with National Park Service stationed at Athens, GA)

- Regional Refuge I&M Network Coordination
 - Includes lead for implementing I&M Policy (e.g., refuge inventory and monitoring plan development)
 - Focuses I&M efforts, to define questions and monitoring of pressing needs to ensure appropriate study designs, valid methods, cost effectiveness, and results provide reliable information to assist making refuge decisions. Work with refuges, FWS Divisions and partners to ensure cohesive and strategic approaches to regional and national wildlife monitoring initiatives.
- Coordinates Refuge I&M activities in accordance with LCC priorities
- Representation on LCC teams and working groups
- Representation on national I&M teams

Steve Holzman, Regional and South Atlantic Data Manager (to be co-located with National Park Service stationed at Athens, GA)

- Regional Refuge I&M data management
- Includes identification of database application needs to store refuge data and allow exchange of data at regional and national scales
- GIS coordination within Refuges and other programs, agencies, organizations
- Representation on National I&M teams
- Representation on Regional GIS teams and LCC teams and working groups
- Provides IT support to I&M and Athens Field Office

Wendy Stanton, Terrestrial Ecologist, co-located Columbia NC Migratory Bird Field Office

Forbes (Maxwell) Boyle, Botanist, co-located Okefenokee NWR

Nicole Rankin, Coastal Ecologist, Cape Roman NWR

Theresa Thom, Freshwater Aquatic Ecologist, Savannah NWR

- Terrestrial, Coastal, Freshwater Aquatic Ecologists and Botanist responsible for identification and implementation of activities to support I&M Network focused on respective ecological components with the Atlantic I&M Network
- Develop and evaluate inventory and monitoring protocols and assemble, analyze, and evaluate data, and prepare reports and publications related to terrestrial objectives
- Assist refuges with inventory and monitoring needs

- Coordinate and implement various surveys undertaken within the Atlantic Network respective location
- Representation on regional and national I&M and other related teams
- Representation on LCC technical teams

Janet Ertel, Deputy Branch Chief (co-located with GCPO LCC stationed at Starkville, MS)

- Gulf Refuge I&M Network Monitoring Coordination
 - Includes Gulf geography lead for implementing I&M Policy (e.g., refuge inventory and monitoring plan development). Focuses Gulf I&M efforts, to define questions and monitoring of pressing needs to ensure appropriate study designs, valid methods, cost effectiveness, and results provide reliable information to assist making refuge decisions. Work with Gulf refuges, FWS Divisions and partners to ensure cohesive and strategic approaches to regional and national wildlife monitoring initiatives.
- Representation on national and regional I&M teams
- Coordinates Refuge I&M activities in accordance with gulf network LCC priorities
- Representation on LCC teams and working groups

Kristine Evans, Assistant Data Administrator, (co-located with GCPO LCC stationed at Starkville, MS)

- Gulf Network Refuge I&M data management
- GIS coordination within Refuges and other programs, agencies, organizations
- Representation on national and regional I&M teams
- Representation on LCC teams and working groups
- Provides IT support to I&M

David Richardson, Terrestrial Ecologist, co-located North Mississippi NWRs Complex

Timothy Fotinos, Botanist, co-located Red River NWR

Meg, Goecker, Coastal Ecologist, co-located Grand Bay NWR

Lee Holt, Aquatic Ecologist, co-located Cache River NWR

- GCPO LCC I&M Ecologists responsible for identification and implementation of activities to support I&M Network focused on respective ecological components
- Develop and evaluate inventory and monitoring protocols and assemble, analyze, and evaluate data, and prepare reports and publications related to terrestrial objectives
- Assist refuges with inventory and monitoring needs
- Coordinate and implement various surveys undertaken within the Gulf Network respective location
- Representation on regional and national I&M teams
- Representation on LCC technical teams

Mike Chouinard, Senior Wildlife Biologist (co-located with TWRA, Jackson, TN)

- Lead for capturing, collating, and characterizing historical I&M data from Refuges (i.e., Legacy Data).
- Serves as Regional lead and member of national team working on the Geo-referenced
- Archive Service to store data and allow exchange of data with other entities.
- Design and implement field and modeling studies with landscape planning and adaptive management including development of species habitat decision support tools.
- Actively seek out and secure funding for projects that emphasize a landscape approach to strategic habitat conservation. Assist in project design and supervises the budgeting and financial tracking of Service funded projects.

3. Planned Activities and Anticipated Products

Summarize the major planned activities and anticipated products of the initiative for the coming year in the categories below. If no activity is planned in a certain category, do not include it. Use a table format similar to the examples (Tables 1 and 2) below. Table 1 captures planned activities by Blueprint Objective; Table 2 captures planned events such as symposia, program reviews, training, and workshops. Some activities may fit into multiple categories; please report each activity only once under the most appropriate heading.

3.1. Identify I&M Priorities for stations and the region.

3.1.1. Status of station Habitat Management Plans

3.1.2. Status of station Inventory and Monitoring Plans

3.1.3. Summary of inventory and monitoring priorities for the region

3.2. Abiotic Resources

3.2.1. Inventories

3.2.2. Monitoring

3.3. Biotic Resources

3.3.1. Inventories

3.3.2. Monitoring

3.4. Stressors (examples: fire, invasive species, climate change)

3.5. Adaptive Management Projects

3.6. Data Management (example: legacy data)

3.7. Communication (examples: symposia, program reviews, training, workshops, partnerships)

Table 1. Region 4 Inventory and Monitoring Activities, by Project or Theme.

Blueprint Objectives and Tasks	Project or Theme; Status	Accomplishments	Staff
IDENTIFY I&M PRIORITIES			
3.1.1	<p><i>Status of station Habitat Management Plans</i> 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_RefugeTargetandStatus.xlsx</p>	<p>Progress of HMP development and completion documented within the Planning Branch. I&M ecologists perform reviews as needed.</p>	<p>Sue Cielinski and Janet Ertel I&M Ecologists assist as needed.</p>
3.1.2	<p><i>Status of station inventory and monitoring plans</i> We are waiting for completion of station HMPs and finalization of I&M policy</p>	<p>Part I of IMP as PRIMR is populated; planned initiation when HMPs are completed and national policy is approved.</p>	<p>I&M and Refuge staff</p>
3.1.3	<p><i>Summary of inventory and monitoring priorities for the region</i> Hire I&M biological staff.</p>	<p>Staffing for the South Atlantic LCC geography of the Atlantic Zone was completed in FY12 with the addition of Theresa Thom as the Aquatic Ecologist co-located at Savannah NWR in January. The Gulf Zone, with emphasis on the GCPO LCC geography, has been staffed effective January 2013.</p> <ul style="list-style-type: none"> • Janet Ertel, Deputy Chief, I&M Branch, and lead for the Gulf Network area, located in Starkville, MS. • David Richardson, Terrestrial Ecologist, located at North Mississippi Refuges Complex. • Tim Fotinos, Plant Ecologist, located at Red River NWR. • Kristine Evans, Data Manager, located in Starkville, MS. • Meg Goecker, Coastal Ecologist, to be located at Grand Bay NWR, and Lee Holt, Aquatic Ecologist, to be located at Cache River NWR, in place January 2013. 	<p>Chuck Hunter and Laurel Barnhill</p>
Input current Refuge surveys into PRIMR database		PRIMR completed on all SALCC	R4 I&M staff

	(survey of surveys), and preform cross walk to identify needs.	refuges; and in progress for refuges within the GCPO LCC geography. Summary reports for each refuge distributed after final edit checks in data base. Initiated development of an I&M objectives matrix to capture inventory and monitoring needs of and for refuges. Boxes of objectives include information from refuges needs assessments and needs of FWS programs and partners. Prioritization criteria planned; matrix and criteria will serve as a planning tool. This year worked closely with Migratory Bird partners to identify objective boxes. <ul style="list-style-type: none"> Partners: Migratory Birds, I&M staff 	with refuges Laurel Barnhill with partners
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 begin in April 2011 Cape Romain NWR - we plan to begin work on Project in FY 2012. Work will be completed by contractor with the assistance of Sue Cielinski and John Faustini, Regional Hydrologist	Analysis initiated on two stations <ul style="list-style-type: none"> Cape Romain HGM started on March 6, 2012 and expected to be completed by early 2014. Work accomplished with multiple partners. Frequent progress reporting via conference calls and WebEx to maintain communication and move project forward. Data mining conducted at Cape Romain as part of HGM process in May 2012. Partners: Refuge staff, I&M, Regional Office, Ecological Services, Ecological Contaminants, USGS, NGOs, Contractors. 	Sue Cielinski and Theresa Thom
2A	<i>Water Resource Inventory and Assessment (WRIA)</i> Water inventories are planned for the following stations: 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 CAPE ROMAIN – planned for 2012-13 in conjunction	Assessment completed and/or initiated. <ul style="list-style-type: none"> CAPE ROMAIN NWR – kickoff meeting for WRIA process was held March 6, 2012. Sharepoint site created and maintained for data dissemination. Initial WRIA data inventory draft summary for Cape Romain NWR WRIA including figures was provided to Regional Hydrologist for analysis June 2012. Analysis on-going and expected in early 2013. Partners: Refuge staff, I&M, Regional Office, Ecological 	Sue Cielinski and Theresa Thom

	<p>with HGM</p> <p>Sue Cielinski will continue to represent R4 on the national water quality team, led by Mike Higgins, and work with John Faustini to refine the WRIA process and advise the team on the development of a database. Assistance will be provided by the Fresh Water Ecologist as appropriate.</p>	<p>Services, Ecological Contaminants, State Agencies, USGS, NGOs, Contractors</p> <ul style="list-style-type: none"> • CAHABA RIVER NWR – kickoff meeting for WRIA process held August 14, 2012. Sharepoint site created and maintained for data dissemination. Monthly conference calls. Inventory and analysis on-going, with draft expected in early 2013. • Partners: Refuge staff, I&M, Regional Office, Ecological Services, Ecological Contaminants, several State Agencies, municipalities, several NGOs, Contractors • WRIA Inventory data call survey to gather information to prioritize refuges and hatchery needs for a WRIA sent to Region 4 refuges and fish hatcheries in May 2012, with resulting data compiled and reported back in September 2012. Criteria developed and prioritization for WRIA surveys in Region 4 expected in early 2013. 	
	ABIOTIC RESOURCES - MONITORING		
5B	<p><i>Complete initial sea-level rise modeling for coastal refuges.</i></p> <p>We plan to organize information on existing refuge SLAMM projects (e.g., objectives, protocols, data storage, etc.). The purpose of this project will be to organize and understand existing SLAMM projects, and identify if data can be scaled to regional efforts.</p>	<ul style="list-style-type: none"> • Coordinated with R2 I&M to identify and coauthor two projects funded by National I&M Office: 1) Evaluating SLAMM data inputs to improve and refine sea-level rise scenarios on refuges within the GCPLCC and 2) Consequences of sea-level rise and anthropogenic stressors on the loss and conversion of wetland habitats for whooping cranes, mottled ducks, and redhead ducks on the GCPLCC • Acquired all existing SLAMM reports for R4 refuges and started to organize information on existing SLAMM projects (to be completed in FY13) 	Nicole Rankin

5A	<p><i>Coordinate with science partners to understand the relevance of models and predictions of changes for refuge management, gather information needed to plan and evaluate adaptation strategies.</i></p> <p>We plan to work with the SALCC and partners to identify the best protocol to use to identify sea-level rise modeling.</p> <p>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.</p>	<p>Participated in webinars that addresses sea level rise models and predictions:</p> <ul style="list-style-type: none"> ○ Demonstration of the Climate Change Vulnerability Index – Jan 2012 ○ Effects of sea-level rise and altered storminess on Piping Plover breeding habitat along the U.S. Atlantic Coast – Jan 2012 ○ Prediction Maps from Climate Envelop Models – Feb 2012 ○ Climate Change in America's National Parks - Sea Level Rise – April 2012 ○ Demonstration of Uncertainty Analysis using the Sea Level Affecting Marshes Model (SLAMM) Webinar – May 2012 ○ Using SLAMM in Modeling Sea Level Rise for Conservation Planning – August 2012 <p>Worked with partners to discuss sea level rise and climate change modeling:</p> <ul style="list-style-type: none"> ○ FWS: Jason Duke, Kris Metzger, Craig Sasser, Refuges – SLAMM ○ USGS: Paul Conrads – Drought and Salinity Intrusion; Judy Drexler – Sea Level Rise Modeling ○ NOAA, TNC: Gulf of Mexico Alliance – Sea level rise modeling and storm surge modeling <p>Within the Gulf Coast LCC, coordinated with R2 I&M to identify and coauthor two projects funded by National I&M Office to evaluating SLAMM data inputs to improve and refine sea-level rise scenarios on refuges within the GCPLCC and consequences of sea-level rise and anthropogenic stressors on the loss and conversion of wetland habitats for whooping cranes, mottled ducks, and redhead ducks on the GCPLCC.</p>	Nicole Rankin
5A	<p><i>Determine need for surface evaluation table (SET) stations</i></p>	<ul style="list-style-type: none"> ● 60 RSET (rod surface elevation tables) stations were installed on 18 	Nicole Rankin with stations

	<p>Set up stations within the South Atlantic LCC geography by determining station objectives, etc. Implementing project funded in FY 11 rfp process.</p>	<p>coastal refuges within the SALCC that will measure rates of sediment accretion and subsidence.</p> <ul style="list-style-type: none"> • Data will be linked with NPS data and used by the SALCC to verify sea level rise models in addition to helping refuge managers identify critical areas where rates of loss are exceeding the ability of the habitat to respond and make decisions towards managing for future conditions. • This project brought together multiple partners (FWS, NPS, TNC, USGS, NOAA, SALCC) to ensure consistent protocols, implementation, and data management were occurring for data to be combined to address landscape scale questions. • Started planning the long-term monitoring component: training field station staff to take measurements (Fall 2012) and purchased equipment needed to put together four measuring kits to be shared among 18 refuges. • Worked closely with R2 I&M to plan RSET installs and monitoring on coastal refuges in LA and TX as part of SLAMM project. • Started gathering information to organize and understand existing and determine future needs for RSET stations on refuges in FL, AL, MS, and LA. • Partners: NWRs, FWS, NPS-I&M, TNC, USGS-Lafayette and Patuxent, NOAA, and SALCC. 	<p>and various cooperators</p>
<p>2B</p>	<p><i>Update Regional Fire Effects Monitoring Guide</i> Work with Fire Management Division to update existing monitoring guide</p>	<p>Worked closely with regional Fire Ecology staff to initiate revisions to the "Fuel and Fire Effects Monitoring Field Guide: USFWS Southeast Region" (2006). Visited multiple field stations (refuges) to discuss how they have historically implemented their fire effects monitoring surveys. Prioritized the list of surveys in the 2006 Field Guide, and consolidated similar methods from multiple surveys; thereby paving the way for a more efficient guidebook.</p>	<p>Forbes Boyle with Fire Management Division</p>

2B	<p><i>Overlay fire history maps with plant community information</i> Assess fire effects across spatially distinct vegetation units and construct fire history maps for each refuge that are based on vegetation/environment condition. The objective is to provide fire managers ecologically meaningful tools that characterize landscape-scale fire regime shifts, that can be used to approximate future conditions of both prescribed and wildland fire.</p> <p><i>Improve fuels models</i> Refine models by including vegetation composition and structure information by community type.</p>	<ul style="list-style-type: none"> • Attended FMO annual workshop and Monitoring Trends in Burn Severity workshop, and established monthly meetings with Regional Fire Ecology team (Fall/Winter 2011) • Gathered vegetation/habitat spatial data and fire history data for Okefenokee NWR (Spring 2012) • Reviewed 2006 Fire Atlas developed for Okefenokee NWR (Summer 2012) • Compiled fuel model, existing vegetation type, and fire regime groups on Okefenokee NWR and placed into a geospatial database (Fall 2012) 	Forbes Boyle with Fire Management Division
BIOTIC RESOURCES - INVENTORIES			
1E	<p><i>Design, fund and implement a strategic process for completing vegetative inventories and cover mapping, using the National Vegetation Classification Standard</i> Lead Chuck Hunter, and Chiefs to identify regional representatives. This project was identified as a national priority in December 2011.</p>	<ul style="list-style-type: none"> • Participated in National Vegetation Mapping team planning calls (Fall-Winter 2011/2012) • Reviewed vegetation mapping procedures with refuge staff from Pinckney Island, Harris Neck, and Okefenokee NWR (Winter-Spring 2012) • Attended work detail on Sumter NF (South Carolina) to discuss vegetation mapping products with the Carolina Vegetation Survey 	Chuck Hunter with Forbes Boyle
1F	<p><i>Support monitoring for adaptive management</i> Assist with refinement of forest inventory data collection. Work with Assistant Regional Forester to update forest inventory protocol.</p>	<ul style="list-style-type: none"> • Participated in forest inventory work with Okefenokee NWR Forest Technicians (Summer 2012) • Discussed forest inventory work with St. Marks NWR Forest Technicians (Summer 2012) 	Haven Barnhill and Forbes Boyle
3A	<p><i>Develop pilot projects focused on mapping and monitoring invasive plants in at least two regions, with a longterm vision of supporting an integrated landscape approach to the management of invasive species across the refuge system.</i></p>	<ul style="list-style-type: none"> • Through FY12 RFP, I&M funded fish community assessment work on Savannah NWR that including standard protocol development using multiple techniques to detect aquatic invasive species. Components of this work include early detection and rapid response, new technologies, and both internal and external education about AIS. Significant on-site technical and logistic 	Theresa Thom

		<p>support was provided. In August 2012, sampling efforts surveyed 22 km river miles along Little Back River in Savannah NWR, and approximately 12 km within impoundments on SAV. Based on preliminary results, 20 native species and one naturalized species (common carp) were detected.</p> <ul style="list-style-type: none"> • Work conducted at Savannah NWR builds on work funded through I&M FY11 RFP conducted at A.R.M. Loxahatchee NWR, including standard protocol development, early detection and rapid response techniques for AIS, and development of eDNA markers for AIS species of concern and emerging threats to aquatic systems. • Partners include: Regional Office, I&M, Refuges, Fisheries, National Fish Hatcheries – Warm Springs & Welaka NFHs. 	
BIOTIC RESOURCES - MONITORING			
1F	<p><i>Support monitoring for adaptive management</i> Coordinate bat monitoring within refuges and with other partners. Assist with implementation of FY11 I&M rfp project and participate in regional bat working group.</p> <p>Assist with implementation of FY12 I&M RFP project</p>	<ul style="list-style-type: none"> • 35 R4 and 1 R3 Refuges and 3 Ecological Service offices were supported across the region in implementation of the Acoustical Bat Monitoring Protocol, including hosting 2 training workshops (Gulf & South Atlantic), technical support and trouble-shooting, and data management coordination and development. • Partners: NWRs, USACE, ERDC, R3 Refuges, R5 I&M, State of Mississippi and USGS-Patuxent • Bat monitoring for Rafinesque’s Big-eared bat and Southeastern myotis (state listed species) on Santee and Savannah NWRs was funded through FY2012 I&M RFP. Initial sampling was conducted in August and September 2012 on both refuges. Equipment and protocols used as part of FY11 I&M bat monitoring contributed significantly to FY12 effort. I&M provided on-site 	<p>Janet Ertel David Richardson Becky Bartel Theresa Thom</p>

		<p>logistical support and coordination with larger sampling effort(s).</p> <ul style="list-style-type: none"> Partners: Santee and Savannah NWRs, Clemson University 	
4	<i>Collect, synthesize and manage information needed to detect shifts in biomes, species ranges, etc. to support and evaluate adaptation strategies at multiple spatial scales.</i>		
4A	<i>Prioritize geographic areas and species based on ecosystem vulnerability</i> 2012 Pollinator Challenge, coordinate pollinator monitoring activities throughout region	<ul style="list-style-type: none"> Serves as Regional Pollinator Coordinator on National Pollinator Team Participated in National Pollinator Week activities (wrote National Blogs and collaborated with RO and WO for media releases). Coordinated Pollinator Challenge activities: NWR, ES offices, National Hatcheries, and RO are all participating and have reported efforts. Performed initial butterfly inventories both on Alligator River NWR and on partner land on nearby Kitty Hawk Woods (NERRS). Developed 5 FWS Factsheets on Pollinator Challenge and citizen science monitoring programs. Created pollinator gardens on 2 Service sites, collaborated with volunteers and Friends Group for fundraising and media events. Collaborate regularly with NC Aquarium horticulturist for native plants for pollinator gardens on refuges/partner lands. 	Becky Bartel
4B	<i>Participate in the phenology task identified by the National Office and step tasks to regional level as developed.</i>	<ul style="list-style-type: none"> Served on National Phenology/Pollinator sub-team Developed a USFWS Factsheet on Nature's Notebook, a program through our partner, the National Phenology Network on phenological monitoring and tested these methods at Pea Island NWR. Answered refuge questions in regards to request (DCN: 052322) ; information to integrating phenology monitoring efforts with other bureaus and the broader scientific community to inform our understanding of climate related shifts. Results from the questionnaire will allow the national I&M Team to integrate observations 	Becky Bartel

		and data management for greater efficiencies.	
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.	Co-lead I&M Bird Team, lead and participate in monthly conference calls. Goal of Team is to take a leadership role, in partnership with FWS migratory birds, in supporting coordinated bird monitoring on national wildlife refuges across the nation. The Team established a number of working groups focused on bird groups and bird monitoring tools to address a number of questions and action items.	Laurel Barnhill represent Refuges I&M
4C	<i>Coordinate bird monitoring with migratory birds and other partners</i>	<ul style="list-style-type: none"> • Conducted monthly SEANET beached bird surveys on Pea Island NWR. • Organized a training session for partners and volunteers to meet with the program coordinator (Sarah Courchesne, Tufts University). • Currently, there are 25+ routes in NC to date (1 NWR, multiple w/partners such as NERRS, Audubon, NC Aquarium, NC Coastal Federation, and many private citizens). • Collaborated w/Craig Harms, DVM at NCSU Center for Marine Sciences and Technologies for all necropsies. • Presented program/data to NC Waterbird Commission meeting with partners from NC State Parks, NC Wildlife Commission, and Audubon. 	Becky Bartel with John Stanton
4C	<i>Coordinate bird monitoring with Migratory Birds and other partners</i> Coordinate grassland bird monitoring Identify needs and develop a strategy for management and monitoring of grassland birds based on needs assessment	<ul style="list-style-type: none"> • Participated in structured decision making workshop (9/2011) to further develop the problem statement and initial models; efforts this FY to gather support and inform others of the effort. • Worked closely with Katie Koch (R3 BMC) coordinator and others to develop various information and outreach tools (fact sheet, power point presentation, poster, and talking points) for use by group to garner support for the project. 	Laurel Barnhill and others from R3, 5 and 6.
4C	<i>Coordinate bird monitoring with Migratory Birds and other partners</i> Coordinate marshbird monitoring Develop a national marsh bird monitoring effort and	Lead secretive marsh bird working group of the I&M Bird Team. Identified core refuge questions related to this species group.	Laurel Barnhill represent Refuges I&M with many

	implement on refuges		others
	STRESSORS		
	We plan to work with the Regional Climate Change Center to determine methodologies needed to identify and monitor stressors/threats to fish and wildlife species. As necessary, work with the Regional Climate Team and National Water Team (Sue Cielinski) to address stressors/threats to aquatic species.	Discussions on-going as part of role with the Regional Climate Team and National Water Team.	Laurel Barnhill with Sue Cielinski
	ADAPTIVE MANAGEMENT PROJECTS		
1F, 4C	<i>Integrated Waterbird Management and Monitoring Program (IWMM)</i> Multi-region, multi-agency project to manage and monitor migrating and wintering waterbirds, including waterfowl and shorebirds	Participated in some Science Team conference calls. Worked to gain support within Region 4.	Laurel Barnhill represent R4 Refuges I&M
1F	<i>Support monitoring for adaptive management</i> Multiple biotic and abiotic inventory and monitoring projects funded with FY11 I&M rfp Completion of the 25 projects selected in FY11	Reports in progress to be posted on R4I&M webpage for the following projects: <ul style="list-style-type: none"> • Forest Habitat Evaluation at Atchafalaya NWR • Pine Savannah restoration monitoring –Tammany Holding Tract • Inventory of frog species in the South Carolina Sandhills with a focus on the pine barrens treefrog and the gopher frog • Clarks River National Wildlife Refuge LiDAR • Inventory and Monitoring of Vernal Pools on Dahomey National Wildlife Refuge • Comprehensive Shorebird Surveys on Front Beach Habitat within Cape Romain NWR • Monitoring productivity, dispersal, and habitat restoration/expansion in the Harris Neck NWR wood stork colony. • Groundwater Quality Monitoring at Logan Cave National Wildlife Refuge • LIDAR and Color digital Imagery for Lower Hatchie NWR • Development of biometric and environmental DNA standardized protocols for early detection and population assessment of aquatic invasive species for Arthur R. Marshall Loxahatchee National Wildlife Refuge. • Population dynamics of the king rail <i>Rallus elegans</i> (Mackay 	Refuges and partners

		<ul style="list-style-type: none"> Island and Currituck NWRs) <ul style="list-style-type: none"> • Assess Wet Pine Savanna Response to Refuge Management MS Sandhill Crane • Bat Species Occurrence and Long-Term Bat Population Monitoring on Refuges using Acoustical Detection (multiple western NWRs) • Monitoring the Effects of Climate Change on Waterfowl Abundance in the Mississippi Alluvial Valley: optimizing sampling efficacy and efficiency • Measuring Sea Level Rise Across the SALCC • Forest Habitat Inventory Equipment for Refuges • Inventory of Bottomland Hardwood Forests on the Roanoke River NWR and Establishment of Continuous Forest Inventory Plots. • Herpetofaunal survey of Santee National Wildlife Refuge • St. Catherine Creek NWR Aquatic Habitat Assessment in Support of Gulf Coastal Plains CPO LCC • An objective analysis of 21 years of fire history at St. Marks NWR utilizing MTBS mapping protocol. • Inventory and Monitoring of the Aquatic Biota of Tallahatchie National Wildlife Refuge • Streamline forest data analysis on R4 refuges (White River NWR) • Flood impacts to Forest Habitat plots established on White River NWR • Support for Water Resource Inventory and Assessments (WRIA) and Hydrogeomorphic analyses (HGM) for Refuges in the Southeast • 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 MANAGEMENT		
1A	<i>Assemble existing abiotic data sets needed by NWRs</i>	<ul style="list-style-type: none"> • Surveyed refuges in the 	Steve Holzman

	<p><i>managers to set management objectives through the CCP process</i></p> <p>Participate in the NWRs Geospatial Advisory Committee (GAC). The purpose is to ensure that NWR managers have the necessary databases at hand to work efficiently.</p>	<p>southeastern Region to determine level of GIS/GPS skills, and determine status of their GIS data.</p> <ul style="list-style-type: none"> The GAC designed a brief survey to provide a high level understanding of the data resources and geospatial capabilities available to support Refuge System programmatic requirements. 	<p>represent R4 on Geospatial Advisory Committee</p>
General	<p><i>Reconciling the inventory of refuge inventories and monitoring review database.</i></p> <p>Participate on National I&M working groups charged with moving this task forward. 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.</p>	<p>Assembled all the SALCC PRIMR databases into one, in the process of review and developing summary reports for refuges.</p>	<p>Steve Holzman and others as needed</p>
General	<p><i>Populate inventories and monitoring review database (PRIMR, survey of surveys)</i></p> <p>We plan to work with refuge biologists to enter data to populate the database (e.g., survey name, objective, justification, etc.) and cross walk findings to determine refuge monitoring and inventory similarities and needs.</p> <p>This will serve as a basis to move towards use of consistent protocols across refuges. This effort will also serve to familiarize us with existing monitoring efforts, issues and concerns.</p>	<p>Data entered into the PRIMR database for LCC geographies where biologists are located. Reports by refuge being generated, proofed and distributed as each refuge completed entering all information.</p> <p>Linked PRIMR database to a spatially explicit tool that enables mapping where surveys are being conducted across the region.</p>	<p>I&M Staff</p> <p>Steve Holzman</p>
General	<p><i>Determine the current status and trend of each population of endangered, threatened, candidate, and delisted/monitored species on NWR lands</i></p> <p>Participate in the T&E task identified by the National Office and step tasks to regional level as developed.</p>	<ul style="list-style-type: none"> Work in progress by National Team. Helped mine information for the first step to compile a list of endangered and threatened species that occur on refuges from existing data bases. Validation of information in ECOS, Regional Data manager will be acting as the point person for assistance to the refuges once information request is posted to DTS. 	<p>Steve Holzman and others as needed</p>
General	<p><i>Determine the current status and trend of each population of endangered, threatened, candidate, and delisted/monitored species on NWR lands</i></p> <p>Participate in sea turtle monitoring</p>	<ul style="list-style-type: none"> Participated in weekly surveys for turtle crawls and nest hatching events Pea Island NWR (May-Sept) Data is contributed with local volunteer efforts (NEST program) and NPS survey efforts to the larger state program (NC Wildlife Commission). 	<p>Becky Bartel</p>
General	<p><i>Determine the current status and trend of each population of endangered, threatened, candidate,</i></p>	<p>Discussed/developed field monitoring protocols and datasheets</p>	<p>Chuck Hunter, Janet Ertel,</p>

	<p><i>and delisted/monitored species on NWR lands</i></p> <p>Participate in coordination of regional gopher tortoise protocol development and monitoring</p>		Becky Bartel
1C	<p><i>Capture, collate, and characterize historical I&M data from refuges.</i></p> <p>Work with National I&M office and team to develop and implement the Geo-referenced Archive Service to store data and allow exchange of data with other entities.</p>	<p>Provided national support in the effort to have all refuge annual narratives from 1970 saved digitally in the USFWS Service Catalog (ServCat). A repository for compiling, organizing, and making accessible recent and historic information that is important to refuge resource management. The information entered in the database is discoverable and retrievable using text and geospatial search tools. ServCat will complement the NCTC Conservation Library and will be an important collaboration tool for the Service and its partners. The next step is to prioritize nationally the types of refuge documents to be entered.</p>	Mike Chouinard
1F	<p><i>Compile Carolina Vegetation Survey Metadata</i></p> <p>Develop a resource organizing information from 4000 plots within the SALCC geography</p>	<p>Compiled dataset from Carolina Vegetation Survey plots established on South Atlantic LCC NWR's. As of August 2012, there are a total of 245 high-quality, geospatially reference, and monumented vegetation-environment plots occurring across 17 refuges within the region. These plots represent 102 distinct National Vegetation Classification Standard community associations; associations represented the most include 1) longleaf pine-bluejack oak / southern wiregrass woodlands, 2) cypress-tupelo semipermanently flooded brownwater swamps, 3) maritime slash pine upland flatwoods, 4) Mid-Atlantic high salt marsh, 5) South Atlantic coastal plain longleaf flatwoods, 6) Southeastern Coastal Plain green ash-elm bottomland forests, and 7) Southern Atlantic Coast salt marsh. A total of 8021 taxon incidences and a total of 1417 taxon concepts are recorded. This species list has not yet been queried with rare species records from state or federal records.</p>	Forbes Boyle

Table 2. Region 4 Inventory and Monitoring Symposia, Program Reviews, Training, and Workshops Planned

Blueprint Objectives and Tasks	Symposium, Program Review, Training, or Workshop	Planned Date	Staff
COMMUNICATION			
1B	Organize a regional HGM webinar. The objective is to inform refuge biologists on HGM goals, protocols and data usage. First in a series of Science Applications/I&M/others sponsored webinars.	Webinar conducted January 25, 2012. The recording is available at http://bcove.me/dwg3x5xy	Laurel Barnhill, John Tirpak, and Sue Cielinski
General	Update regional I&M fact sheet. 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.	Multiple presentations by I&M staff to refuges and partners outlining the initiative: VA-NC Ecoteam meeting (12/11), Mig Bird Retreat (1/11), GCPO staff meeting (1/18), SEPIF (2/8), GCPO Steering Committee (4/11), S. Fl Ecoteam (5/23), FL aquatic partners (8/2), SCDNR and partners climate summit (9/13).	Laurel Barnhill Theresa Thom Janet Ertel Nicole Rankin Becky Bartel
General	Complete the MOU/interagency agreement with NPS 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 completed.	Chuck Hunter, Joe DeVivo and Laurel Barnhill
General	Keep the regional inventory and monitoring SharePoint Site updated. The purpose of this site is to provide central storage and collaboration space for Region 4 I&M documents, information and ideas.	Fishnet site (Sharepoint) is working smoothly as a sharing space for I&M activities. Migrated information to new site and maintain site organization.	Steve Holzman with I&M ecologists
General	Meet with RRB on a regular basis (e.g., every 2 months) to coordinate on Refuge biological program issues.	Met at irregular intervals to discuss items related to Planning and I&M.	Sue Cielinski and Laurel Barnhill
General	Work closely with all LCCs serving on committees and working groups as priorities and processes are defined.	-Served as member of the SALCC consulting team. -Participated in weekly GCPO staff conference calls. -Participated in GCPO staff meetings (1/18/12), and Adaptation Science Workshop (9/18/12).	All I&M staff

		<ul style="list-style-type: none"> -Assisted with interview process for GCPO GIS position (7/12). -Participated in SALCC third Thursday web-casts (through out year). -Part of team to develop surrogate species training agenda for SALCC geography (9/12). 	
General	Complete a Project Record for current monitoring efforts conducted by refuges where protocols are not clearly documented.	Throughout year as needed for specific projects (e.g., SET).	All I&M staff

4. Budget Narrative and Budget

4.1. Provide a brief description of how current and projected I&M funding is anticipated to be spent during the upcoming FY, including the major work activities presented in Section II. List the major planned expenditures of I&M funds, including staff salaries and operations, contracts and agreements. Do not include contributions from outside the I&M funded initiative in the work plan. (Matching, in-kind, and leveraged funding from outside the I&M initiative will be included in the annual I&M administrative report.)

BFY2012 Activity as of 12/4/2012	Object Class Description	Object Class (OC)	FY2012 Actuals	FY2012 Accruals	FY2013 Actuals
648,464.60	Personnel Compensation	11	603,709.70	44,292.00	462.90
302,360.26	Personnel Benefits	12	285,165.51	16,265.62	929.13
23,268.12	Travel and Transportation of Persons	21	21,319.17	0.00	1,948.95
64.10	Transportation of Things	22	64.10	0.00	0.00
13,763.97	Rent, Communications, and Utilities	23	13,251.62	0.00	512.35
246.06	Printing and Reproduction	24	246.06	0.00	0.00
169,071.60	Other Contractual Services	25	166,498.63	0.00	2,572.97
65,025.23	Supplies and Materials	26	63,874.54	0.00	1,150.69
110,905.89	Equipment	31	103,607.89	0.00	7,298.00
225,762.00	Grants, Subsidies, and Contributions	41	225,762.00	0.00	0.00
1,558,931.83					

5. Appendix Map of NWRs stations in the region, by state and LCC.

