

# **Black Duck International Harvest Strategy**

The purpose of this document is to describe the harvest strategy agreed to on July 26, 2012 by the Migratory Birds Program of the Canadian Wildlife Service (CWS) and the U. S. Fish and Wildlife Service (USFWS) with respect to harvesting American black ducks. The agreement can be changed at any time upon notice and discussion between the parties.

## **Introduction:**

The American black duck is an important species to waterfowl hunters in Canada and the United States. The Black Duck Adaptive Harvest Management Working Group (Working Group) was formed in 2000 to develop a cooperative, international Adaptive Resources Management approach to managing the black duck harvest in North America. The Working Group is comprised of Federal, Provincial, State and non-government biologists representing waterfowl managers and stakeholders from both countries. In 2008 the 2 countries formed the Black Duck International Management Group (Management Group), consisting of administrators from CWS, USFWS, and the Atlantic and Mississippi Flyway Councils, to address policy issues associated with international harvest management that were beyond the purview of the Working Group. The Management Group was responsible for developing black duck harvest strategy recommendations to the Canadian and United States of America Federal agencies and the Flyway Councils, whereas the existing Working Group provided technical advice to the Management Group.

At its initial meeting in 2008, the Management Group agreed that an international harvest strategy for black ducks is needed because the resource is valued by both countries and both countries have the ability to influence the resource through harvest. The Management Group also agreed a harvest strategy should be based on an Adaptive Harvest Management (AHM) approach based on breeding ground integrated survey data (Appendix 1). The strategy should also provide a formal approach to determining appropriate harvest levels and fair allocation of the harvest between countries.

The Management Group and their technical staff met again via teleconference on February 6, 2012 to negotiate an international harvest strategy for black ducks. The Management Group is composed of: Wayne MacCallum (Atlantic Flyway Council), Dave Scott (Mississippi Flyway Council), Rick Bennett (USFWS), Brad Bortner (USFWS), Basile van Havre (CWS), and Doug Bliss (CWS). Their technical support staff at this meeting consisted of: Min Huang (Atlantic Flyway Technical Section), Rocky Pritchert (Mississippi Flyway Technical Section), Paul Padding (USFWS), Patrick Devers (USFWS), Jim Kelley (USFWS), Kathy Dickson (CWS), and Eric Reed (CWS). The Management Group agreed to recommend the international AHM strategy for black ducks described below.

## **The strategy:**

### **Fundamental objectives**

The three fundamental objectives of black duck harvest management are to:

- Maintain a black duck population that meets legal mandates and provides consumptive and non-consumptive use commensurate with habitat carrying capacity;
- Maintain societal values associated with the hunting tradition; and
- Maintain equitable access to the black duck resource.

AHM model:

Measures of population size

The AHM model is based on spring breeding-ground abundance as estimated by the integrated Eastern Waterfowl Survey from the core survey area. The core survey area is comprised of USFWS strata 51, 52, 63, 64, 66, 67, 68, 70, 71, and 72. The American black duck population measure is based on 'indicated pairs', defined as: 1 individual observed equals 1 indicated pair whereas a group of 2 is assumed to represent 1.5 indicated pairs.

Measures of productivity

Fall age ratios are estimated using harvest age ratios derived from the USFWS and CWS parts collection surveys, adjusted by direct band recoveries for differential vulnerability.

Measures of harvest

Harvest rate is the measure of harvest used in the models, which use direct recoveries of adult and juvenile male and female black ducks banded in Canada, 1961- 2006 to estimate age- and sex-specific harvest rates, corrected for country-specific band reporting rates associated with different band types.

Measures of annual survival

Direct and indirect band recoveries of adult and juvenile male and female black ducks banded in Canada, 1961- 2006 are used to estimate age- and sex-specific annual survival rates.

Monitoring programs needed for strategy implementation

Recognizing the importance of maintaining the long-term data sets that support the above harvest strategy, Canada and the United States will implement the following monitoring programs in a way that supports the need of the harvest strategy:

- a. Harvest surveys (parts and questionnaire)
- b. Eastern Waterfowl Breeding Population Survey
- c. Pre-season banding.

Strategy objective

The objective of the strategy is to maintain the continental harvest rate at 98% of Maximum Sustainable Yield (MSY) as estimated by the AHM model.

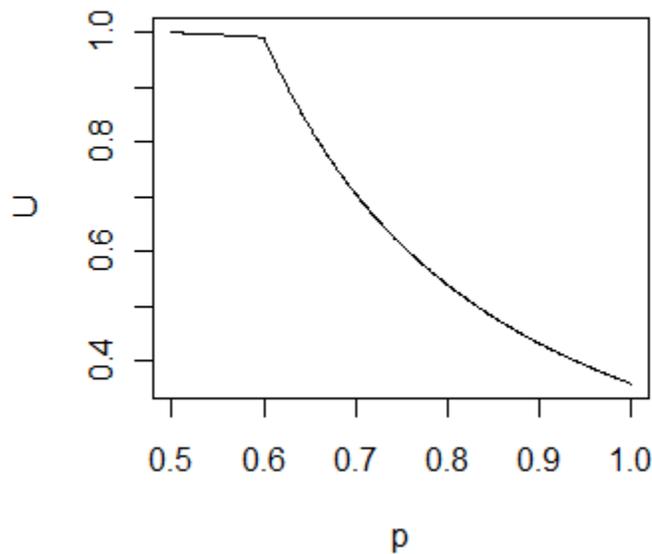
Allocation of allowable harvest between the United States and Canada

The allowable harvest is determined for each country through the use of a parity function that aims to optimize harvest allocation options that are closest to the allocation objective sought. The allocation objective is:

*Aim for a 50% distribution of the allowable harvest in each country, but accept annual variations in the range of 40-60% in either country.*

This description of the harvest allocation objective recognizes the historical equity in American black duck harvest between Canada and the United States while acknowledging incomplete control over harvest.

Harvest parity between the 2 countries will be assured through the use of a constraint which discounts combinations of country-specific harvest rates that are expected to result in allocation of harvest that is >50% in one country. The constraint applies a mild penalty on country-specific harvest options that result in one country receiving >50% but <60% of the harvest allocation and a stronger discount on combinations resulting in one country receiving >60% of the harvest allocation. This approach involves a 2-phase splicing of the function with different slope values, and is represented in graphical form by:



Where:

p is the proportion of harvest allocated to one country; and  
u is the utility of a specific combination of country-specific harvest options in achieving the objective of black duck adaptive harvest management.

Country-specific harvest opportunities will be determined from a set of expected harvest rate distributions defined as regulatory packages. Initially, Canada will develop 4 regulatory packages (liberal, moderate, restrictive and closed) and the United States will develop 3 (moderate, restrictive, closed), with the Canadian ‘moderate’ and United States ‘restrictive’ packages defined as 1997-2010 harvest levels. The Canadian ‘liberal’ and United States ‘moderate’ packages should aim to produce an increase of 30% of the realized harvest rate over 1997-2010 levels (specified below) while the Canadian ‘restrictive’ package would aim for a 30% reduction of harvest relative to 1997-2010 levels. The ‘closed’ package would require either country to prohibit black duck harvest.

This international harvest strategy uses adult male harvest rates as the index for harvest of all black ducks. Thus, target harvest rates are defined as country-specific harvest rates of adult male

black ducks, as estimated from direct band recoveries from all band types. Expected harvest rate distributions under the various regulatory packages will be updated annually to include data from the most recent year.

The initial harvest targets, representing 1997-2010 levels and expressed as adult male harvest rate, are 0.035 (SE 0.012) for the Canadian ‘moderate’ package and 0.052 (SE 0.011) for the United States ‘restrictive’ package.

#### Determining regulations to meet harvest targets

Canada and the United States will determine, independently, appropriate regulations designed to achieve their prescribed harvest targets as identified under the regulatory packages. Currently neither the United States nor Canada has recent experience with harvest regulations designed to restrict or to liberalize regulations. When a regulatory change (i.e., a liberalization or restriction relative to current harvest regulations) is prescribed for the first time, the resulting country-specific regulatory framework (i.e., season length and bag limit) should be used in at least two different years to allow for assessment before changes to the framework can be made. This does not preclude annual changes among optimal country-specific policies based on status of the population, thus years of application of the framework do not need to be consecutive. Proposed changes to regulatory packages that already meet the harvest targets should be demonstrably harvest neutral (i.e., no expected increase in harvest). Regulations will vary independently between countries, based on the status of the population and optimal strategy as determined under the AHM model. Assessment of regulatory packages will be based on harvest rate and harvest survey data to ensure that they meet the objectives of the strategy.

#### Evaluation of strategy

Elements of the strategy will be evaluated on a regular basis:

- Regulatory packages (3 years) – do packages meet the harvest rate objectives?
- Model performance (annual; 6-yr) – does at least one of the models continue to predict population abundance well?
- Model set (6-yr) – does the model set correctly characterize the uncertainty around what factors drive the black duck population, and are there any models in the current set that should be replaced?
- Management objectives (6-yr) - do we still wish to harvest at 98% of MSY and parity between countries?

The Working Group will oversee and conduct evaluations and assessments and make recommendations to the policy-making bodies in both countries.

#### Data management

The Black Duck AHM strategy is dependent on 3 datasets achieved through annual monitoring programs, including harvest surveys (parts and questionnaire surveys in Canada and the United States), the Eastern Waterfowl Breeding Population Survey, and pre-season banding. Data resulting from these programs are currently maintained by the CWS, the USFWS, and the U.S. Geological Survey. Annual processing and analyses of the data required for Black Duck AHM will be conducted by appropriate personnel in the USFWS and CWS.

#### Model maintenance and updating

The model code will be housed at Patuxent Wildlife Research Center in the office of the Atlantic Flyway Representative. The model will be run and the results, in the form of optimal country-

specific policies, will be communicated to the USFWS and the CWS no later than September 1 in any given year.

**Appendix 1**. Technical support for adaptive harvest management for American black ducks.  
Final report – 28 December 2010. (see document: AHM final report 2010.pdf)