

# **ADAPTIVE HARVEST MANAGEMENT (AHM) for the 2002 Duck Hunting Season**

## ***Summary for the AHM Working Group***

*Fred Johnson*

*Division of Migratory Bird Management (DMBM)*

*U.S. Fish & Wildlife Service (USFWS)*

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This document summarizes and supplements information provided in the 2002 AHM annual report, and is intended to help members of the Working Group respond to questions from other waterfowl managers, the public, and the outdoor media. The first few sections of this briefing address various situational issues, while the latter sections provide the AHM 2002 results and some additional issues for consideration.

**NOTHING CONTAINED IN THIS BRIEFING REPRESENTS AN OFFICIAL POSITION OF THE USFWS ON THE SELECTION OF THE 2002 DUCK-HUNTING REGULATIONS.** The USFWS will propose a regulatory alternative for public comment following the meetings of the Flyway Councils at the end of this month and the Service Regulations Committee on July 31 and August 1.

### **The AHM Process**

The USFWS continues to strongly support the AHM process for setting duck-hunting regulations in the U.S. AHM reflects two of the USFWS's highest priorities, which are state-of-the-art science and partnerships. Extensive involvement of the Flyway Councils and others on the AHM Working Group helps ensure that the best science is used to provide maximum hunting opportunities consistent with resource protection.

AHM improves on the process that has been successful in perpetuating waterfowl populations for over 50 years. Since AHM was initiated in 1995, our understanding of waterfowl population dynamics has increased, and that has helped us deal with some difficult choices about hunting regulations. And we've dealt with those issues in a more informed and systematic way than in the past.

### **2002: A Challenging Year**

Developing duck hunting regulations that are scientifically sound and broadly supported by conservation professionals and the hunting community is always a challenge. This year, that challenge is especially evident due to a number of factors.

## ***Habitat Conditions and Duck Populations***

As you probably know by now, the May survey results have been finalized. The bad news is that pond numbers in the Prairie Pothole Region have declined dramatically from last year, and are at a record low in Prairie Canada. May ponds in Canada and the U.S. fell from 4.6 million last year to 2.7 million this year, and are 45% below the long-term average. The estimate of 1.439 million ponds in Prairie Canada this year was the lowest since that survey began in 1961 (the previous low was 1.443 million in 1981). May ponds in the U.S. portion of the survey were down 32% this year compared to 2001. Since the May survey was conducted, water conditions have improved in Montana, the western Dakotas, southern Saskatchewan, and southern Alberta. However, most biologists think the precipitation was too late to help nesting ducks this year.

Periodic drought is a characteristic feature of the Prairie Pothole Region, and while it leads to short-term declines in duck numbers, it is necessary for the long-term productivity of prairie wetlands. Conservation efforts to restore wetland basins and improve nesting cover are continuing to make significant progress, and will enhance the value of water once it returns to the prairies

The good news this year is that duck numbers did not decline dramatically. The total population of breeding ducks in the traditional survey area declined 14% from 36.1 million to 31.2 million. However, total ducks are only 6% below the average since surveys began in 1955.

The breeding population estimate for mallards in the traditional survey area was 7.5 million, statistically unchanged from last year and near the long-term average. Surveys of mallards in the Great Lakes states (Michigan, Minnesota, and Wisconsin) indicated the population increased from 780 thousand in 2001 to 1.0 million this year. The combined estimate of mallards from the traditional survey area and from the Great Lakes states (8.5 million) is used for recommending duck hunting regulations in the three western Flyways under the AHM process.

The effect of the midcontinent drought this spring likely will manifest itself in terms of lower duck populations next year. Even if the hunting season were to be closed this fall in Canada and the U.S., the midcontinent mallard population would be expected to decline by 6% between now and next year. Although open hunting seasons are expected to produce a slightly greater decline, differences in predicted population sizes next year do not vary much among regulatory alternatives. It's also important to remember that the AHM process accounts not only for these short-term regulatory impacts, but also for the long-term consequences of current regulatory decisions.

The population of eastern mallards, used to recommend a regulatory alternative for the Atlantic Flyway, is derived from a combination of aerial surveys in Canada and ground surveys in the northeastern states. The preliminary estimate of the eastern mallard population this year is 1.00 million, essentially unchanged from 1.01 million last year.

### ***Technical Improvements to AHM***

The population models upon which harvest regulations for midcontinent and eastern mallards are based have been in place since 1995 and 2000, respectively. However, the basic structure of the models, alternative hypotheses of population dynamics, and evidence associated with each hypothesis (i.e., model “weights”) are subject to continuous review by parties both internal and external to the AHM process. This year, some important revisions have been made to these protocols. Most importantly, empirical corrections have been made for the positive bias in estimated growth rates of midcontinent and eastern mallards (for more details about how these corrections were made, refer to the technical reports available on the AHM website at <http://migratorybirds.fws.gov/mgmt/ahm/ahm-intro.htm>).

Although there was some indication of bias in estimated growth rates of midcontinent mallards as early as the late 1970s, it was only of academic interest because predictive population models were not used to help set hunting regulations. With the advent of AHM and the use of models to recommend regulations, it has become necessary to correct population models for any source of bias. The bias-correction made this year results in a slightly more conservative regulatory strategy (i.e., the regulations prescribed for a variety of population and pond levels) for midcontinent mallards. However, correction for the bias would NOT have changed the liberal hunting regulations since 1995 because population and pond numbers were so high. The bias correction has had little effect on the outlook for regulations in the Atlantic Flyway, which are based on the status of eastern mallards. The source of the bias in mallard growth rates remains unknown, but monitoring programs used to estimate survival and reproductive rates are being carefully scrutinized.

### ***Framework-date Extensions and Other Proposals to Change the Regulatory Alternatives***

Because AHM helps ensure resource protection through an optimal use of the specified regulatory alternatives (whatever they may be), proposals to modify the set of regulatory alternatives primarily involve social trade-offs (e.g., with framework-date extensions, additional hunting opportunity early and late within a season may be accompanied by fewer liberal seasons over the long term).

As requested by the USFWS, the AHM Working Group conducted an assessment of all the changes proposed by either the USFWS or Flyway Councils (see the June 11, 2002 *Federal Register*). These proposals are: (a) extended framework dates in the moderate and liberal alternatives; (b) elimination of the very restrictive regulatory alternative; (c) consideration of closed seasons only for population levels below those associated with open seasons in the past; and (d) a restriction on the annual change in regulatory alternative to one step either up or down. The framework-date extensions and the 1-step annual change have the greatest potential to decrease the frequency of liberal regulations (see the section in this document entitled “Additional Technical Information” for more results of this assessment).

In the *Federal Register* published on July 17, 2002, the USFWS announced its decisions about the proposed changes in regulatory alternatives. The USFWS has decided to adopt the regulatory alternatives as proposed in the March 19, 2002 *Federal Register*. The only changes to the set of

regulatory alternatives are the extension of framework dates in the moderate and liberal alternatives. The USFWS feels that no further changes are warranted until a more comprehensive review of the regulatory alternatives and harvest-management objectives has been completed.

## **AHM Results for 2002**

The model-based prediction for mallards in the traditional survey area for 2002 was 7.299 million, which compares favorably with the observed population of 7.504 million (a difference of 205k or -2.7%). Because predicted and observed population sizes were so close, the weights associated with the alternative models of population dynamics did not change much this year. Those weights, in contrast to those for the bias-uncorrected models, are suggestive of partial compensation of hunting losses and weakly density-dependent reproduction.

For the 2002 season, a regulatory strategy for the three western Flyways was derived using: (a) the revised population models and associated weights for midcontinent mallards; (b) the dual objectives to maximize long-term cumulative harvest and achieve a population goal of 8.8 million midcontinent mallards; and (c) the 2002 regulatory alternatives as specified in the July 17, 2002 *Federal Register*. Based on a midcontinent population size of 8.5 million mallards (traditional surveys plus MN, MI, and WI) and 1.44 million ponds in Prairie Canada, the regulatory prescription for the Pacific, Central, and Mississippi Flyways in 2002 is the liberal alternative.

I calculated a regulatory strategy for the Atlantic Flyway based on: (a) the revised population models and associated weights for eastern mallards; (b) an objective to maximize long-term cumulative harvest; and (c) the regulatory alternatives as specified in the July 17, 2002 *Federal Register*. Based on a breeding population size of 1.0 million eastern mallards, the regulatory prescription for the Atlantic Flyway in 2002 is the liberal alternative.

Considering the decline in May pond numbers, these results are certainly not those predicted by many. However, the weight of biological evidence suggests that mallards can support harvest rates associated with the 2002 “liberal” regulatory alternative (the observed rate on adult male midcontinent mallards during the 2001-02 liberal season was 11%, and with framework-date extensions it is expected to be 14%). However, it is increasingly apparent that the future of AHM will depend heavily on our collective ability to account for the harvest potentials of duck species other than mallards. This need is particularly evident in a year like this, when some species remain below objective levels and when production of most duck species is expected to be poor. Therefore, the DMBM feels that a general solution to this problem must be the highest priority of the AHM Working Group. The DMBM also is trying to determine the extent to which liberal regulations this year might adversely affect other duck species in the midcontinent region.

## **Strategic Issues in AHM**

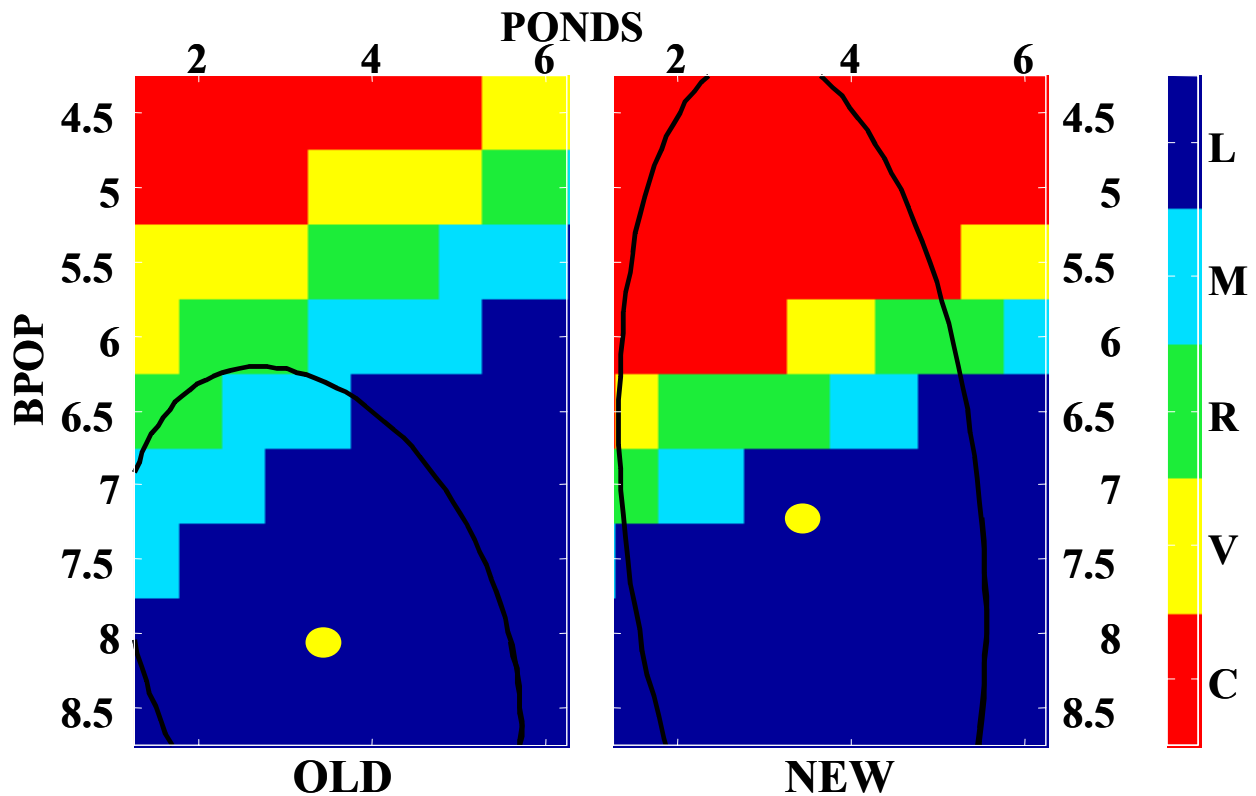
AHM provides a means to explore the biological implications of hunting regulations, given unambiguous harvest-management objectives and a specified set of regulatory alternatives. The

USFWS would like the Flyway Councils to work with us to further refine harvest-management objectives and regulatory alternatives to provide the most satisfactory hunting experience, with the strongest safeguards for the waterfowl resource. Therefore, the USFWS has decided to convene a task force, comprised of recognized state and federal leaders in waterfowl management, to help address these and other questions related to future application of AHM. This task force will need to work closely with the USFWS, the Flyway Councils, and the AHM Working Group. In addition, the Wildlife Management Institute has received federal aid to help explore the relationship between regulations and hunter satisfaction, and to recommend how such information might be used in the AHM process. These results, when available, will be extremely useful to the task force in its deliberations.

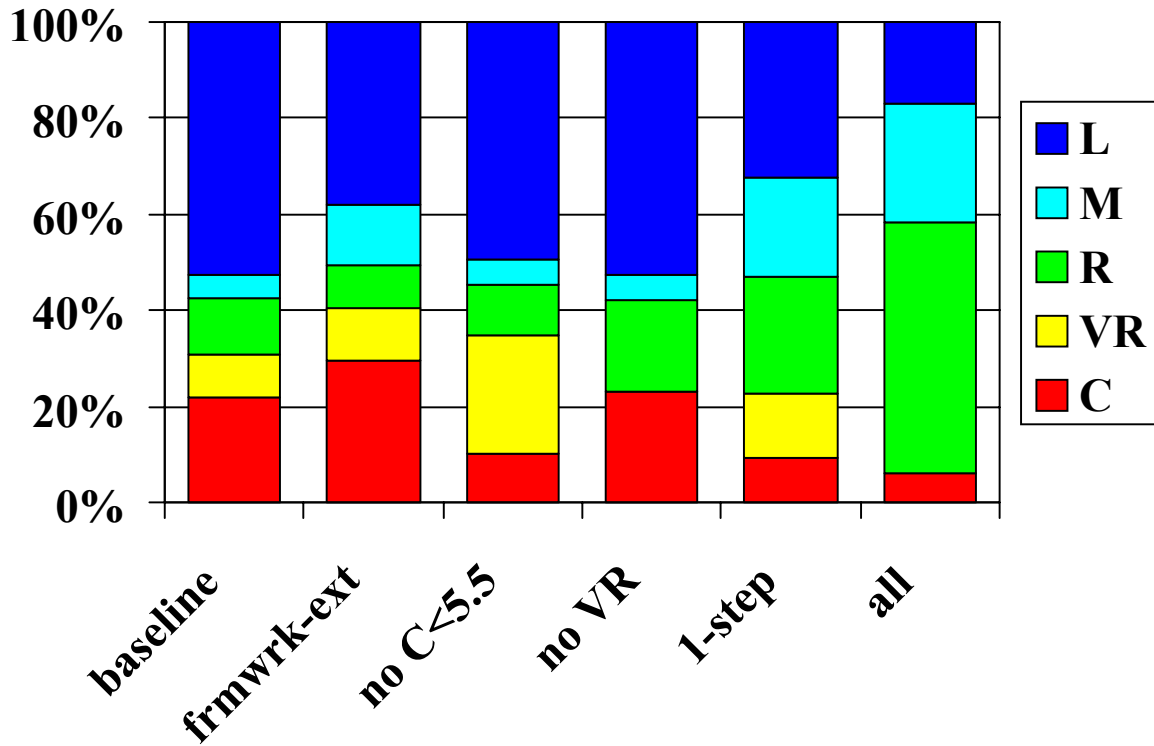
### Additional Technical Information

As mentioned earlier, correction for the positive bias in survival and reproductive rates of midcontinent mallards has resulted in a more conservative harvest strategy. The following two strategies compare the old, bias-uncorrected strategy from 2001 with what it would have been had the bias-correction been in place (the yellow dot is the expected mean population size and pond number, and the ellipses enclose the range of conditions you'd expect to encounter 95% of the time).

In these figures, BPOP is the combined mallard population from the traditional survey area and the Great Lake states, and ponds are from Prairie Canada only.



As depicted in the following figure, regulatory proposals put forward by the USFWS or Flyway Councils would be expected to influence the frequency of years the three western Flyways spend in each of the regulatory alternatives (baseline is the same as NEW above - i.e., with bias correction):



The following table depicts optimal regulatory choices<sup>a</sup> in the three western Flyways for the 2002 hunting season. This strategy is based on the 2002 regulatory alternatives (with framework-date extensions), on the revised midcontinent-mallard models and weights, and on the dual objectives of maximizing long-term cumulative harvest and achieving a population goal of 8.8 million mallards. The shaded cell represents pond and mallard numbers (rounded to the nearest 0.5 million) and the optimal regulatory choice for 2002.

Mallards <sup>c</sup>	Ponds <sup>b</sup>										
	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0
<4.5	C	C	C	C	C	C	C	C	C	C	C
4.5	C	C	C	C	C	C	C	C	C	C	C
5.0	C	C	C	C	C	C	C	C	C	C	C
5.5	C	C	C	C	C	C	C	C	C	C	C
6.0	C	C	C	C	C	C	C	VR	VR	VR	VR
6.5	C	C	C	VR	R	R	R	R	R	M	M
7.0	R	R	R	R	R	M	M	M	M	L	L
7.5	R	R	M	M	M	L	L	L	L	L	L
8.0	M	L	L	L	L	L	L	L	L	L	L
8.5	L	L	L	L	L	L	L	L	L	L	L
>8.5	L	L	L	L	L	L	L	L	L	L	L

<sup>a</sup> C = closed season, VR = very restrictive, R = restrictive, M = moderate, and L = liberal.

<sup>b</sup> Estimated number of ponds in Prairie Canada in May, in millions.

<sup>c</sup> Estimated number of midcontinent mallards during May, in millions.

For more information, contact Fred Johnson (phone:352-378-8181 x372 or email: fred\_a\_johnson@fws.gov) or visit the AHM website, which can be found at <http://migratorybirds.fws.gov>