Evaluating food use by Anatidae while using Rainwater Basin Waterfowl Production Areas

FY13

Progress Report

#64530492011

PROJECT DESCRIPTION

To describe wetland ingesta (i.e. diet) of northern pintail (*Anas acuta*, NOPI), American wigeon (*Anas americana*, AMWG), northern shoveler (*Anas clypeata*, NSHV), green-winged teal (*Anas crecca*, GWT), mallard (*Anas platyrhynchos*), and gadwall (*Anas strepera*, GADW) on Rainwater Basin (RWB) Waterfowl Production Areas (WPAs) at peak abundance during spring migration. NOPI are a target species of the North American Waterfowl Management Plan and were designated as a science priority for 2011 by the Great Plains Landscape Conservation Cooperative. The RWB is believed to provide habitat for 30% of the continental NOPI population during spring migration (Gersib et al. 1992). Additionally, the RWB Joint Venture's (RWBJVs) implementation plan estimates 50% of the midcontinent mallard population use RWB wetlands during the spring migration.

Wetland-derived seed resources may be a limiting factor for granivorous species, especially after peak populations of early migrants pass through the RWB area (Drahota 2012). Peak abundance of mallard and NOPI occur 2-3 weeks before AMWG, GWT, GADW, and NSHV peak. Therefore, later arriving species experience reduced wetland-derived seed resources in RWB wetlands (Drahota 2012). To the point, Euliss and Harris (1987) found GWT wintering diets were similar to NOPI diets; therefore niche partitioning is likely occurring for species with overlapping diets during spring migration. During spring migration, later arriving ducks likely have depleted wetland-derived seed biomass available (Drahota 2012). Therefore, future management may focus on maximizing wetland-derived seed resource availability 2-3 weeks after ducks begin to arrive in the RWB to increase fat acquisition rates for birds with poorer body condition (Casady 2013). This work supports regional and national bioenergetic models used to determine carrying capacity for mid-latitude stopover habitats. Specifically, this will help meet RWBJV and RWB WMD objectives (Newton 2006, Drahota et al. 2008, Callicutt et al. 2011, Petrie et al. 2011).

OBJECTIVES

1) To evaluate food use of selected Anatidae that currently utilize the RWB as a mid-latitude refueling stopover and establish baseline data about dietary patterns.
2) To estimate carrying capacity of RWB habitats based on food use and wetland-derived forage availability (Drahota 2012) and forage quality (Fig. 2 and 3).
3) To evaluate depletion rates caused by large populations of Anatidae in comparison to what is available and evaluate current management practices that may influence forage availability for concurring species use.
4) Evaluate the forage composition to determine how much each species rely on waste grain versus wetland derived resources and evaluate body condition as a dependent variable in diet selection.
5) Determine baseline body condition of six common species of waterfowl during peak migration use.

METHODS AND PROTOCOLS

We monitored waterfowl populations during the first 8 weeks of spring migration to approximate peak abundance of mallard, NOPI, GWT, AMWG, NSHV, and GADW. Bird behavior was monitored using a flock-scan technique (Altmann 1974) prior to sampling, birds exhibiting feeding behavior (dabbling, pecking, probing, grubbing, diving, and scything; following Davis and Smith 1998) were sampled during the 7-14 day peak abundance period for that species.

Plucked whole birds were sent to Long Point Avian Energetics Laboratory, Port Rowan, Ontario, where ingesta will be separated and lipid content will be determined for 311Anatidae (see Table 1).

Table 1. Waterfowl collected in 2012-13.

Species	Male	Female	Total	Goal	HY	AHY
NOPI	107	1	108	120	34	74
Mallard	63	35	98	132	39	59
GWT	51	14	65	130	28	37
AMWG	11	3	14	20	3	11
GADW	7	2	9	20	5	4
NSHV	12	5	17	20	10	7
Total	**251**	**60**	**311**	**502**	**119**	**192**

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DATA ANALYSIS / MODELS

Ingesta are still being categorized into plant and animal material and identified to Genus. This data will determine the percent composition of ingesta. This data can then be compared to Pearse et al. (2011). For the ducks, morphometric measurements were used to correct for body mass estimates. This data will also help determine fat content and energetic requirements for each guild. In Fig. 1, the histogram indicates that spring sample ducks in the RWB are smaller than published body mass estimates from wintering grounds (Baldassarre and Bolen 1994).

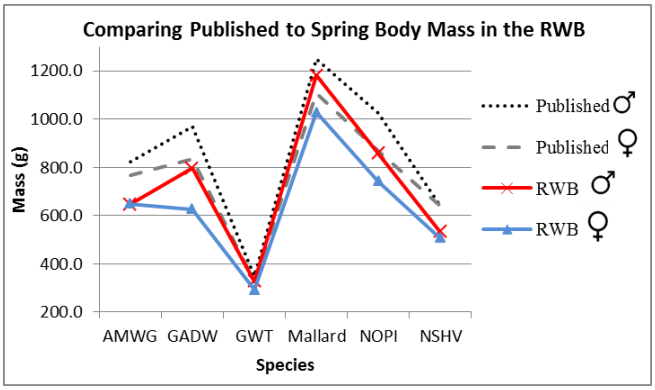

FIG. 1 PUBLISHED AND RWB MEAN BODY MASS FOR SAMPLED ANATIDS

Forage quality is also being analyzed to determine nutritional quality of wetland seed resources available in moist-soil annual (MSA) and moist-soil perennial stands (MSP). Some of these values are published, but many seeds in found in the RWB do not have any published values. In general, MSA stands provide more energy available (Drahota 2012), and these pant communities provide high nutritional quality than MSP stands (Fig. 2 and 3).

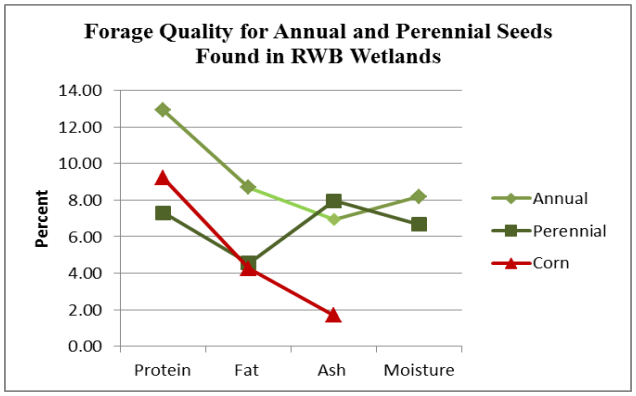

FIG. 2 THE PERCENT MEAN PROTIEN, FAT, AND ASH FOR SEEDS FOUND IN MSA AND MSP STANDS COMPARED TO CORN.

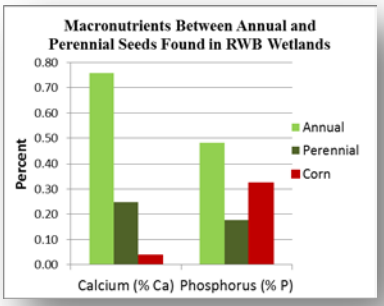

FIG. 3 MACRONUTRIENT LEVELS FOR SEEDS AVAILABLE IN MSA, MSP AND FOR CORN.

DATA MANAGEMENT

Data for this project is currently stored in Excel files. These files will be downloaded into the Service's shared data base after the project is complete.

PARTNERS

Over 14 people have been involved in the project, representing staff from the FWS, U.S. Geological Survey, the Rainwater Basin Joint Venture, and the University of Nebraska, Kearney (UNK).

SOURCES OF SUPPORT

Volunteers from UNK were used to collect and record data. The UNK biological department also provided laboratory space for processing birds. USGS and the Avian Energetics Laboratory have both provided technical support.

2012-13' Contribution by RWB WMD: $50,000.00

2012-13' Contribution by Partners: $8,000.00

2012-13' Contribution I&M Program: $132,000.00

CURRENT STATUS

Laboratory work is ongoing and will continue throughout the winter. Ingesta categorization takes a considerable amount of laboratory work. A total of 86 ingesta samples were collected in 2012, it will take another ~5 weeks to complete this data set. A total of 224 ingesta samples were collected in 2013, it will

take another ~17 weeks to complete this work. A final report is expected to be completed by October 2014.

CHALLENGES

Funding in 2012 was not received until after the peak migration period for most waterfowl occurred. Therefore, the 2012 sampling fell short of our sampling objectives (n=85, goal was 210). 2013 was much closer in terms of meeting the sampling protocol (n=224, goal was 251).

Shipping birds to Canada was very difficult. A considerable amount of planning and paperwork was required; however, good planning and lots of communication with all parties involved ensured success. Minimal problems were encounter during the shipment of birds to Canada. This is apparently much different than other scientific work conducted by various organizations; most have had many problems crossing the border.

MORE INFORMATION

Contact the Rainwater Basin WMD office for more information about this project:

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