Chesapeake Bay Program | Indicator Analysis and Methods Document
Black Duck Wintering Population | Updated 04-06-2016

Indicator Title: Black Duck Wintering Population

Relevant Outcome(s): Black Duck

Relevant Goal(s): Vital Habitat

Location within Framework (i.e., Influencing Factor, Output or Performance): Performance

A. Data Set and Source

(1) Describe the data set. What parameters are measured? What parameters are obtained by calculation? For what purpose(s) are the data used? Black duck numbers in the watershed are estimated annually as part of the Mid-winter Waterfowl Surveys conducted by teams of pilots and biologists from the state natural resource agencies.

(2) List the source(s) of the data set, the custodian of the source data, and the relevant contact at the Chesapeake Bay Program.
- Source: Tim Jones, Atlantic Coast Joint Venture, US FWS
- Custodian: Jennifer Greiner, Habitat GIT Coordinator, FWS
- Chesapeake Bay Program Contact (name, email address, phone number): Kyle Runion (Habitat GIT Staff, Chesapeake Research Consortium, runion.kyle@epa.gov, 410-267-9830)

(3) Please provide a link to the location of the data set. Are metadata, data-dictionaries and embedded definitions included? Data and metadata are available the U.S. Fish and Wildlife Service's Migratory Bird Data Center: https://migbirdapps.fws.gov/

B. Temporal Considerations

(4) Data collection date(s): On or around January 1 every year. Specific dates vary due to weather conditions.

(5) Planned update frequency (e.g., annual, biannual, etc.):
- Source Data: Annual
- Indicator: Annual

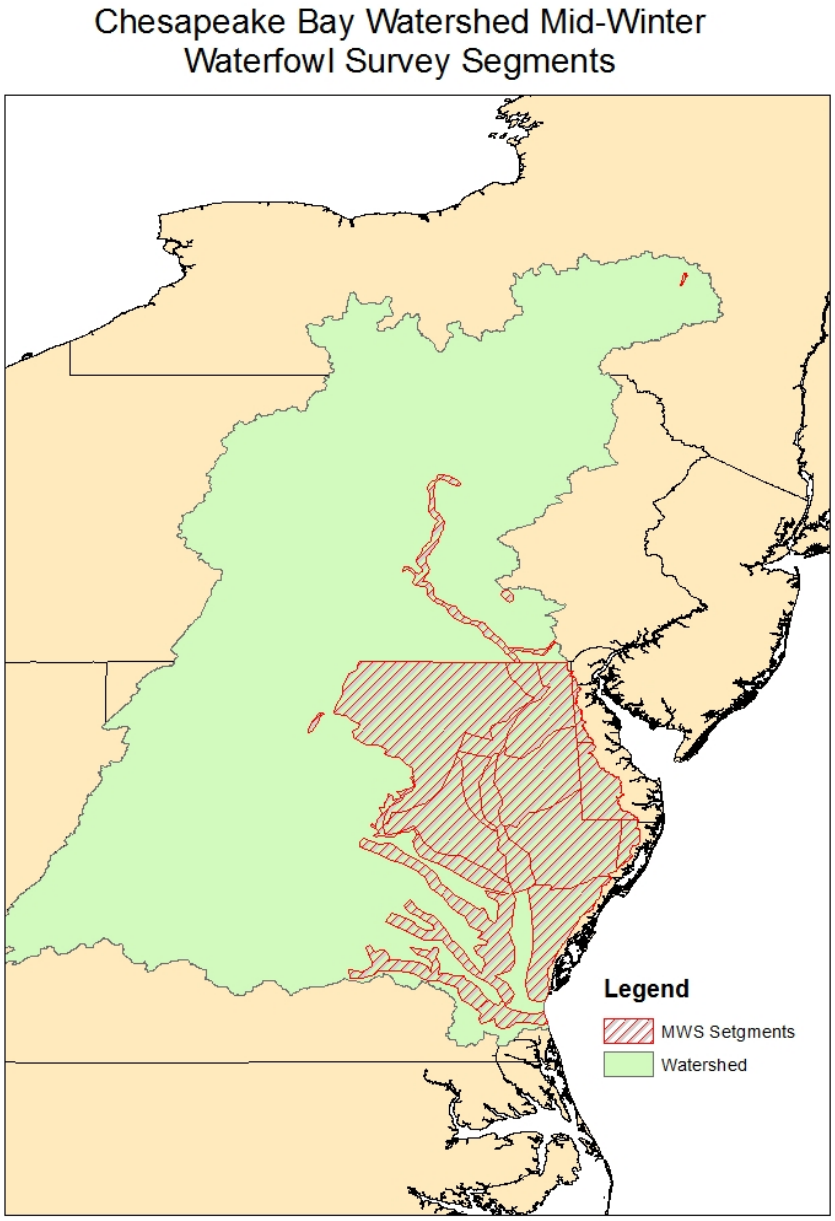
(6) Date (month and year) next data set is expected to be available for reporting: March 2017

C. Spatial Considerations

(7) What is the ideal level of spatial aggregation (e.g., watershed-wide, river basin, state, county, hydrologic unit code)? Watershed-wide

(8) Is there geographic (GIS) data associated with this data set? If so, indicate its format (e.g., point, line polygon). Yes, polygon showing surveyed segments.

(9) Are there geographic areas that are missing data? If so, list the areas. Yes, see map, areas in green without hatching are not surveyed but represent extremely low density black duck wintering areas.



(10) Please submit any appropriate examples of how this information has been mapped or otherwise portrayed geographically in the past. N/A

D. Communicating the Data

(11) What is the goal, target, threshold or expected outcome for this indicator? How was it established? The target wintering population of black duck in the Chesapeake watershed is 100,000. This target is based on a North American Waterfowl Management Plan continental breeding population goal of 640,000 black ducks, most recently revised in 2004.

(12) What is the current status in relation to the goal, target, threshold or expected outcome? Progress is currently below expectations.

(13) Has a new goal, target, threshold or expected outcome been established since the last reporting period? Why? No.

(14) Has the methodology of data collection or analysis changed since the last reporting period? How? Why? No.

(15) What is the long-term data trend (since the start of data collection)? Black duck numbers have been rising inconsistently.

(16) What change(s) does the most recent data show compared to the last reporting period? To what do you attribute the change? Is this actual cause or educated speculation? Wetland restoration activities in the area have allowed the black duck population to increase in recent years.

(17) What is the key story told by this indicator?
Population of black duck in this area can be an indicator for the health of its food sources and its habitat in the Bay Watershed.

E. Adaptive Management

(18) What factors influence progress toward the goal, target, threshold or expected outcome? Habitat loss, degradation, and fragmentation, both locally and at other ends of the Atlantic Flyway population's range. Food availability – affected by competition among other species and proximity to disturbance. Shoreline disturbance. Invasive species. Climate impacts.

(19) What are the current gaps in existing management efforts? Maps showing vulnerability to development (currently under development) and sea-level rise would help the Program gain a better picture of habitat challenges for sustaining the target population.

(20) What are the current overlaps in existing management efforts? N/A

(21) According to the management strategy written for the outcome associated with this indicator, how will we (a) assess our performance in making progress toward the goal, target, threshold or expected outcome, and (b) ensure the adaptive management of our work? Habitat and food availability maps are to be rerun as necessary; the annual survey

F. Analysis and Interpretation

Please provide appropriate references and location(s) of documentation if hard to find.

(22) What method is used to transform raw data into the information presented in this indicator? Please cite methods and/or modeling programs. No transformations are required. Program R was used to calculate the three-year moving averages.

(23) Is the method used to transform raw data into the information presented in this indicator accepted as scientifically sound? If not, what are its limitations? Yes, within the assumptions of the MWS.

(24) How well does the indicator represent the environmental condition being assessed? Annual variability due to environmental factors makes using population measurements a less than ideal way to assess state of the habitat conditions. Until we can accurately track changes in habitat conditions, this is the best alternative surrogate.

(25) Are there established reference points, thresholds, ranges or values for this indicator that unambiguously reflect the desired state of the environment? Yes.

(26) How far can the data be extrapolated? Have appropriate statistical methods been used to generalize or portray data beyond the time or spatial locations where measurements were made (e.g., statistical survey inference, no generalization is possible)? Survey is considered a census so there are no need for statistical methods. Data should not be extrapolated beyond current surveyed segments.

G. Quality

Please provide appropriate references a location(s) of documentation if hard to find.

(27) Were the data collected and processed according to a U.S. Environmental Protection Agency-approved Quality Assurance Project Plan? If so, please provide a link to the QAPP and indicate when the plan was last reviewed and approved. **If not, please complete questions 29-31.** No.

(28) *If applicable:* Are the sampling, analytical and data processing procedures accepted as scientifically and technically valid? Yes

(29) *If applicable:* What documentation describes the sampling and analytical procedures used? See link in #3. Survey design and field procedures are determined by individual states. The Mid-winter Survey is, today, conducted primarily by fixed-wing aircraft. The Mid-winter Survey is known as a "cruise" survey, in that specific predefined transects are not defined. Instead, an aerial crew determines the best and most practical means to conduct a complete count of all waterfowl within a predefined unit area. The exact means of coverage may vary from year to year; however, the objective is to obtain a complete count of all waterfowl within the survey unit. The survey is conducted annually and typically starts the first week of January. Cooperators then enter data into a data entry application and the data is sent directly to the respective Flyway office where an annual report is produced and data are stored.

(30) *If applicable:* To what extent are procedures for quality assurance and quality control of the data documented and accessible? N/A

(31) Are descriptions of the study design clear, complete and sufficient to enable the study to be reproduced? Yes

(32) Were the sampling, analytical and data processing procedures performed consistently throughout the data record? In 2016, yes. Historically, the Mid-winter Survey has been criticized for its lack of a statistical sampling design, differences in field methods among states, changes in survey personnel and variability in personnel experience, variation in survey effort, and changes in surveyed areas within states. Eggeman and Johnson (1989) summarized many of the limitations with the Atlantic Flyway Mid-winter Waterfowl Survey. Because of these limitations, caution must be used in making inferences about population trends using data from this survey. Any such attempts should be made in close consultation with state and Federal agency personnel that have knowledge of specific limitations of these data for individual states and species. Refer to for more information and for sources.

(33) If data sets from two or more sources have been merged, are the sampling designs, methods and results comparable? If not, what are the limitations? N/A

(34) Are levels of uncertainty available for the indicator and/or the underlying data set? If so, do the uncertainty and variability impact the conclusions drawn from the data or the utility of the indicator? No, survey represents a census.

(35) For chemical data reporting: How are data below the MDL reported (i.e., reported as 0, censored, or as < MDL)? If parameter substitutions are made (e.g., using

orthophosphate instead of total phosphorus), how are data normalized? How does this impact the indicator? N/A

(36) Are there noteworthy limitations or gaps in the data record?

Inconsistencies within the current database period (taken from https://migbirdapps.fws.gov/mbdc/databases/mwi/aboutmwi_allflyways.htm):

- .
- 2007
  - .
  - New York survey data are from Long Island only. Counts for black ducks and brant are probably reasonable, but counts for other species are likely too small, especially mallards, canvasbacks, Canada geese, and mute swans.
- 2008 -
- 2009 - New York survey data are from Long Island only
- 2010 - New York survey data are from Long Island and Lake Champlain only
- 2011
  - New York survey data are from Long Island and Lake Champlain only.
  - Failure of the voice/GPS computer program prevented Pennsylvania from completing or compiling aerial survey segment and sub-segment data. In an effort to reconcile lost data, ground counts were performed, although in some cases even these efforts were not feasible. Therefore, counts for this state are not comparable to previous years. Extent of data loss for individual species varied from minimal (snow geese, tundra swans) to moderate (Canada geese and most duck species) to extensive (mergansers).
- 2012 and 2013
  - New York survey data from Long Island only. Counts for black ducks and brant are probably reasonable, but are likely too small for other species, especially mallards, canvasbacks, Canada geese, and mute swans.
  - .
- 2014
  - New York survey data from Long Island, Lake Champlain, and western part of state only. Counts for black ducks and brant are probably reasonable, but are likely too small for other species, especially mallards, canvasbacks, Canada geese, and mute swans.
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- 2015
  - New York survey data from Long Island, Finger Lakes region, Great Lakes shorelines, and Lake Champlain. Counts are not comparable to previous years due to wide variation in survey area.

H. Additional Information (*Optional)*

(37) Please provide any further information you believe is necessary to aid in communication and prevent any potential misrepresentation of this indicator.