



2009 Annual Report



The **mission** of the **BDJV** is to implement a cooperative population monitoring, research and communication program to provide the information required to manage black ducks and restore the population to the **North American Waterfowl Management Plan (NAWMP)** goal



*North American Waterfowl
Management Plan*

*Plan nord-américain de
gestion de la sauvagine*

*Plan de Manejo de Aves
Acuáticas de Norteamérica*

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1.0 MONITORING RESULTS

Goal: Develop, support and guide monitoring programs to provide information on the distribution, population growth trends, and demographic parameters of black ducks throughout their annual range.

1.1 Breeding Waterfowl Population Surveys

Results from the integrated Eastern Breeding Waterfowl Survey indicate that the black duck breeding population in 2009 was an estimated 463,600 breeding birds. This estimate is 7.15% lower than 2008 and is 28% lower than the NAWMP Population Goal (640,000 breeding birds; Figure 1). Similarly, the 2009 population estimate in the northeastern U.S. (39,523 \pm 6,228 SE) was 39% lower than 2008 (65,121 \pm 16,838 SE); Figure 2).

Figure 1. Trend in black duck breeding abundance based on the Integrated Eastern Breeding Waterfowl Survey¹

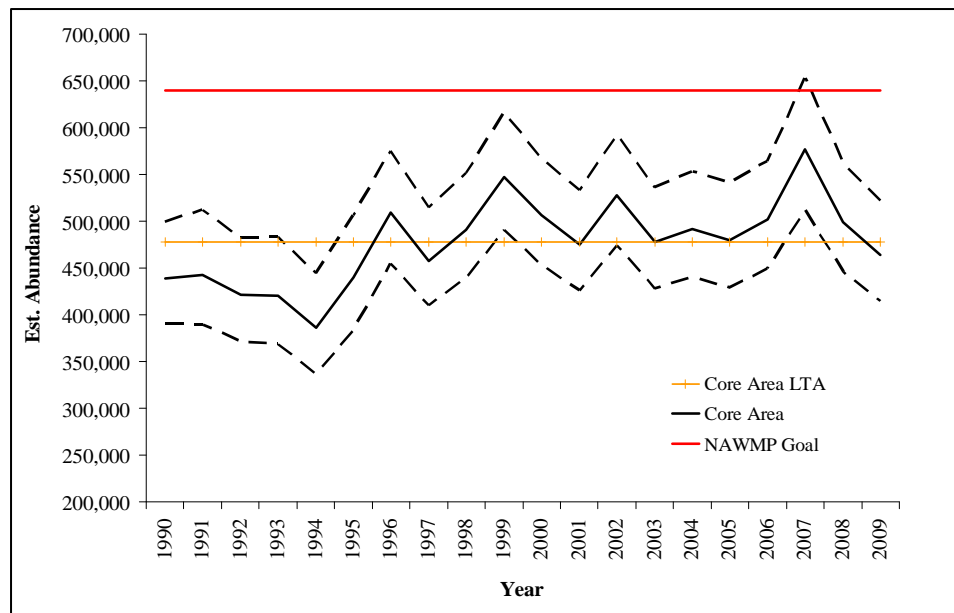
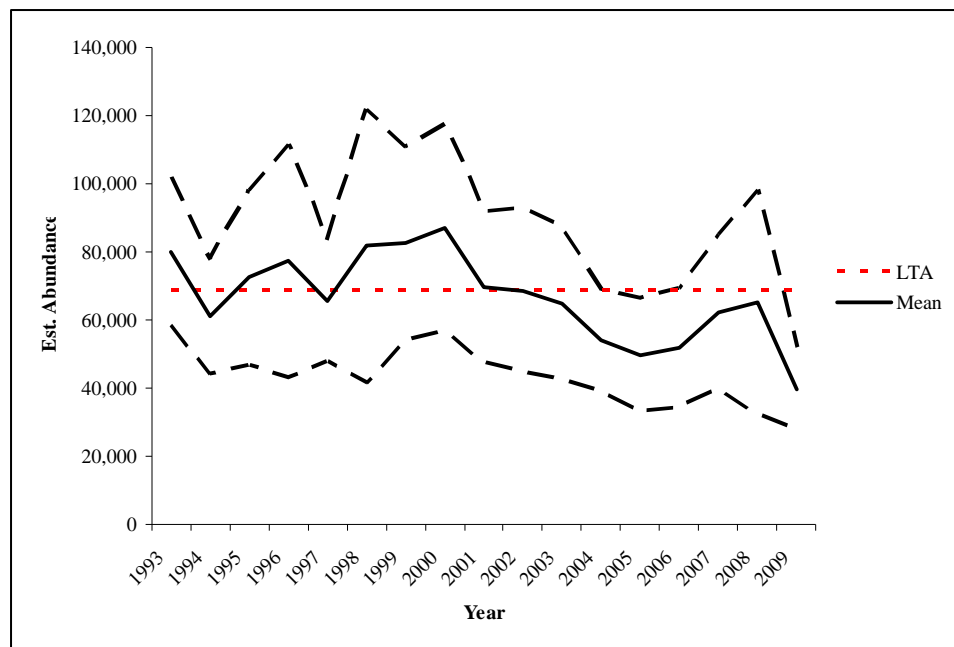


Figure 2. Population estimates (and 95% confidence interval; black line) for black ducks based on the Atlantic Flyway Breeding Waterfowl Plot Survey, 1993–2009. The long-term average (1993–2008; LTA) is represented by the red dotted line.

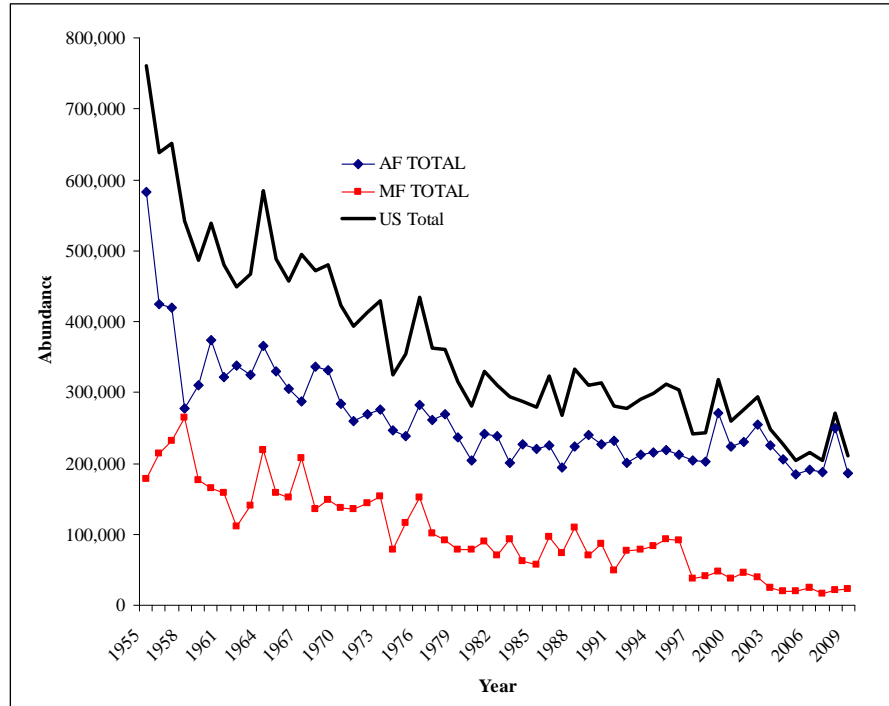


¹ Annual breeding population is estimated using a Bayesian statistical framework resulting in small changes in annual mean estimates

1.2 Mid-winter Inventories

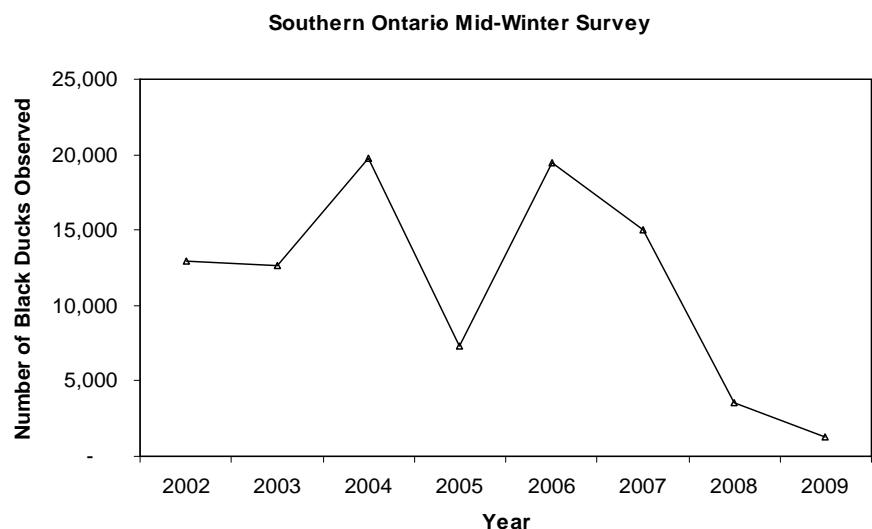
Each year the Canadian Wildlife Service (CWS) and the United States Fish and Wildlife Service (USFWS) conduct independent surveys to monitor the abundance and distribution of wintering waterfowl. The USFWS has been conducting the Mid-Winter Inventory (MWI) since the 1950s. The MWI provides the longest-running time series of black duck abundance across a large portion of its historic winter range.² In 2009, the USFWS Mid-Winter Inventory continued to indicate a declining wintering population (Figure 3). The 2009 estimate (210,064) was 23% less than the 2008 estimate (271,179).

Figure 3. Trend in black duck abundance based on the USFWS Mid-Winter Inventory.



The Ontario Mid-Winter Survey covers the northern shore from the Ontario / Quebec border (St. Lawrence) to Presqu'île (Lake Ontario). In winter 2009, the wintering population of black ducks in Ontario was 1,244 compared to 3,558 in 2008 (65% decline; Figure 4). The 2009 estimate also represents an 89% decline from the 8 year average of 11,503 wintering black ducks.

Figure 4. Trend in black ducks abundance based on the Southern Ontario Mid-Winter Inventory.



² Brook et al., found that a shift in midwinter distribution of black ducks may be partly responsible for the decreasing trend in MWS counts. See JOURNAL OF WILDLIFE MANAGEMENT 73(1):98-103; 2009

1.3 Black Duck Pre-Season and Winter Banding Programs

The 2009 pre-season banding program resulted in 4,542 banded black ducks (Table 1). This was a 10.7% increase of the 2008 total. Hatch-year males accounted for 37% of the banded birds followed by hatch-year females (26%), after hatch-year males (23%) and after hatch-year females (14%). The mean annual number of black ducks summarized by region is presented in Table 2. Reward bands were not placed on black ducks in 2009.

Table 1. Number of black ducks banded in the pre-season (July–September) 2009 and 2008.

| Location | 2009 | 2008 | % Change |
|----------------------|------|------|----------|
| Alberta | 1 | 1 | 0.00 |
| Manitoba | 7 | 7 | 0.00 |
| New Brunswick | 812 | 1222 | -33.55 |
| Newfoundland | 427 | 545 | -21.65 |
| Nova Scotia | 192 | 110 | 74.55 |
| Ontario | 294 | 270 | 8.89 |
| Prince Edward Island | 4 | 41 | -90.24 |
| Quebec | 2278 | 1382 | 64.83 |
| Saskatchewan | 10 | 10 | 0.00 |
| Connecticut | 40 | 24 | 66.67 |
| Maine | 242 | 290 | -16.55 |
| Maryland | 0 | 4 | -1.00 |
| Massachusetts | 14 | 33 | -57.58 |
| New Hampshire | 11 | 0 | N/A |
| New Jersey | 31 | 32 | -3.13 |
| New York | 20 | 35 | -42.86 |
| Pennsylvania | 34 | 27 | 25.93 |
| Vermont | 80 | 36 | 122.22 |
| Indiana | 0 | 3 | -1.00 |
| Michigan | 12 | 8 | 50.00 |
| Minnesota | 20 | 7 | 185.71 |
| Wisconsin | 13 | 14 | -7.14 |
| North Dakota | 0 | 2 | -1.00 |
| Total | 4542 | 4103 | 10.70 |

Note: Banding Data obtained from the Bird Banding Laboratory on December 22, 2009.

Table 2. Mean annual number of black ducks banded pre-season by region.

| Area | Period | Mean | SD | Min | Max |
|-----------|-----------|---------|--------|------|------|
| Ontario | 1964–1989 | 1379.33 | 698.63 | 521 | 3085 |
| Ontario | 1990–2009 | 785.50 | 338.36 | 270 | 1368 |
| Québec | 1964–1989 | 1468.15 | 674.03 | 504 | 3467 |
| Québec | 1990–2009 | 1838.70 | 447.09 | 908 | 2476 |
| Maritimes | 1964–1989 | 2134.37 | 633.80 | 693 | 3261 |
| Maritimes | 1990–2009 | 2322.30 | 518.39 | 1435 | 3758 |
| Maine | 1964–1989 | 674.44 | 404.09 | 152 | 1643 |

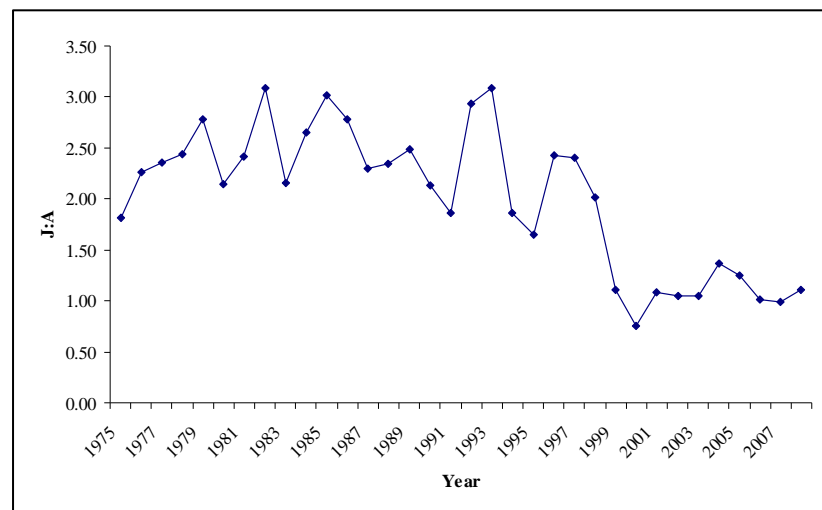
| | | | | | |
|--------------------|-----------|---------|---------|------|------|
| Maine | 1990—2009 | 321.40 | 114.17 | 126 | 621 |
| Atlantic Flyway | 1964—1989 | 2657.44 | 1308.87 | 1265 | 5563 |
| Atlantic Flyway | 1990—2009 | 1120.30 | 632.00 | 472 | 2594 |
| Mississippi Flyway | 1964—1989 | 485.81 | 362.60 | 99 | 1502 |
| Mississippi Flyway | 1990—2009 | 125.40 | 103.97 | 29 | 326 |

The Winter Banding Program is a 5-year pilot to test the feasibility of a two-season banding program (pre-season and post-season) to estimate black duck seasonal survival. This project is being conducted in cooperation with the Atlantic and Mississippi Flyway Council, State and Provincial Agencies, the USFWS National Wildlife Refuge System, USFWS Division of Migratory Bird Management, and CWS. The initial post-season banding effort will begin in January–February 2010.

1.4 Harvest Surveys and Black Duck Productivity

Estimates of black duck productivity are based on the age ratio of harvested birds corrected for relative vulnerability. Black duck age ratios exhibited a drastic decline between 1997 and 2000, but productivity has been relatively constant since 2001 (Figure 5).

Figure 5. Trend in black duck age ratios (as measured by Harvest Survey data) 1975–2008



2.0 RESEARCH PROGRAM

Goal: Support and guide research on black duck population dynamics, habitat ecology, monitoring programs, and management techniques to identify and mitigate limiting factors.

2.1 Project Status and Summaries

In 2009 the BDJV supported seven research projects; 6 are on-going and 1 was completed. Summaries of each project follow below.

Determining food resource availability and estimating habitat carrying capacity for wintering and spring staging American black ducks in Virginia and southern New Jersey.

- a. Principal Investigators: Yerkes, T., M. Eichholz, C. K. Williams, and P. M. Castelli.
- b. Dates: 2006–2010

- c. Goal: determine the types and amounts of acres of coastal habitat required to support NAWMP goal of wintering and spring migrating black ducks along the Atlantic coast.
- d. Status: Field is completed and these have been completed by each graduate student working in Virginia and New Jersey. Work is on-going (led by T. Yerkes and J. Coluccy, Ducks Unlimited) to generate a range wide estimate of carrying capacity using the collected data and a revised version of the true-met model.

True metabolizable energy of American black duck foods.

- a. Principal Investigators: Coluccy, J. M, and T. Yerkes.
- b. Dates: 2009–2010
- c. Goal: Estimate the true metabolizable energy for 6 food items found to be important to black ducks in the winter carrying capacity study by Yerkes et al. This information is critical to calculating an accurate estimate of winter carrying capacity using the true-met model.
- d. Status: Feeding trails have been completed and statistical analyses are being conducted.

Examining local and geographic habitat use patterns over the annual life cycle.

- a. Principal Investigators: Yerkes, T., and J. Bowman
- b. Dates: 2007–2010
- c. Goal: Identify and describe migration routes and linkages between wintering and breeding areas.
- d. Status: Data were collected in the winters of 2007/08 and 2008/09. A total of 68 adult female birds were instrumented with satellite Platform Transmitting Terminals (PTTs) in the winters of 2007/08 (n=29) and 2008/09 (n=39). Of these units 62 provided GPS location information and 65 provided accurate Argos (triangulation) locations. The data analyses are complete and manuscripts (e.g., M.S. thesis, final report, and peer-reviewed publications) are in preparation.

Incorporating the Northeastern Waterfowl Survey into a composite spatial analysis of the American black duck population.

- a. Principal Investigators: Sauer, J., B. Gardner, G. Zimmerman, and J. A. Royle.
- b. Dates: 2008–2010
- c. Goal: Develop the technical ability (i.e., statistical model) to incorporate data from the Northeastern Waterfowl Survey into the composite estimate of black duck breeding population size.
- d. Status: The Principal Investigators are currently working incorporating the northeastern data into the non-spatial analysis framework. Once completed the spatial analysis will be completed.

Black duck population and habitat model for Maritimes Canada.

- a. Principal Investigators: Lieske, D., M. Gloutney, R. Milton, K. Connor, R. Dibblee, B. Pollard, D. Howerter.
- b. Dates: 2008–2010
- c. Goal: The goal of this project is to aid the Eastern Habitat Joint Venture conservation planning process by: 1) identifying key landscape and wetland-level factors determining

- use by breeding black ducks, and 2) produce a comprehensive, maritime-wide prediction surface to support the identification of important land parcels.
- d. Status: Several analyses and resulting models have been completed for Nova Scotia and New Brunswick and a manuscript is in preparation. An analysis of the Prince Edward Island data will be completed soon and the development of a hierarchical wetland-level/plot-level model will be explored.

Technical support for adaptive harvest management of the American black duck.

- a. Principal Investigator: Conroy, M.
- b. Dates: 2008–2010
- c. Goal: develop a adaptive harvest management model to assist the Canadian and U.S. federal agencies and Flyway Councils establish annual harvest regulations.
- d. Status: Technical development of the model continues on schedule. Recent reviews by the Adaptive Harvest Management Working Group (BDAHMMWG) indicate broad support for the direction and effort of the modeling project. Continued work will focus on a model that incorporates informative prior information (based on the Mid-Winter Inventory) and an evaluation addressing structural uncertainty via competing models (i.e., hypotheses) or parametric uncertainty. Concurrent work by the BDAHMMWG will address unresolved policy issues to guide the final form of the model.

Linking Canadian harvested juvenile American black ducks to their natal areas using stable isotope methods.

- a. Principal Investigators: Ashley, P., K. Hobson, S. L. VanWilgenburg, N. North, and S. Petrie.
- b. Dates: 2006–2009
- c. Goal: Improve understanding of the linkages between breeding and harvest areas in Canada at a scale relevant to black duck harvest and habitat management.
- d. Status: Completed. Manuscript is in preparation for publication in peer-reviewed journal.

2.2 Black Duck Integrated Population and Habitat Modeling

The Black Duck Integrated Modeling Working Group (hereafter Working Group [WG]) met in Hadley, MA from 9-10 September 2009. This was the first working session held by the group. The purpose to the working session was to focus on describing black duck habitat management context and identifying habitat features that influence black duck vital rates. The working session resulting in the development of an initial conceptual model of black duck annual cycle and important habitat relationships (Figure 6). The working group will hold another working session in 2010 with the goal of programming the first prototype of the integrated population/habitat model.

Figure 6. Conceptual model of black duck annual life cycle and example of habitat relationships during winter.

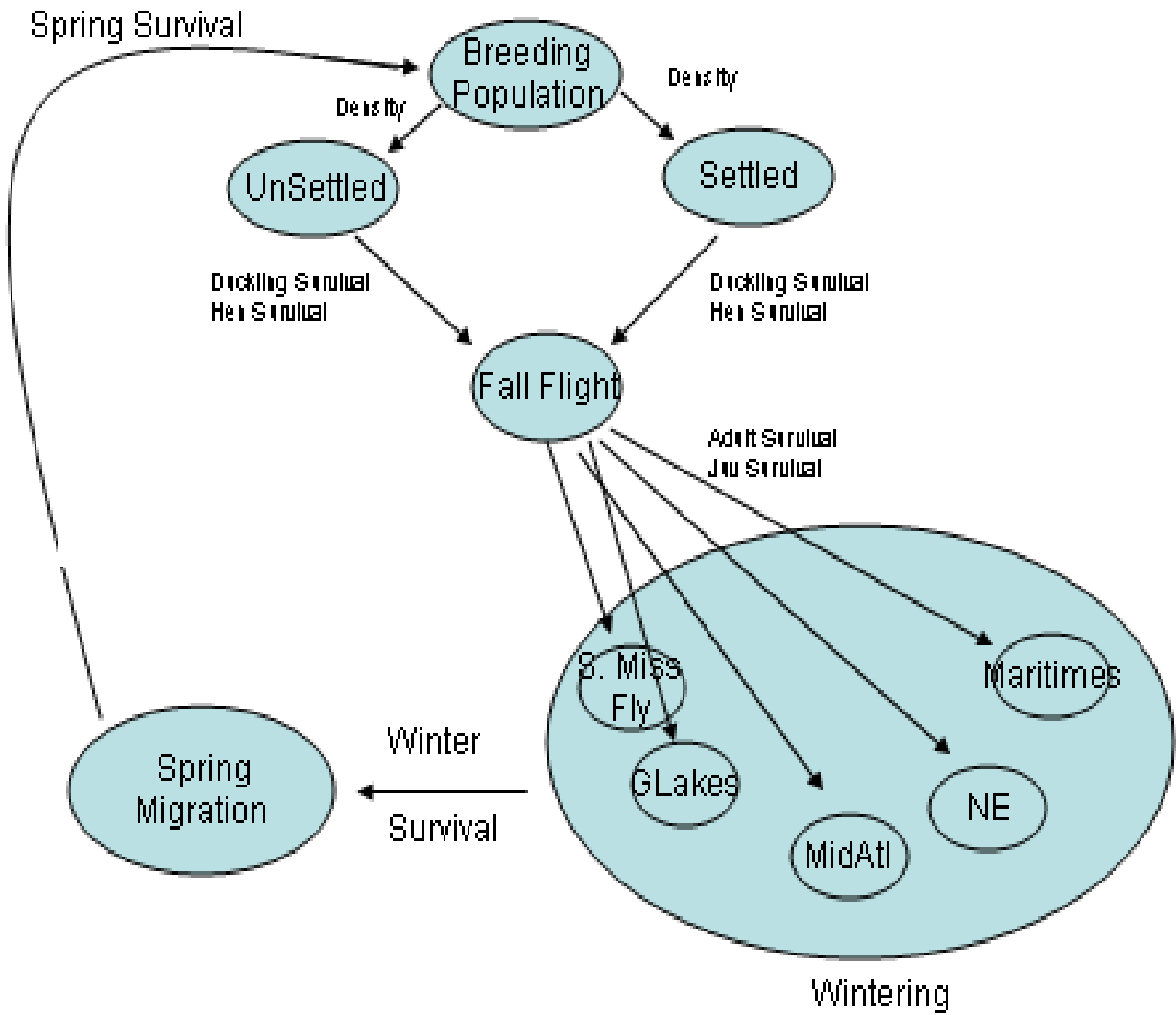
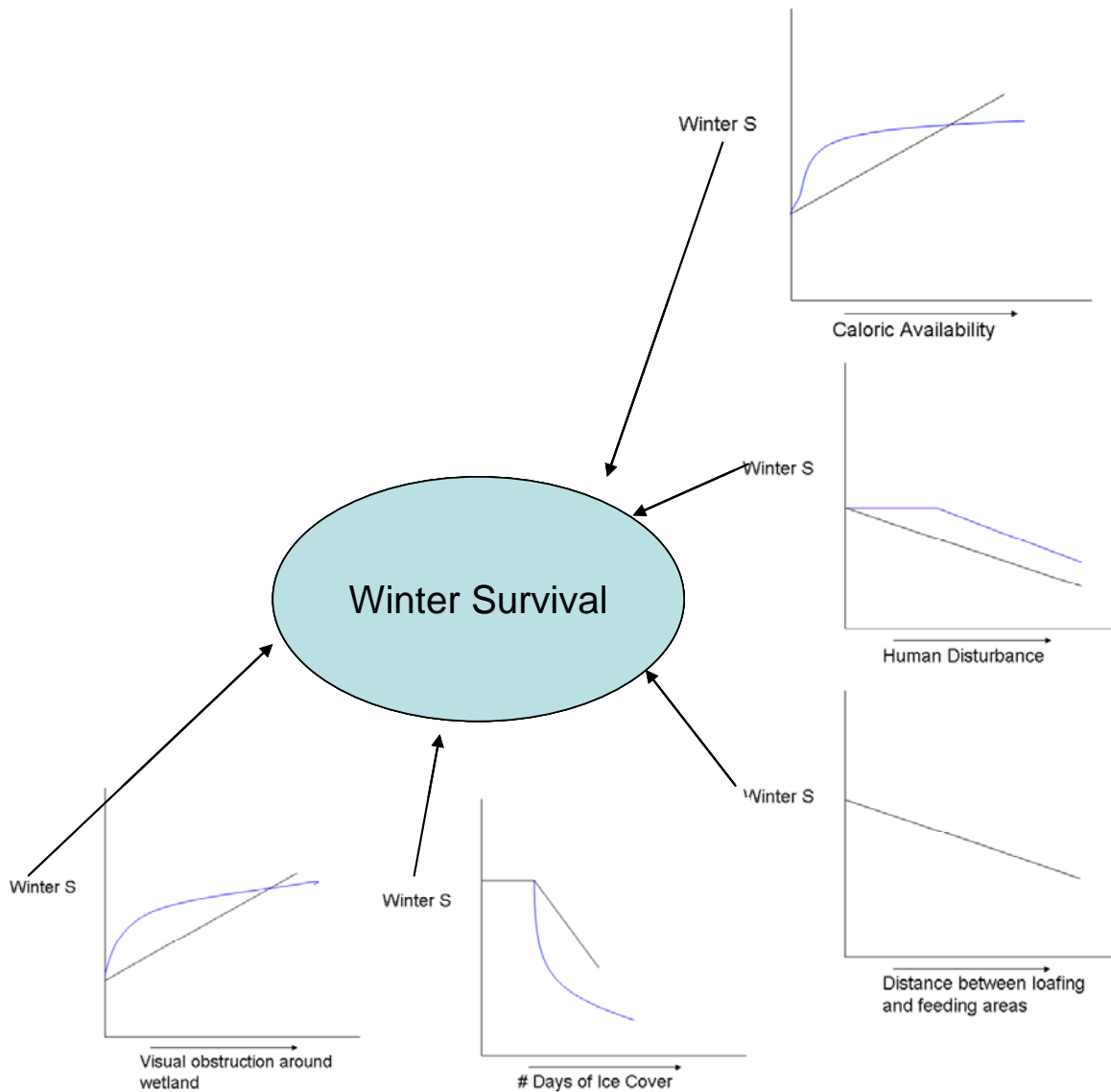


Figure 6. Conceptual model of black duck annual life cycle and example of habitat relationships during winter.



3.0 COMMUNICATIONS PROGRAM

Goal: Communicate results of monitoring and research programs to associated habitat joint ventures, natural resource agencies, policy-makers, and stakeholders to support black duck conservation efforts.

The promotion and sharing of scientific information among Flyway Councils, universities and wildlife agencies in Canada and the U.S. is vital to ensuring sustained populations of Black Ducks and other waterfowl that share their breeding range. The results of partner efforts in 2009 support each of the three objectives of the communications program³ and are described below.

³ Objectives: Maintain and increase participation and support for black duck research and management; assist in habitat conservation and facilitate regulatory management.

3.1 5th North American Duck Symposium

Several BDJV-sponsored research projects were presented at the 5th North American Duck Symposium which was held in Toronto, Ontario (August 2009). Abstracts can be obtained from the Symposium website (www.northamericanducksymposium.org).

Oral Presentations:

- i. Darveau "Is the eastern boreal forest a low priority habitat for waterfowl?"
- ii. D'Amours "What is currently driving nesting waterfowl abundance in the eastern Canadian forest: natural or human-driven processes?"
- iii. Cramer et al "Estimating habitat carrying capacity for American black ducks wintering in southern NJ"
- iv. Ashley et al "Linking Canadian harvest American black ducks to their natal areas using stable isotope analysis."

Poster Presentations:

- v. Lewis et al "Determining food resource availability for wintering and spring staging American black ducks on the eastern shore of VA."
- vi. Colucy and Yerkes "True metabolizable energy of American black duck foods"
- vii. Lemelin et al "Mapping wetlands and predicted breeding waterfowl abundance in Quebec forests"
- viii. Anderson et al "Spring migration ecology of American black ducks determined by satellite telemetry".

Side meeting:

- i. Held a Habitat Joint Venture Round table meeting to explore setting regional (JV) black duck population objectives and to discuss the coherence among habitat, harvest and population objectives.

3.2 Fostering Collaboration, Sharing Information

Two relatively new U.S.-based Habitat Joint Ventures namely the Appalachian Mountain Joint Venture (AMJV) and the Central Hardwoods Joint Venture (CHJV) have identified the American Black Duck as a priority species. The AMJV coordinator, Brian Smith, attended our fall meeting to explore opportunities for collaboration and the CHJV also expressed interest in working cooperatively.

The BDJV Science Coordinator gave a presentation to USFWS National Wildlife Refuge (NWR) (Northeast Region) personnel at their annual project leader meeting held in Virginia Beach, VA.

The presentation provided an opportunity to inform NWR personnel about the mission of the joint venture and resources the JV could contribute to black duck management on NWR lands. The meeting also

provided an opportunity to inform NWR biologists and managers about on-going research and the implementation of the 2-season banding program. Ultimately, participation at this meeting allowed the joint venture to increase communication and interactions with a critical partner.

3.3 BDJV Website

Websites (the BDJV website and those of our partners) serve as a primary vehicle for managing and sharing information about black duck ecology and management. The revision and expansion of the Black Duck Joint Venture website continues to be a high priority for the Communications Working Group. Changes to the website are anticipated throughout 2010.

In 2009 Ducks Unlimited featured BDJV supported research into black duck winter carrying capacity at the following address: www.ducks.org

Black Duck Study

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FEATURED DU RADIO SHOWS

- The American Black Duck
- Satellites & Ducks w/ Dr. Tina Yerkas: 1
- Satellites & Ducks w/ Dr. Tina Yerkas: 2

Black Duck Study in the News

- Ducks Unlimited studying Prime Hook black ducks Cape Gazette, Lewes, Del.
- Ducks Unlimited releases black ducks in Flanders as part of ongoing study 27east.com (from The Southampton Press, Southampton, N.Y.)
- How to spy on a black duck delawareonline.com (from The News Journal, Wilmington, Del.)

Background

American black duck populations have declined by as much as 60 percent in traditional wintering areas. Several possible explanations exist for this decline, one of which is the loss and degradation of quality wintering habitat in the Atlantic and Mississippi flyways. In response to this issue Ducks Unlimited and its partners initiated multi-year studies in New York, New Jersey and Virginia to examine wintering ecology and to quantify food resources and carrying capacity for wintering and spring staging black ducks along the Atlantic Flyway. This year the black duck research initiative will be expanded to include the use of satellite transmitters with GPS technology, which will allow researchers to track birds for up to 3 years as they move between wintering areas in New Jersey, Virginia and Ohio, and breeding areas.

Objectives

The primary objectives of the black duck research initiative are to:

- Document local habitat use, movement and activities of wintering black ducks in Ohio, New Jersey, New York and Virginia.
- Determine the availability and depletion of important black duck food sources along the Atlantic coast during winter.
- Determine current food habits of black ducks wintering the Atlantic coast.
- Estimate the energetic carrying capacity of habitats along the Atlantic coast for wintering black ducks.

4.0 Partner Contributions

The success of Black Duck Joint Venture programs relies, in large part, on the contributions of many partner agencies on an ongoing basis. The summary table below includes direct contributions to BDJV programs but it is recognized that each of our programs, surveys and banding in particular, requires a significant in-kind or staff time contribution that is not represented in the table below.

Table 2. 2009 Partner Contributions to the BDJV (US dollars).

| Organization | Surveys | Research ¹ | Banding | Communications | Coordination ¹ | Total |
|---|------------------|-----------------------|------------------|----------------|---------------------------|--------------------|
| US Fish and Wildlife Service Black Duck Joint Venture | | \$267,244 | | \$1,175 | \$178,867 | \$447,286 |
| US Fish and Wildlife Service (Office of the Atlantic Flyway Representative) | \$140,000 | | \$85,000 | | | \$225,000 |
| U.S. Geological Survey | | \$17,000 | | | | \$17,000 |
| Canadian Wildlife Service | \$377,180 | \$1,500 | \$17,571 | \$500 | \$12,837 | \$409,588 |
| Atlantic Flyway Council | | | \$216,000 | | | \$216,000 |
| Mississippi Flyway Council | | | \$15,000 | | | \$15,000 |
| Ducks Unlimited Inc. | | \$224,447 | | \$1,000 | | \$225,447 |
| Ducks Unlimited Canada | | \$7,500 | | | | \$7,500 |
| Ontario Ministry of Natural Resources | | | \$54,000 | | \$2,500 | \$56,500 |
| Waterfowl Research Foundation | | \$7,500 | | | | \$7,500 |
| Winous Point Marsh Conservancy | | \$19,000 | | | | \$19,000 |
| Private Contributions | | \$900 | | | | \$900 |
| Nova Scotia Department of Natural Resources | | \$7,500 | | | | \$7,500 |
| New Brunswick Department of Natural Resources | | \$7,500 | \$1,285 | | | \$8,785 |
| Canadian Wildlife Cooperative Health Centre | | | \$5,000 | | | \$5,000 |
| Upper Mississippi River and Great Lakes Joint Venture | | \$30,000 | | | | \$30,000 |
| University of Delaware | | \$47,868 | | | | \$47,868 |
| Ohio Division of Wildlife | | \$5,000 | | | | \$5,000 |
| New Jersey Division of Fish and Wildlife | | \$19,708 | | | | \$19,708 |
| Forsythe National Wildlife Refuge | | \$32,000 | | | | \$32,000 |
| State of Connecticut | | \$79,256 | | | | \$79,256 |
| Total | \$517,180 | \$773,923 | \$393,856 | \$2,675 | \$194,204 | \$1,881,838 |

¹. Includes cash and in-kind dollars.

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