

# Integrated Waterbird Management and Monitoring Initiative Progress Report

## *Fall 2010 to Spring 2012*

### Background

The U.S. Fish and Wildlife Service (USFWS), the migratory bird Joint Ventures, the Flyway Councils, and the states strive to ensure that adequate resting and feeding habitat is available for waterbirds (waterfowl, shorebirds, and waders) as they migrate and winter along the Atlantic and Mississippi Flyways. Lack of standard protocols and coordinated monitoring can hinder these efforts by making it difficult to address crucial questions. How important is a single site in the flyway context? What species should be the focus of managers at a specific site? How can many managers coordinate their actions across the flyway so that birds have the right habitat conditions, at the right time, in the right places? The Integrated Waterbird Management and Monitoring (IWMM) initiative seeks to standardize and coordinate monitoring of migrating and wintering waterbirds and their habitats across the Atlantic and Mississippi flyways and to develop decision support tools informed by monitoring data to address management

questions at local, regional, and flyway scales. Monitoring data will be used in an adaptive management framework to continually learn about outcomes of waterbird management and update models at all three spatial scales to improve management decision making. The IWMM is a collaboration among conservation partners located along the Atlantic and Mississippi Flyways, including the USFWS, U.S. Geological Survey, the states, Ducks Unlimited and other non-governmental agencies. As a result of participants' efforts over the past two years, IWMM is closer to achieving its vision of collaboration, integration, and decision support.

In the summer of 2010, the IWMM developed standardized waterbird and habitat monitoring protocols and distributed these protocols to a network of participants located throughout the two flyways. The pilot phase of monitoring began in the fall of 2010 with data collection and with the goals of using pilot data to (1) improve IWMM bird and habitat monitoring protocols,



USFWS

*Green-winged Teal*

(2) inform the development of decision support tools, and (3) provide basic reports to participants regarding the temporal and spatial dynamics of non-breeding waterbird distributions and habitat conditions. This progress report addresses, in part, the third goal by providing an overview of IWMM monitoring efforts and bird and habitat observations from fall 2010 to spring 2012. It also provides information about ongoing efforts to address the first two goals.

### Monitoring Effort and Observation, Fall 2010 to Spring 2012

During the pilot phase, 120 IWMM observers collected monitoring data at 874 managed wetlands nested within 174 wetland complexes. The number of wetland units monitored increased from 418 in the first year (fall 2010, spring 2011) to 710 in the second (fall 2011, spring 2012). The greatest number of monitored wetlands was located in the IWMM's North Atlantic region (363), followed by the Upper Mississippi (314), South Atlantic (172), and Lower Mississippi (25) (Figure 1). Participants in Missouri recorded monitoring data at 163 unique wetland units, the most of any state.

IWMM participants observed 9,859,821 waterbirds during the pilot phase monitoring. Of these observations, 8,941,699 were waterfowl, 758,838 were shorebirds, and 159,284 were waders. The most abundant waterfowl, wader, and shorebird species were mallard, white ibis, and dunlin, respectively (Table 1). The average number of individuals detected per survey varied by guild, region, and season (Table 2). On average, participants recorded more waterfowl than waders or shorebirds and generally more shorebirds than waders. Migration phenologies varied across years and wetland complexes (Figure 1).

*Table 1. Three most abundant non-breeding species observed for each guild during pilot phase monitoring (fall 2010 to spring 2012).*

Waterfowl		Waders		Shorebirds	
Species	Count	Species	Count	Species	Count
Mallard	1,894,653	White Ibis	42,061	Dunlin	163,106
Snow Goose	1,855,553	Great Egret	30,068	Semipalmated Sandpiper	147,733
Green-winged Teal	902,913	Great Blue Heron	21,408	Sanderling	79,837

*Table 2. Average number of non-breeding individuals observed per ground count during the pilot phase (fall 2010 to spring 2012). Counts are stratified by guild, region, and migratory period.*

IWMM Region	Waterfowl		Waders		Shorebirds	
	Fall	Spring	Fall	Spring	Fall	Spring
North Atlantic	444	564	7	6	88	96
South Atlantic	553	615	25	51	30	50
Upper Mississippi	1658	577	2	2	4	13
Lower Mississippi	6110	5321	0	0	0	0

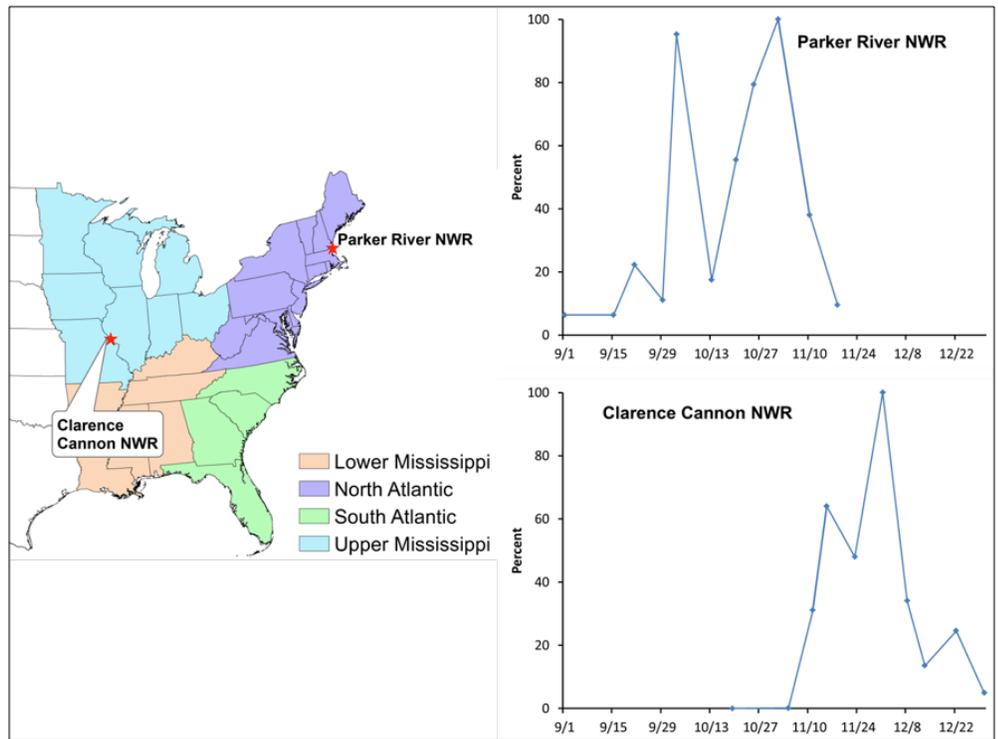
During the pilot phase, participants conducted 2,178 habitat surveys to complement waterbird monitoring efforts. In addition to other habitat features, the abundance of waterbirds in a wetland may depend on percent canopy vegetation cover and interspersions (i.e., clumping of vegetation and water patches). Consequently, IWMM staff used habitat surveys to assign wetlands to one of nine habitat states representing unique combinations of vegetation cover (low, moderate, high) and interspersions (low, moderate, high) classes (Table 3). During the pilot phase, monitoring indicated that wetlands were observed in each of the nine habitat states. Nevertheless, habitat surveys documenting wetlands with low cover and high interspersions were relatively rare. IWMM staff members are currently exploring relationships between these habitat states and bird counts.

### Protocol Revisions

IWMM is further analyzing waterbird and habitat monitoring data from the pilot phase to revise and improve monitoring protocols and to help develop decision support tools. All aspects of the bird and habitat monitoring protocols are being evaluated in light of the pilot data. For example, IWMM currently recommends two habitat surveys during both fall and spring migration periods, but if pilot data show little difference in measured habitat features within a season, and if the extra data would not impact decision-making, IWMM may recommend one habitat survey for fall and spring. A protocol validation study has been developed to compare habitat monitoring data from

*Table 3. Percent of 2,178 habitat surveys that documented different habitat states during the pilot phase (fall 2010 to spring 2012). Habitat states were defined using vegetation cover and interspersions. Vegetation cover classes defined as: low < 20% cover; moderate 20-80% cover; high > 80% cover. Interspersions qualitatively defined based on clumping of vegetation and water patches. Low interspersions corresponds to clumped patches of vegetation and water whereas high interspersions represented well-integrated patches of vegetation and water.*

Vegetation Cover	Interspersions		
	Low	Moderate	High
Low	21	5	2
Moderate	19	18	6
High	16	6	7



*Figure 1. Migration chronology curves for green-winged teal (Anas crecca) at two Integrated Waterbird Management and Monitoring wetland complexes during fall of 2011. Percent of maximum count is plotted against date.*

our current rapid assessment protocol with data from a more intensive protocol to identify the optimal level of habitat monitoring for decision-making. We expect our validation study and protocol revisions to be completed in early 2013.

### Decision Support Tools for Managers

IWMM is using pilot data to aid the development of decision support tools, especially for local scale management decisions. Currently, IWMM staff members are modeling relationships between waterbirds and habitat features across survey units. Modeled relationships will allow IWMM to identify highly influential habitat features, enabling the development of decision support tools linking management actions to habitat features and habitat features to waterbird responses. These tools will inform local management decisions aimed at maximizing the contribution of survey units to waterbird populations across the flyways. IWMM expects these decision support tools to be available in late 2013.

### Ongoing Monitoring Efforts

IWMM staff members are grateful for past monitoring efforts that have helped the IWMM initiative evolve to its current stage. Ongoing IWMM monitoring efforts will help the IWMM initiative continue to grow by (1) evaluating the logistical feasibility of revised monitoring protocols and (2) enabling the IWMM to

evaluate and refine its decision support tools. Participants will also be able to capitalize on their continued monitoring efforts by producing multi-year reports summarizing waterbird and vegetation observations. To support these reporting activities, the IWMM is working to expand reporting options available in its monitoring database.

The result of this collaboration and integration over the past two years is that the IWMM Initiative is that much closer to providing decision-makers at three spatial scales (local, regional, flyway) with the information they need to answer the following question: how can many managers coordinate their actions across the flyway to have the right habitat conditions, at the right time, in the right places for non-breeding waterbirds in the Atlantic and Mississippi Flyways?

### For additional information or questions contact:

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