

DATE: August 20, 2007

TO: Natural Resources Board

FROM: Secretary Matthew Frank

SUBJECT: Implementation of SAK deer population model audit recommendations

Background

In 2005, the Natural Resources Board commissioned an outside auditor's review of the Department's Sex-Age-Kill formula for estimating deer populations. The review was completed by a panel of nationally recognized population modeling and deer management experts under the direction of a stakeholder steering committee. The steering committee identified and selected panel members and asked them to work toward six specific objectives:

- 1) Evaluate the potential for bias of population estimates.
- 2) Evaluate the key assumptions of the model.
- 3) Evaluate the source of error in the model.
- 4) Determine which of the key input variables are most important in the population estimate.
- 5) Estimate the variance of inputs and their influence on estimates.
- 6) Determine whether other models would perform better.

The final SAK Audit report was accepted by the NRB in February of this year. Since then the stakeholder steering committee met three times to evaluate the report's recommendations and conclusions and to develop a strategy for implementing improvements in the Department's use of the model and communication with the public regarding deer population estimates. Specifically, the steering committee has been developing strategies to communicate key audit findings to the public, evaluating buck survival research projects; identifying improvements to the fawn:doe ratios; and working on new deer management communication strategies.

This report is an update of the progress of the stakeholder steering committee and DNR deer management program in response to recommendations in the final report. Next steps and conclusions for the stakeholder steering committee are outlined herein also.

SAK Audit recommendations and progress**Audit Recommendation:**

Only August and September data should be used to estimate fawn:doe ratios. We recommend that a systematic sampling scheme producing reasonable coverage be considered. We also recommend WDNR initiate an analysis of the extent of variation in fawn:doe ratios and an evaluation of alternative sampling schemes.

Implementation Progress:

The Department has completed an analysis of the exclusion of July fawn:doe data and resultant effects on the deer population estimates in two deer management regions (Northern and Central Forest). August-September estimates of fawn:doe ratios were slightly higher, but more variable

without July data (because the sample size is lower). The new estimates showed the same long-term trends as the existing historical data that includes July fawn:doe data. Resulting population estimates without July fawn:doe ratios were 6% higher in the Northern Forest deer management region and averaged 13% higher in the Central Forest deer management region. (attachment)

Our initial analysis indicates that implementing the audit recommendation will result in *increased* deer population estimates in future years. We believe further evaluation is warranted before we incorporate this recommendation into our annual operations.

Department research staff are designing a pilot project for implementation in 2008 that will evaluate the efficiency of establishing survey routes and protocols for collecting fawn:doe ratio for comparison to the methods currently used.

Finally, the UW-Stevens Point is conducting a citizen based fawn:doe survey through their deer project. This project could be a good opportunity to build credibility and further involve citizens and hunters in deer population estimates. This will be an independent data set to track changes and variation. There won't be any useful trends to compare for several years, but the maintenance and promotion of this project were endorsed by the stakeholder group.

Audit Recommendation:

Provide SAK estimates as abundance estimates rather than density estimates. Reporting deer abundance as total numbers rather than deer density minimizes problems with public concern when local abundance appears to deviate from reported densities.

Implementation Progress:

The Department will provide population estimates in both ways: abundance and density. Abundance estimates will be used when communicating in public forums while density estimates are necessary for assessing whether deer populations are at goals identified in administrative code. The Department will stress in deer communications the uneven distribution of deer across the landscape and the continued need for scouting and effective hunting techniques.

Audit Recommendation:

Continue to use 5 year averages for yearling buck and yearling doe percents. The report also recommended using a weighted average in the model.

Implementation Progress:

The use of 5 year averages was implemented immediately in the 2006-7 over winter deer population estimates. Weighted averages will be used in 2008.

Audit Recommendation:

In order to estimate variance produce confidence intervals for the population estimates, the buck recovery rate should be estimated through field studies.

Implementation Progress:

UW Madison researchers and Department research staff are developing a cost comparison of the effectiveness and practicality of three methods to estimate buck survival. These include: Radio collars; ear tags; and genetic mark recapture surveys; or a combination of these techniques.

The stakeholder steering committee will review this analysis and make recommendations for the next steps to pursue.

Audit Recommendation:

The number of deer management units in Wisconsin has increased over time in response to demands for more finely tuned management. However, keeping deer management units at a size in which sufficient data can be collected and stochastic variability is small is critically important for population estimation and management recommendations.

Implementation Progress:

The stakeholder steering committee has asked the DNR deer committee to address the issue of deer management unit aggregation. The deer committee will respond to this request at a meeting on September 12 and hopes to provide draft options for the Natural Resources Board to consider.

Management unit aggregation requires careful consideration based on recent human dimensions research (see below). The practical impact to deer population modeling accuracy and the functional impact to hunters and agency credibility are key considerations in evaluating the ramifications of management unit aggregation.

Audit Recommendation:

There is a great need to better understand the relationship between the over-winter deer population and the population prior to the following hunting season.

Implementation Progress:

Dr. Tim Van Deelen at UW Madison has developed a project proposal for a graduate student to evaluate various simulations of the annual rate of population increase under different conditions and assumptions. The grant proposal will be submitted this fall.

Audit Recommendation:

“We recommend that any evaluation of the predictive capabilities of the SAK model be applied to individual deer management units (DMUs) over time rather than across DMUs. Special attention should be paid to understanding deer harvests and populations in those DMUs where the SAK model predicts poorly over time because it might provide insight for improving deer population modeling in Wisconsin.”

Implementation Progress:

The Department will continue to examine the model in the future and the panel’s observations will be a part of that examination. The recommendation to pay particular attention to units where the model performs poorly will help focus further work in this area.

Priorities of the stakeholder steering committee

In 2007, the Department commissioned Dr. Robert Holsman of the University of Wisconsin Stevens Point to survey Wisconsin deer hunters knowledge of the SAK population model and their perceptions of annual deer population monitoring. Dr. Holsman presented the results at a June meeting of the stakeholder steering committee. His key findings are:

- a. Most hunters are unaware of SAK. If they are aware of it, most do not understand the model. Only 6% of hunters said they had a good working knowledge of SAK.

- b. The results of this SAK audit will matter little to the vast majority of hunters. Their attitudes and opinions of and their confidence in deer population estimates will not be changed by the knowledge that SAK works or doesn't work.
- c. Hunters' own perceptions influence what they believe and whether they'll be willing to change those beliefs. Their interpretation of the deer population is influenced by what they see while hunting and what they see during the year. Generally, hunters are not influenced by deer population estimate or harvest figures.
- d. Hunters perception estimates of deer density are around half of what SAK shows.
- e. DNR credibility is the number one influencing factor in whether hunters believe the deer population estimate. It's not scientific credibility. It's not about science. It's street credibility, of which, technical competence is probably the least important factor after shared values and fairness and trust.
- f. Hunters are relatively unaware of the costs of high deer abundance. Thus goals for deer populations are not hunters' goals. Goals are societal goals. Deer populations then become a values judgment for hunters and non-hunters.
- g. Refinements in the science will not benefit the credibility or believability of the deer population model in hunters' eyes.

Considering these findings the stakeholder steering committee decided that communication and outreach to hunters and the public should be DNR's the top priority on which to focus efforts and resources followed by scientific research. They then recommended five actions to improve outreach and communication about the deer population model:

1. Update and re-print the "Wisconsin Deer Management Program" book
2. Develop a pamphlet and identify methods for distribution.
3. Include a segment in the deer show of the results of the audit
4. Put an article in the Natural Resources magazine about the process and the results
5. Put together a DVD for distribution that expands on the Deer 2007 television show segment.

The Department and the stakeholder steering committee have begun work on four of these items and all four should be complete by early next year. The deer committee concluded that updating and reprinting of the "Wisconsin Deer Management Program" book would best be completed after the next Deer Management Unit review is complete next year.

Follow up

This document will serve as an outline for a final implementation plan that will be developed by the SAK stakeholder steering committee. The implementation plan will include tasks, targets, timelines, and budget requirements along with prioritization for agency implementation. The SAK stakeholder committee intends to deliver the final implementation plan to the Board in February. The implementation plan will mark the conclusion of the tasks for the steering committee and we propose to conclude steering committee actions with Board acceptance of the implementation plan.