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Harvest Information Program: Evaluation and Recommendations

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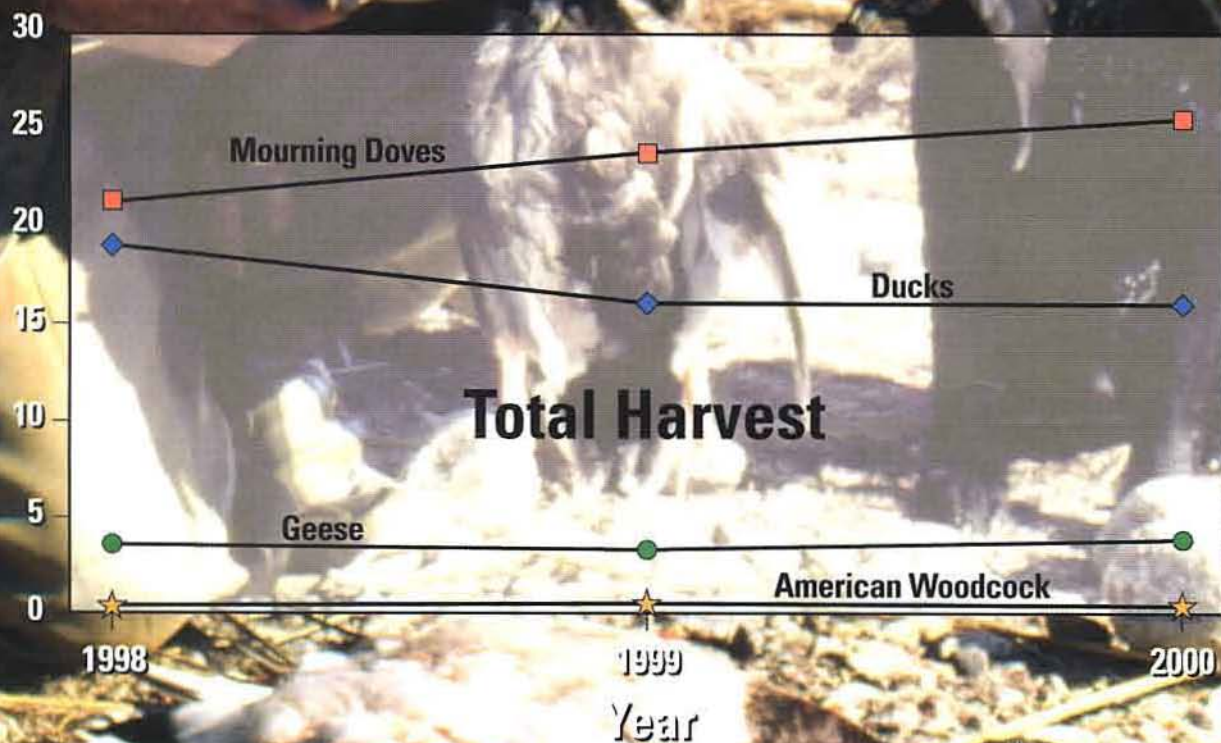
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Harvest Information Program: Evaluation and Recommendations

Millions



Cover photo by David E. Sharp. Taken at Lake Helen in North Dakota, 1978.

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Harvest Information Program: Evaluation and Recommendations

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Washington, DC

June 2002

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Harvest Information Program: Evaluation and Recommendations

EXECUTIVE SUMMARY

June 2002

HISTORICAL BACKGROUND

In 1989, William Molini, then President of IAFWA, appointed an ad hoc committee to develop a strategy for improving the overall reliability of the annual harvest estimates of migratory game birds and directed special emphasis on those species for which harvest data were the least satisfactory, e.g., doves and woodcock. In 1990, that ad hoc committee recommended to IAFWA that the Service, in cooperation with the states, establish a regulation requiring all migratory game bird hunters to obtain a nationwide permit annually. That recommendation (in *Ad Hoc Committee Report on Waterfowl Breeding Ground Surveys and Migratory Bird Harvest Surveys*) was approved at IAFWA's September 1990 business meeting and forwarded to the Service the following month. The intent to create rules for a national migratory bird harvest information program was published in the *Federal Register* in June of 1991. Today, the program is very different from the one envisioned by IAFWA and the Service in 1991. Instead of a nationwide permit, HIP consists of 49 states (Hawaii is not required to participate) supplying separate sampling frames to the Service for use in deriving national and regional estimates of migratory bird harvest. A more thorough explanation for the evolution of HIP is contained in the full report.

NEED FOR EVALUATION

The Harvest Information Program (HIP) became fully operational in 1998, but concerns existed about its operation and usefulness. Accordingly, the Migratory Shore and Upland Game Bird (MSUGB) Subcommittee (now known as the MSUGB Working Group) of the International Association of Fish and Wildlife Agencies (IAFWA) deemed it appropriate at their September 1999 meeting to undertake a comprehensive review of the program to determine whether it was meeting its goal and objectives and whether modifications were necessary. The U.S. Fish and Wildlife Service (Service) endorsed the review wholeheartedly. Ron George, Chairman of the MSUGB Subcommittee, appointed Jeff Ver Steeg as Chairman of an Ad Hoc Committee on HIP to conduct the assessment that is summarized here and detailed in the full report.

APPROACH

We began by compiling all pertinent files and correspondence relative to the formation of HIP. Concurrently, a variety of experts were invited to undertake a multi-faceted review of the existing program. These experts were organized into 9 "Task Groups" and each group was assigned a specific aspect of HIP to evaluate. The areas of investigation are detailed in the full report; the key findings are provided in this Executive Summary. It soon became evident that much of the information to assess HIP did not exist. Therefore, we were compelled to develop a rather extensive questionnaire that was sent to each state fish and wildlife agency in the United States. All states participating in HIP responded. Results from that survey, and the analyses of existing harvest data on file with the Service, were the basis for this report.

FINDINGS

The Need for HIP

We believe that the need for HIP is no less than it was in 1990. Better harvest information is essential to the responsible management of migratory game bird populations and to the future of migratory game bird hunting. Various federal and state laws, in effect, mandate that the harvest of migratory game birds be limited to levels compatible with their ability to maintain their populations. We conclude that HIP can provide biologists with many of the facts needed to ensure that both the migratory bird resource, and the hunting tradition, will continue for future generations to enjoy. However, that is not to say that HIP is perfect; it is not. Below are listed what we perceive as some of HIP's key strengths and weaknesses, and recommendations for improvement.

Strengths of HIP

The states and the Service established HIP with the primary goal of providing a means to conduct uniform, national harvest surveys annually for all migratory game bird species. Although there are still some deficiencies in the program, the primary goal has been achieved. Most of the HIP harvest surveys are producing reliable results, at least to the extent that comparability with the results of other surveys indicate reliability. For the 1999-2000 waterfowl hunting season, the HIP waterfowl harvest survey estimated a total national duck harvest of 16,047,200 birds (+/- 4% or 641,900 birds) and a total national goose harvest of 3,325,800 birds (+/-6% or 299,500 birds). Those estimates are very similar to the results of the federal duck stamp-based Waterfowl Hunter Survey that the Service still conducts annually, which estimated 15,824,900 ducks harvested and 3,073,900 geese harvested during the 1999-2000 season. Also, the 2 surveys obtained very similar results at the flyway level.

Although HIP hunter activity and harvest estimates for doves, woodcock, and the other migratory game bird species are not identical to similar estimates derived from state surveys, the differences seem to be mainly due to differences in the sample frames, survey instruments and procedures, and analytical assumptions used. In most cases, state survey and HIP estimates of the harvest per active hunter for those species agree closely. While HIP is currently providing standard state, regional, and national hunter activity and harvest estimates as intended, there is still much room for improvement.

Weaknesses of HIP

There are several areas where HIP can be improved and many of the weaknesses are interrelated. For example, vendor compliance remains a concern in several states that use license vendors to register hunters for HIP. Some vendors automatically register all hunters with HIP, whether those hunters are required to register or not. Some vendors fail to ask the screening questions altogether. Other vendors simply respond on behalf of the hunter (often without the hunter's knowledge or consent). One reason for this is that some vendors view the screening questions as burdensome and time consuming. Vendor compliance and the screening questions are therefore related to a certain extent. However, some hunters also view the screening questions as intrusive and time consuming. Memory bias may play a role in the accuracy of the hunter's response as well. So, the screening questions also present certain challenges of their own, unrelated to vendor compliance.

Surprisingly, not all migratory bird hunters seem to be aware of the requirement to be HIP-certified. As agency efforts to inform hunters of HIP wane, hunter awareness and compliance are likely to decline. Enforcement of hunter compliance varies greatly around the country, and few states undertake extensive efforts to monitor hunter compliance. The same can be said for vendor compliance.

Enforcement of HIP compliance, both on the part of vendors and hunters, has been inconsistent at best. In some states, the issue of vendor non-compliance is a serious concern, especially with chain stores that sell hunting licenses. If non-compliance is not treated in a fashion similar to other related regulations, e.g., possession of a migratory waterfowl stamp, then both hunters and vendors fail to take the requirement seriously.

Exempted groups of hunters, e.g., youths, seniors, lifetime license holders, and landowners, present certain challenges from a sampling standpoint. As the number of hunters exempted from HIP registration increases, so does the potential for "accuracy error" and, ultimately, the likelihood of misleading harvest estimates.

Despite these shortcomings, HIP is working and has the potential for considerable improvement. What follows are our key recommendations for improving the program.

RECOMMENDATIONS

Note: These recommendations are not in priority order.

The Future of the Harvest Information Program

The Service should continue with HIP. We believe the need for HIP is as great as, if not greater than, it was when the program was created. However, we believe significant improvement is warranted and, therefore, we recommend that the states and the Service pursue several changes to improve the program.

Information and Education

The Service and the states must increase their efforts to educate hunters and vendors about the HIP certification requirement and the importance of the program. Although compliance among waterfowl hunters on the whole appears fairly high, awareness of HIP among other migratory game bird hunters has considerable room for improvement. Given that the intensive educational efforts typical of most states at the beginning of HIP have waned, hunter compliance in the future is more likely to decline rather than remain stable or increase (see Tasks 4 and 5).

Communication with the States

The Service should work closely with the states *collectively* to improve state agency acceptance of HIP as the standard for obtaining needed harvest data. Continued communications and information exchange between states and the Service will be crucial in order to improve understanding and acceptance of HIP. Nationwide workshops like those of the past could be particularly useful. We especially urge the Service to provide the states with preliminary reports on HIP survey results prior to the beginning of the annual regulations-setting process (see Task 7).

The Service should contact the states *individually* to determine any special needs related to implementing HIP. Additional dialogue about specific state problems and needs is crucial to improving the program and increasing its acceptance. The Service should also share information from states successfully using HIP with other states desiring assistance in implementation. In some cases, HIP provides an opportunity for individual states to discontinue redundant surveys, resulting in a cost savings to the state. We therefore recommend that the Service assist interested states in determining if, and when, HIP can provide data of sufficient quality to replace individual state surveys (see Task 7).

Screening Questions

We recommend that the Service further investigate the feasibility of a reduced level of stratification, primarily by examining an additional year of survey data. We also recommend that the Service pilot a shorter series of screening questions to measure the actual impact of using a reduced level of stratification. Although inconclusive, available information suggests that this approach has merit. Because it will not require a large increase in sample size, the associated costs are not likely to be much greater than the current approach and the quality of the information should not be significantly compromised. We believe that reducing the time and effort required to ask and answer the screening questions has the potential to improve vendor and hunter compliance (see Tasks 2 and 5).

Enforcement of Hunter Compliance

We recommend stricter enforcement of the HIP registration requirement in states where such enforcement has been minimal or nonexistent (see Tasks 4 and 5).

We recommend that, to the extent possible, both the Service and the states provide a more consistent level of HIP enforcement throughout the country (see Task 4). We believe that HIP compliance should be enforced with the same vigor as hunting without a federal or state waterfowl stamp. We specifically urge the Law Enforcement Committee of the IAFWA to develop uniform enforcement guidelines as soon as possible for adoption by the Service and the states.

Vendor Compliance

License vendors are important state agency partners. As such, sanctions or enforcement action against vendors can present special problems. However, license vendors are a critical component of the HIP system in a large number of states. As long as license vendors continue to play a role in HIP, the committee recommends that states employ better techniques to monitor vendor compliance. We also recommend that states establish clear and significant consequences for vendor noncompliance (see Tasks 3 and 5).

We recommend that the President of the IAFWA assign an existing committee, or form an ad hoc committee, to analyze our recommendations further related to vendor compliance. Among other things, that committee should investigate the relationship we detected between the amount of the fee collected by the vendor and the degree of compliance (see Task 3).

We recommend that states examine, and possibly adopt, HIP-certification systems that eliminate or minimize the services of license vendors. Collecting HIP information directly from hunters without third-party, i.e., license vendor, intervention would eliminate many data errors caused by the third party (see Task 8). However, we note that the HIP-certification systems that eliminate the need for license vendors also tend to be the most expensive (see Task 9) and, therefore, may not be an affordable solution for every state. We also suggest that the states consider a standardized, multi-state system for HIP data collection and possibly other permits (see Task 8).

HIP Registration Fees

Each state without the authority to require a fee for HIP registration should consider seeking such authority. Charging a fee for a migratory bird stamp or permit required of all migratory game bird hunters has the potential to increase hunter awareness as well as hunter and vendor compliance. There appears to be a relationship between the amount of the fee charged and the degree of compliance (see Task 3). Additionally, such a fee could generate revenues to support or offset the cost of HIP education and enforcement efforts.

Such a stamp or license could also be very useful to generate state matching shares for such funding programs as CARA, NAWCA, P-R funds, MARSH and other grant sources to foster improved bird conservation (see Tasks 3 and 6).

Exempted Hunters

We recommend that states minimize the number of hunters exempted from HIP. Name and address lists that contain outdated information, fail to include all active hunters, or include inactive hunters compromises the surveys. The sampling frame is the foundation of the HIP surveys. Without this solid foundation, HIP cannot provide sound results. Consequently, it is important for states to improve their efforts to obtain the highest quality HIP sampling frames (see Task 6).

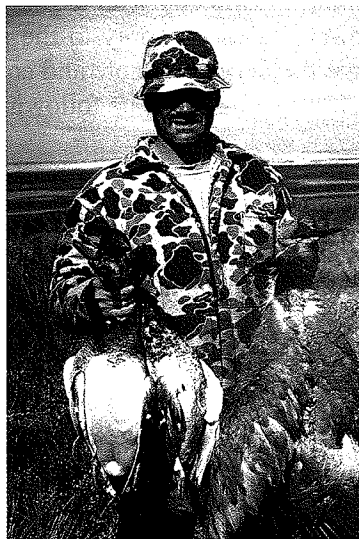
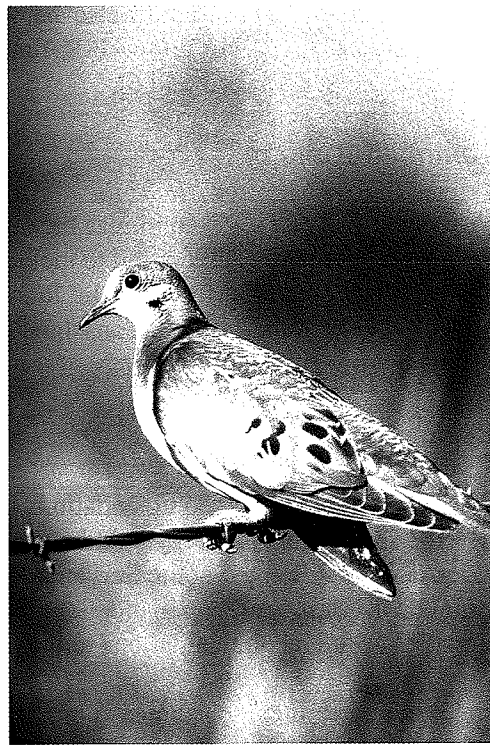
Mechanics

There are a number of recommendations in the full report dealing specifically with the “nuts and bolts” of the HIP survey methodology. Although a few of these recommendations apply to the states, most are understandably directed at the Service. We strongly encourage the Service to note and consider them. A complete list of these recommendations can be found primarily under Task 6. The following are just a few examples of the recommendations to the Service:

1. Investigate potential sources of bias and to evaluate the impact of such biases on the harvest estimates.
2. Develop and maintain data to determine trends and variations in bias over time.
3. Conduct additional research over a number of years to determine if the bias is consistent and to ensure that current harvest estimates are correlated with reality.
4. Determine the impact on harvest survey results when changes are made to the survey design.

Funding

We recommend that IAFWA support an increase in the Service's budget of \$300,000 annually to assist the Division of Migratory Bird Management (MBM) with research and outreach efforts related to many of these recommendations. We further suggest that \$150,000 of the \$300,000 be allocated to MBM on an annual basis as part of the base budget for at least the next 10 years to support efforts directed specifically at improving the HIP survey design and methodology (see Task 6 regarding research needs).



Top left: Success on Youth Waterfowl Hunting Day at the Russell Lakes State Wildlife area in southern Colorado. *Photo by David Dolton.* Top right: Mourning dove. *Photo by Larry Ditto.* Middle: Hunter with mallards and sandhill cranes near Mercer, North Dakota. *Photo by David Sharp.* Bottom left: Greater scaup. *Photo by T. J. Moser.* Bottom right: Hunter with green-winged teal near Jamestown, North Dakota. *Photo by David Sharp.*

A History of the Development of the Harvest Information Program

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Abstract: This report reviews the need for an improved nationwide harvest survey of migratory game birds which led to a new survey being instituted to help guide management decisions for these species. Also, we document the efforts to develop and implement the nationwide Harvest Information Program (HIP). HIP was proposed in 1990 by the International Association of Fish and Wildlife Agencies (IAFWA). The goal was to provide reliable estimates of hunter activity and harvest at national and regional scales for all migratory game bird species. The objectives were to: (1) establish a national sampling frame annually that consists of all migratory game bird hunters in the United States, and (2) develop national harvest surveys for each migratory game bird species. The U.S. Fish and Wildlife Service (Service) and the IAFWA's committees jointly addressed various issues that surfaced through the implementation phase. At the beginning of the pilot phase in 1991, a state/federal technical group was formed to evaluate program requirements, the different approaches used by the pilot states, and the Service's survey procedures during the pilot phase. Changes were incorporated into the program as a result of the technical group's evaluation. The Migratory Shore and Upland Game Bird (MSUGB) Committee became the lead committee for the IAFWA after the pilot phase. The Flyway Councils were also kept apprised and invited to provide input. The Service held 6 special workshops from 1991 to 1997 with state HIP coordinators to identify and address issues and concerns with program implementation details. The program rules were promulgated through the *Federal Register* process, thus allowing further state and public input on the Proposed Rule and succeeding rule changes. Resolution of the major issues were: (a) the Service pays the state for each record the state provides to help defray the cost to the states; (b) migratory bird hunters are required to validate or certify for HIP in each state that they hunt migratory birds; and, (c) states are not required to HIP-certify hunters who are exempt from state hunting licenses. Most other issues raised through the implementation process were handled with agreements between the Service and the individual state wildlife agencies. Once HIP was fully operational, the MSUGB Subcommittee (formerly Committee) deemed it appropriate to undertake a comprehensive review of HIP to determine whether it is meeting its goal and objectives and whether modifications are necessary. An Ad Hoc Committee on HIP was formed to undertake this task. This report is the result of that effort.

HISTORICAL REVIEW

The Harvest Information Program (HIP) was developed to fill the need for reliable harvest data to help guide management decisions for migratory game birds. Federal waterfowl harvest surveys have existed since 1952. However, the surveys lacked a reliable sampling frame of names and addresses of all migratory bird hunters and, thus, did not adequately address webless migratory game birds. In addition to improving the existing waterfowl harvest survey, the goal of establishing a new survey was to provide reliable estimates of hunter activity and harvest at national and regional scales for *all* migratory bird species. The objectives were (1) to establish a national sampling frame annually that consists of all migratory game bird hunters in the United States, and (2) to develop national harvest surveys for each migratory game bird species.

Over the years, many proposals were made and even bills were introduced in Congress, to establish some type of a permit to hunt migratory birds that would provide a reliable national sampling frame. At the International Association of Fish and Wildlife Agencies' (IAFWA) September Meeting in 1989, President William Molini appointed an ad hoc committee comprised of Ken Babcock (MO) as Chair, Pete Duncan (PA), and Red Hunt (CA) to develop a strategy for obtaining information on basic data gaps on migratory birds. The committee prepared an *Ad Hoc Committee Report on Waterfowl Breeding Ground Surveys and Migratory Bird Harvest Surveys* that was presented to the IAFWA in September 1990. The following

recommendations were made in that report. A time-line of actions taken on these recommendations is shown in Table 1.

1. The IAFWA should urge the U. S. Fish and Wildlife Service (Service) to publish a proposed rule in the *Federal Register* establishing a regulation requiring all migratory bird hunters to obtain annually a national migratory bird hunting permit. For waterfowl hunters, this permit would be required in addition to the federal duck stamp and the permit would be valid in all states. The effective date of this regulation should be July 1, 1992.
2. The Service should be responsible for printing the permits and supplying them to the state wildlife agencies by July 1 of each year for distribution to their normal license vendors or in a manner which best meets their specific needs.
3. The permit should be designed to provide a current list of names and addresses of migratory bird hunters from which a sample could be drawn to conduct a post-season harvest survey.
4. The Service should enter into a Memorandum of Understanding (MOU) with each state outlining the responsibilities of each party concerning the national migratory bird hunting permit program. The MOU would clarify that the cost of the permit would be established by the state, and the state would retain all funds generated by sales.
5. The Service should be responsible for conducting post-hunting-season migratory bird harvest surveys that meet national and regional management needs. The Service should work with individual states to design surveys that meet special management needs or which might replace existing state surveys.
6. Final design of the national migratory bird hunting permit and procedures for implementation should be developed by a committee chaired by the Service with appropriate representation of Service staff, plus one representative from each of the four waterfowl flyway councils and a representative each from the IAFWA Migratory Wildlife Committee and the Migratory Shore and Upland Game Bird Committee.

There was considerable debate at the business meeting on the merits of the recommendations. The following was taken from the minutes of the business meeting, September 11, 1990 in New Orleans, LA, and is recorded in the IAFWA proceedings. "Mr. Babcock then presented the conclusions and recommendations of the report relative to harvest data. Bontadelli (of California) moved and Duncan (of Pennsylvania) seconded a motion to accept the conclusions and recommendations of the report relative to harvest data. Mr. Kelly (of Alabama) indicated he was supportive of the proposal. A question was then asked if the Service had authority to implement such a study. The response was "yes." Can the Service do it without additional revenue? Again the response was "yes." Also, a question on will there be an opportunity to comment on the mechanism for implementation. At this point Mr. Doig (New York) proposed an alternative to delay approval until the Service does a further feasibility study and considers the matter at a later date. Sensing little support, the alternative was withdrawn. Following considerable discussion and several comments supporting the proposal, the vote was called. The motion passed unanimously, with three abstentions for the record: Mr. Opolka for Michigan, Mr. Doig for New York and Dr. Timmerman for South Carolina."

In October 1990, IAFWA formally requested that the Service implement the recommendations. At the IAFWA March 1991 Executive Committee meeting in Denver, CO, the Association's president, William Molini, announced that he was establishing the Migratory Shore and Upland Game Bird (MSUGB) Committee as a separate committee with Ken Babcock as Chairman. The main charge to the MSUGB Committee was to establish a mechanism to acquire data on migratory upland birds. Previously, the Committee was a subcommittee of the Migratory Wildlife Committee.

At the March 23, 1991, MSUGB Committee meeting in Edmonton, Alberta, Tom Dwyer, Chief of the Service's Office of Migratory Bird Management (MBMO), stated that the Service recognized the effort must be truly cooperative (between the Service and the states) to achieve the objectives and proposed initiation of a 2-year pilot project to begin during the 1992-93 hunting season. At the successful conclusion of the pilot study, 10-15 states would be added each year until all states were phased in, probably by 1998. He also stated that "Financing any additional staff will need to be phased in along with the addition of states as the survey progresses".

In June 1991, the Service published a Notice of Intent in the *Federal Register* to establish rules for the Migratory Bird Harvest Information Program. The Service published this Notice to provide information on both the need and procedures that may be necessary to initiate a new program. This notice was to allow the Service to receive public comment and suggestions in advance of preparing a proposed rule to implement the program.

The following was documented in the September 7, 1991 meeting minutes of the Migratory Shore and Upland Game Bird Committee and describes the original intent to implement the program. The name of the effort was changed from "The National Bird Harvest Information *Permit*" to "The National Bird Harvest Information *Program*" [emphasis added] to eliminate the word "permit" which was objectionable to some state agencies. The proposal would have a few states participate in a two-year pilot. At the time of the September meeting, proposed pilot states were California, Missouri, Pennsylvania, and South Dakota. Even though there was not a true Proposed Rule in place, let alone a Final Rule, the Service, being true to its commitment to work with the states, had already worked out a MOU with all 4 states (Pennsylvania had already signed the MOU). The intent was to phase in additional states starting in 1994 and have all states participating by 1998. All migratory game bird hunters in participating states would be required to have in their possession a signed Harvest Information Card with a serial number assigned by the Service. The card would be filled out at the time of "purchase." The states could charge a fee or provide free survey cards. Information gathered would be name, address, and date along with a few questions that could be used to stratify sampling for an efficient survey of all migratory bird hunters. There would also be room for the states to ask additional questions to assist them with individual state surveys. The vendors would send the survey cards to the Service within one day of issuance. State agencies would develop adequate control measures to ensure accounting of all responses and actual survey cards.

Also at the time of the September 1991 meeting, 2 other options were being considered for having cards separate from state licenses. The first option would be to combine the Harvest Information Card with a state hunting license, the survey card remaining separate. The state would assume responsibility for accounting of the Harvest Information Cards. The state license of each hunter would have stamped or printed on it "Migratory Bird Harvest Information Card", and a space would be available for the hunter's signature, birth date, issue date, and the serial number of the survey card. The second option would be to combine both Harvest Information and survey cards with a state license. Under this option, the state would assume responsibility for the accounting of the information. The state agencies would promptly mail to the Service a computer diskette with the names, addresses, date of issuance, and answers to voluntary questions.

The Service would select a sample of hunters for harvest surveys of the various species or groups of species. Letters and hunting record forms would be sent to hunters from each sample within two weeks of receipt of the names and addresses. The survey procedures would be the same as the existing Waterfowl Harvest Survey, except that names and addresses would no longer be obtained from federal duck stamp purchasers.

The cost of the pilot study was estimated to be \$352,000 per year (\$86,000 for staffing and \$266,000 for operating expenses, including a public information campaign). After considerable debate over the use of soft money or asking for a line item in the Service budget, it was decided to have the IAFWA support a line item for the two-year pilot phase.

On September 17-18, 1991, a meeting was held in St. Louis, MO, for the Service to gather input from the states for the development of the HIP pilot stage. Representatives from Missouri, California, Pennsylvania, Illinois, Minnesota and South Dakota, with responsibilities for surveys, waterfowl management, administration, licensing, permits, revenue, and research, were present to assure that all aspects of the states' responsibility for implementing HIP were considered.

Delays in getting the Proposed Rule in the *Federal Register* and the associated problems slowing implementation of the program are documented in the minutes of the Migratory Shore and Upland Game Bird Committee meeting March 28, 1992, in Charlotte, NC. Questions from within the Department of Interior initially delayed the process. Just as these problems were resolved, the President froze all government regulations and put a 90-day moratorium on publishing any new regulations, further delaying publication of the Proposed Rule.

Originally, 4 states, Pennsylvania, Missouri, California and South Dakota were to participate in the first year of the 2-year pilot stage. However, Pennsylvania had to drop out because state regulations required federal action, i.e., publication of a Proposed Rule, to be taken earlier. The question posed to Tom Dwyer, Chief, MBMO, asked if there were any restrictions on the stated use of the sampling frame. He responded that there were none. If a state chooses to combine the HIP with their state license, they will have all the names and addresses available for use without restriction. If a state opts to treat their licensing system and HIP separately, the Service will immediately make the database available to that state, the entire database, not just the sample used for the surveys. It was also asked if a public relations effort was going to be conducted to educate hunters on the need and reasons for the program. Mr. Dwyer answered that a video that was shown to the committee was the first effort and the Service budgeting included money for educational purposes. Also, outdoor writers had been contacted and several articles written, and Ducks Unlimited agreed to show the video at their events. In Missouri, provisions were made for the first year for hunters to purchase the HIP card if they were encountered in the field without one, thereby avoiding law enforcement problems. Mr. Dwyer said that the last thing that is desired is to anger people over a new program that is desperately needed, and that federal law enforcement officials also will be asked to be lenient on "HIPsters" the first year.

The minutes of the MSUGB Committee September 12, 1992 in Toledo, OH, reflect that most of the time was spent discussing HIP. The proposed regulation was finally published in June of 1992. It changed from what had been discussed at the March meeting. The main change was that the Service would not be providing survey cards to the states, thus shifting more of the responsibility and cost to state agencies. The change in the Proposed Rule was the result of concerns raised by the Office of Management and Budget (OMB) during their review of the Proposed Rule. OMB agreed on the need for the program, but felt strongly that it should be a state priority and not burden the hunters with a dual recording process. OMB expressed concerns about requiring hunters to carry a card with the Service's logo and that it might be perceived as a federal hunting license. Also, OMB was concerned about the federal cost of the program. The Service stated they could not provide the states with survey cards but they suggested the Service could provide funding assistance through alternative approaches, although it may be limited to the dollar support planned originally.

The proposed regulation called for phasing in additional states each year after the pilot stage. Starting with states that have the most migratory bird hunters, about 1 million hunters would be added each year over a 5-year period, until all states participated by 1998. The Proposed Rule suggested a yearly entry date for each state and required the states to send in hunter survey information within 5 days of issuance. The Service indicated that a state's entry date would be viewed as a guideline and there would be flexibility within reason. Turnaround time for HIP-certification information may be negotiated in developing individual memoranda of understanding between the Service and each state.

The states raised several concerns. Some states would have to revise their licensing system requiring changes in state law that the legislature may not want to enact. Concerns were raised that the program may evolve into a mandated federal program without federal funding. Service personnel responded that even though funds were tight, they should be able to cover the current pilots. They also stated that they had requested a budget increase to fund the program and that the amount requested along with, possibly, the use of Federal Aid funds may provide funds to help the states. There was a question raised that if a state legislature were to rule against implementation of HIP in that state, what would the Service do? The Service's reply stated in the minutes was "Use of a reasoning and cooperative approach (Note: mandatory compliance was not discussed)." There were 2 other issues raised that the Service could not address at that time. The first was how are hunters that are exempt from a state hunting license, e.g., juniors, seniors, and landowners, going to be handled? The second was if a state legislature stipulates that non-residents, as well as residents, must have the state permit, how would the conflict be resolved since the Proposed Rule called for the HIP card to be valid in all states?

As recorded in the minutes of the MSUGB Committee's March 20, 1993 meeting in Washington, D.C., "Mr. Babcock stated that this program continues as one of the top priorities of the Committee. The ad hoc committee that originally represented the IAFWA to develop the proposal for the program has been dissolved; the IAFWA president has invested the administrative oversight for full implementation of the program to this committee". Mr. Babcock also announced that Mr. Bob Jessen had been hired by the Service as coordinator of HIP and considering Bob's vast experience in Mississippi and the Central Flyway activities, he viewed it as a positive indication of the Service's willingness to work closely with the states in solving their problems as they enter the program.

The following is summarized from the March 20, 1993 minutes of the MSUGB Committee. The Final Rule was published in the March 19, 1993, *Federal Register*. It would have come out earlier as a final rule, but delays were caused by waiting to get input at the IAFWA September meeting and the change in administration and the attendant procedural changes. The implementation schedule remained the same in the Final Rule with a goal of bringing a million hunters into the program per year until 1998 when all states would be participating. OMB not only rejected the concept of a federal permit, but also ruled against the Service cost-sharing state permits because it would imply that the Service would be involved in licensing. However, the Service thought it may be able to cost-share other aspects of the program. The requirement of a 5-day turn-around time for obtaining names and addresses had been softened; the Service would work with individual states to arrive at a mutually acceptable solution. The Service was still exploring alternatives to resolve the problem of sampling exempt hunters (hunters not required to have a state hunting license, e.g., juniors, seniors, and landowners). As to the problem of a state legislature having to enact HIP legislation and failing to do so, the Service responded that they were prepared to negotiate with individual states to reach an equitable solution.

At their September 11, 1993 meeting in Lake Placid, NY, the MSUGB Committee discussed at length the issue of sampling exempt hunters. That discussion resulted in the Committee passing a motion, introduced by Duane Shroufe (AZ), that the Committee go on record in support of a modification of the sampling frame for the Migratory Bird Harvest Information Program that would recognize the fact that some states might have to participate in something other than a universal frame of all migratory bird hunters. Vernon Beville (TX) asked if there wasn't a second part to that motion to encourage those states that initially must pursue a modified approach to find ways to provide all names and addresses. Ken Babcock indicated that he thought that was implied as part of the negotiations that would go on between the Service with each individual state, and that it may not need to be part of the motion.

Congress was considering the Service's budget request for the support of HIP at the time of that meeting. The amounts being considered were \$750,000 in the Senate and \$250,000 in the House of Representatives.

These funds would be used for capital equipment, staffing, and to purchase the names and addresses from the states. There was also a request for Federal Aid Administrative funds through the IAFWA Grants-in-Aid Committee. These funds would be used to help defray some of the start-up costs by the states in modernizing their licensing equipment to help reduce their annual operational costs. Paul Schmidt, the new MBMO Chief, reported on the third annual workshop on the National Migratory Bird Harvest Information Program that was held prior to the Committee Meeting. About 20 states and 50 people attended. He also stated that the Service intended to continue these workshops. Mr. Babcock commended the Service for these workshops because they provided a forum for people to discuss concerns; out of the resulting discussions, HIP will continue to develop and move forward. There was also discussion about how to keep the Flyway Technicians informed and involved in the evolution of HIP.

At the March 19, 1994 meeting in Anchorage, AK, the Service briefed the Committee on proposed changes to the HIP rule. The proposal for 1994 stated that all migratory bird hunters must identify themselves in each state participating in HIP. Also, hunters will be exempt from the permit requirement if they are also exempt from state licensing requirements. There was considerable discussion on how these exemptions should be handled. It was reported that Dr. Vernon Wright at Louisiana State University was investigating the degree of bias and looking at ways to sample the exempt hunters. No action was taken pending the results of Dr. Wright's on-going study. The IAFWA Grants-in-Aid Committee had endorsed, and the Service approved, the Federal Aid administrative funds grant for \$500,000/year for 3 years to be split among the states entering the program in 1994 through 1996. (The Service also requested and received a Federal Aid grant for states that entered into the program in 1997 and 1998. The total from both grants was \$3.25 million for the states to initiate HIP.) The amount distributed to each state was based on the estimated number of hunters in the state. Funding assistance for smaller states was based on a minimal payment of \$25,000 for paper names and addresses and \$50,000 for electronic files. Also, the Service was to pay each state agency \$0.30 per migratory bird hunter name and address provided for sampling purposes for the first two years and \$0.10 each year thereafter. These prices were deemed to represent fair market values. The reimbursement was not to cover total state costs, but it was intended to show partnership between the states and the Service. The FY 1994 annual budget request was for \$750,000, but the Congressional appropriation was reduced to \$500,000. Even though the program was technically out of the pilot phase, it was noted that continued innovative problem-solving would be necessary throughout the entire implementation period. The minutes also noted that the workshops, hosted by the Service, were an exceptionally productive way to identify and resolve problems through cooperative participation between the Service and the states.

In 1995, a small group of Technical Section representatives from the Flyway Councils met with the Service in Laurel, MD in response to the Pacific and Atlantic Flyway Councils' recommendation that HIP surveys be used to gain more precise harvest estimates for some species. The group developed a proposal that addressed the extent and precision levels needed for the survey to address management needs for major and minor species of migratory birds. The proposal would expand the number of surveys and forms that would be needed from 3 to 5. The 5 surveys would be (1) a waterfowl harvest survey covering ducks, sea ducks, geese, and brant; (2) a survey covering mourning doves, white-winged doves, and band-tailed pigeons; (3) a coot, gallinule, rail, and snipe survey; (4) a sandhill crane survey; and, (5) a woodcock survey. The proposal was taken to Flyway Councils and the Migratory Bird Committee of the IAFWA without objections being raised. The Service then incorporated these 5 separate surveys into HIP.

After the pilot phase, the only major change to the program was timing of when individual states were to enter into the program. These changes were addressed by publishing the schedule changes in the *Federal Register*. All of the states except Hawaii, which is not required to participate, were in the program by the fall of 1998.

The issue of how to survey hunters exempt from having a state license had no universal resolution. However,

states were encouraged to make every attempt to include exempt hunters into the sampling frame, and those states that could, did so.

At the March 1999 meeting of the MSUGB Subcommittee (formerly Committee), Ken Babcock suggested that an ad hoc group be formed to work with Paul Padding to help work through problems associated with HIP. Mr. Babcock felt that the Service shouldn't have to go back to the states to solve all the problems; some peer pressure may be necessary. Discussion revolved around that fact that, since HIP was now fully operational, it was appropriate to undertake a comprehensive review of the Program in order to determine whether it was meeting its objectives and whether modifications were necessary. After getting approval and support from the IAFWA's Migratory Wildlife Committee, Subcommittee Chairman Ron George appointed Vernon Bevill as Chairman of that group which became known as the Ad Hoc Committee on HIP. Chairmanship later shifted to Jeff Ver Steeg. Richard Elden was hired to coordinate the collection of information from the states and also coordinate the committee's reports. Attachment A gives the basic plan of approach the ad hoc committee used to organize a group and identify some of the evaluation needs of this effort. This report is the result of that effort.

CURRENT SITUATION

Despite some initial opposition from a few hunters and non-government organizations, e.g., the National Rifle Association, HIP now seems to be well received by both hunters and the organizations that many of them belong to, including the NRA. The burden imposed on hunters has turned out to be minimal, and the states' and the Service's efforts to point out the conservation and management benefits of the program have apparently been successful. About 4 million hunters are participating in HIP each year, and very few of them seem to consider it a burden. However, HIP is less popular with the license vendors who are required to issue migratory bird hunters their HIP certifications in some states, with little or no compensation for their extra effort.

Although the Service apparently believes that HIP is close to achieving the goal of reliable hunter activity and harvest estimates for all migratory game birds, the states have mixed opinions. Some states are satisfied with the program and the results of the HIP surveys, while others are concerned about the cost burden HIP imposes on them and/or the reliability of the HIP survey results to date. Thus, some states question whether the program's benefits justify its costs. There does seem to be consensus among the states and the Service that HIP still can be, and must be, improved to fully achieve its goals.



Dove hunter near Abilene, Texas. Photo by David Dolton.

Table 1. Accepted recommendations of the 1990 *Ad Hoc Committee Report on Waterfowl Breeding Ground Surveys and Migratory Bird Harvest Surveys* and subsequent action taken.

Ad Hoc Committee recommendations	Action taken
The International Association of Fish and Wildlife Agencies (IAFWA) urged the U.S. Fish and Wildlife Service (Service) to publish a proposed rule in the <i>Federal Register</i> establishing a regulation requiring all migratory bird hunters to annually obtain a national migratory bird hunting permit. For waterfowl hunters, this permit would be required in addition to the federal duck stamp. The effective date of this regulation should be July 1, 1992.	June 1991: The Service published a Notice of Intent to establish the Migratory Bird Harvest Information Program in the <i>Federal Register</i> . "Permit" was changed to "Program". The Service would provide the Program Card to the states. State license vendors would distribute the cards for all migratory bird hunters.
The Service shall be responsible for printing the permits and supplying them to the state wildlife agencies by July 1 of each year for distribution to their normal license vendors or in a manner which best meets their specific needs.	June 1992: The Proposed Rule was published in the <i>Federal Register</i> . The Service would not be providing permits or reimburse the states for issuing HIP certification. HIP started as a 2-year pilot program for volunteer states after which the Service would do an evaluation and then phase in all states by 1998. March 1993: Final Rule was published in the <i>Federal Register</i> . Each year a new Final Rule was published adding more states into the program.
The permit would be valid in all states, regardless of where purchased.	August 1995: <i>Federal Register</i> required hunters to be HIP certified in all states where they hunted migratory birds.
The permit shall be designed to provide a current list of names and addresses of migratory bird hunters from which a sample could be drawn to conduct a post-season harvest survey.	Hunters that are exempt from the purchase of state hunting licenses are also exempt from the HIP certification requirement.
The Service shall enter into a Memorandum of Understanding (MOU) with each state outlining the responsibilities of each party concerning the national migratory bird hunting permit program. The MOU shall clarify that the cost of the permit shall be established by the state and the state shall retain all funds generated by sales.	At the start of the program, the Service entered into a MOU with each of the participating pilot states. After the pilot state, responsibilities were specified in each new Final Rule.
The Service shall be responsible for conducting post hunting season migratory bird harvest surveys that meet national and regional management needs. The Service should work with individual states to design surveys that meet special management needs or which might replace existing state surveys.	Throughout the implementation and current operation of HIP, surveys were designed to obtain, as accurately as possible, state and national estimates of harvest and hunter participation.
Final design of the national migratory bird hunting permit and procedures for implementation should be developed by a committee chaired by the Service with appropriate representation of Service staff, plus one representative from each of the 4 waterfowl Flyway Councils and a representative each from the IAFWA's Migratory Wildlife Committee and the Migratory Shore and Upland Game Bird Committee.	There was close coordination with the IAFWA committees and the Flyway Councils. The Service sponsored HIP workshops with the states from 1991 to 1997 that also served as the state/federal technical group.

Attachment A.

September 17, 1999

Report to: Migratory Shore and Upland Game Bird Subcommittee (MSUGB)

By: Vernon Bevill, Texas Parks and Wildlife Department
 Paul Padding, U.S. Fish and Wildlife Service

Subject: Establishing an Ad Hoc Committee to Evaluate the Nationwide Implementation of
 the Harvest Information Program (HIP)

Since the March 1999 meeting of the MSUGB Subcommittee in California, we have met twice for the purpose of developing a basic plan of approach for organizing an Ad Hoc HIP Evaluation Committee and we have identified some of the evaluation needs of this effort. Since HIP was approved as a collaborative effort of the International Association of Fish and Wildlife Agencies (IAFWA) and the Service in 1991, we thought it important to approach the following in this evaluation:

1. Revisit the goals and objectives for HIP as set forth by the IAFWA in the earlier meetings to determine whether HIP is operating within the context defined by the IAFWA. If changes or modifications have occurred, what prompted these changes and how were they approved?
2. Now that HIP has been in place in some states for five or more years and in all states for at least two years, determine the continuing issues and/or problems relating to the following:
 - a) are HIP screening questions providing information necessary to stratify the survey as envisioned; b) determine the scope, types and impact of vendor non-compliance; c) determine the same for hunter non-compliance; d) determine the role and impact of the large chain type licensing vendors, such as Wal-Mart, in the overall success or failure of HIP; e) evaluate the current reliability of the national surveys on migratory birds with special emphasis on waterfowl, woodcock, doves, and lesser hunted species; f) determine how HIP has impacted state level survey capability and reliability; g) evaluate the success/problems associated with different types of license systems on the quality of the data received; h) determine the real cost of HIP as an ongoing responsibility of the states and the Service; and i) determine whether implementation of HIP has had a positive or negative impact on the number of licenses sold within a state.
3. Conduct a survey of State Wildlife Agency heads to determine whether HIP still has the support it had when implemented.
4. Develop recommendations necessary to improve or resolve current issues and problems associated with HIP and report to the MSUGB Subcommittee by the March meeting in 2001.

Page 2, Ad Hoc committee on HIP Evaluation

To accomplish the scope of the evaluation outlined above, we believe that it will require hiring a person on contract through the Service to serve as a coordinator for the various phases of the evaluation to assure that the technical aspects and survey requirements are carried through. The Ad Hoc Committee will be comprised of members with expertise in agency administration, license administration, migratory bird biology, Point of Sale licensing, and human dimensions.

The evaluation of this program will require some travel for all committee members, so agreeing to participate in this evaluation should be based on top-management being willing to allow full participation. The first of order of business will be to secure support from the Service, MBMO to fund a contract for a part-time Coordinator for up to two years.

As chairman of the Ad Hoc Committee, I will solicit committee membership from the above noted areas. A general organization meeting should be held by the end of January 2000. A formal evaluation plan will be developed in time to review at the March 2000 MSUGB meeting.

It is anticipated that a number of internal surveys will be required to get at the scope and depth of issues and problems associated with administration of HIP using the different types of licensing systems. Because of the shift toward more automation in licensing, special attention will be paid to how well HIP operated within such systems, referred to as POS systems. The diversity on the Ad Hoc Committee should allow us to identify some education and/or process issues that can be tested during the 2000 license year.

It is also anticipated that a number of focus group meetings may be required with both hunters and license vendors to identify problems and possible solutions associated with HIP and/or the way it is administered.

Since 2000 will be the third full year of implementation, we will attempt to determine whether hunters and vendors are performing better as a result of becoming more familiar with the system, thus improving compliance and the quality of the data.

The product of the Ad Hoc Committee will be a report and recommendation to the IAFWA on the status of implementation nationwide, continuing problems of a serious nature, and recommended solutions and/or alternatives.

A potential list of Ad Hoc members has been developed. From this list, the chairman will contact each person to determine their interest in serving as a committee member.

Do the Harvest Information Program Screening Questions Provide the Information Necessary to Stratify the Survey as Envisioned?

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Abstract: The preliminary analysis outlined in this report indicates that the Harvest Information Program (HIP) screening questions currently in use provide the information necessary to stratify the survey as envisioned. Using no stratification, i.e., using simple random sampling, will reduce the precision of the harvest estimates. This approach would require an overall increase in sampling effort of 103% to maintain current precision levels. A reduced stratification scheme results in estimates with similar precision to those estimated under full stratification. However, while reducing the levels of stratification may be a viable way to reduce survey complexity without sacrificing precision, estimates obtained through the simpler stratification scheme were significantly different from those obtained under full stratification. Thus, further study is needed to fully assess the impacts of a reduced stratification scheme. The analysis reported here is based only on data from the 1999 HIP waterfowl and upland game bird surveys.

INTRODUCTION

We were charged with determining whether or not the Harvest Information Program (HIP) screening questions provided the information necessary to stratify the survey as envisioned. In this report, we outline the approach taken to answer this question, present results of the work to date, and summarize the work that still needs to be completed.

The stratification currently used in the sampling protocol for HIP surveys is comprised of 4 levels for the waterfowl and upland game bird (dove) surveys and 2 levels for the woodcock and snipe, rail, gallinule and coot surveys. Information concerning ducks and geese from the 1999-2000 HIP waterfowl survey and mourning dove data from the 1999-2000 HIP upland game bird survey was used as a starting point in assessing the effectiveness of current HIP stratification. This information is considered preliminary because it is based on data from the first year that acceptable sampling frames were available for most states and because it only concerns results from 2 of the 4 HIP surveys.

The stratification currently in use in the HIP waterfowl survey sampling procedure consists of 4 levels for each of 2 species and is determined by a hunter's responses to screening questions regarding their hunting success the previous year. These questions are presented to the hunter when he/she receives HIP certification according to the state-specific licensing method. Hunters are assigned to 2 different stratification levels based on the number of ducks and the number of geese they report bagging the previous season. The levels are: "NONE" – bagged no ducks/geese the previous season; "LOW" – bagged 1-10 ducks/geese; "HIGH" – bagged >10 ducks/geese; and, "OTHER" – bagged sea ducks/brant. For states where sea ducks and/or brant are not hunted, the stratification consists of 3 levels rather than 4.

A similar stratification scheme is used in the upland game bird survey with LOW being redefined as "bagged 1-30 doves" and HIGH being redefined as "bagged > 30 doves." The OTHER category is used for band-tailed pigeons in states that have a hunting season for that species.

CENTRAL QUESTION

The central question considered in this work was "How would the elimination of stratification in HIP affect the precision of the HIP estimates?" A secondary question was "What increase in sampling effort would be required under simple random sampling in order to maintain a level of precision similar to that obtained under a stratified approach?"

The question of precision and how it is affected by a change in sampling scheme is important to the integrity and usefulness of HIP. Stratification is commonly used as a method to increase precision and was incorporated into HIP as an efficient method to obtain precise estimates. Several years ago, an ad hoc task group was appointed to investigate the issue of the screening questions and the HIP stratification scheme. The resulting work of that task force included a set of goal precision levels for each survey. Under the current sampling protocol, HIP comes close to meeting these goals for both the waterfowl and upland game bird survey for some, but not all states. The premise of this current work is that those goal precision levels are still in effect and the consequences of any changes in HIP that will make those goals more difficult to reach need to be clearly stated and understood.

APPROACH

In order to assess the effect of a simple random sampling scheme on precision levels of HIP estimates, the initial step was to obtain a simple random sample (SRS). To accomplish this in theory, we would want to use the universe of hunters (the sample frame), select a SRS and conduct a HIP survey of hunters selected in the sample. Once the survey was complete we could obtain harvest and hunter-activity estimates and compare them to those obtained under a simultaneously conducted survey using the stratification scheme. Since we could not actually select and conduct two simultaneous waterfowl or upland game bird surveys, due to time and other constraints, another approach was taken. The technique we employed, known as bootstrapping, is a widely used and well accepted resampling method. The premise of bootstrapping is based on the idea that the distribution of values found in a random sample of size n from the population is the best guide to the distribution in the population, when no other knowledge about the population is known. To approximate what would happen if the population was sampled under an alternative sampling scheme, it makes sense to use that scheme to resample (with replacement) the original sample.

Data from the 1999-2000 HIP waterfowl survey was used to construct a series of bootstrap SRSs from which harvest estimates and their variances were computed. The averages of these statistics, over all bootstrap samples, provided estimates of what we would expect to find under a SRS scheme. This method was then repeated using the original (full) stratification sampling (FSS) scheme and the statistics obtained from that analysis were compared to the SRS results. At the request of the ad hoc HIP committee, we also considered an alternative (reduced) stratification sampling (RSS) scheme in which the LOW and HIGH levels are combined. This reduces the levels of stratification to three levels (NONE, SOME, and OTHER) and would allow states to ask hunters fewer questions when they purchase their hunting license. The bootstrap analysis was conducted using this scheme and the results compared to FSS and SRS. This same approach (SRS, FSS, and RSS) was then repeated with the 1999-2000 HIP data for mourning doves.

METHODS

Using the 1999-2000 HIP waterfowl survey sample data, 1000 random samples were selected. Since the sample data originally arose from a stratified sampling scheme and, therefore, did not necessarily reflect the population stratum proportions, each stratum was sampled in proportion to its occurrence in the population. For example, assume that in a given state the population stratum proportions were 50%, 30%, 10% and 10% for NONE, LOW, HIGH and OTHER, respectively and we needed to select a random sample of size $n=500$.

The sample stratum proportions in that state may have been: 30%, 30%, 20% and 20%. The bootstrap SRSs were structured so that 250 (50%) were randomly selected with replacement from the NONE stratum, 150 (30%) were randomly selected with replacement from the LOW stratum, 50 (10%) were randomly selected from the HIGH stratum and 50 (10%) were randomly selected from the OTHER stratum. The sample that results is what we would have expected had a SRS scheme been applied to the entire population of hunters. For each state, 1000 different samples were obtained using this general framework, harvest estimates and variances were computed, and means of those estimates and variances over all 1000 samples were calculated.

For comparison, this approach was repeated using the FSS scheme. In this case however, the samples were selected based on the sample stratum proportions. In the example above, this means that we would randomly select with replacement 150 (30%) from the NONE stratum, 150 (30%) from the LOW stratum, and 100 (20%) each from the HIGH and OTHER strata. As above, 1000 different samples were obtained for each state and the appropriate estimates and means of the estimates were computed.

Finally, the bootstrap approach was repeated using a RSS scheme to address the impact of reducing the number of categories in the screening questions. This reduction amounted to combining the LOW and HIGH strata, resulting in a three level stratification scheme: NONE, SOME and OTHER (for states where sea duck and brant were hunted).

For all 3 types of samples, SRS, FSS, and RSS, the coefficient of variation ($CV = \text{standard deviation}/\text{mean}$ expressed as a percent) was obtained. The CV provides a unit-less measure of relative variability which can be used for comparison between the three types of sampling.

Finally, the estimated sample sizes needed under SRS in order to obtain the precision levels obtained under FSS were calculated to assess the increase in sampling effort needed under this alternative sampling scheme.

The same methodology used with the waterfowl data was then applied to the mourning dove data using the appropriate sampling scheme.

RESULTS

The results of this study concerning the effect of SRS on the precision of the estimates are presented in Table 1 and Figs. 1-8. Table 1 summarizes the average CV for each sampling scheme for each of 6 variables: total duck hunting days and bag, total goose hunting days and bag, and total mourning dove hunting days and bag. Figure 1 shows the comparison of CVs between the FSS and the SRS for ducks and geese. The response variable is the difference in CVs. States in which the SRS CV was higher than the FSS CV are depicted in gray. Figures 2-3 are also generated from the waterfowl analysis and represent similar comparisons between RSS and SRS, and between RSS and FSS. Figures 4 and 5 illustrate results for similar analyses for mourning doves. Note that the comparisons of both FSS and RSS with SRS yielded the same results (Fig. 4).

The general trend in the SRS comparisons with both FSS and RSS shows that the stratified schemes result in more precise estimates for most states. The comparison of CVs from the FSS and RSS shows mixed results in terms of precision levels. However, for most of the states in which the RSS yielded a lower CV (depicted by states with diagonal lines in the figures), the differences in CVs between the 2 stratification schemes were very small, often less than 5%. These small differences in the CVs are reflected in Table 1.

Although there appear to be small differences in CVs between the FSS and RSS, it is important to note that there are larger differences in the point estimates obtained through the simulation process. Table 2 shows the total average bag bootstrap estimates for duck, geese, and mourning dove obtained through each of the 3 sampling schemes and, for the RSS and SRS schemes, the percent the estimates vary from those obtained

by full stratification. The estimates obtained through reduced stratification are higher than those from full stratification by 5%-9%. It has been hypothesized that an additional benefit from the FSS may be that it has an effect on reducing non-response bias although this has not been tested. The results in Table 2 indicate that full stratification may result in more accurate and precise estimates, however, additional study of how the stratification scheme affects non-response bias is warranted before any conclusions can be made.

Figures 6-8 depict the results of the sample size analysis. Considering any one of the 6 major response variables used in this analysis, sampling effort would need to be greatly increased in order to obtain similar precision levels under SRS as those obtained under FSS. An assessment of the sample size question indicated that sampling effort would need to be increased by 103% overall to gain the current level of precision if SRS were to be implemented.

DISCUSSION AND CONCLUSIONS

It is clear from this preliminary analysis that the HIP screening questions are providing the information necessary to stratify the survey as envisioned. For most states, stratified sampling results in more precise estimates than would be obtained under a SRS scheme. The obvious question that arises concerns those states for which this result does not hold true. It has been noted previously that not all hunters are placed in the correct stratum due to a variety of reasons related to the HIP-certification process. Stratification is a method to group like elements together so as to reduce variation within each group. If the groups (strata) are not homogeneous due to incorrect classification, it is possible that the resulting variance will be higher than expected and result in the anomaly we see here. Results for several states that are known, by past history, to do a good job of obtaining accurate stratum information (South Dakota, Kansas, Wisconsin, Missouri, and Pennsylvania) indicate that stratification is adequate.

The sample size analysis indicates that sampling effort under SRS would need to increase by over 100% of the current rate in order to obtain current precision levels. This value assumes that response rates under SRS would remain the same as they are now under the current scheme. However, under SRS, many more hunters who were previously placed in the NONE stratum may be selected. It is not known how the response rates of these less successful or occasional hunters will vary from the current rates. It should be noted that a decrease in response rates under SRS would further reduce precision. Furthermore, it should be noted that under the current scheme, we have not yet achieved the stated precision goals as outlined by a state-federal technical group charged with addressing this issue several years ago, which were later approved by the Migratory Shore and Upland Game Bird Subcommittee. Adjusting HIP to a new sampling scheme will delay the achievement of these precision levels for an undetermined amount of time and will depend on having the necessary resources available to increase sampling effort.

Table 1. Comparison of average coefficient of variation (CV) between 3 sampling schemes.

Variable (total)	Full stratification	Reduced stratification	Simple random sampling
Duck hunting days	10.34	10.15	11.18
Duck bag	11.96	11.76	13.90
Goose hunting days	16.40	16.53	17.32
Goose bag	19.05	19.61	23.32
Mourning dove hunting days	13.79	13.77	15.49
Mourning dove bag	14.22	14.2	17.41

Table 2. Total average duck, goose, and mourning dove bag bootstrap estimates based on the 3 sampling schemes. Percent change in the estimates from full stratification is provided in parentheses.

Variable (total)	Full stratification	Reduced stratification	Simple random sampling
Duck bag	15,867,581	17,267,051 (+ 9%)	15,849,761 (- 0.1%)
Goose bag	3,348,565	3,509,917 (+ 5%)	3,471,862 (+ 4%)
Mourning dove bag	23,916,583	26,425,363 (+ 8%)	24,478,190 (+ 2%)



Northern pintail. USFWS photo by Glen Smart.

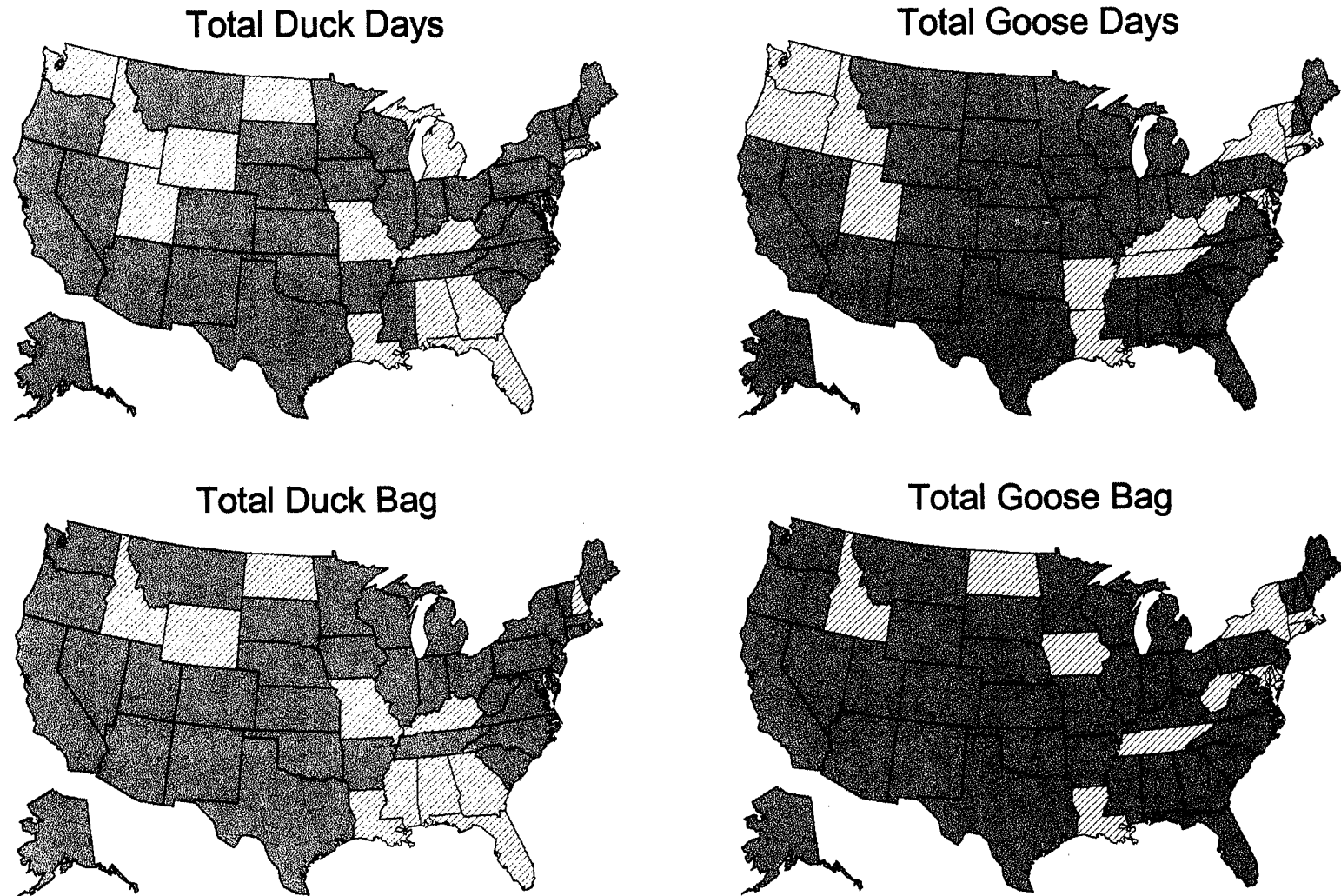


Fig. 1. Difference in coefficient of variation (CV) between a fully stratified sample (FSS) and a simple random sample (SRS) of hunters for estimates of total duck hunting days and bag, and total goose hunting days and bag. Solid = CV of a SRS > CV of a FSS; lined = CV of a SRS < CV of a FSS.

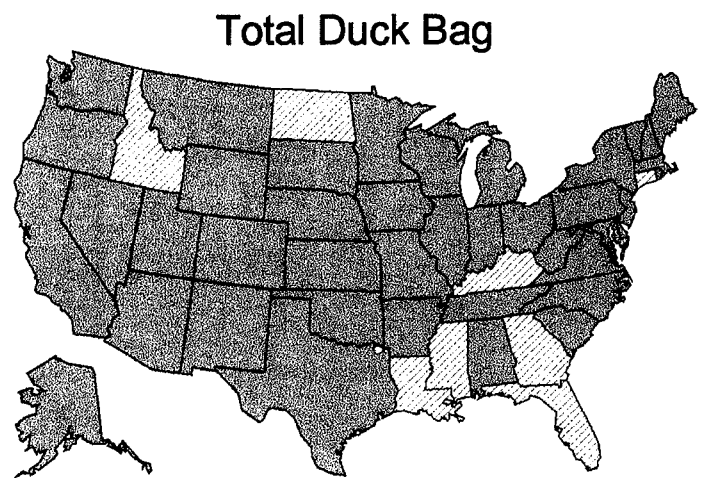
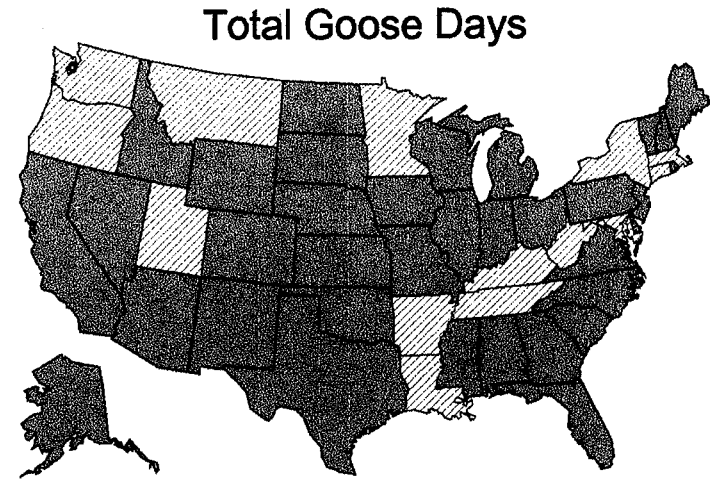
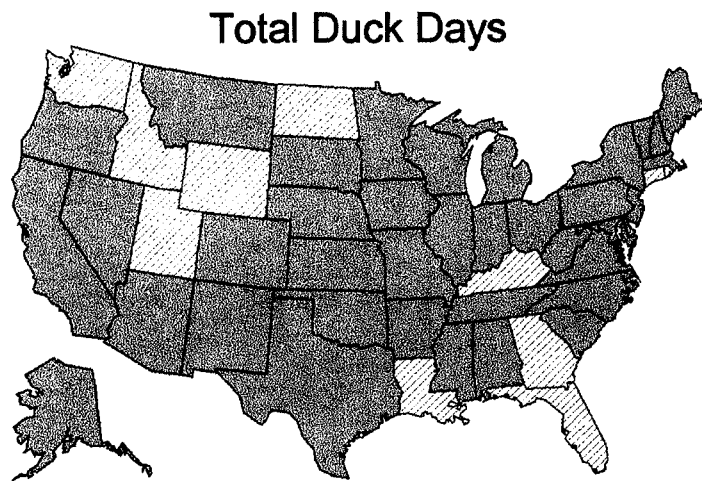


Fig. 2. Difference in coefficient of variation (CV) between a reduced stratified sample (RSS) and a simple random sample (SRS) of hunters for estimates of total duck hunting days and bag, and total goose hunting days and bag. Solid = CV of a SRS > CV of a RSS; lined = CV of a SRS < CV of a RSS.

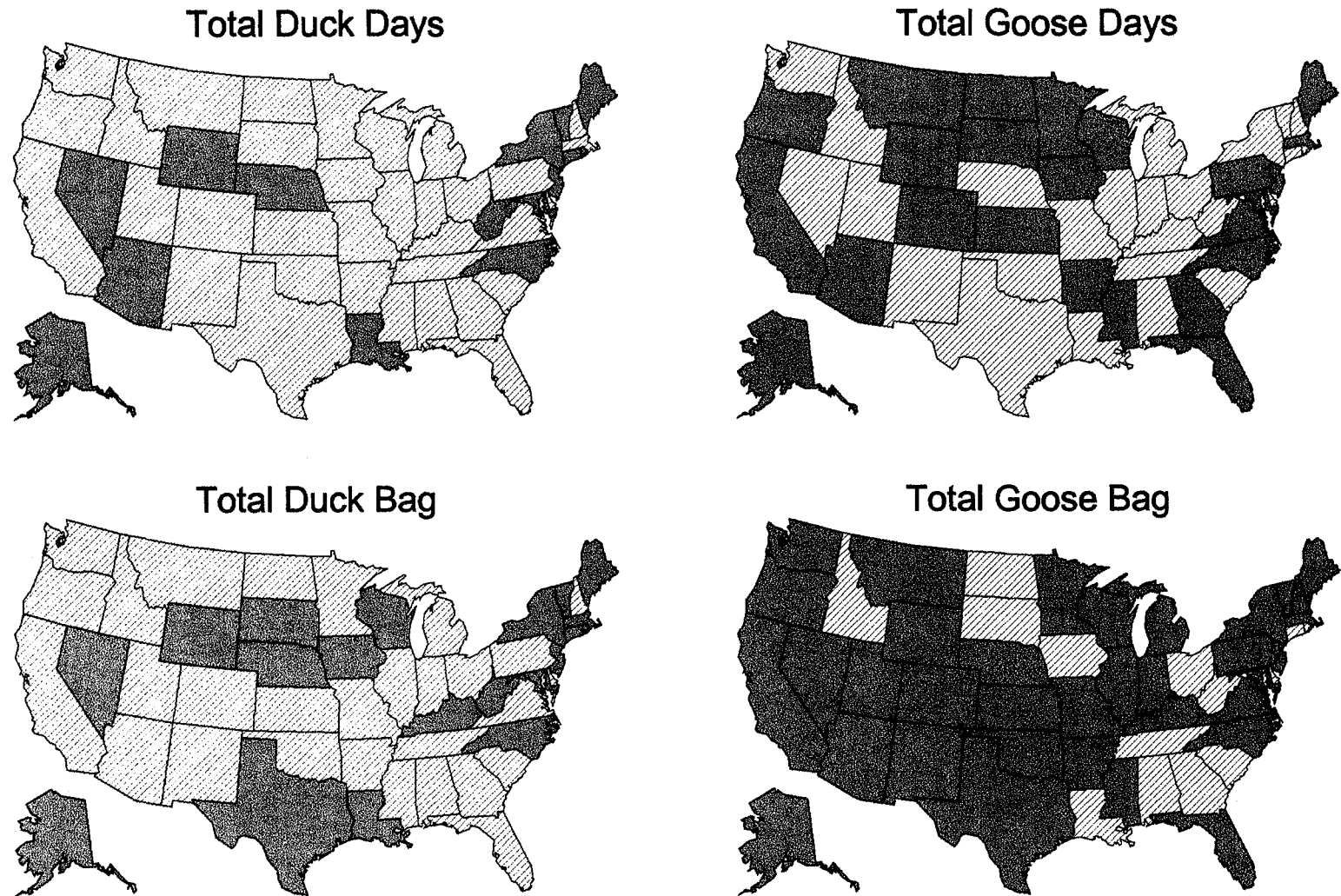
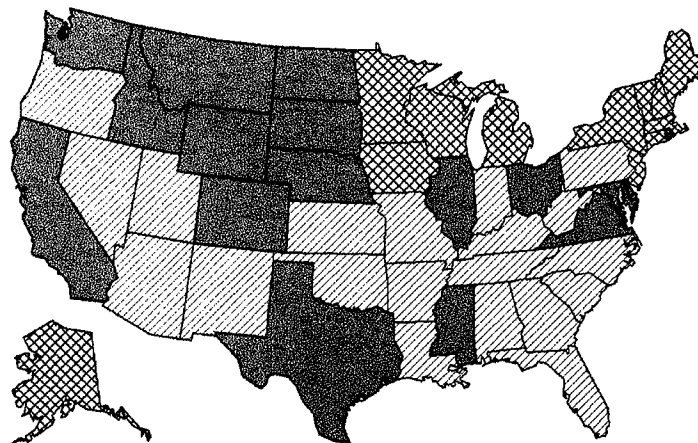


Fig. 3. Difference in coefficient of variation (CV) between a fully stratified sample (FSS) and a reduced stratified sample (RSS) of hunters for estimates of total duck hunting days and bag, and total goose hunting days and bag. Solid = CV of a FSS > CV of a RSS; lined = CV of a FSS < CV of a RSS.

Total Mourning Dove Days



Total Mourning Dove Bag

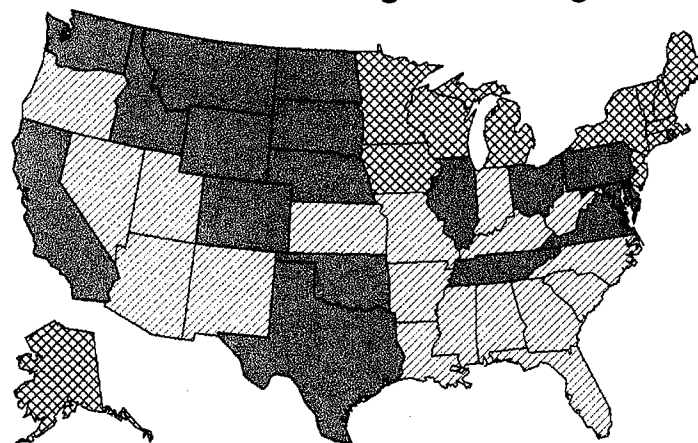


Fig. 4. *Note: These represent 2 separate analyses with the same results.* **Analysis 1:** Difference in coefficient of variation (CV) between a fully stratified sample (FSS) and a simple random sample (SRS) of hunters for estimates of total mourning dove hunting days and bag. Solid = CV of a FSS > CV of a SRS; lined = CV of a FSS < CV of a SRS; hatched = no season. **Analysis 2:** Difference in CV between a reduced stratified sample (RSS) and a SRS. Solid = CV of a RSS > CV of a SRS; lined = CV of a RSS < CV of a SRS; hatched = no season.

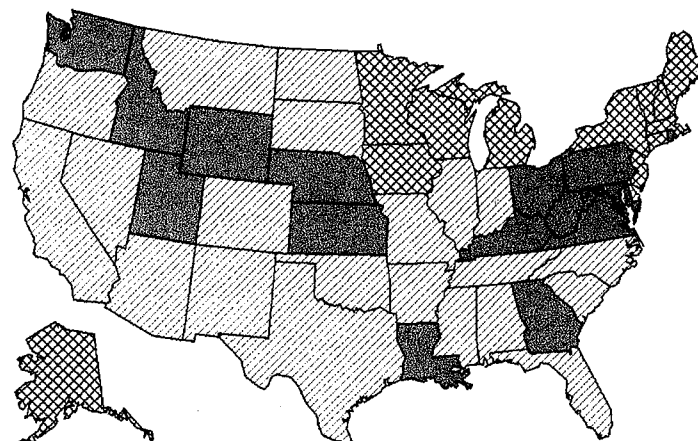
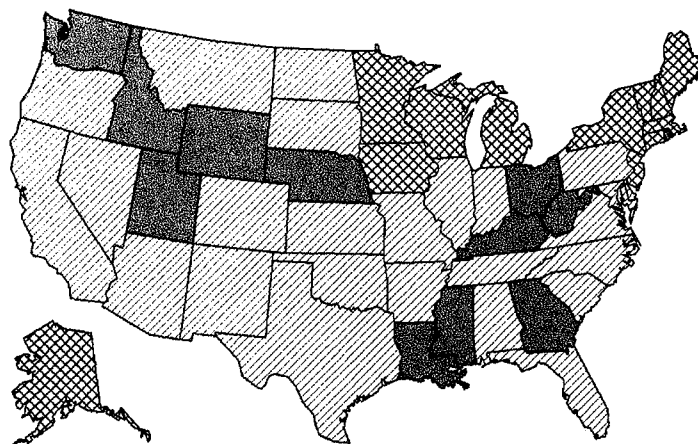


Fig. 5. Difference in coefficient of variation (CV) between a fully stratified sample (FSS) and a reduced stratified sample (RSS) of hunters for estimates of total mourning dove hunting days and bag. Solid = CV of a FSS > CV of a RSS; lined = CV of a FSS < CV of a RSS; hatched = no season.

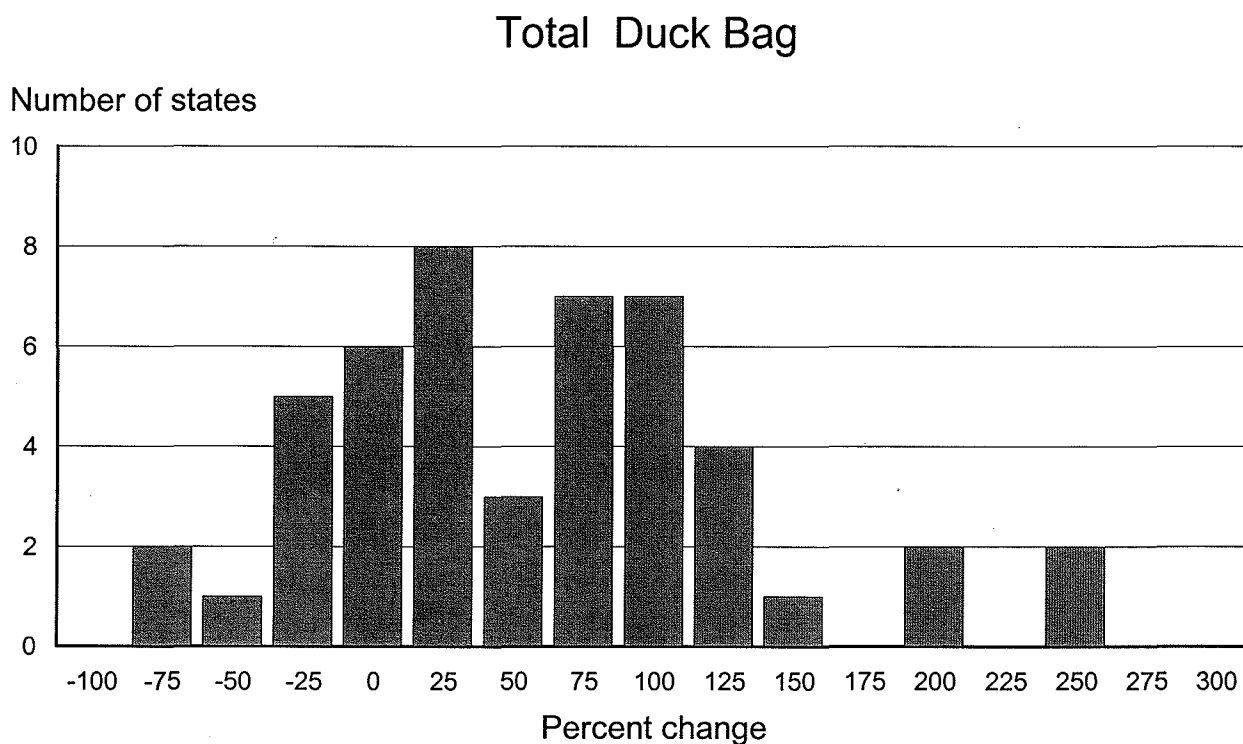
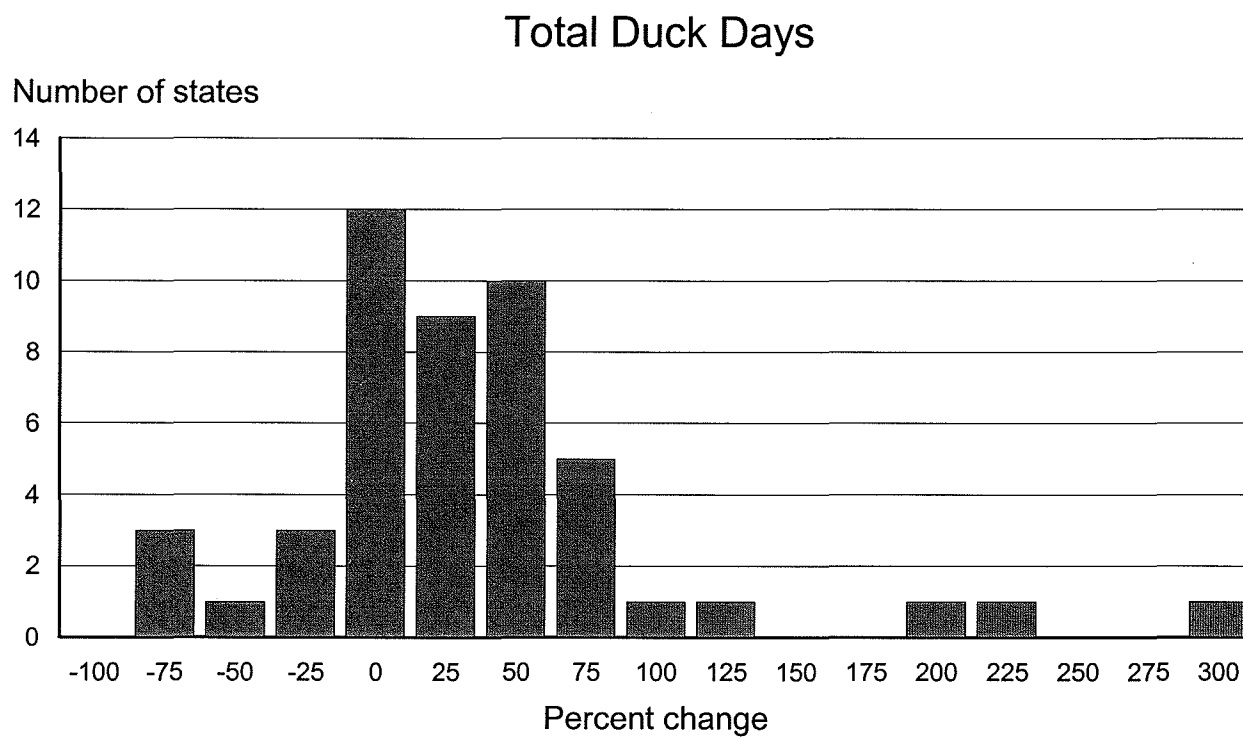
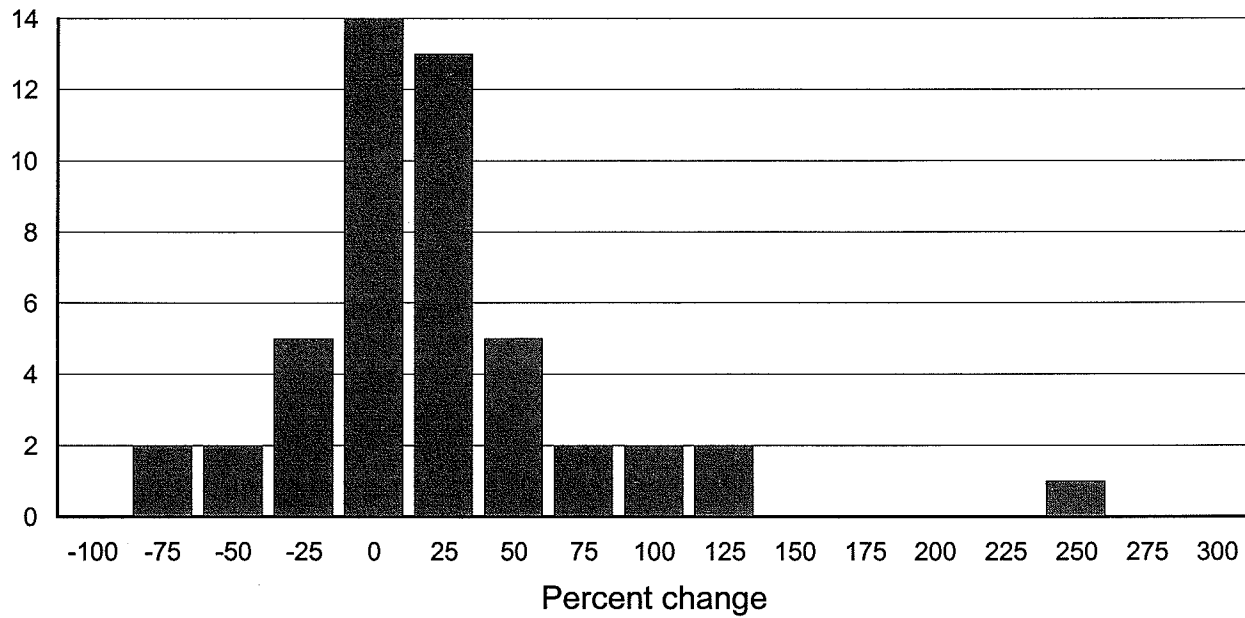


Fig. 6. Summary of the state-level increases in sampling effort (percent change) needed to achieve current precision levels for estimates of total duck hunting days and bag if the Harvest Information Program used a simple random sampling design rather than a stratified sampling design.

Total Goose Days

Number of states



Total Goose Bag

Number of states

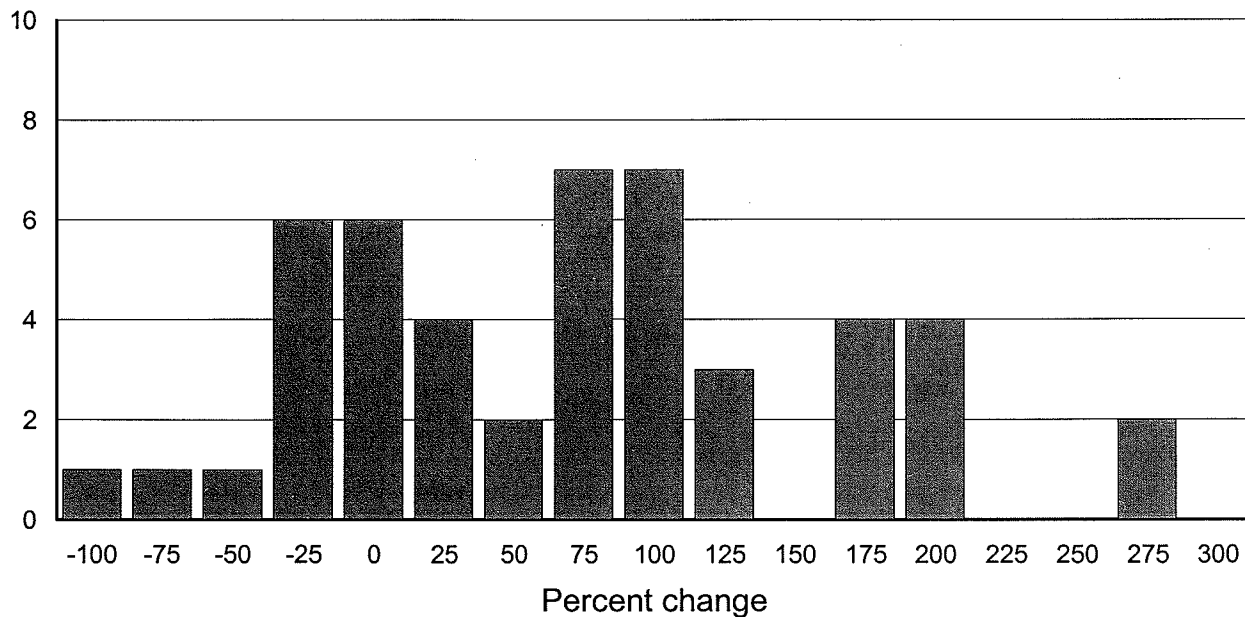
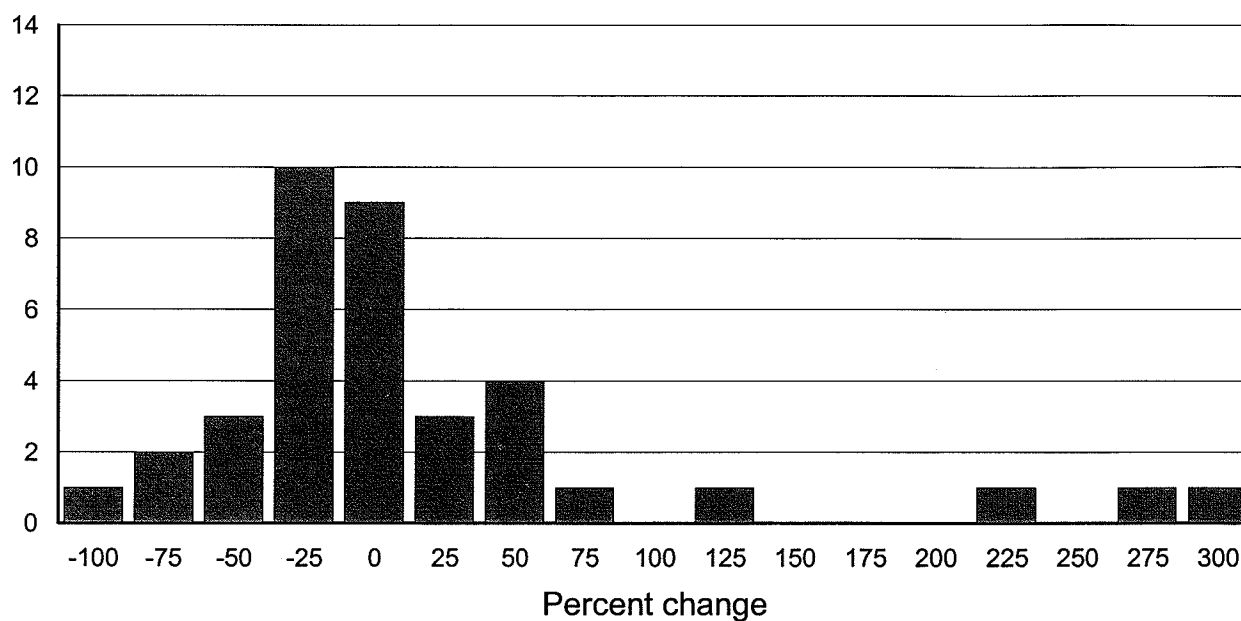


Fig. 7. Summary of the state-level increases in sampling effort (percent change) needed to achieve current precision levels for estimates of total goose hunting days and bag if the Harvest Information Program used a simple random sampling design rather than a stratified sampling design.

Total Mourning Dove Days

Number of states



Total Mourning Dove Bag

Number of states

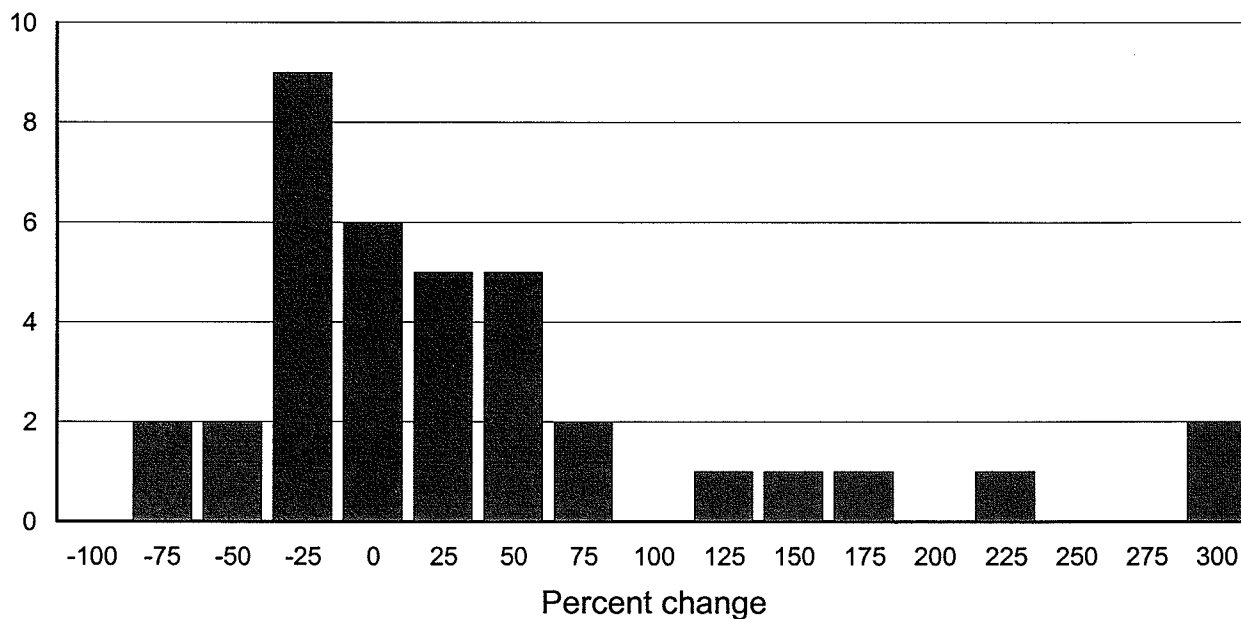
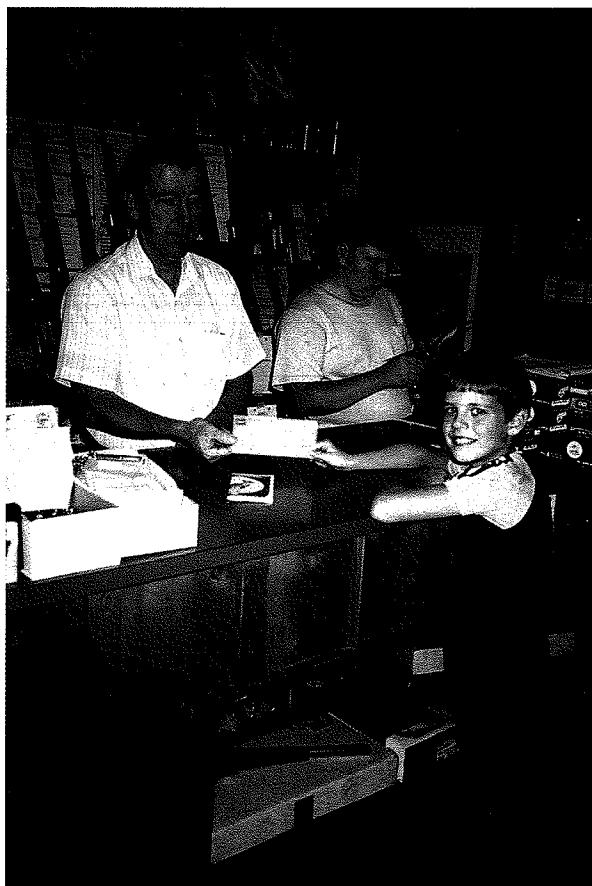


Fig. 8. Summary of the state-level increases in sampling effort (percent change) needed to achieve current precision levels for estimates of total mourning dove hunting days and bag if the Harvest Information Program used a simple random sampling design rather than a stratified sampling design.



Purchasing first hunting license. *Photo by David Dolton.*

The Types, Impacts, and Scope of Vendor Non-compliance with the Harvest Information Program

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Abstract: Preliminary studies indicate that vendor non-compliance is a significant problem with properly recording Harvest Information Program (HIP) information. Most states do not have any penalty for vendor non-compliance. License vendors who entered HIP screening questions and received a vendor commission of <\$0.20 over-reported HIP certifications by almost 126% of the base. Conversely, license vendors who entered the screening questions and received a vendor commission of >\$0.20 under-reported the number of HIP certifications. Most of the states whose estimates of the number of migratory bird hunters were significantly higher than the U.S. Fish and Wildlife Service's Harvest Survey Section's estimates are the major migratory bird harvest states. Consequently, the issue of vendor non-compliance in those states is a serious concern.

INTRODUCTION

Most migratory bird hunters obtain their Harvest Information Program (HIP) certification from license vendors. HIP's success is dependent on the participation of all migratory bird hunters in the program. Thus, the degree of compliance by, and the quality of data received from, the various license vendors are significant contributing factors to HIP's success in adequately determining harvest.

During 2000, states were asked 30 direct and indirect questions that related to license vendors, hunters and the HIP certification process. During the survey, states were asked to submit any applicable study that they had completed related to any of the questions. Two states (North Carolina and Texas) submitted copies of their studies evaluating the compliance by license vendors. Both of these studies indicated they have vendor compliance issues.

Additionally, the Harvest Surveys Section (HSS) (U.S. Fish and Wildlife Service, Division of Migratory Bird Management), compiled state-specific migratory bird hunter estimates for 1999 and 2000 that were based on the 1991 and 1996 *National Survey of Fishing, Hunting, and Wildlife-Associated Recreation* estimates, federal duck stamp sales, and information provided by state wildlife biologists. The number of 1999 HIP certifications exceeded the HSS estimate by 12.6%. The estimated 2000 HIP certifications exceeded the HSS estimate by 31.6% (4.3 million hunters vs. 3.3 million). Over-certifications can significantly affect the HIP harvest estimates and cost of the program.

RESULTS

Vendor non-compliance studies by North Carolina, Texas, and an unpublished study by Idaho found non-compliance to be a significant issue. North Carolina and Idaho found vendor non-compliance to be in the

17% range. Texas reported widespread anomalies in responses to the screening questions throughout their vendors. They also reported that "Large multipurpose stores had lower [HIP] awareness ratings, lower customer attitude ratings, and typically had more than 5 clerks selling licenses." Interestingly, the Texas study found that 17% of their vendors had no working knowledge of HIP and 62% recognized HIP only as that program "where you ask a bunch of questions".

For most states, the level and degree of vendor non-compliance with HIP is simply undetermined. Only 4 states out of 47 responses stated they systematically monitor the quality of data from vendors. The most frequent quality-assurance activity was listed by 31 states which said they follow up on hunter complaints of vendor non-compliance. The next most frequent method was similar in that 25 states said they investigate vendors based upon incidental observations by agency staff. Both of these methods to detect vendor non-compliance are dependent upon a personal observation of a potential non-compliant action and that person being sufficiently concerned to contact the appropriate personnel in the agency.

The HIP Survey had 7 questions related to vendor penalties for non-compliance. An overwhelming number of responding states (40 of 45) indicated there were no penalties for vendors that did not HIP-certify migratory bird hunters. Of the 5 states that said there were penalties, no state has ever penalized a vendor for failure to HIP-certify migratory bird hunters. Additionally, states were asked if there was a penalty for vendors who HIP-certify hunters, but do not send in HIP data. An even larger number of states (44 of 46 responses) reported there were no penalties and the 2 states with penalties for this form of non-compliance said they had never penalized a vendor.

The 3 vendor compliance studies suggest that vendor non-compliance appears to be surprisingly uniform among the 3 widely divergent states. The responses to the HIP Survey suggest that there is a very small chance of detecting vendor non-compliance and that even if it is detected, there are no penalties to the license vendor. The degree of non-compliance can also be inferred by combining the states' responses to the HIP Survey with the HSS estimate of the number of migratory bird hunters in 1999. There were 2 primary license vendor systems— automated and manual. Many states supplemented their primary license systems with telephone, Internet or other ancillary methods. Twenty-five states *did not* have the license vendors enter the hunters' responses to the HIP screening questions into their license system while 24 states *did* require the license vendor to do so.

Table 1 shows the states that did not have the license vendor enter the answers to the HIP screening questions. In general, the number of hunters that were HIP-certified in those states was less than the HSS estimate for 1999 HIP certifications. States in which license vendors received a vendor commission had an average difference from the HSS estimate (-3%) that was similar to this category's overall average (-9%), but their standard deviation and range of differences were smaller than those states that did not pay the vendor a commission.

Different results were obtained in states that had the vendor enter the answers to the HIP screening questions (Table 2). For the 24 states that used this method, 15 had an automated license system that included HIP-certification, and 9 had manual HIP certification. Regardless of the license system, the table shows the average difference from the HSS 1999 estimate was +21% with a range from -34% to +169%. It also suggests that despite "common sense", vendors that receive no vendor commission or a minimal vendor commission over-reported HIP certifications by an average of 26% of the HSS base with a very wide variance ranging from -34% to +169%. Conversely, vendors who received a vendor commission >\$0.20 (average was \$0.40) actually under-reported by an average 6%.

Table 3 shows those 15 states that have automated license systems through which vendors entered the answers to the HIP screening questions. Thirteen of those states paid their vendors <\$0.20 per HIP

certification. Of those, 10 (76.9%) over-reported HIP certifications and only 3 under-reported. The average difference from the HSS estimate was +35%, with a range of -20% to +109%. There were 2 states whose vendors received commissions >\$0.20; their average difference from the HSS estimate (+8%) was much smaller. This suggests that rather than having vendors certify hunters to collect the vendor commission, vendors with no or minimal commissions are certifying hunters to "get it over with." Most of the states that were significantly over the HSS estimate were major migratory bird harvest states. This is a significant vendor non-compliance issue in these states, which is a serious concern.

Table 4 details the states that had manual license systems (and/or HIP-certification systems) through which the vendors entered the answers to the HIP screening questions. HIP certifications in 7 of those states were less than the HSS estimate, whereas only 1 state HIP-certified more hunters than the HSS estimate. The amount of vendor commission, or lack of commission, did not have any significance to vendor compliance. With a manual system, vendors can easily skip the screening questions and not certify the hunter, thus, there is a significant non-compliance issue of under-certifying hunters.

RECOMMENDATIONS

1. The states should actively monitor vendor compliance and explore vendor education and promotional methods to help improve voluntary compliance.
2. The states should review their vendor penalties for non-compliance, pursue vendor penalties where needed, and emphasize enforcement of HIP requirements for vendors and the application of vendor penalties, where warranted, to improve vendor compliance.



Left: Hunter with mallards at the Cleveland Waterfowl Production Area in North Dakota. *Photo by David Sharp.* Right: Mallard pair. *USFWS photo by Tim McCabe.*

Table 1. Comparison of the number of 1999 Harvest Information Program (HIP) certifications submitted by states with the Harvest Survey Section's estimate of hunter numbers in states that did not have the license vendor enter the answers to the HIP screening questions.

State	Percent difference	Vendor commission	Vendors with commission		Vendors with no commission		Vendors with commission < \$0.20		Vendors with commission > \$0.20		License systems*
			Percent difference	Vendor commission	Percent difference	Vendor commission	Percent difference	Vendor commission	Percent difference	Vendor commission	
Alabama	-4	\$0.10	-4	\$0.10			-4	\$0.10			M/P
Alaska	-15	\$0.00			-15	\$0.00	-15	\$0.00			M/P/I
Colorado	-19	\$0.00									M/P/I
Connecticut	-3	\$1.00	-3	\$1.00					-3	\$1.00	M
Delaware	-11	\$0.00									M/P/I
Illinois	-31	\$0.00									M/P/I
Indiana	-3	\$0.00									M/P/I
Iowa	+1	\$0.00									M/P
Kansas	+4	\$0.50	+4	\$0.50					+4	\$0.50	M/I
Massachusetts	-44	\$0.00									M/P/I
Montana	-32	\$0.50	-32	\$0.50					-32	\$0.50	M/I
Nebraska	-5	\$0.00									M/P/I
Nevada	-31	\$0.00									M/P/I
New Hampshire	+45	\$0.00									M/P/I
New Jersey	-34	\$0.00									M/P
New Mexico	-3	\$1.00	-3	\$1.00					-3	\$1.00	M
New York	-38	\$0.00									M/P/I
North Dakota	+5	\$0.00									M/P/I
Oklahoma	-4	\$0.00			-4	\$0.00	-4	\$0.00			M/P
Pennsylvania	+20	\$1.00	+20	\$1.00					+20	\$1.00	M/I
South Carolina	+6	\$0.00			+6	\$0.00	+6	\$0.00			M/P/I
Utah	+9	\$0.00									M/P/I
Virginia	-24	\$0.00									M/P
West Virginia	-19	\$0.00			-19	\$0.00	-19	\$0.00			M/P
Wyoming	+5	\$0.00			+5	\$0.00	+5	\$0.00			M
Average	-9		-3	\$0.68	-5		-5		-3	\$0.80	
SD	19.8		15.4	\$0.34	10.2		9.3		16.8	\$0.24	
Maximum	+45		+20	\$1.00	+6		+6		+20	\$1.50	
Minimum	-44		-32	\$0.10	-19		-19		-32	\$0.50	
Count	25		6		5		6		5		
<0	17	68.0%	4	66.7%	3	60.0%	4	66.7%	3	60.0%	
>0	8	32.0%	2	33.3%	2	40.0%	2	33.3%	2	40.0%	

* M= Manual P= Phone I= Internet

Table 2. Comparison of the number of 1999 Harvest Information Program (HIP) certifications submitted by states with the Harvest Survey Section's estimate of hunter numbers in states that had the license vendor enter the answers to the HIP screening questions.

State	Percent difference	Vendor commission	Vendors with commission		Vendors with no commission		Vendors with commission < \$0.20		Vendors with commission > \$0.20	
			Percent difference	Vendor commission	Percent difference	Vendor commission	Percent difference	Vendor commission	Percent difference	Vendor commission
Arizona	-33	\$0.15	-33	\$0.15			-33	\$0.15		
Arkansas	+47	\$0.10	+47	\$0.10			+47	\$0.10		
California	-12	\$0.00			-12	\$0.00	-12	\$0.00		
Florida	+2	\$0.00			+2	\$0.00	+2	\$0.00		
Georgia	+65	\$0.00			+65	\$0.00	+65	\$0.00		
Idaho	-9	\$0.75	-9	\$0.75					-9	\$0.75
Kentucky	-25	\$0.25	-25	\$0.25					-25	\$0.25
Louisiana	+3	\$0.00			+3	\$0.00	+3	\$0.00		
Maine	+169	\$0.00			+169	\$0.00	+169	\$0.00		
Maryland	+25	\$0.35	+25	\$0.35					+25	\$0.35
Michigan	-6	\$0.00			-6	\$0.00	-6	\$0.00		
Minnesota	-20	\$0.00			-20	\$0.00	-20	\$0.00		
Mississippi	-34	\$0.10	-34	\$0.10			-34	\$0.10		
Missouri	-3	\$0.00			-3	\$0.00	-3	\$0.00		
North Carolina	+109	\$0.10	+109	\$0.10			+109	\$0.10		
Ohio	+86	\$0.10	+86	\$0.10			+86	\$0.10		
Oregon	+13	\$0.00			+13	\$0.00	+13	\$0.00		
Rhode Island	-26	\$0.00			-26	\$0.00	-26	\$0.00		
South Dakota	0	\$0.00			0	\$0.00	0	\$0.00		
Tennessee	+61	\$0.00			+61	\$0.00	+61	\$0.00		
Texas	+53	\$0.00			+53	\$0.00	+53	\$0.00		
Vermont	-7	\$0.00			-7	\$0.00	-7	\$0.00		
Washington	-14	\$0.25	-14	\$0.25					-14	\$0.25
Wisconsin	+48	\$0.00			+48	\$0.00	+48	\$0.00		
Average	+21		+17	\$0.24	+23		+26		-6	\$0.40
SD	49.3		50.2	\$0.20	48.6		51.8		18.7	\$0.21
Maximum	+169		+109	\$1.50	+169		+169		+25	\$0.75
Minimum	-34		-34	\$0.10	-26		-34		-25	\$0.25
Count	24		9		15		20		4	
<0	11		5	55.6%	6	40.0%	8	40.0%	3	75.0%
>0	12		4	44.4%	8	53.3%	11	55.0%	1	25.0%

Table 3. Comparison of the number of 1999 Harvest Information Program (HIP) certifications submitted by states with the Harvest Survey Section's estimate of hunter numbers in states having automated license systems through which the license vendors entered the answers to the HIP screening questions.

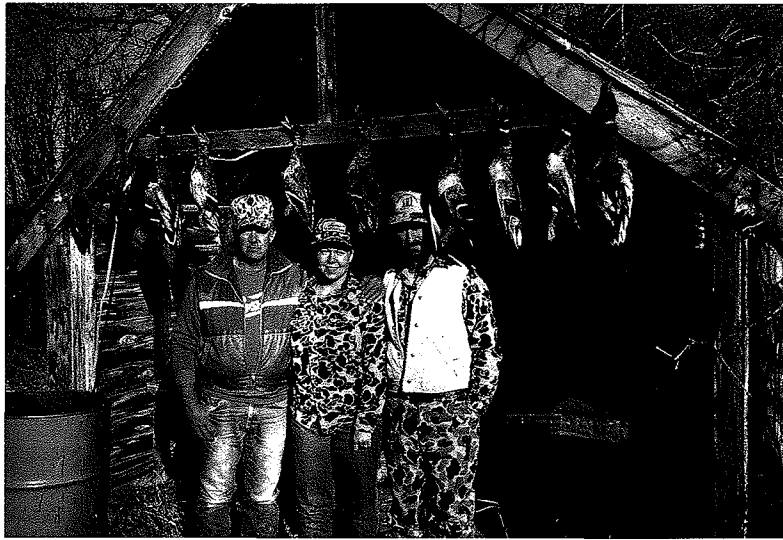
State	Percent difference	Vendor commission	Vendors with commission < \$0.20		Vendors with commission > \$0.20		License systems*
			Percent difference	Vendor commission	Percent difference	Vendor commission	
Arkansas	+47	\$0.10	+47	\$0.10			A/P/I
Florida	+2	\$0.00	+2	\$0.00			A/P/I
Georgia	+65	\$0.00	+65	\$0.00			A/P/I
Idaho	-9	\$0.75			-9	\$0.75	A/P/I
Louisiana	+3	\$0.00	+3	\$0.00			A/P/I
Maryland	+25	\$0.35			+25	\$0.35	A
Michigan	-6	\$0.00	-6	\$0.00			A/P/I
Minnesota	-20	\$0.00	-20	\$0.00			A/M/P/I
Missouri	-3	\$0.00	-3	\$0.00			A
North Carolina	+109	\$0.10	+109	\$0.10			A/P
Ohio	+86	\$0.10	+86	\$0.10			A
Oregon	+13	\$0.00	+13	\$0.00			A
Tennessee	+61	\$0.00	+61	\$0.00			A
Texas	+53	\$0.00	+53	\$0.00			A/P
Wisconsin	+48	\$0.00	+48	\$0.00			A/P
Average	+32		+35		+8	\$0.55	
SD	37.3		38.3		17	\$0.20	
Maximum	+109		+109		+25	\$0.75	
Minimum	-20		-20		-9	\$0.25	
Count	15		13		2		
<0	4	26.7%	3	23.1%	1	50.0%	
>0	11	73.3%	10	76.9%	1	50.0%	

* A= Automated M= Manual P= Phone I= Internet

Table 4. Comparison of the number of 1999 Harvest Information Program (HIP) certifications submitted by states with the Harvest Survey Section's estimate of hunter numbers in states having manual license systems through which the license vendors entered the answers to the HIP screening questions.

State	Percent difference	Vendor commission	Vendors with commission < \$0.20		Vendors with commission > \$0.20		License systems*
			Percent difference	Vendor commission	Percent difference	Vendor commission	
Arizona	-33	\$0.15	-33	\$0.15			M/P/I
California	-12	\$0.00	-12	\$0.00			M
Kentucky	-25	\$0.25			-25	\$0.25	M
Maine	+169	\$0.00	+169	\$0.00			M
Mississippi	-34	\$0.10	-34	\$0.10			M
Rhode Island	-26	\$0.00	-26	\$0.00			M
South Dakota	0	\$0.00	0	\$0.00			M
Vermont	-7	\$0.00	-7	\$0.00			M
Washington	-14	\$0.25			-14	\$0.25	M
Average	+2		+8		-20	\$0.25	
SD	60.1		66.8		5.5	\$0.00	
Maximum	+169		+169		-14	\$0.25	
Minimum	-34		-34		-25	\$0.25	
Count	9		7		2		
<0	7	77.8%	5	71.4%	2	100.0%	
>0	1	11.1%	1	14.3%	0	0.0%	

* M= Manual P= Phone I= Internet



Top: Picking shed. *Photo by David Sharp.* Bottom left: Successful goose hunt in Oregon. *Photo by Margaret Thompson Mathewson.* Bottom right: Duck hunting in flooded bottomland hardwoods in Arkansas. *Photo by J. P. Schneider.*

The Scope and Impact of Hunter Non-compliance with the Harvest Information Program

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Abstract: Hunter compliance with the harvest Information Program (HIP) requirement that all licensed migratory bird hunters must participate is critical to the program's success. Although information on hunter compliance is scarce, the available evidence suggested that HIP compliance rates among waterfowl hunters are probably >90% in most states, but compliance rates are probably lower in most states for dove and woodcock hunters. This may be because many dove and woodcock hunters do not consider those species to be migratory birds, thus they do not think the HIP requirement applies to them. We recommend that the States and the U.S. Fish and Wildlife Service take steps to improve HIP compliance rates by renewing their efforts to inform and educate all migratory bird hunters and license vendors about the HIP requirement, and by enforcing the HIP requirement.

INTRODUCTION

The primary key to the success of the Harvest Information Program (HIP) is that all licensed migratory bird hunters must participate. Hunters are required to be HIP-certified in each state in which they hunt migratory birds, but so far, it appears that compliance with this requirement is a problem in some states. Our goal was to determine the scope of hunter non-compliance and the impacts of non-compliance on HIP survey results.

Direct estimates of hunter compliance rates were available from only a few states. These estimates were based on the findings of law enforcement officers who checked migratory bird hunters in the field, or on hunter survey results. We also compared the results of various harvest surveys to get some idea of both overall compliance rates and compliance by different types of hunters. Although this was an indirect method of examining compliance rates, which required several assumptions, these comparisons may provide some guidance on where efforts to increase compliance should be concentrated.

DIRECT ESTIMATES

Nine states provided data on field checks by law enforcement officers in their responses to the recent IAFWA HIP evaluation survey. These were states in which some or all law enforcement officers were asked to keep track of how many of the migratory bird hunters that they checked in the field had the required HIP certification. These law enforcement reports suggest that overall compliance rates are high (>90%), but may be somewhat lower for dove hunters than other migratory bird hunters, at least in some states (Table 1). Note that the data from Arizona suggest that dove hunter compliance increased significantly in 2000 compared with previous years. This likely is due to the fact that in 2000, Arizona required dove hunters to purchase a separate \$3.00 permit that served as proof of HIP participation. However, so few hunters were checked for HIP certification prior to 2000 that we can not conclusively attribute the increase in compliance to the \$3.00 permit requirement.

Six states provided data on compliance from surveys of hunters, and those compliance rate estimates were generally lower than the law enforcement estimates (Table 2). However, it should be noted that the lowest compliance estimates (Illinois and Michigan) were also the most out-dated (1996 and 1997-98, respectively). We also note that the validity of survey results depends on the ability and willingness of respondents to answer accurately, which may be problematic as illustrated by the survey that the Texas Parks and Wildlife Department conducted to estimate HIP compliance rates. Results of that survey indicated that some hunters reported getting HIP-certified when they actually did not, and some said they did not get HIP-certified when the electronic licensing records showed that they actually did. Despite the potential problems with these survey results, they do seem to indicate that compliance rates are higher for waterfowl hunters than they are for dove and woodcock hunters (Table 2).

COMPARISONS OF THE 2 FEDERAL WATERFOWL HARVEST SURVEYS

We compared state-specific estimates derived from the 1999 HIP waterfowl survey and the 1999 federal duck stamp-based national waterfowl harvest survey to help get some idea of compliance by waterfowl hunters. We used estimates of active waterfowl hunters for the comparisons because those estimates are only 1 or 2 steps removed from actual counts (of HIP certifications and federal duck stamps sold, respectively) and are not likely to be significantly influenced by response bias. [We assume that hunters may forget about and/or exaggerate their harvest, but it is unlikely that they will misreport whether or not they hunted waterfowl.] The comparison of the 2 estimates was based on whether the point estimate from the duck stamp-based survey fell within the 95% confidence interval for the HIP estimate, and how precise the HIP estimate was. We assigned each state a "match" ranking based on how well the 2 estimates agreed (Table 3). It should be noted that we do not consider the duck stamp-based estimate to be "truth" in these comparisons. Recently, our ability to obtain accurate counts of duck stamps sold at the state level has deteriorated, and the duck stamp-based survey also tends to underestimate hunter numbers in states having many nonresident hunters.

The 2 estimates of active waterfowl hunters were in very close or at least fairly close agreement for 38 states ("match" ranks 1-4, see Table 3). Two of the states that were not in close agreement have many nonresident waterfowl hunters (Arkansas and North Dakota), which is why the HIP estimate was significantly greater than the duck stamp-based estimate. HIP and duck stamp-based estimates for Idaho and California, 2 more states that were not in close agreement, have agreed closely in previous years, and at this point we are not sure why there were significant differences for 1999. At least part of the discrepancy for Colorado is due to an inflated duck stamp sales figure, which resulted in the duck stamp-based survey overestimating hunter numbers for the state. Thus, these comparisons suggest that in most states, HIP compliance among waterfowl hunters is similar to their compliance with the regulation that they must have a federal duck stamp. We assume that compliance with the duck stamp requirement is very high.

COMPARISONS OF HIP AND STATE HARVEST SURVEYS

We also compared estimates of active dove and woodcock hunters derived from state harvest surveys with HIP estimates, again using "match" ranks to facilitate the comparisons. State survey estimates reported in the International Association of Fish and Wildlife Agency's HIP evaluation survey were used for these comparisons. Since we only had reliable HIP estimates for 1999, and some of the state estimates were for the 1998 hunting season, we compared estimates from 2 different years in some cases. Although this is not ideal methodology, the data available for comparisons were very limited. So, in order to get the most from the available data, we assumed that the true number of active hunters does not change much in just 1 year.

Estimates of active dove hunters matched very well to fairly well for 5 of the 17 states that provided estimates (Table 4). In all cases where the 2 estimates did not match well, the state estimate was significantly greater than the HIP estimate. Estimates of woodcock hunters matched very well to fairly well for 8 of the

13 states that provided estimates (Table 5). However, note that the “match” rank criteria for woodcock hunter estimates were much less stringent than they were for the dove and waterfowl hunter estimate comparisons, because the HIP woodcock hunter estimates were much less precise than the other HIP estimates. In all but one case where the 2 estimates of woodcock hunters did not match well, the state estimate was significantly greater than the HIP estimate.

Since the state harvest surveys utilize sampling frames, sampling rates, and survey methodologies that vary from state to state, we did not have a single, “standard” set of dove and woodcock hunter estimates to compare with HIP estimates like we did with the waterfowl hunter estimates. Furthermore, since we do not have a uniform “standard” that we know is close to “truth”, the comparisons in Tables 4 and 5 are of little use by themselves. However, we were able to make use of the estimates from states that provided both waterfowl and dove hunter estimates or both waterfowl and woodcock hunter estimates. We assumed that the degree to which state survey results reflected “truth” was the same for its estimates of duck, goose, dove, and woodcock hunters. This assumption seemed reasonable because those 4 state-specific estimates were all derived from similar survey methodology by the state, and in most cases were all derived from the same survey. Similarly, we assumed that state-specific HIP estimates of duck, goose, dove, and woodcock hunters were all equally reflective of the true number of each of those types of hunters that were HIP-certified (i.e., the number of those hunter types in the sample frame). Again, this assumption seemed reasonable because all of the HIP estimates were obtained using the same methodology.

If these assumptions are correct, then we would expect HIP estimates and state survey estimates to differ by roughly the same proportion for all types of hunters if compliance rates are the same for all types of hunters. However, if compliance rates differ among hunter types, we would expect the proportional differences between HIP and state estimates to vary among hunter types as a function of compliance rates. For example, if a state’s active duck hunter estimate is 20% higher, and its active goose hunter estimate is 30% higher, than the corresponding HIP estimates, it would suggest that compliance rates are similar for duck and goose hunters. However, if the same state’s dove hunter estimate is 150% higher than the HIP estimate (rather than somewhere around 20% or 30%), it would suggest that the HIP estimate is biased low because the HIP sample frame did not include all of the state’s dove hunters. This would imply that the compliance rate for dove hunters was lower than it was for duck and goose hunters. Since we compared point estimates without taking variances into account, we expected considerable variation among the calculated proportional differences for a state. Therefore, we only considered very large discrepancies, such as the one illustrated in the example above, to be indicative of compliance rate differences.

Comparisons based on waterfowl and dove hunter estimates for 14 states (Table 6) suggested that compliance rates of the 2 hunter types were similar in 6 states (Alabama, California, Florida, Georgia, South Dakota, and Texas), lower for dove hunters in 3 states (Arizona, Louisiana, and Virginia), probably lower for dove hunters in 3 more states (Delaware, Maryland, and Pennsylvania), and higher for dove hunters in 2 states (New Mexico and Wyoming). Comparisons of waterfowl and woodcock hunter estimates for 9 states suggested that compliance rates for those two hunter types were similar in Alabama, Louisiana, Maryland, and Minnesota, but lower for woodcock hunters in Delaware, Michigan, New York, Pennsylvania, and Virginia.

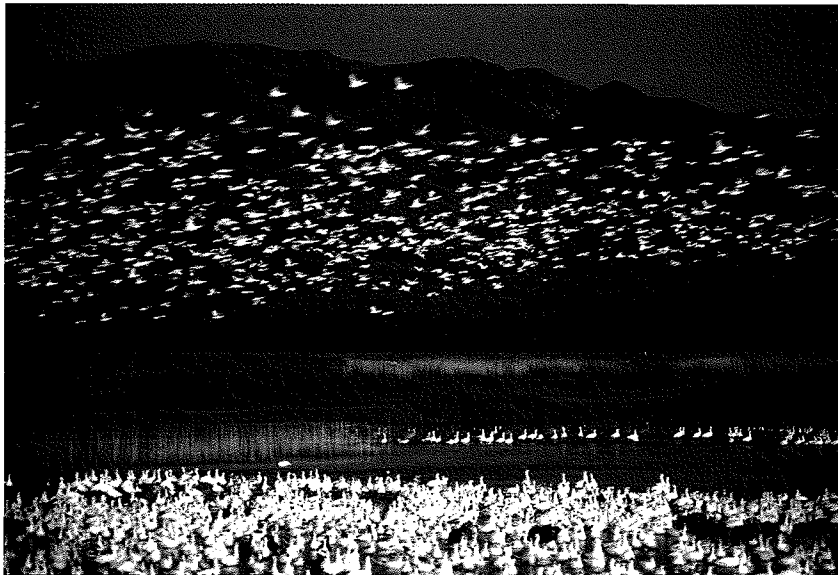
CONCLUSIONS AND RECOMMENDATIONS

The available evidence suggested that compliance rates are high (probably >90%) for waterfowl hunters in most states. This is not surprising given that most states made substantial efforts to notify migratory bird hunters of the HIP requirements, and presumably all waterfowl hunters know that waterfowl are migratory birds. However, the data also suggested that compliance rates are lower for dove and woodcock hunters. This may be due to the fact that significant numbers of dove and woodcock hunters do not know that those

species are migratory birds, thus they do not consider themselves migratory bird hunters. Information and education efforts to publicize HIP have waned in most states since they first implemented the program. As a consequence, compliance rates among migratory bird hunters other than waterfowl hunters will probably decline rather than increase over time.

Less than 100% compliance will result in HIP hunter activity and harvest estimates that are biased low. Since we do not know what compliance rates are, we do not know the magnitude of the bias at this point. The evidence suggests that compliance varies among both states and hunter types, which further complicates the problem of getting a sufficient understanding of the bias to allow reliable interpretation of the survey results. Finally, there is a high probability that compliance rates will deteriorate over time, thereby exacerbating the bias problem.

Therefore, we recommend that all states and the U.S. Fish and Wildlife Service (Service) take steps to improve compliance rates and to maintain them at a high level for all types of migratory game bird hunters. Efforts should be aimed primarily at migratory shore and upland game bird hunters, particularly dove and woodcock. They should include renewed emphasis on informing hunters about the HIP requirements and the need for HIP certification along with renewed and sustained efforts to make sure that license vendors provide HIP certification to all migratory bird hunters. These steps should also include law enforcement efforts by all states and the Service to enforce the HIP requirement on hunters in the field, because without active enforcement, high compliance rates will not be achieved and sustained. State and federal law enforcement officers should issue citations to migratory bird hunters who do not have the required HIP certification.



Snow geese at the Bosque del Apache National Wildlife Refuge, New Mexico. *Photo by David Dolton.*

Table 1. Harvest Information Program compliance rates reported by law enforcement personnel.

State	Year	Hunter type	Number of hunters checked	Percent of hunters HIP-certified
Arizona	1997	Dove	27	70%
Arizona	1999	Dove	41	71%
Arizona	2000	Dove	2,416	96%
Georgia	1998	Dove	5,697	96%
Georgia	1999	Dove	6,158	95%
Georgia	2000	Dove	9,774	97%
Pennsylvania	1999	Dove	3,711	99%
Tennessee	1996	Dove	1,000	98%
Virginia	1999	Dove	1,195	95%
Virginia	2000	Dove	1,574	90%
West Virginia	1998	Dove	114	76%
Pennsylvania	1999	Waterfowl	6,524	99%
West Virginia	1998	Waterfowl	24	92%
Pennsylvania	1999	Woodcock	199	99%
Maryland	1994-99	Migratory bird	Unknown	>95%
Minnesota	1999	Migratory bird	Few	90%
Minnesota	2000	Migratory bird	Few	99%
Pennsylvania	1999	Migratory bird	10,434	99%
Utah	1999	Migratory bird	500	97%
West Virginia	1998	Migratory bird	138	80%

Table 2. Harvest Information Program compliance rates estimated from surveys conducted by states.

State	Year	Hunter type	Percent of hunters HIP-certified
Illinois	1996	Dove	58%
Pennsylvania	1999	Dove	80%
Illinois	1996	Waterfowl	78%
Michigan	1997-98	Waterfowl	70%
Pennsylvania	1999	Waterfowl	94%
Michigan	1997-98	Woodcock	32%
Pennsylvania	1999	Woodcock	66%
Colorado	1998	Migratory bird	>90%
Colorado	1999	Migratory bird	>90%
Illinois	1996	Migratory bird	66%
Pennsylvania	1999	Migratory bird	82%
Rhode Island	1999	Migratory bird	95%
Texas	1998	Migratory bird	88%

Table 3. Number of active waterfowl hunters estimated by the 1999 Harvest Information Program (HIP) vs federal duck stamp waterfowl harvest surveys. "Match" rank 1 = point estimates overlap, HIP confidence interval (CI) <16% of HIP estimate; 2 = estimates overlap, HIP CI >15%; 3 = estimates nearly overlap, HIP CI <16%; 4 = estimates nearly overlap, HIP CI >15%, or estimates fairly close, HIP CI <16%; 5 = estimates not close, HIP CI <11%; 6 = estimates not close, HIP CI >10%.

State	HIP waterfowl survey		Duck Stamp Survey	
	Point estimate	95% CI	Point estimate	"Match" rank
Delaware	4,900	4,300 - 5,500	4,600	1
Iowa	23,900	22,700 - 25,100	24,600	1
Michigan	55,400	51,500 - 59,300	56,100	1
Missouri	30,700	26,700 - 34,700	27,700	1
Nebraska	25,000	23,000 - 27,000	26,300	1
Nevada	5,800	4,900 - 6,700	6,600	1
New Jersey	9,700	9,000 - 10,400	10,000	1
Oklahoma	17,000	14,500 - 19,600	16,600	1
Oregon	28,000	26,300 - 29,700	26,800	1
Rhode Island	1,400	1,200 - 1,600	1,300	1
Texas	107,300	95,500 - 119,100	102,500	1
Virginia	17,900	15,400 - 20,400	18,900	1
Washington	32,500	29,900 - 35,100	35,000	1
Wisconsin	86,700	81,500 - 91,900	87,100	1
Alabama	14,100	10,400 - 17,800	14,400	2
Georgia	15,100	10,900 - 19,300	17,300	2
Indiana	17,400	14,300 - 20,500	18,400	2
Maine	9,600	7,700 - 11,500	8,500	2
North Carolina	30,200	22,300 - 38,100	26,100	2
South Carolina	17,800	14,200 - 21,400	20,200	2
Vermont	2,500	1,900 - 3,200	2,900	2
Arizona	6,200	4,300 - 8,100	6,100	2
Florida	15,100	10,600 - 19,600	17,400	2
Kentucky	20,100	13,900 - 26,300	15,400	2
West Virginia	1,000	100 - 2,000	1,300	2
Alaska	6,200	5,500 - 6,900	7,400	3
Connecticut	5,300	4,800 - 5,800	4,500	3
Louisiana	87,400	82,200 - 92,600	95,600	3
New Hampshire	3,500	3,200 - 3,800	3,900	3
Pennsylvania	43,800	39,000 - 48,600	38,800	3
South Dakota	33,500	31,200 - 35,800	29,400	3
Utah	21,500	18,900 - 24,100	24,400	3
Kansas	20,500	18,000 - 23,000	15,800	4
Maryland	21,200	19,300 - 23,100	18,000	4
Mississippi	16,200	13,100 - 19,300	20,700	4
New Mexico	3,000	2,200 - 3,800	3,900	4
New York	24,000	22,600 - 25,400	28,600	4
Tennessee	21,500	16,600 - 26,400	27,200	4
Arkansas	74,500	69,300 - 79,700	53,700	5
California	49,800	46,300 - 53,300	65,500	5
Illinois	39,100	36,000 - 42,200	52,800	5
Massachusetts	3,400	3,200 - 3,600	8,000	5
Minnesota	76,200	71,600 - 80,800	120,100	5
North Dakota	42,400	40,300 - 44,500	26,500	5
Colorado	19,600	17,100 - 22,100	34,800	6
Idaho	16,400	14,600 - 18,200	20,800	6
Montana	12,500	10,600 - 14,400	18,100	6
Ohio	26,100	22,400 - 29,800	35,100	6
Wyoming	5,900	4,400 - 7,400	9,200	6

Table 4. Number of active dove hunters estimated by the 1999 Harvest Information Program (HIP) survey vs 1998 or 1999 state harvest surveys. "Match" rank 1 = point estimates overlap, HIP confidence interval (CI) <16% of HIP estimate; 2 = estimates overlap, HIP CI >15%; 3 = estimates nearly overlap, HIP CI <16%; 4 = estimates nearly overlap, HIP CI >15%, or estimates fairly close, HIP CI <16%; 5 = estimates not close, HIP CI <11%; 6 = estimates not close, HIP CI >10%.

State	HIP dove survey		State survey	
	Point estimate	95% CI	Point estimate	"Match" rank
Colorado	14,200	12,100 - 16,300	13,272	1
New Mexico	7,400	4,700 - 10,100	7,618	2
South Dakota	10,900	8,600 - 13,200	12,518	2
Wyoming	2,900	1,500 - 4,300	2,418	2
Pennsylvania	39,900	35,900 - 43,900	49,551	4
Alabama	57,300	52,700 - 61,900	73,500	5
Arizona	30,500	28,400 - 32,600	56,157	5
California	56,400	50,800 - 62,000	114,249	5
Georgia	46,900	42,200 - 51,600	109,096	5
Kansas	36,300	33,400 - 39,200	73,800	5
Oklahoma	37,200	34,200 - 40,200	69,527	5
South Carolina	37,000	33,300 - 40,700	58,701	5
Texas	297,500	282,600 - 312,400	393,352	5
Delaware	3,700	2,500 - 4,900	6,146	6
Florida	18,100	14,300 - 21,900	25,911	6
Louisiana	40,100	32,900 - 47,300	67,100	6
Maryland	5,400	3,900 - 6,900	10,957	6
Virginia	23,400	20,800 - 26,000	50,970	6

Table 5. Number of active woodcock hunters estimated by the 1999 Harvest Information Program (HIP) survey vs 1998 or 1999 state harvest surveys. "Match" rank 1 = point estimates overlap, HIP confidence interval (CI) <50% of HIP estimate; 2 = estimates overlap, HIP CI >50%; 3 = estimates nearly overlap, HIP CI <50%; 4 = estimates nearly overlap, HIP CI >50%, or estimates fairly close, HIP CI <25%; 5 = estimates not close, HIP CI <50%; 6 = estimates not close, HIP CI >50%.

State	HIP woodcock survey		State survey	
	Point estimate	95% CI	Point estimate	"Match" rank
Minnesota	14,600	9,900 - 19,300	19,200	1
Pennsylvania	14,900	8,500 - 21,300	12,212	1
Wisconsin	24,800	19,600 - 30,000	24,000	1
Louisiana	7,200	2,100 - 12,300	5,500	2
Maryland	3,400	0 - 7,600	1,148	2
Oklahoma	2,500	300 - 4,700	821	2
Texas	14,400	0 - 19,500	1,737	2
Delaware	50	0 - 150	362	4
Alabama	4,000	2,300 - 5,700	500	5
Michigan	21,600	16,200 - 27,000	53,067	5
Virginia	300	200 - 400	2,597	5
Florida	0		595	6
New York	4,600	2,300 - 6,900	11,682	6

Table 6. Percent by which the state survey estimate of hunter numbers exceeds the 1999 Harvest Information Program (HIP) survey estimate. A "<0" denotes a state survey estimate less than the HIP survey estimate.

State	Year	Hunter type			
		Duck	Goose	Dove	Woodcock
Alabama	1998	37	65	28	
California	1999	105	63	102	
Florida	1998	50		43	
Georgia	1998	170	117	133	
South Dakota	1999	8	19	15	
Texas	1999	80	13	32	
Delaware	1998	35	39	65	
Maryland	1999	72	28	104	
Pennsylvania	1999	3	<0	24	
Arizona	1999	7	8	84	
Louisiana	1999	16	9	67	
Virginia	1998	15	52	118	
New Mexico	1998	173	56	3	
Wyoming	1999	83	112	<0	
Alabama	1998	37	65		<0
Louisiana	1999	16	9		<0
Maryland	1999	72	28		<0
Minnesota	1998	77	52		32
Delaware	1998	35	39		620
Michigan	1998	15	48		146
New York	1999	47	28		154
Pennsylvania	1999	3	<0		82
Virginia	1998	15	52		766

The Role and Impact of the Large Chain Store License Vendors, such as Wal-Mart and State Wildlife Agencies, in the Overall Success or Failure of the Harvest Information Program

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Abstract: Wal-Mart and K-Mart were the 2 leading non-agency chain store license vendors. All chain stores combined sold an average of 45% of the licenses each year in each of the 26 states reporting sales by chain stores. Sixty-eight percent of the reporting states indicated that their agencies did a better job of handling Harvest Information Program (HIP) certifications than did other vendors. There were no apparent differences in the performance assessment of HIP among these other vendors. However, the assessment of all licensing responsibilities (HIP and non-HIP) indicates that Wal-Mart and K-Mart (combined) are performing at a slightly lower level. Seven recommendations are offered for improving the performance of large chain stores in order to comply with HIP.

INTRODUCTION

Central to the theme of evaluating the Harvest Information Program (HIP) is the role that large chain stores have in the success or failure of HIP. Most state wildlife agencies use vendors to sell and distribute licenses and other associated material. Historically, these vendors were very important and possibly the only link the state agency had with the sportsperson. As our society has developed and urbanized, many hunters have changed their pattern of shopping from small stores to large chain stores in urban centers.

These large chain stores have significant personnel turnover which varies from chain to chain and also from store to store. The successful implementation and continuation of a licensing or permitting process through the sporting goods departments of these stores can be a significant problem.

METHODS

States were asked to respond to 1 quantitative and 4 subjective questions in a matrix which related to major chain store license vendors in their state. For the survey, states were instructed to consider their agency to be a major chain store (Appendix A, question 51). The state wildlife agency, Wal-Mart, and K-Mart were listed specifically and slots were left blank to list up to 6 additional vendors.

RESULTS

Write the percent of all licenses sold by each chain store.

K-Mart and Wal-Mart accounted for sales of licenses in 24 and 26 states, respectively, in the survey, with 49 states reporting. Wal-Mart was the largest chain store license vendor; 12 states reported that they sold more than 25% of their licenses. K-Mart was second with 8 states reporting sales of 10% or more. One state (Mississippi) reported that Wal-Mart sold 86% of the licenses and 1 (West Virginia) reported that K-Mart sold 25%. Wal-Mart and/or K-Mart averaged 32.4% of total sales in these states. Other vendors listed include, but are not limited to, Sports Authority, Dick's Sporting Goods, Bass Pro Shops, Academy Sports,

Alco, and Rite-Aid. Data from this survey also indicate that all chain stores combined sold an average of 45% of the licenses each year in each of the 26 states.

Circle the letter that best indicates how well each chain store handles HIP; G=good, F=fair and P=poor.

As expected, 25 of 30 states indicated that their agency did a *good* job handling HIP while 5 indicated that they did a *fair* job. By contrast, states indicated that 21.2% of other vendors did a *good* job, 58.4% did a *fair* job, and 20.3% did a *poor* job. There were no apparent differences in performance assessment among the other vendors (including Wal-Mart and K-Mart).

Please circle the letters that best indicate the methods your state uses to assess each chain store's performance; A= look for suspicious patterns in data or conduct other types of audits, B=systematic monitoring by agency staff, C=incidental observations by agency staff, D=follow-up on citizen complaints and E= other.

States used various techniques to assess the performance of vendors. There were no apparent differences in these techniques among all vendors, including the agencies. *Incidental observations by agency staff* and *follow-ups on citizen complaints* were the most commonly used techniques, both employed by >60% of the states. About 30% of the states indicated that they *look for suspicious patterns in data or conduct other types of audits*, and/or that they use *systematic monitoring by agency staff* to assess vendor performance.

Circle the letter that best indicates how each chain store handles HIP compared to non-chain stores; B= better, S= same and W=worse.

As expected, most states felt that their agencies handled HIP better than non-chain stores. Twenty responded with *better*, 5 responded with *same*, and 1 responded with *worse*. However, there are some apparent differences in the responses to this question which relate to non-agency chain stores. There were no apparent differences in the responses relative to Wal-Mart and K-Mart or among the other vendors. When Wal-Mart and K-Mart were combined and compared to a grouping of the remaining vendors, it appears that states have determined that the latter grouping does a better job. Wal-Mart and K-Mart combined received ratings of 5.4% *better*, 60.7% *same*, and 33.9% *worse*. In contrast, the other chain stores combined received ratings of 11.7% *better*, 78.3% *same*, and 10% *worse*.

How well does each chain store handle other non-HIP licenses? G=good, F=fair and P=poor.

Again, agencies reported that chain stores did a good job with 24 indicating *good* and 4 indicating *fair*. Also, the responses for Wal-Mart and K-Mart were consistent, but contrasted slightly to a grouping of the other vendors. Wal-Mart and K-Mart combined had ratings of 14 (23.3%) *good*, 34 (56.7%) *fair*, and 12 (20.0%) *poor*. The other vendors combined had ratings of 19 (29.7%) *good*, 36 (56.3%) *fair*, and 9 (14.1%) *poor*. Relatively, there were more *poor* responses for the Wal-Mart/K-Mart group and more *good* responses for the other vendors combined. The *fair* response was similar for both groupings.

DISCUSSION

Chain stores have a substantial impact upon states' licensing systems. Obviously, most states feel that their licensing departments are doing a better job than other vendors. Additionally, most states feel that Wal-Mart and K-Mart are doing a poorer job in implementing HIP and other licenses or permits than other chain stores. Although the survey did not ask the state to rank the vendors, it seems from the results that there is consensus among the states that they (the Agencies) are doing the best job with HIP, other chain store vendors are next, and Wal-Mart and/or K-Mart are last.

It is not clear from the data collected in this survey whether the sheer volume of licenses sold by a vendor diminishes the success of HIP. Clearly, the high volume of HIP permits issued by large vendors such as Wal-Mart and K-Mart, when combined with significant employee turnover, may be a major deterrent to success.

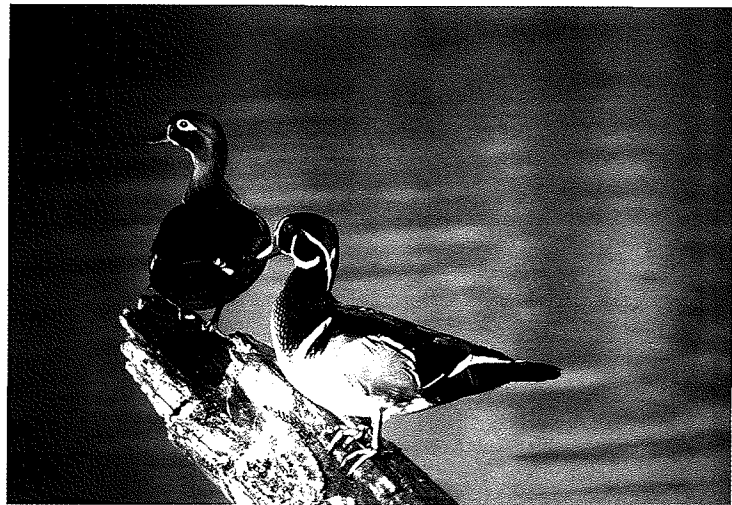
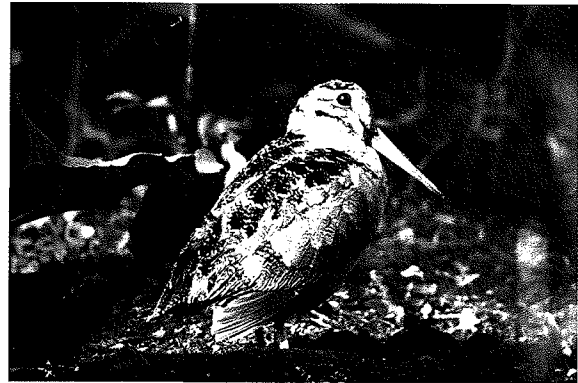
RECOMMENDATIONS

Several states made specific recommendations for improving the performance of large stores. However, they also stated that these techniques had met with mixed success in their respective states. This committee used these recommendations as the basis for developing the following:

1. Develop better monitoring techniques and criteria and take punitive or other corrective action against vendors when needed.
2. Use all available methods and techniques to train vendor personnel on a regular basis. Use of videos, telephones, and printed material is recommended.
3. Enlist the support of, and educate, upper-level management of these vendors.
4. Get a larger percentage of HIP certifications through the state wildlife agency. This can be accomplished using available telephone and Internet systems.
5. Simplify the questions on the HIP forms.
6. Educate the hunters and enlist their support in the HIP certification process.
7. Establish a nationwide telephone (800) system for all HIP certifications.



Canada goose. USFWS photo by Tim McCabe.



Top left: Band-tailed pigeon. *Photo by Worth Mathewson.* Top right: Snow goose. *Photo by David Dolton.* Middle: American woodcock. Bottom left: Common snipe. *Photos by Jack Bartholmai.* Bottom right: Wood ducks. *USFWS photo by Dave Menke.*

The Current Reliability of Harvest Information Program Surveys

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Abstract: The task group examined 4 areas of non-random error, which influence bias associated with Harvest Information Program (HIP) estimates: (1) sampling bias; (2) non-measurement bias; (3) field measurement bias; and, (4) processing bias. These sources of bias associated with HIP surveys should be reduced where possible to provide realistic harvest and hunter pressure estimates. Eliminating as many state exemptions as possible from migratory bird hunter certification lists is a high priority recommendation. Remaining exemptions should be mutually agreed upon by all states with an understanding of the impact each exemption contributes to errors in final estimates. Response rates should be greater than 85% for each HIP survey conducted within a state. Further research is needed to increase current response rates. Research is also needed to determine the impact of measurement error due to inaccuracies in respondents' answers. Additional research likely is needed to design a questionnaire that will reduce these types of measurement errors. Finally, procedures used to process surveys should be examined to determine if coding, entry, or analysis problems are impacting the accuracy of survey results.

INTRODUCTION

The Migratory Bird Harvest Information Program (HIP) provides estimates of migratory bird harvest at national and regional scales. The purpose of this cooperative effort between the states and the U. S. Fish and Wildlife Service (Service) is to provide these estimates for use in harvest management decisions for migratory game birds. Due to the importance of these data in the regulatory process, it is necessary that these estimates be reliable and precise. In other words, a thorough understanding of the biases and their magnitude is important in judging the degree of reliance that can be placed on these estimates when used in the decision process.

Sources of bias that influence the reliability of HIP surveys are called non-sampling (Lessler and Kalsbeek 1992) or non-random error. Non-random error is often called errors of measurement or bias, and is quantified by the distance that the estimate is from its true population value. This distance is not influenced by sampling error, which is the uncertainty due to measuring only a small portion of the population. Sampling error is usually measured by the variance of the estimate. Sampling error, i.e., the variance of the estimate, added to the square of the bias provides a useful measure for judging the accuracy of an estimator. This combined measure is known as the mean square error of the estimate (Cochran 1977:15).

Fortunately, sampling error can be measured as each survey is conducted. Non-random error, however, cannot be measured through a direct approach. Non-random error must be evaluated through examination of procedures, auxiliary survey research, independent research into specific sources of non-random error, and critiquing the survey with an intuitive checklist of non-random error sources. The expense of thoroughly evaluating non-random error can often exceed the cost of the original survey, but the costs are usually worthwhile given the importance of the estimates and their use. However, non-random error may be larger and can contribute more to total survey error than sampling error (Fern Filion, pers. commun.). Therefore, non-random error is much more difficult to measure, but may affect applicability of survey results to a greater extent than sampling error.

Like all surveys, the HIP survey is affected by non-random error. If managers ignore non-random error in HIP results, their decisions concerning migratory game bird hunting can be greatly impacted. Bird populations may be negatively impacted through a too-liberal regulation, or hunters may be adversely impacted by restrictive regulation packages due to biases associated with harvest estimates. In either case, understanding the potential survey bias may prevent migratory bird populations and/or hunters from being adversely impacted by imprecise and inaccurate harvest estimates derived from HIP surveys.

Our goal was to explore different sources of non-random error and to make recommendations concerning the impacts of bias on estimates of harvest, hunter numbers and hunter pressure.

METHODS

We used information from a survey of HIP-cooperator states that the International Association of Fish and Wildlife Agencies (IAFWA) conducted in late 2000. This survey was conducted so that the Ad Hoc Committee on HIP could determine states' views concerning the HIP effort. In our analyses, we carefully examined questions concerning sources of bias in HIP surveys.

We also used a model of total survey error developed by Sheriff and Fillion (Fig. 1) as a tool for addressing non-random error. The 4 elements of non-random error are: (1) sampling biases; (2) non-measurement biases; (3) field measurement biases; and, (4) processing results (Groves 1989; Lessler and Kalsbeek 1992). Each of these sources of non-random error affects results by causing the estimate to be either higher or lower than the true value. Even though these sources act independently upon the resulting estimate and the interpretation of results, they may be multiplicative and additive in terms of their impact upon total non-random error within survey results. An enormous challenge exists in obtaining measurable estimates of bias. We explored each source of bias through results of a survey of states involved in HIP, results from on-going HIP surveys, and through an intuitive approach based on literature. The topics explored for each source of non-random error are as follows:

1. Sampling Biases

- Inclusion of non-migratory bird hunters in the sampling frame
- Failure to identify hunter properly in sampling frame
 - Incomplete address
 - Improper response to stratification questions
 - Out-of-date addresses
- Failure to identify all units
 - Identification of hunters who have valid HIP certificates in field, but do not appear in list
 - Identification of exempt hunters
- Multiplicity of names and addresses within the sampling frame

2. Non-measurement Biases

- Non-response to questionnaire
 - Undeliverable questionnaires
 - Delivered, but sampled person does not respond
 - Able to respond
 - Unable to respond (e.g., health reasons, death, etc.)
 - Unwilling to respond
 - Completed but not received by the U.S. Fish and Wildlife Service
- Item non-response to individual questions

3. Field Measurement Biases

- Telescoping of responses from other hunts outside of state of interest
- Telescoping of responses from previous year's hunts
- Duplicity of hunter information in response
- Omission of information from hunts of interest
- Misinterpretation of questionnaire instructions
- Questionnaire design issues, such as readability, length, flow, etc.

4. Processing Results

- Data capture errors in transcription
- Improper analysis
- Improper interpretation of results

By no means is this list exhaustive. These items only represent the most common and important sources of bias. We believe they are also the most influential in the successful implementation of HIP surveys and using HIP results.

RESULTS

Ideal Scenario

Ideally, the sampling frame from each state would include everyone who hunts migratory game birds within the state, and each of these hunters would truthfully answer each of the screening questions at the time that they register for HIP. No one would appear in the state's sampling frame more than once, and the names and addresses would be correct and useable. Upon being randomly selected, hunters would receive HIP questionnaires prior to their first hunting trip. At the conclusion of each hunting trip, selected hunters would correctly record the place that they hunted and the number of birds harvested. At the conclusion of the survey period, hunters would promptly summarize and return their questionnaires to the Service. The postal system would properly deliver all questionnaires from the hunters. The questionnaires would be correctly coded and entered into the database to be analyzed. All analyses would be done correctly under the assumptions of the sampling technique used. The results from these analyses would provide unbiased estimates of the number of migratory game birds harvested and hunting pressure. The sampling error or precision of these estimates would also be provided so that the users could judge the quality of the results. This ideal case would produce estimates with no non-random error or bias, and likely will never exist.

In the real world, problems include such things as defects in sampling frames provided by each state, non-measurement error due to differential non-response, biases in the information provided by the hunters, and processing errors associated with transcription and analysis of data. Also, errors in interpreting HIP results can be further confounded by using this uncertain harvest information during the decision process as if it were unbiased.

Results from the state survey conducted by IAFWA showed that 2-4 states believe that harvest estimates were "very distant" from "reality" depending upon species, while 4-5 states believe that estimates of hunter numbers and days of hunting were "very distant" (Table 1). Surprisingly, most states indicated that for commonly hunted species, such as ducks, geese, doves and woodcock, results were perceived to be "very close" or "close" to "reality." For species that do not have a large hunter constituency, e.g., snipe, coots, and rails, we would expect HIP results to be less precise and possibly have a higher degree of bias associated with them. However, a number of states indicated that for these lesser hunted species results were at least "close" to perceived reality. Yet, most states that provided an opinion for these species indicated results were

“distant” or “very distant” from reality. This dichotomy might be expected due to narrow interest in these lesser hunted species, and knowledge about hunting activities for these species probably is not well developed at the state or the national level. Overall, however, these results show that states have a mixture of opinions concerning the amount of bias associated with HIP results. HIP appears to be providing harvest, hunter number, and days hunted information that is generally unbiased according to the perception of most states.

Sampling Biases

The sampling frame is the foundation of any survey (Lessler and Kalsbeek 1992), and sampling bias occurs due to problems associated with this frame. The sampling frame consists of the finite population about which we wish to make some inference. In the case of HIP, the finite population would consist ideally of all migratory game bird hunters. Problems in the sampling frame can cause survey results to overestimate or underestimate the true values of the target population. Typical problems include non-target individuals, multiplicity of the same individual, omission of individuals, and improper information concerning those included in the sampling frame.

The HIP sampling frame consists of 49 separate lists of hunters. Each of the 49 participating states submits a list of migratory game bird hunters from their state. Therefore, sampling frame errors cause bias to be differential among HIP survey results due to the 49 individual state sampling frames. Fortunately, the sources of survey error have common components that can be evaluated as a whole for HIP, but each state in turn must seriously address those components that affect the quality of their sampling frame submitted to the Service.

Failure to Identify All Migratory Bird Hunters in the Sampling Frame

Sources of Problem.— Sources of error associated with not including all migratory game bird hunters within a state’s sampling frame include:

- Hunters exempt from inclusion in sampling frame
- Hunters failing to become certified
- Failure to capture hunter information even though hunter submits to certification process.

These sources of error cause estimates to be lower than they should be due to exclusion of some individuals from the sampling frame.

Survey Results.— Forty-one states allow licensing exemptions for certain classes of migratory bird hunters (Table 2). Of these, 32 states allow an exemption from HIP certification for certain classes of migratory bird hunters. Only 8 states indicated that they had no exemptions from state or HIP requirements concerning licensing or HIP certification.

“Juniors” or youth hunters were the most common HIP certification exemption (24 states). The age varied from 12-16 with 6 states not reporting an age. Age 16 was the most common reported limit with 13 states indicating that they allow HIP exemption below this age.

The next most common exemption allowed from HIP certification was “landowners hunting on their own land”. Eighteen states allow this exemption (Table 2). This category was followed by “seniors” with 12 states indicating that they exempt this group from HIP certification (Table 2). The age range for “seniors” provided by 8 of these states was 59-69 years old. The most common category was “above age 64” with only 1 state reporting lower than this age. These exempt categories were followed by exemptions for HIP certification for “disabled veterans” (9 states), “persons with disabilities” (7 states),

“other” (7 states), and 1 state reporting an exemption for “other landowners” (Table 2). Under the “other” category, the exemptions from HIP certification included “resident military leave” (3 states), “low income,” “descendants hunting on family farm,” “tenant farmers and family,” “family members residing on farmland,” and “legally defined Native American Kansas residents” (1 state reporting for each of these categories).

We also attempted to examine the issue of migratory bird hunters who were not exempt but failed to be HIP certified. Techniques used to estimate these values included:

- Comparisons with stamp sales (3 states)
- Comparisons with certified purchases (2 states)
- Survey of licensed hunters (not just HIP certified hunters) (2 states)
- Survey of certified HIP hunters (2 states)
- Survey of all hunters, including exempt hunters (1 state)
- General population survey (1 state)
- Law enforcement field contacts (1 state)
- Field check of dove hunters for compliance (1 state)

The range of compliance by species varied from:

- Waterfowl (70-100% for 8 states reporting)
- Doves (58-100% for 6 states reporting)
- Woodcock (32-100% for 4 states reporting)
- Rails (100% for 2 states reporting)
- All migratory bird hunters (66-100% for 10 states reporting)

Eight states using field checks of migratory bird hunters showed the range of compliance to be variable. For doves, it ranged from 70-99% and waterfowl ranged from 92-99% compliance.

Recommendations.— Because the sampling frame is the foundation of any survey, exemptions of some hunter groups from the target population within the sampling frame can have a profound impact on the estimates and their usefulness in the decision process. Any group that is exempted from HIP certification causes an underestimate in the total harvest, days afield and active hunter results. Having a consistent exemption among states, e.g. youth hunters, and having all states conform to this exemption allows for a consistent comparison of results among states and interpretation on a national or regional scale. It is recommended that states which allow more than the youth exemption from HIP certification work to eliminate these other exemptions as soon as possible.

All states should also work toward a 100% inclusion of their non-exempt migratory bird hunters in their HIP lists. Migratory bird hunters who are missing from HIP lists cause results to be underestimated.

Failure to Identify Hunters Properly in Sampling Frame

Sources of Problem.— One problem that can occur during the HIP certification process is that a migratory bird hunter may submit his/her information to be HIP-certified but his/her name and address is either unknown or not included in the sampling frame. This can be due to mechanical failures in the certification process that incorrectly registers the name and address of the hunter or even fails in capturing the name and address altogether. These reporting failures may be due to problems with vendor, data processing problems, etc.

Survey Results.— The IAFWA’s survey of states did not directly address this problem. We, however, explored responses concerning the proportion of states that verify the names and addresses. Thirteen

states (27%) indicated they verify the names and addresses at the time a hunter certifies with HIP. A like number of states also link HIP hunters with name and address information in a separate database. Only 2 states had penalties for vendors who HIP-certify hunters but fail to send in HIP data, and only 1 of these states thought that penalties improved compliance even though neither state has assessed a penalty.

Recommendations.— States need to develop systems that will ensure that everyone is included in the sampling frame. Methods, such as cross-verifying sales with records in the HIP sampling frame, should be used to monitor this process. States need to build processes that will ensure names and addresses of those reported HIP-certified are included in the sampling frame. If names and addresses of HIP-certified individuals can not be determined for a small proportion of the frame, then these numbers should be reported to the Service. Although this recommendation focuses only on a few names and addresses of HIP-certified hunters, states should strive to obtain all the names and addresses for everyone HIP-certified.

Inclusion of Non-migratory Bird Hunters in the Sampling Frame

Sources of Problem.— The inclusion of non-migratory bird hunters as being HIP certified does not necessarily bias the estimates of total harvest, days afield and active hunter participation. This problem, however, impacts the survey efficiency through the measure of precision. In the case of HIP, responding hunters can be easily identified by particular migratory species. This information can be used to derive an unbiased estimate (Lessler and Kalsbeek 1992).

This issue was not quantitatively addressed in the survey of states, but 14 states thought the problem would impact the accuracy of estimates obtained from HIP data either highly or moderately (Table 3).

Recommendations.— People who have no intention of migratory bird hunting during any year should not be included in a state's HIP sampling frame, because their inclusion is costly both for the states and the Service. States should develop processes that would not HIP-certify these people. The purchase of a migratory bird hunter's permit has proven effective in eliminating many non-migratory bird hunters or the general public from being included in HIP sampling frames. When non-migratory bird hunters are included in the lists, there is a higher survey cost due to the increased number of questionnaires that must be mailed and processed to maintain the desired level of precision for the estimates (Groves 1989). It also creates hunter dissatisfaction when they receive surveys for some activity in which they do not participate which in turn potentially impacts long-term response rates.

Multiplicity of Names and Addresses within the Sampling Frame

Sources of Problem.— Multiplicity occurs when the same person appears in the sampling frame more than once. In terms of HIP, we expect multiplicity to occur among frames submitted by the states, because migratory game bird hunters often hunt in more than 1 state. HIP surveys were designed to accommodate multiplicity among frames. Multiplicity becomes a problem when within a state an individual is included in the state's HIP certification information more than once. The effect of multiplicity in this case is to overestimate the total harvest, days afield, and number of active hunters. Unfortunately, not much information exists concerning multiplicity in individual state HIP information.

Recommendations.— Individual state HIP sampling frames should be examined for multiplicity to determine the degree of this problem. If the problem is found to exist, states should take action to develop processes that eliminate duplicates from their HIP sampling frame before submitting it to the Service.

Non-measurement Biases

Non-measurement bias occurs most commonly when selected individuals in the sample do not respond to the questionnaire or to an item within the survey. The impact that this source of bias has upon results can be especially acute when differential rates of response occur based upon some key attribute within the sample. For example, if individuals with high success rates are more likely to respond than those that did not hunt or were unsuccessful, harvest estimates would tend to be higher than the true value. What begins as a representative sample from the sampling frame will not be representative through this self-selection method of respondents (Filion 1980).

Non-response to the Questionnaire

Sources of Problem.— Two sources of non-response to the questionnaire exist; either the postal system did not deliver the questionnaire or the sampled individual chose not to respond. For the first part of the problem, the postal system returns a number of questionnaires that are not deliverable (Table 4). The response rate of those that are believed to be delivered varies by state (Table 4).

For the surveys conducted in 1999, response rates were highest for woodcock (Table 4). Response rates for woodcock varied by state from 31-88% with a national estimate of 60% for the 35 states involved. Undeliverable rates varied from 0% to 37% with a national estimate of 7%. For the 37 states involved in the 1999 dove survey, the response rates varied from nearly 39-80% with a national estimate of 56%. Undeliverable rates for doves varied from 0% to nearly 47% with a national estimate of 8%. For the 1999 waterfowl and coot surveys, the top ends of their response rates were somewhat lower than the other 2 surveys. Response rates varied across the 49 states from nearly 36-74% for waterfowl and 35-75% for coots. Their national estimates for response rates were 52% for waterfowl and 56% for coots. However, ranges for undeliverable rates were similar to woodcock and doves in that for waterfowl it varied from 2-42% (estimate at the national scale for the 49 states was 8%) and 0-37% for coots (national estimate of 8%).

The HIP surveys use 4 different mailing waves to contact selected hunters and those who do not respond to the survey. These waves follow the Dillman (1978) method, and consist of an initial mailing of the questionnaire, a postcard reminder at the end of the particular hunting season, a follow-up reminder including a new questionnaire to non-respondents, and from those who do not respond to this follow-up questionnaire a group is selected to receive a certified letter containing a fresh questionnaire. These mailing waves have been found to increase response rate.

Recommendations.— A goal of at least an 85% response rate to minimize the impact of non-response should be established for HIP surveys. At this level of response, bias in estimates is often influenced more by other sources of non-random error than through differential values between respondents and non-respondents. This target is not being achieved, except for the 1999 woodcock survey (Massachusetts had a response rate of 88%). For the HIP surveys, very few states have response rates that were greater than 70% (e.g. - 7 of 37 states for 1999 dove survey were greater than 70%, 1 of 49 for the waterfowl surveys, 6 of 35 for the woodcock survey, and 6 of 49 for the coots survey). Therefore, it is recommended that additional procedures be explored that would push the response rate towards the 85% target. Dillman (2000) recommends that a letter be sent to the selected individuals prior to the questionnaire, in this case the record form, being mailed. The questionnaire is then sent about a week later followed by a postcard reminder and "thank you" about a week after the questionnaire is mailed. This system might be modified slightly in order to increase response rates. Dillman (2000) also suggests incentives and other methods for increasing the response rate, which might be considered for the HIP surveys.

Model-based methods using both Bayesian and traditional techniques should be explored to estimate the impacts of non-response upon the design-based estimates for total harvest, days afield and active hunters. Filion (1980) illustrated a method using information from each follow-up wave to extrapolate values at the 100% response level. Lessler and Kalsbeek (1992) reviewed several other procedures. An overview of a Bayesian model-based approach was also provided by Lessler and Kalsbeek (1992). Land and McCall (1993) used a Bayesian approach to estimate the effects of nonignorable non-response. With the development of Markov Chain Monte Carlo (MCMC) approaches in the Bayesian environment (Gilks et al. 1996), there is much promise in using Bayesian hierarchical models to address the non-response issue. Further research into these model-based approaches should be conducted with emphasis on correcting the impact of non-response.

Item Non-response to Individual Questions

Sources of Problem.— When a respondent skips an item within the questionnaire, this can contribute to bias in the results. We did not have quantified information from past HIP surveys that addressed this issue. Therefore, we do not know how serious this issue might be and its impact upon HIP results.

Recommendations.— A number of techniques exist for aiding in the elimination of non-random error when item non-response occurs. Lessler and Kalsbeek (1992) review a broad number of these techniques. The most common and acceptable method for dealing with item non-response is to use imputation to fit a replacement for the non-response. Imputation techniques usually implement a model-based approach or classification method. Techniques such as hot-decking (Cox 1980) have been popular in solving this type of problem for other surveys. However, with the advent of MCMC approaches further research in this area may be beneficial in reducing item non-response errors in HIP surveys.

We also recommend that data be kept and analyzed concerning item non-response rates. This information should be examined closely to determine the degree that item non-response impacts HIP results.

Field Measurement Biases

Field measurement biases occur when respondents provide incorrect information. The respondent may or may not intentionally provide data that are incorrect. Field measurement biases are called recall bias, memory bias, or brag bias. These biases can cause estimates to be either higher or lower than the true population values depending upon the degree and direction taken by respondents. Evidence from other game harvest surveys indicates that hunter survey results tend to overestimate the harvest, and that reported harvest from surveys is spread more evenly throughout the season than actually occurs (Filion 1980).

Sources of Problem.— A number of reasons may exist for a respondent not providing truthful information. A common occurrence is for the respondent to “telescope” events outside of the spatial-temporal frame of the survey. In these cases, the hunter might include information from previous years’ hunts or from hunting trips outside of the state. Also, hunters may include the party hunting results instead of their own personal hunting results in an attempt to be helpful. Hunters may also omit hunting trips and harvest. They may be very conscientious at the start of the migratory bird season in recording their hunting trip information, but they forget to record later trips. For those hunters who do not complete the record card after each hunt but are requested to summarize their season through one of the follow-up questionnaires duplicity may be an additional source of measurement error. This occurs when hunters remember an event from one hunt (e.g. - shooting 3 birds) as having occurred on more than 1 occasion, in effect duplicating the event and report over harvest and/or days afield. Duplication, omissions, and telescoping all contribute to the problems of field measurement biases.

Beyond the hunter response, the questionnaire itself can contribute to the hunter's inability to supply correct information. Misinterpretation of questionnaire instructions, or length and complexity of the questionnaire can contribute to the hunter's failure to complete the survey.

Recommendations.— Fortunately, HIP survey questionnaires are designed as a diary or record book of hunting activity. This design helps minimize the bias associated with telescoping, omitting, or duplicating hunting trip information if the data for each hunt are completed immediately following the trip. However, this does not prevent a hunter from procrastinating and telescoping, omitting, or duplicating information if the diary is completed at a much later date than the hunt or some time following the season. We recommend that research be conducted to determine the amount of bias contributed due to the diary and how hunters are completing it. This process could follow similar work done by Atwood (1956) and Wright (1978). Wright (1978:253) provides a model of sources of non-measurement and field measurement biases. With information about the amount of field measurement biases, further research into questionnaire design and methodology should be conducted to optimize the survey package to achieve an objective for minimizing field measurement biases at a reasonable cost.

Beyond researching the field measurement biases problem, states should immediately review their processes used to supply the Service with names and addresses of HIP-certified migratory bird hunters. The time between HIP certification and the mailing of diaries to selected hunters should be reduced to no more than a week. All names and addresses acquired 4 weeks before a migratory bird hunting season within a state should be delivered to the Service at least 3 weeks prior to the hunting season at a minimum. This will provide the Service time to select hunters and mail diaries, ensuring that hunters will have them available at the start of the season.

Processing Results

Sources of Problem.— Processing of returned questionnaires can also be an opportunity for biases to impact survey results. The act of coding, data entry, and analysis are usual sources of this type of bias in harvest estimates. Even the act of interpretation and reporting of estimates can be a source of bias.

Recommendations.— A close audit of the processing of returned survey questionnaires should be undertaken to determine if improvements could be made concerning the coding and data entry of questionnaire information into electronic form. Tests of this system could be easily done using a separate survey. Questionnaires from this separate survey would be reviewed by an audit team for completeness and "correct" answers. Then these questionnaires would be randomly injected into the normal processing of HIP surveys. Once the electronic information was made available, these data would be compared with the audit data to determine the error rates in this process.

Survey data do not always follow a symmetric distribution; thus, normal confidence intervals can be inadequate. We recommend that other techniques, such as a bootstrap approach (Shao and Tu 1995; Manly 1997) or a Bayesian approach using Gibbs sampling (Gilks et al. 1996; Manly 1997), should be explored to account for this asymmetry in the confidence intervals. At the very least, the amount of asymmetry in the HIP data should be measured to determine if it is sufficient to warrant further attention.

A survey of users of HIP results should also be considered. This survey would be more of a marketing survey to determine how these results are used and customer satisfaction concerning the presentation of results. Within this survey, questions concerning timing of results availability, level of precision for estimates and media in which results are presented should be covered.

Impressions about Bias in HIP Surveys

States were asked their opinions concerning how different sources of bias affect the accuracy of estimates obtained from HIP data. States were not consistent in how they viewed the full range of sources of bias (Table 3). States generally believed that issues associated with the sampling frame composition and memory biases had the most impact upon the accuracy of the estimates. Those sources of bias associated with processing data and results were viewed by states as having the least impact upon the HIP data. None of the 10 categories were viewed by all states as being of low impact. Therefore, some states do view all 10 sources of bias categories as having a high or medium impact upon HIP results. Given this stance, the HIP survey process can be improved or should be studied to determine degrees that each of these sources of bias impacts the results of HIP.

GENERAL RECOMMENDATIONS

This task group also had several general recommendations concerning the HIP survey efforts. We would strongly recommend that as changes are made to survey design research be conducted to determine the magnitude of the changes upon the results. To maintain a set of data that could be used as a trend indicator, consistency of bias through time must be maintained or measured. To determine if the bias is consistent, additional research, which is often more expensive than conducting the operational HIP surveys, should be conducted over a number of years to ensure that current estimates are correlated with truth.

An additional amount of funding should be supplied to HIP to support research that would address many of the recommendations and issues presented in this report. We recommend that an additional \$150,000 or more be appropriated or allocated on an annual basis for at least the next 10 years to support research that would improve the HIP survey efforts. Much of this research would probably need to be contracted to institutions that have a strong record of addressing non-random error issues in surveys.

We also highly recommend that states try to maintain a current address list with the fewest number of exempt hunters in their HIP information that is delivered to the Service. The sampling frame is the foundation of the HIP surveys. Without this solid foundation, HIP cannot provide sound results that can aid in migratory bird management. Therefore, it is imperative that each state individually and all states as a group continue to improve their efforts in obtaining the highest quality sampling frames for the HIP survey efforts.

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Top: White-winged dove. *Photo by Roy Tomlinson.* Bottom: White-winged dove hunter in south Texas. *Photo by David Dolton.*

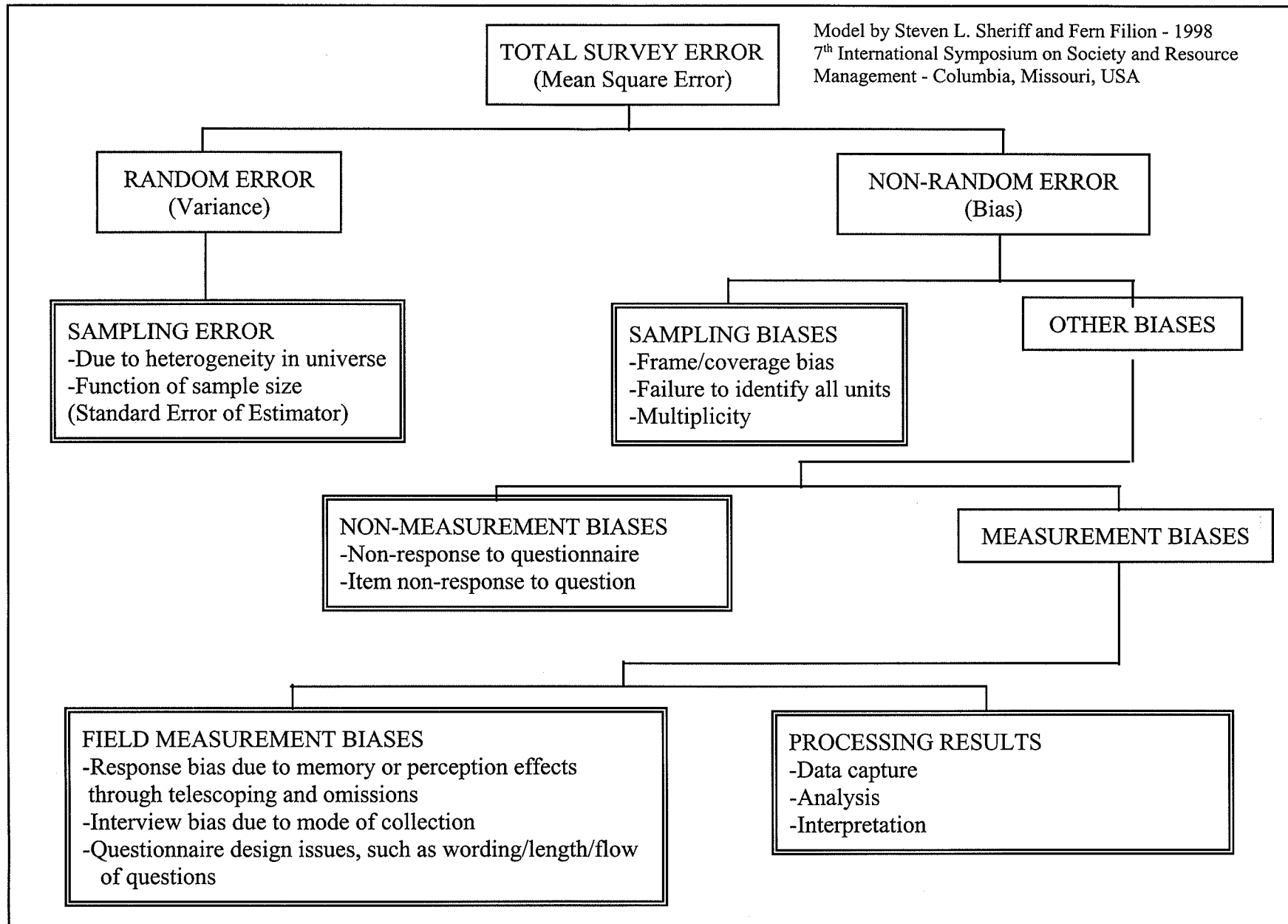


Fig. 1. Model of total survey error (Steven L. Sheriff and Fern Filion, pers. commun.).

Table 1. Frequency of states indicating the distance they thought Harvest information Program results were from "reality" for estimates of harvest, hunter numbers, and days hunted.

Species	Very close	Close	Distant	Very distant	Don't know	No response
Harvest Estimates						
Ducks	2	18	8	2	16	3
Geese	2	15	10	4	15	3
Doves	0	10	7	4	17	11
Woodcock	0	9	3	4	25	8
Snipe	0	4	6	4	30	5
Coots	0	5	4	5	30	5
Rails	0	5	4	3	29	8
Estimates of Hunter Numbers						
Ducks	4	17	5	4	15	4
Geese	4	16	6	5	14	4
Doves	0	8	9	4	17	11
Woodcock	1	9	5	4	21	9
Snipe	0	2	7	5	30	5
Coots	0	4	5	5	29	6
Rails	0	3	5	4	28	9
Estimates of Days Hunted						
Ducks	2	15	7	4	17	4
Geese	3	14	5	6	17	4
Doves	0	9	7	4	18	10
Woodcock	1	7	4	5	24	8
Snipe	1	2	5	5	31	5
Coots	1	3	3	5	31	6
Rails	1	3	3	4	29	9



American wigeon.

Table 2. Migratory bird hunters who are exempt from having a state hunting permit (S) and those exempt from the Harvest Information Program (HIP) certification process (H) according to 2000 HIP Survey results.

State	Seniors	Juniors	Landowners	Other landowners	Veterans	Disabled veterans	Persons with disabilities	Other
Alabama	S H	S H	S	--	--	--	--	--
Alaska	S H	S H	--	--	--	S H	S H	S H
Arizona	--	S H	--	--	--	--	--	--
Arkansas	S	S H	--	--	--	--	--	S
California	--	--	--	--	--	--	--	--
Colorado	--	--	--	--	--	--	--	--
Connecticut	S	--	S H	--	--	--	--	S H
Delaware	S H	S H	S H	--	--	S H	--	--
Florida	S H	S H	--	--	--	S H	S H	S H
Georgia	S H	S H	S H	--	--	H	H	--
Idaho	--	--	--	--	--	--	--	--
Illinois	--	--	S H	--	--	S H	S H	S H
Indiana	--	--	S	--	--	--	--	--
Iowa	--	S H	--	--	--	--	--	--
Kansas	S H	S H	S H	--	--	--	--	S
Kentucky	H	H	S H	--	--	- H	H	S H
Louisiana	S	S H	--	--	--	--	--	--
Maine	S H	--	S H	--	--	H	H	H
Maryland	--	--	S	--	--	--	--	S
Massachusetts	--	--	S	--	--	--	--	--
Michigan	--	--	S H	--	--	--	--	--
Minnesota	--	S H	S H	--	--	--	--	S H
Mississippi	S	S	S	--	--	--	S	--
Missouri	S	S H	S	--	--	--	--	--
Montana	S	S	--	--	--	--	S	--
Nebraska	S	S H	--	--	S	S	--	--
Nevada	--	S H	--	--	--	--	--	--
New Hampshire	S H	S H	S H	--	--	--	--	--
New Jersey	--	S H	--	--	--	--	--	S
New Mexico	--	--	--	--	--	--	--	--
New York	--	--	S -	--	--	S	--	--
North Carolina	--	S H	S H	--	--	--	--	--
North Dakota	--	S	S	--	--	--	--	--
Ohio	--	--	S H	--	--	S H	--	--
Oklahoma	S H	S H	S H	--	--	S	--	--
Oregon	--	S	S	--	--	--	--	--
Pennsylvania	--	--	S H	--	--	--	--	--
Rhode Island	--	S H	S	S	--	--	--	--
South Carolina	S	S H	--	--	--	S	S	--
South Dakota	--	--	S H	--	--	S	S	--
Tennessee	H	S H	S H	S H	--	S H	S H	--
Texas	--	--	--	--	--	S	--	--
Utah	--	--	--	--	--	--	--	--
Vermont	--	--	S H	--	--	--	--	--
Virginia	--	S	S	--	--	--	--	--
Washington	--	--	--	--	--	--	--	--
West Virginia	S H	S H	S H	--	--	S	--	--
Wisconsin*	S	S	--	--	--	--	--	--
Wyoming	S	S H	--	--	--	--	--	--

* Some seniors and juniors are exempt from state permit requirements.

Table 3. State response summary by category for question in the Harvest Information Program (HIP) Survey stating: "Please indicate how much your state believes the following sources of bias affect the accuracy of estimates obtained from HIP data."

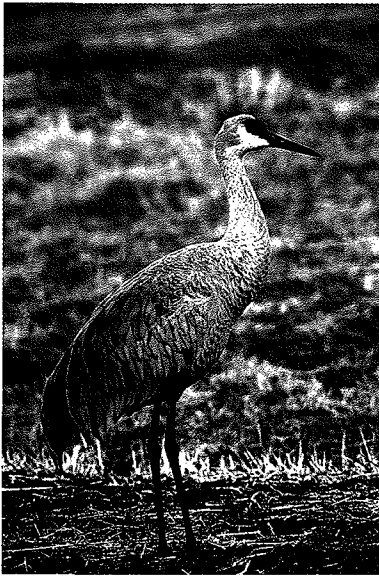
Category	High impact	Medium impact	Low impact	Don't know	No response
Not having all names and addresses in the sampling frame due to exempt hunters	2	5	34	7	0
Not having all names and addresses in the sampling frame due to people not registering even though they are not exempt	5	11	22	10	1
sampling frame due to HIP certification processing problems	2	9	27	9	2
Not having correct screening information due to agent issues	5	12	22	7	3
Including people in the sampling frame that do not intend to hunt migratory birds	4	10	30	5	0
Memory bias of survey respondents selected by the U.S. Fish and Wildlife Service	2	10	16	14	0
Service mailings and follow-ups by selected persons	2	7	13	27	0
Errors in coding and data entry	2	2	24	24	0
Inaccuracies in analysis or inappropriate analyses	1	4	20	24	0
Misinterpretation of results or definitions	2	2	22	22	1
Other sources (these included USFWS scanning process, not including spring snow goose harvest, sample size, and hunters and vendors not understanding screening questions.	2	3	1	9	34

Table 4. Sample size, undeliverable rate (UNDEL. RATE), and response rate (RESP. RATE) for 1999 Harvest Information Program surveys of doves, waterfowl, woodcock, and coots. The UNDEL. RATE for each survey reflects the percent of the sample that was returned by the postal services as not deliverable or addresses unknown. The RESP. RATE is the percent of the sample that was delivered by the postal service that was completed and returned by individuals within the sample.

State	Dove sample	Dove UNDEL. rate	Dove RESP. RATE	Waterfowl sample	Waterfowl UNDEL. RATE	Waterfowl RESP. RATE	Woodcock sample	Woodcock UNDEL. RATE	Woodcock RESP. RATE	Coot sample	Coot UNDEL. RATE	Coot RESP. RATE
Alabama	1410	4.2	45.5	911	4.9	44.5	982	6.1	54.1	838	4.8	51
Alaska	-	-	-	470	2.6	52.8	-	-	-	65	0	70.8
Arizona	829	3.1	58.7	616	5	50.8	-	-	-	217	6	59.3
Arkansas	2283	9	50.5	3104	9.9	47.4	502	11.8	49.2	634	13.1	52.1
California	1981	5.1	56	2559	5.5	51.2	-	-	-	530	7	59.8
Colorado	689	8.3	70.6	682	10.6	61.8	-	-	-	178	12.9	61.3
Connecticut	-	-	-	284	3.5	69.7	56	5.4	71.7	29	3.4	75
Delaware	259	10.8	51.9	709	10.4	52.4	36	8.3	42.4	149	13.4	59.7
Florida	1375	46.8	51.2	1057	42.2	41.6	177	37.3	55	1052	36.9	52
Georgia	1973	11.2	46.6	1080	9.9	36	282	10.3	50.6	263	10.6	49.4
Idaho	576	6.8	70.2	759	6.2	61	-	-	-	67	7.5	59.7
Illinois	1048	7.2	69.1	1151	6.3	57.5	206	7.3	60.2	181	9.4	59.8
Indiana	610	9.2	62.6	565	7.4	53.3	160	4.4	64.7	119	5.9	57.1
Iowa	-	-	-	941	8.3	59	272	4	75.1	181	5.5	65.5
Kansas	1322	3.6	67.4	1166	6	59.8	137	4.4	72.5	330	5.8	64.3
Kentucky	100	3	47.4	275	4.7	45.8	46	6.5	41.9	103	2.9	54
Louisiana	1477	5.3	46.1	2351	5.9	47	353	5.9	53.3	427	6.8	53.5
Maine	-	-	-	1329	7.8	41.6	4430	6.5	60.6	8041	6.6	53.3
Maryland	421	7.1	58.1	1548	8.6	51	130	8.5	58.8	163	9.8	59.9
Massachusetts	-	-	-	735	6.9	74	45	4.4	88.4	142	4.2	73.5
Michigan	-	-	-	1653	3.9	52.6	941	3.3	58.1	1055	2.9	49.5
Minnesota	-	-	-	1893	4	51	690	3.6	69.9	1028	5.4	65
Mississippi	1003	3.7	50.2	711	4.4	52.2	183	4.9	60.9	193	5.2	47
Missouri	949	10.1	55.5	1090	11.9	52.4	231	9.1	31	149	8.1	58.4
Montana	125	1.6	66.7	337	3.3	57.4	-	-	-	177	5.6	70.1
Nebraska	1031	5.7	66.8	1353	5.9	59.7	182	8.8	70.5	301	4.7	57.8
Nevada	224	13.8	69.4	341	11.7	65.1	-	-	-	88	11.4	64.1
New Hampshire	-	-	-	2313	3.3	47.6	428	4	63.5	188	4.3	62.2
New Jersey	-	-	-	725	6.3	54.9	57	8.8	63.5	151	13.2	62.6

Table 4. Continued.

State	Dove sample	Dove UNDEL. RATE	Dove RESP. RATE	Waterfowl sample	Waterfowl UNDEL. RATE	Waterfowl RESP. RATE	Woodcock sample	Woodcock UNDEL. RATE	Woodcock RESP. RATE	Coot sample	Coot UNDEL. RATE	Coot RESP. RATE
New Mexico	297	8.4	58.5	439	6.8	61.6	-	-	-	75	5.3	67.6
New York	-	-	-	1456	9	61.1	211	9	77.1	186	12.4	65.6
North Carolina	1083	6.2	47.7	969	7.1	46	551	9.4	48.7	250	8	53.9
North Dakota	609	6.6	70.8	1240	5.5	56	-	-	-	110	10.9	62.2
Rhode Island	10	0	80	683	2	68.5	76	1.3	66.7	171	3.5	61.8
South Carolina	1830	7.3	48.7	1154	8.7	37.8	346	7.5	49.7	485	4.3	62.1
South Dakota	721	5	69.3	1060	7	65.8	-	-	-	188	6.9	74.9
Tennessee	1083	9	38.9	1391	10.1	36.5	367	10.1	42.7	365	14.2	35.5
Texas	6257	9.4	46.2	5141	10	44.2	374	13.9	49.4	1220	10.3	45.5
Utah	2303	5.1	75.1	702	10.8	54.8	-	-	-	211	4.7	63.7
Vermont	-	-	-	341	6.2	58.8	109	2.8	69.8	307	7.2	57.5
Virginia	829	9	59.9	988	10.7	57.9	180	8.9	67.1	194	11.9	67.8
Washington	369	9.2	72.5	1274	8.8	59	-	-	-	710	10.6	73.9
West Virginia	117	2.6	66.7	374	4	57.7	6	0	66.7	34	5.9	50
Wisconsin	-	-	-	2235	3.8	60	1058	4.2	74.1	488	2	69.7
Wyoming	140	1.4	76.8	140	4.3	64.2	-	-	-	41	4.9	59



Top left: Greater sandhill crane. *Photo by Roy Tomlinson.* Top right: Sandhill crane hunters near Tappan, North Dakota. *Photo by John Lokemoen.* Bottom: Greater sandhill cranes leaving a night roost at the Bosque del Apache National Wildlife Refuge in New Mexico. *Photo by Roderick Drewien.* Sandhill crane harvest estimates for Alaska are derived via the Harvest Information Program (HIP). For states in the continental U.S., these estimates are calculated from a sample of hunters who have obtained a special federal permit to take the birds. In Colorado and Texas, HIP or point-of-sale electronic records are used to identify crane hunters in lieu of a special permit.

The Impact of the Harvest Information Program on State-Level Survey Capability and Reliability

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Abstract: We focused on how the implementation of the Harvest Information Program (HIP) has changed state survey methodologies in recent years. While some state surveys have been discontinued, numerous state surveys continue based on regional or other special needs. States reported both positive and negative impacts to their state surveys caused by HIP. We recommend further communication and information exchange to improve the acceptance of HIP in many states and possibly reduce duplicate efforts to obtain harvest statistics. Also, there is a need for completed HIP survey information to be distributed to states in a timely manner.

INTRODUCTION

With the implementation of the migratory game bird Harvest Information Program (HIP), a primary goal was to provide estimates of migratory bird harvest at national and regional scales. As a part of the implementation, it was determined that the level of precision of HIP estimates might not be adequate to meet individual state's needs for survey information. This was listed in a letter from the U.S. Fish and Wildlife Service (Service) to all State Directors during the summer of 1995. Nevertheless, HIP appears to have had an impact on state harvest surveys. Questions were posed to all states on how HIP has changed state survey methodologies in recent years.

RESULTS

Of 48 states responding to questions regarding HIP impacts on state surveys, 64% indicated that state harvest surveys for all species previously conducted before HIP implementation had continued to date. Seventeen percent of the states continued some previously conducted surveys and 19% discontinued their individual surveys.

States were also questioned on how state survey methodology had changed with the implementation of HIP. Seventy-three percent of the responses indicated that no changes had been made in state survey methodologies and had maintained a status quo. The majority of changes in those states making adjustments was directly due to the implementation of HIP.

Only 8 states indicated that problems were encountered in the implementation of HIP. Problems varied from administrative costs and licensing logistics. Some problems were resolved with assistance from the Service.

States were asked to describe any positive and negative impacts to their state surveys. On the positive side, many states indicated improved efficiency, reduced costs, improved sampling bases, and elimination of state surveys. On the negative side, delay in receiving harvest data from the Service, increased costs in switching programs, distrust of HIP estimates, and the loss of some sampling frames for state surveys were noted.

DISCUSSION

Since the implementation of HIP was thought by many states as a way to improve overall efficiency in collecting harvest information for all migratory bird species, it can be perceived from this survey that HIP has impacted some state surveys. Over 80% of states are still conducting independent surveys. Special information needs to aid in state migratory bird harvest management appears to be the primary reason why a majority of states have retained their individual survey efforts.

An Executive Summary (of the May 1995 HIP meeting in Denver, Colorado) was prepared by the Service and distributed to each State Director. It clearly stated the reason why states might consider retaining their efforts as follows: "HIP surveys are designed to produce state-level estimates with 95% confidence intervals of 10-20% for mourning doves, ducks, geese, and woodcock. For many states, that level of precision will not be adequate to replace their state migratory bird harvest surveys because they often need precise estimates at a much finer level (zones, counties, etc.)."

States can use HIP results for comparative purposes with the realization that differences in sampling frames, methodology, presentation, and analytical methods may affect results differently among surveys. States may require results to be precise at much finer levels (zones, counties, etc.) than are provided by HIP. However, if a state only needs statewide harvest estimates for their use, then HIP results may be sufficient, allowing a state to discontinue their survey efforts for migratory bird harvests. In many cases, HIP results may need to be supplied in a timely manner to meet this need.

RECOMMENDATIONS

One area that would aid both the Service and states concerns special management seasons that are implemented among several states, such as the Conservation Order for the population reduction of light geese and special early seasons for resident Canada geese. By having the Service implement separate surveys to evaluate the impact of these special seasons, a more consistent approach could be used. This type of consistency would eliminate differing methods used among states for evaluating these seasons. This unified effort through the Service might cause a burden on both the states and the Service in obtaining meaningful results. States might need to establish a unified system in order to supply a consistent sampling frame, while the Service would have the burden of designing, conducting, and funding these additional surveys for the benefit of all. This recommendation should be a Standard Operating Procedure when the Service requires evaluation at a national or regional scale for implementation of special management regulations.

Two surveys (state and HIP) for all species seems to be occurring in a majority of states and an overall reduction of state surveys with the implementation of HIP has not resulted. It is strongly recommended that the Service, working with the International Association of Fish and Wildlife Agencies (IAFWA), continue to strive to improve acceptance of HIP as the standard for obtaining needed harvest data. No doubt, recommendations and their implementation from other task groups working on the review of HIP will result in wider acceptance of this program and elimination of some state concerns. Continued communications and information exchange between states and the Service will be crucial in order to gain wider acceptance of HIP.

It should not be expected that 2 separate methodologies should result in the same estimates for harvest. HIP is capable of providing acceptable national and regional estimates for many species. However, the needs of some states to focus on a particular species because of special management concerns or for legal requirements shouldn't preclude continuation of a state survey. However, the states should consider using HIP information in place of conducting their own surveys, if HIP supplies their necessary data needs. A followup survey might be conducted among states to pinpoint exact needs and factors that

would aid in decreasing multiple surveys. An information and education program might be developed by IAFWA using information from states that have successfully used HIP to assist other states in implementation.

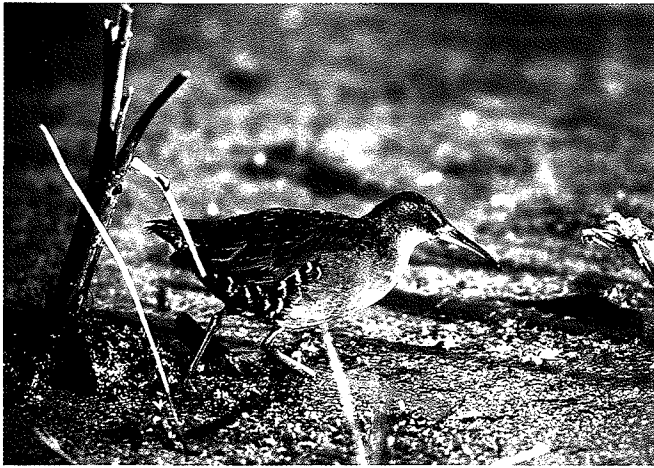
Finally, improved delivery of HIP estimates seems crucial to the acceptance of the program. The Service should continue to strive for improved time-lines for completion of final harvest estimates and work closely with states to maintain good sampling frames.



Long-tailed duck. *USFWS photo by Glen Smart.*



Common eiders. *Photos by T. J. Moser.*



Left column from top: Virginia rail, *photo by Jack Bartholmai*; purple gallinule, *USFWS photo by Roy Lowe*; king rail, *photo by Gregory Kearns*. Right column from top: common moorhen, *photo by Jack Bartholmai*; clapper rail, *photo by Gregory Kearns*; sora, *photo by Jack Bartholmai*.

An Evaluation of the Success and Problems with Different Types of License Systems on the Quality of Data Received

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Abstract: A review of various license systems used for collecting Harvest Information Program (HIP) data indicates little difference in the effectiveness of the system employed. Many states use multiple license systems, which makes it impossible to identify one system as the best. That trend will probably increase in the future. Common sense indicates the best data will be collected directly from the hunter with no interference from a third party, i.e., a license agent. An example would be an Internet system. The next best approach would be to reduce the number of third party participants and let a few license agents specialize in HIP data collection for multiple states.

BACKGROUND

States use a variety of license systems that fall into 6 types. Although there may be slight variations from state to state, there are 4 basic systems: manual, automated, telephone, and Internet.

Manual Licenses

Licenses are in a paper or paper-like format and information must be hand-written by a license agent or the hunter. There may be stamps, which authorize additional activities, attached to the license. One to one contact between the seller and purchaser is required. A manual or semi-automated count of sold/unsold licenses is required for compilation of statistical numbers and for accounting purposes.

The 2 types of manual systems are:

1. Separate individual licenses for each type of privilege or multiple books of individual licenses.
2. Universal licenses that allow the license agent to check off the types of privileges purchased.

Automated Licenses Sold at a Walk-in Agent's Location

Licenses are sold on equipment that immediately captures sales data and prints out a license on paper or paper-like stock. Sales data are transmitted to a host location for compilation of statistical numbers and for accounting purposes. These systems require one-to-one contact between the seller and the purchaser.

The 2 types of automated license systems in this category are:

1. Store and forward automation which collects data at the agent's location and transmits accumulated data to the host location at specified times.
2. Online automation has either continuous or dial-up access to the host-system database and can immediately update those files with sales data. The agent can also verify the hunter's information, making changes as necessary.

Telephone License Sales

Licenses are sold utilizing a toll-free line that is supported by a live operator or an interactive voice response (IVR) system. The hunter calls the telephone number and provides required information. They may be given a temporary authorization number for immediate use and/or have the permanent license mailed to the hunter within 2 weeks.

Internet License Sales

Hunters access a web site, providing all information required for purchasing a license. They may be given a temporary authorization number for immediate use and/or have the permanent license mailed to them within 2 weeks. Some states also have a system that allows the hunter to print the license from their personal computer.

LICENSE SALES AND HIP CERTIFICATION

As technology advances, most states are taking advantage of the opportunities presented and use multiple systems for their license sales.

HIP certification may be issued using the same method as is used for issuing licenses or it may be different. For example, a state issuing paper licenses may not offer paper HIP certification but require hunters to use a toll-free telephone service for it. Also, HIP certification may be offered through even more systems than a state's licenses are offered. For example, a state issuing paper licenses may offer HIP certification by telephone, Internet, and paper.

EFFECTS OF DIFFERENT LICENSE SYSTEMS

To review the effects of different license systems on collection of data, we looked at the quality of data submitted. The U. S. Fish and Wildlife Service Division of Migratory Bird Management's Harvest Surveys Section (HSS) collects data from all states and reviews the results. Two benchmarks from HSS have been used for this task. The first is estimates of the number of migratory bird hunters in each state, based on a combination of factors, including estimates from the *National Survey of Fishing, Hunting and Wildlife-Associated Recreation*, federal duck stamp sales, and information from state wildlife biologists. The actual number of migratory bird hunters was not known for any state, thus, no true reference numbers were available (Table 1). Many states have changed their collection processes since this snapshot of information was taken. The following review is based on the status reflected in the HIP Survey as it was returned in the later months of 2000.

Actual HIP certifications in 11 states fall within +/- 5% of the HSS estimate (Table 2). Four of these states used a single license system to collect HIP data. The remaining 7 states used 2 or 3 different systems for issuing licenses and HIP certifications. In some instances, the system used for HIP was not the same system used for licenses. For instance, Iowa has a manual universal system for selling licenses, but collects HIP data by telephone. Basically, all systems were used by at least 1 state for licenses. Additionally, all systems were used by at least 1 state for HIP.

There were 19 states for which actual HIP certifications missed the HSS estimated number of migratory bird hunters by +/- 25%. Once again, all license systems were used by at least 1 state with only 6 states using a single type of license system. All types of license systems were used to collect HIP data. Once again, methods used for HIP did not necessarily match the licensing systems. Details of this information can be found in Table 2.

States with unusual patterns in their total HIP certifications, as reported in Table 1, were contacted for possible explanations. This was not a question on the survey but, after further discussion, was considered to be an important factor in evaluating the task. Although various reasons or possibilities were expressed, the majority of states' answers involved problems with either hunters or license agents. Mostly, they cited unconcern or lack of understanding by either or both of these groups. Some states indicated that they had changed their license systems, but did not feel that was a long-term problem. They thought the change in itself caused the fluctuations, not the type of system adopted.

The second benchmark is the product of another chapter of this report (see *The Scope and Impact of Hunter Non-compliance with the Harvest Information Program*, p. 39). In that chapter, "match ranks" comparing HIP estimates of hunter numbers with results of other surveys range from 1 (the best match) to 6 (the worst match). Ducks and geese have a combined match rank (waterfowl) with doves and woodcock each having separate match ranks. For this comparison, doves and woodcock were considered as 1 unit, with waterfowl comprising the other unit. All states with a match rank of 1 or 6 were listed for each unit (Table 3). Again, all types of license systems were used and HIP certification systems did not always match the basic license system.

CONCLUSIONS

All license systems can be used effectively to collect data. The dedication of the hunter or license agent in providing and collecting data seems to have more of an effect than the type of system used. Although the hunters can provide inaccurate data, the more likely situation is that the agent does not take the time to collect accurate information. Many agents have already learned that a shortcut for the time-consuming survey is to simply answer "no" to the first question. Typically, license agents sell hunting and fishing licenses as a draw for their business. Any commission they are paid for issuing licenses does not compensate for the time and effort involved with the sales. Only 15 states indicated they paid the agents a commission for HIP certification. These commissions ranged from \$0.10 to \$1.00. Three states paid \$1.00 or more and included Connecticut (\$1.00), New Mexico, (\$1.00), and Pennsylvania (\$1.00).

Two of these states, Connecticut and New Mexico, were within +/- 5% of the HSS estimate, whereas Pennsylvania was about 20% over the HSS estimate. Apparently, there is no clear benefit to a commission at this level even though it is the highest paid commission.

As technology changes in future years, the role of the license agent may change drastically, possibly to the point of fading away. But today's fish and wildlife agencies still rely heavily upon the local businessman for license distribution. Although hunting and fishing licenses are not critical to the operation of businesses, distribution of licenses through those local businesses is critical to fish and wildlife agencies. Attempts to penalize those businesses for failure to comply with complicated requirements, without compensating them for the time involved, will create problems. Although 2 states have established penalties for non-compliance, neither of them have ever levied the penalty. One state, Pennsylvania, indicated a perception that the threat of being penalized improved compliance.

Theoretically, the best method of capturing data would be directly from the hunter, not through a sales agent. The ideal situation would also include capturing a current address at the time of certification instead of relying on information in a database that may be updated infrequently. It would also be better to collect responses to survey questions prior to issuing the certification. Since capturing alpha information on a telephone interactive voice response system is extremely difficult, the Internet is the only system that meets the criteria listed above and would allow a hunter to respond to questions and get an authorization number prior to certification. A live operator system would be the next best option. The contractor would have a minimal number of persons to train, as opposed to the 700 to 1,000 agents for each state, and would focus on the process as a primary business function. Local businesses currently

used by states for license agents do not have HIP certification as a primary business function. It's one tiny, very unprofitable part of their business.

There is no state that currently uses the Internet as a sole method of issuing HIP certifications. Not all hunters have access to this system so it will remain as a supplemental system for the near future.

There are several states that use a live operator telephone system as the sole provider of HIP certifications. Although this still requires the intervention of a third party to record data, the state is dealing with only 1 third party and not multiple vendors. There is universal access to telephones and, by using a toll free line, the access cost to the hunter is at most the cost of a call from a pay phone.

Currently, there is no one best method available and no consistency. Neighboring states may use totally different systems.

RECOMMENDATIONS

Four of the 9 task groups studied the HIP-certification process. All 4 concluded there were problems related to license vendors collecting data. Most states rely on a large number of retail license agents to collect data and/or issue the certifications. Efforts to monitor compliance, as suggested in Task 3 (p. 31), can be very complicated, time consuming, and costly with no assurance of success or even improvement. Task 4 (p. 39) recommends that states work with license agents to ensure that all migratory bird hunters are provided HIP certification. Task 5 (p. 47) notes particular problems with the large chain stores. These stores have multiple locations, a high employee turnover, and a high volume of sales/certification. In our analysis, we found that the accuracy of HIP data is more closely connected to the dedication of individuals providing the information than to the type of collection/issuance system used.

We recommend eliminating a third party from having to ask hunters for information. Collecting information directly from hunters is clearly preferable. Currently, some states allow the hunter to report HIP information via the Internet and through telephone systems without third-party intervention. As a result our findings, we recommend that this type of "direct-collection" system be investigated thoroughly.

We recommend a multi-state system for HIP certification. A uniform, standardized system for data collection would address problems with hunters knowing what to do and how to comply. While this would require a high level of cooperation between states, we believe that hunters will soon expect such regional or centralized systems given the technology available today.

We recommend an analysis of alternative methods of collecting hunter information that would result in more data being collected with a higher level of accuracy. All license systems are capable of collecting hunter information. However, the accuracy of this information depends on hunters and license vendors. If a hunter provides faulty information, there is very little that can be done beyond educational efforts. If a license vendor does not collect information properly, there are several alternatives for action.

Table 1. *National Survey of Fishing, Hunting, and Wildlife-Associated Recreation* (Survey) migratory bird hunter estimates, 1999 Harvest Survey Section (HSS) estimates, and number of 1999 and 2000 Harvest Information Program (HIP) certifications.

State	Survey		HSS	HIP certifications		Percent difference		License systems*						
	1991	1996	1999	1999	2000	1999	2000	1	2	3	4	5	6	7
Alabama	104,000	83,000	100,000	95,648	95,787	-4	-4				x	x		
Alaska	13,000	17,000	11,000	9,333	9,884	-15	-10				x	x		
Arizona	71,000	75,000	60,000	40,450	45,023	-33	-25				x		x	
Arkansas	75,000	107,000	100,000	147,132	191,063	+47	+91	x	x		x	x		
California	234,000	247,000	180,000	157,775	157,806	-12	-12				x			
Colorado	58,000	62,000	60,000	48,300	46,472	-19	-23					x	x	
Connecticut	8,000	7,000	8,000	7,788	7,330	-3	-8				x			
Delaware	15,000	22,000	10,000	8,937	8,708	-11	-13					x	x	
Florida	67,000		80,000	81,623		+2			x			x	x	x
Georgia	77,000	128,000	90,000	148,898		+65		x	x				x	
Idaho	26,000	38,000	30,000	27,229	26,355	-9	-12	x				x	x	
Illinois	121,000	98,000	100,000	69,134	72,356	-31	-28					x	x	
Indiana	38,000	27,000	35,000	33,880	34,111	-3	-3					x	x	
Iowa	26,000	36,000	30,000	30,285	31,475	+1	+5					x	x	
Kansas	54,000	63,000	55,000	57,266	58,729	+4	+7	x			x		x	
Kentucky	81,000	77,000	60,000	45,165	50,751	-25	-15				x			
Louisiana	127,000	141,000	140,000	144,610	137,816	+3	-2	x	x			x	x	
Maine	12,000	25,000	25,000	67,220	58,948	+169	+136	x	x					
Maryland	34,000	47,000	40,000	50,164	49,231	+25	+23	x	x					
Massachusetts	18,000		10,000	5,582	5,915	-44	-41					x	x	
Michigan	92,000	114,000	110,000	103,675	105,379	-6	-4		x			x	x	
Minnesota	84,000	151,000	150,000	119,750	187,102	-20	+25	x	x		x			
Mississippi	86,000	120,000	90,000	59,542	61,570	-34	-32				x	x	x	
Missouri	81,000	62,000	70,000	68,070	61,425	-3	-12	x	x					
Montana	20,000	31,000	25,000	16,934	15,928	-32	-36				x			
Nebraska	48,000	51,000	50,000	47,467	43,507	-5	-13	x			x		x	
Nevada	18,000	17,000	15,000	10,423	9,858	-31	-34					x	x	
New Hampshire	7,000	11,000	10,000	14,453	6,224	+45	-38					x	x	
New Jersey	26,000	23,000	20,000	13,262	11,785	-34	-41					x	x	
New Mexico	23,000	18,000	20,000	19,307	22,001	-3	+10				x			
New York	60,000	59,000	60,000	37,291	35,711	-38	-40					x	x	
North Carolina	94,000	117,000	100,000	209,076	230,333	+109	+130	x	x					
North Dakota	34,000	22,000	50,000	52,546	41,097	+5	-18		x		x	x	x	
Ohio	36,000	49,000	60,000	111,715	378,810	+86	+531	x	x					
Oklahoma	77,000	73,000	70,000	66,862	58,632	-4	-16			x				
Oregon	33,000	57,000	50,000	56,659	56,087	+13	+12	x						
Pennsylvania	111,000	79,000	100,000	119,831	120,621	+20	+21				x		x	
Rhode Island	3,000	4,000	3,000	2,222	1,996	-26	-33				x			
South Carolina	70,000	90,000	90,000	94,951	87,896	+6	-2			x		x	x	
South Dakota	39,000	46,000	50,000	50,101	45,961	0	-8				x			
Tennessee	73,000	71,000	75,000	120,542	299,804	+61	+300	x	x					
Texas	470,000	369,000	500,000	763,361	819,799	+53	+64	x	x					
Utah	20,000	26,000	30,000	32,709	31,654	+9	+6			x			x	
Vermont	6,000	15,000	10,000	9,277	7,199	-7	-28				x			
Virginia	93,000	48,000	60,000	45,841	44,789	-24	-25					x	x	
Washington	51,000	65,000	55,000	47,097	45,207	-14	-18				x			
West Virginia	6,000		4,000	3,259	3,484	-19	-13				x			
Wisconsin	108,000	98,000	110,000	162,420	174,912	+48	+59	x	x					
Wyoming	6,000	22,000	12,000	12,565	11,697	+5	-3				x			
Total	3,134,000	3,208,000	3,273,000	3,747,627	4,108,228									

* 1 = automated online; 2 = automated store and forward; 3 = manual universal; 4 = manual multiple books; 5 = telephone; 6 = Internet; 7 = other.

Table 2. License systems used by states in which actual Harvest Information Program (HIP) certifications were (1) in close agreement with (within 5% of) the Harvest Survey Section's (HSS) estimate of migratory bird hunters in the state, and (2) very different from (more than 25% off) the HSS estimate. "L" indicates the method(s) the state used to sell hunting licenses and "H" indicates the method(s) used to issue HIP certifications.

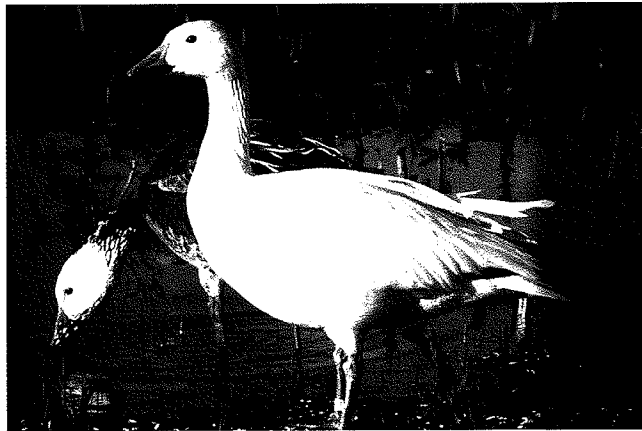
State	License system					
	Automated online	Automated store and forward	Manual universal	Manual multiple books	Telephone	Internet
States within +/- 5% of HSS estimate						
Alabama				L/H	L/H	
Connecticut				L/H		
Florida		L			L/H	L/H
Iowa			L		H	
Kansas	L/H			L/H		L/H
Louisiana	L	L/H			L/H	L/H
Missouri	L/H	L/H			H	
Nebraska	L			L	H	L/H
New Mexico				L/H		
Oklahoma			L/H		L/H	
South Dakota				L/H		
States more than +/- 25% off HSS estimate						
Arizona	L/H	L/H	L/H	L/H	L	L/H
Arkansas	L/H	L/H			L/H	L/H
Georgia		L/H			L/H	L/H
Illinois				L	L/H	L/H
Maine				L/H		H
Maryland		L/H				
Massachusetts			L	L	H	
Mississippi			L/H		H	
Montana				L		H
Nevada				L	H	
New Hampshire			L		H	H
New Jersey				L	H	
New York			L		H	H
North Carolina		L/H			L/H	
Ohio		L/H				
Rhode Island			L/H			
Tennessee	L					
Texas	L/H	L/H			L/H	
Wisconsin	L	L/H			L/H	

* = stamps; ** = mail; ^ = separate form

Table 3. License systems used by states for which Harvest Information Program (HIP) survey estimates of active hunters (1) agreed closely with results of other surveys (best match), and (2) differed most widely from results of other surveys (worst match). "L" indicates the method(s) the state used to sell hunting licenses and "H" indicates the method(s) used to issue HIP certifications.

State	License system						
	Automated online	Automated store and forward	Manual universal	Manual multiple books	Telephone	Internet	Other
Best match/waterfowl							
Delaware			L	L	H	H	
Iowa			L		H		
Michigan		L/H			L/H	L/H	
Missouri	L/H	L/H			H		
Nebraska	L			L	H	L/H	
Nevada				L	H		
New Jersey				L	H		
Oklahoma			L/H		L/H		
Oregon	L/H						
Rhode Island			L/H				
Texas	L/H	L/H			L/H		
Virginia				L	H		
Washington				L/H			
Wisconsin	L	L/H			L/H		
Best match/dove and woodcock							
Colorado				L	H	H	
Minnesota	L/H	L/H	L/H		L/H		
Pennsylvania				L/H		L/H	
Wisconsin	L	L/H			L/H		H
Worst match/waterfowl							
Colorado				L	H	H	
Idaho	L/H				L/H	L/H	
Montana				L	H		H^
Ohio		L/H					L/H**
Wyoming				L/H		H	
Worst match/dove and woodcock							
Delaware			L	L	H	H	
Florida		L			L/H	L/H	L*
Louisiana	L	L/H			L/H	L/H	
Maryland		L/H					H^
New York			L		H	H	
Virginia				L	H		

* = stamps; ** = mail; ^ = separate form



Top: Snow goose hunter in North Dakota. Middle left: Hunter in Saskatchewan with geese (white-fronted, Canada, Ross's, and snow). *Photos by T. J. Moser.* Middle right: Snow geese. *USFWS photo by Dave Menke.* Bottom: White-fronted geese. *Photo by T. J. Moser.*

Estimated Annual Costs Associated with the Harvest Information Program

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Abstract: We used data provided by state wildlife agencies and the U. S. Fish and Wildlife Service to estimate the total annual cost of the Harvest Information Program (HIP) at \$4,441,000. This figure includes administrative costs incurred by the states (\$1,516,000) and the USFWS (\$1,161,000); costs incurred by hunters, including both the direct cost of HIP fees and the indirect cost of the value of the time it took for them to obtain HIP certification (\$1,020,000); and costs incurred by license vendors, in the form of the value of the time it took them to issue HIP certifications (\$744,000).

INTRODUCTION

Annual, ongoing costs associated with the Harvest Information Program (HIP) that can be quantified to some degree fall into 6 categories: (1) direct costs incurred by the state wildlife agencies during the process of collecting the required information from all migratory bird hunters and sending those data to the U.S. Fish and Wildlife Service (Service); (2) direct costs incurred by the Service through payments to the states for the required data; (3) direct costs to hunters in the form of fees that some states charge them for the required HIP certification; (4) indirect costs to hunters for the time they spend obtaining HIP certification; (5) indirect costs to license vendors for uncompensated time they spend providing HIP certification to hunters; and, (6) direct costs to the Service to conduct the harvest surveys. This report attempts to quantify costs associated with those 6 categories.

STATE COSTS

Estimates of direct costs to the states were obtained from the International Association of Fish and Wildlife Agency's (IAFWA) HIP evaluation survey that all states responded to last year. One of the questions on that survey specifically asked for estimates of operating costs. Although most states provided cost estimates, several respondents indicated that not all costs were included in their estimates, and several states that did not provide an estimate indicated that it was impossible to isolate and quantify the costs of HIP within their overall licensing system. A few states did not give a reason for not providing an estimate. For those states that did not report a cost estimate, we derived approximations from states with similar HIP-certification systems, based on either the average cost per HIP certification for states that did provide estimates, or a "best guess." For states with electronic licensing systems that did not report a cost estimate, we based the estimates in this report on an overall cost of \$0.30 per HIP certification. For states with paper HIP-certification systems that did not provide cost estimates, we used an average cost of \$0.50 per HIP certification to derive cost estimates. Telephone and Internet HIP-certification systems cost an average of \$1.50 per certification. Thus, we obtained at least a "ball park" estimate of the gross costs of HIP for each state.

The state-specific gross cost estimates were reduced by the estimated amount the Service will pay the states annually for the HIP data. For any state that charges hunters a fee for HIP certification, we also reduced that state's gross cost by the total revenue gained by the state from the HIP fee. State revenue from HIP fees was

reported on the IAFWA survey. After making these adjustments to the gross cost estimates, the total annual net estimate of costs for all states combined was \$1,516,351 (see Table 1 for state-specific details). Given the tenuous nature of much of the information used to derive this figure, it should be viewed as a "ball park" estimate.

SERVICE PAYMENTS TO STATES

The Service pays the states on a per migratory bird hunter basis for the HIP data that the states collect. The annual payment is \$0.10 per migratory bird hunter record, and the total estimated cost to the Service, based on the number of migratory bird hunter records received for the 1999-2000 season, is \$318,550 (Table 1).

HUNTER COSTS

Hunters incur direct costs in states that charge a fee for HIP certification, and indirect costs in all states in terms of the time it takes them to obtain HIP certification. The Office of Management and Budget (OMB) requires federal agencies to report the impact of information collection procedures on the public by estimating "burden hours", i.e., the total number of hours spent by the public providing the required information. We used this method, and a value of \$8.00 per hour, to quantify the indirect costs to hunters (OMB's most recent time value that we know of is \$7.26 per hour, but that was 3 years ago).

The IAFWA survey asked each state to report the amount of time it takes for a hunter to obtain HIP certification for each of the methods of HIP certification available to the hunter in that state. We used this information, combined with the total number of HIP certifications issued in each state for the 1999-2000 season, to estimate the total number of hours hunters spent in each state obtaining HIP certification (see Table 2 for state-specific details). For states that did not provide a time estimate, we used the average of the time estimates provided by other states with similar HIP-certification procedures. We used only the time estimate for each state's primary HIP certification method to estimate the total time burden on hunters. The time estimate for all states combined is 109,265 burden hours, the value of which is a total of \$874,117 at \$8.00 per hour (Table 2). We then added the state HIP fee revenue to hunter cost estimates, but only up to the amount that equaled the state's HIP operating total costs. The total direct and indirect cost to hunters is estimated at \$1,019,572 annually. This estimate would obviously change if time was valued differently.

LICENSE VENDOR COSTS

We used the same data and methods to estimate burden hours incurred by license vendors as a result of providing HIP certification to hunters. Since states that have telephone and/or Internet HIP registration do not involve their license vendors in the process, the total estimated number of burden hours was lower at 81,219. We used a rate of \$12.00 per hour to estimate the value of the license vendors' time burden. We then reduced the state-specific vendor cost estimates by the amount of compensation the states pay their license vendors for HIP certifications, as reported by the states in the IAFWA survey. The total estimated cost to license vendors comes to \$743,922 (see Table 3 for state-specific details). Like the estimate of hunter costs, this estimate is dependent on the dollar value time is given.

SERVICE HIP SURVEY COSTS

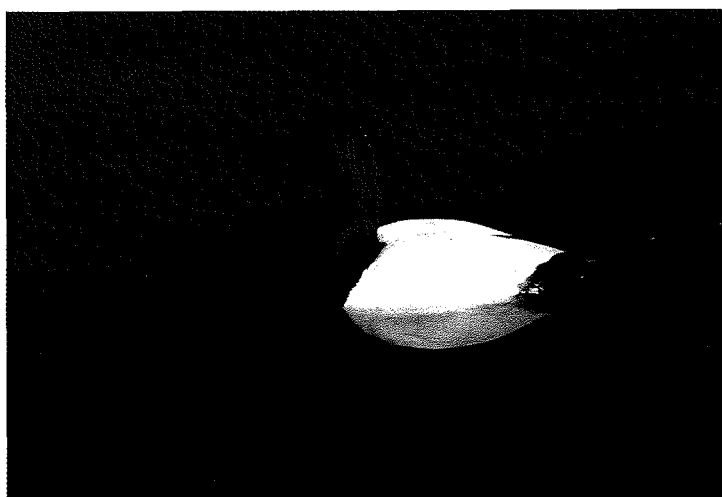
We based our estimate of the Service's survey costs on current HIP survey procedures and the expected sample sizes for all types of HIP harvest surveys combined (150,000). The total annual cost estimate of \$842,000 includes postage, printing, equipment maintenance, and personnel costs directly associated with conducting the HIP surveys.

SUMMARY

The total estimated annual cost of HIP, including the value of the time spent by hunters and license vendors on obtaining/providing HIP certification, is approximately \$4,441,000. This total includes state costs of about \$1,516,000, Service costs of about \$1,161,000, hunter costs of about \$1,020,000, and license vendor costs of about \$744,000. This should be considered a "ball park" estimate. Our goal was only to provide cost information, therefore, we do not have any recommendations to make based solely on the contents of this report.



Black duck. *USFWS photo by Glen Smart.*



Canvasback. *Photo by T. J. Moser.*

Table 1. Estimated state agency operating costs associated with the Harvest Information Program.

State	Reported direct cost	Fee	Revenue from fee	Cost minus fee revenue	Payment from Service	Net cost to state
Alabama	\$32,000			\$32,000	\$9,350	\$22,650
Alaska	\$15,000			\$15,000	\$950	\$14,050
Arizona	\$21,000	\$3.00	\$150,000	\$0	\$4,100	\$0
Arkansas	\$44,100*			\$44,100	\$14,700	\$29,400
California	\$163,000			\$163,000	\$15,800	\$147,200
Colorado	\$88,000			\$88,000	\$4,700	\$83,300
Connecticut	\$25,000	\$2.00	\$8,000	\$17,000	\$800	\$16,200
Delaware	\$13,500			\$13,500	\$900	\$12,600
Florida	\$25,000			\$25,000	\$4,150	\$20,850
Georgia	\$2,800			\$2,800	\$9,800	\$0
Idaho	\$1,000	\$1.50	\$31,000	\$0	\$2,700	\$0
Illinois	\$110,000			\$110,000	\$6,800	\$103,200
Indiana	\$51,990			\$51,990	\$3,300	\$48,690
Iowa	\$63,000			\$63,000	\$3,000	\$60,000
Kansas	\$25,000	\$0.50	\$0	\$25,000	\$5,700	\$19,300
Kentucky	\$30,565	\$4.00	\$180,000	\$0	\$1,550	\$0
Louisiana	\$115,000			\$115,000	\$14,350	\$100,650
Maine	\$5,000			\$5,000	\$6,750	\$0
Maryland	\$14,000			\$14,000	\$2,450	\$11,550
Massachusetts	\$10,000			\$10,000	\$550	\$9,450
Michigan	\$31,050*			\$31,050	\$10,350	\$20,700
Minnesota	\$100,000			\$100,000	\$10,800	\$89,200
Mississippi	\$6,000			\$6,000	\$5,800	\$200
Missouri	\$20,400*	\$6.00	\$408,000	\$0	\$6,800	\$0
Montana	\$4,211			\$4,211	\$1,700	\$2,511
Nebraska	\$65,000			\$65,000	\$4,700	\$60,300
Nevada	\$16,000			\$16,000	\$1,000	\$15,000
New Hampshire	\$4,000			\$4,000	\$1,400	\$2,600
New Jersey	\$22,500			\$22,500	\$1,300	\$21,200
New Mexico	\$10,000**	\$1.00	\$0	\$10,000	\$1,750	\$8,250
New York	\$56,000			\$56,000	\$3,650	\$52,350
North Carolina	\$66,000*			\$66,000	\$9,000	\$57,000
North Dakota	\$59,000			\$59,000	\$5,200	\$53,800
Ohio	\$1,000			\$1,000	\$10,900	\$0
Oklahoma	\$30,000**			\$30,000	\$4,150	\$25,850
Oregon	\$1,000			\$1,000	\$5,650	\$0
Pennsylvania	\$31,700	\$3.00	\$259,975	\$0	\$10,850	\$0
Rhode Island	\$2,000			\$2,000	\$200	\$1,800
South Carolina	\$45,000**			\$45,000	\$9,500	\$35,500
South Dakota	\$20,000	\$3.00	\$132,000	\$0	\$4,600	\$0
Tennessee	\$36,150*			\$36,150	\$12,050	\$24,100
Texas	\$236,550*			\$236,550	\$54,000	\$182,550
Utah	\$50,000			\$50,000	\$3,200	\$46,800
Vermont	\$4,000**			\$4,000	\$750	\$3,250
Virginia	\$60,000			\$60,000	\$4,450	\$55,550
Washington	\$25,000			\$25,000	\$4,650	\$20,350
West Virginia	\$4,000			\$4,000	\$300	\$3,700
Wisconsin	\$48,750*			\$48,750	\$16,250	\$32,500
Wyoming	\$3,400			\$3,400	\$1,200	\$2,200
Total	\$1,913,666			\$1,781,001	\$318,550	\$1,516,351

* Estimated cost \$0.30 per name, based on other states' electronic licensing system reported costs.

** Estimated cost \$0.50 per name, based on other states' reported costs for similar system.

Table 2. Estimated migratory game bird hunter costs associated with the Harvest Information Program.

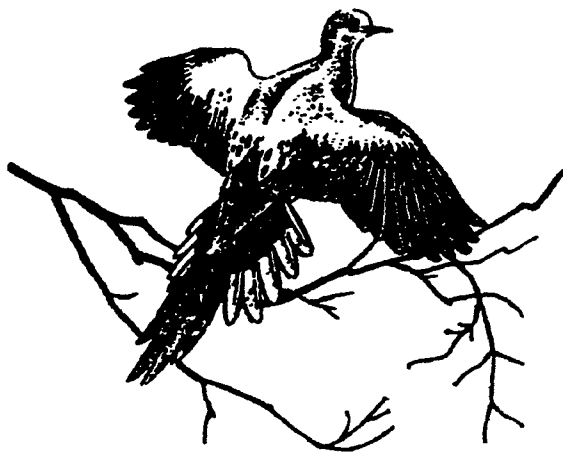
State	HIP certifications	Hunter burden hours	Burden hours value *	State costs covered by hunter fees	Total
Alabama	95,000	2,375	\$19,000		\$19,000
Alaska	9,500	317	\$2,533		\$2,533
Arizona	50,000	3,333	\$26,667	\$21,000	\$47,667
Arkansas	147,000	4,900	\$39,200		\$39,200
California	158,000	6,583	\$52,667		\$52,667
Colorado	60,000	4,000	\$32,000		\$32,000
Connecticut	8,000	667	\$5,333	\$8,000	\$13,333
Delaware	9,000	600	\$4,800		\$4,800
Florida	80,000	1,333	\$10,667		\$10,667
Georgia	100,000	1,667	\$13,333		\$13,333
Idaho	27,000	450	\$3,600	\$1,000	\$4,600
Illinois	68,000	4,533	\$36,267		\$36,267
Indiana	33,000	2,750	\$22,000		\$22,000
Iowa	30,000	2,000	\$16,000		\$16,000
Kansas	57,000	4,750	\$38,000		\$38,000
Kentucky	45,000	2,250	\$18,000	\$30,565	\$48,565
Louisiana	143,500	3,588	\$28,700		\$28,700
Maine	67,500	563	\$4,500		\$4,500
Maryland	45,000	1,500	\$12,000		\$12,000
Massachusetts	5,500	458	\$3,667		\$3,667
Michigan	103,500	2,588	\$20,700		\$20,700
Minnesota	180,000	4,500	\$36,000		\$36,000
Mississippi	60,000	1,000	\$8,000		\$8,000
Missouri	68,000	1,133	\$9,067	\$20,400	\$29,467
Montana	17,000	850	\$6,800		\$6,800
Nebraska	47,000	3,133	\$25,067		\$25,067
Nevada	10,000	667	\$5,333		\$5,333
New Hampshire	14,000	700	\$5,600		\$5,600
New Jersey	13,000	542	\$4,333		\$4,333
New Mexico	17,500	875	\$7,000		\$7,000
New York	36,500	1,521	\$12,167		\$12,167
North Carolina	220,000	5,500	\$44,000		\$44,000
North Dakota	52,000	1,300	\$10,400		\$10,400
Ohio	109,000	2,725	\$21,800		\$21,800
Oklahoma	60,000	2,000	\$16,000		\$16,000
Oregon	56,500	1,883	\$15,067		\$15,067
Pennsylvania	108,500	2,713	\$21,700	\$31,700	\$53,400
Rhode Island	2,000	133	\$1,067		\$1,067
South Carolina	95,000	1,583	\$12,667		\$12,667
South Dakota	46,000	1,533	\$12,267	\$20,000	\$32,267
Tennessee	120,500	1,004	\$8,033		\$8,033
Texas	788,500	9,856	\$78,850		\$78,850
Utah	32,000	2,133	\$17,067		\$17,067
Vermont	7,500	125	\$1,000		\$1,000
Virginia	44,500	3,708	\$29,667		\$29,667
Washington	46,500	775	\$6,200		\$6,200
West Virginia	3,000	150	\$1,200		\$1,200
Wisconsin	162,500	5,417	\$43,333		\$43,333
Wyoming	12,000	600	\$4,800		\$4,800
Total	3,770,500	109,265	\$874,117	\$145,455	\$1,019,572

* Value calculated based on \$8.00 per hour.

Table 3. Estimated license vendor costs associated with the Harvest Information Program.

State	HIP certifications	Vendor burden hours	Burden hours value *	Vendor compensation		Net value of vendor burden
				Per name	Total	
Alabama	95,000	2,375	\$28,500	\$0.10	\$9,500	\$19,000
Alaska	9,500	317	\$3,800		\$0	\$3,800
Arizona	50,000	3,333	\$40,000	\$0.15	\$7,500	\$32,500
Arkansas	147,000	4,900	\$58,800	\$0.10	\$14,700	\$44,100
California	158,000	6,583	\$79,000	\$0.15	\$23,700	\$55,300
Colorado	60,000				\$0	\$0
Connecticut	8,000	667	\$8,000	\$1.00	\$8,000	\$0
Delaware	9,000				\$0	\$0
Florida	80,000	1,333	\$16,000		\$0	\$16,000
Georgia	100,000	1,667	\$20,000		\$0	\$20,000
Idaho	27,000	450	\$5,400	\$0.75	\$20,250	\$0
Illinois	68,000				\$0	\$0
Indiana	33,000				\$0	\$0
Iowa	30,000				\$0	\$0
Kansas	57,000	4,750	\$57,000	\$0.50	\$28,500	\$28,500
Kentucky	45,000	2,250	\$27,000	\$0.25	\$11,250	\$15,750
Louisiana	143,500	3,588	\$43,050		\$0	\$43,050
Maine	67,500	563	\$6,750		\$0	\$6,750
Maryland	45,000	1,500	\$18,000	\$0.35	\$15,750	\$0
Massachusetts	5,500				\$0	\$0
Michigan	103,500	2,588	\$31,050		\$0	\$31,050
Minnesota	180,000	4,500	\$54,000		\$0	\$54,000
Mississippi	60,000	1,000	\$12,000	\$0.10	\$6,000	\$6,000
Missouri	68,000	1,133	\$13,600	\$1.00	\$68,000	\$0
Montana	17,000	850	\$10,200	\$0.50	\$8,500	\$0
Nebraska	47,000				\$0	\$0
Nevada	10,000				\$0	\$0
New Hampshire	14,000				\$0	\$0
New Jersey	13,000				\$0	\$0
New Mexico	17,500	875	\$10,500	\$1.00	\$17,500	\$0
New York	36,500				\$0	\$0
North Carolina	220,000	5,500	\$66,000	\$0.10	\$22,000	\$44,000
North Dakota	52,000				\$0	\$0
Ohio	109,000	2,725	\$32,700		\$0	\$32,700
Oklahoma	60,000	2,000	\$24,000		\$0	\$24,000
Oregon	56,500	1,883	\$22,600		\$0	\$22,600
Pennsylvania	108,500	2,713	\$32,550	\$1.00	\$108,500	\$0
Rhode Island	2,000	133	\$1,600		\$0	\$1,600
South Carolina	95,000	1,583	\$19,000		\$0	\$19,000
South Dakota	46,000	1,533	\$18,400		\$0	\$18,400
Tennessee	120,500	1,004	\$12,050		\$0	\$12,050
Texas	788,500	9,856	\$118,272		\$0	\$118,272
Utah	32,000				\$0	\$0
Vermont	7,500	125	\$1,500		\$0	\$1,500
Virginia	44,500				\$0	\$0
Washington	46,500	775	\$9,300	\$0.25	\$11,625	\$0
West Virginia	3,000	150	\$1,800		\$0	\$1,800
Wisconsin	162,500	5,417	\$65,000		\$0	\$65,000
Wyoming	12,000	600	\$7,200		\$0	\$7,200
Total	3,770,500	81,219	\$974,622		\$381,275	\$743,922

* Value calculated based on \$12.00 per hour.

Appendix A.**Harvest Information Program (HIP) Survey**

**Migratory Shore and Upland Game Bird Working Group
of
The Migratory Wildlife Committee**

International Association of Fish and Wildlife Agencies



HARVEST INFORMATION PROGRAM (HIP) SURVEY

(International Association of Fish and Wildlife Agencies)

This survey is part of an evaluation of HIP. Your input is essential to help ensure that HIP fulfills its mandate to provide quality migratory bird harvest information.

Name of State Agency: _____	
Name of person coordinating survey: _____	
Title of person coordinating survey: _____	
Address: _____	
Phone Number: _____	E-mail Address: _____

Please use the following definitions when filling out this survey:

- ▶ **License vendors** *(also called license agents or license deputies in some states) refers to the locations where hunting licenses are sold. For example, if Wal-Mart has 15 stores where licenses are sold, each of those 15 stores should be considered a separate license vendor. If an individual store has several check-out counters where licenses are sold, the store still only counts as one license vendor.*
- ▶ **Chain stores** *include national, regional, or local chains that have more than one license vendor in your state such as gas stations, sporting good stores, or department stores.*
- ▶ **HIP certification** *is any process used by a state to identify migratory bird hunters and issues them proof of compliance with the HIP requirement.*
- ▶ **HIP permit** *refers to any separate migratory bird permit or migratory bird stamp that is used by a state to identify migratory bird hunters, HIP-certify them, and provide them with proof of compliance with the HIP requirement.*

If you need additional space to answer open-ended questions or to clarify your responses, please attach additional pages as needed.

Please check the appropriate answer or fill in the blank.

1. Does your state use the following types of sport license systems:

Yes No



- ☐ ☐ Automated online
☐ ☐ Automated store & forward
☐ ☐ Manual universal
☐ ☐ Manual multiple books
☐ ☐ Telephone
☐ ☐ Internet
☐ ☐ Other

If other, please specify _____

2. Does your state HIP certify hunters at any of your state agency offices (state agency license vendors)?

☐ No → (Skip to Question 4)

☐ Yes ↓

3. How many state agency license vendors do you have?

_____ *number of state agency vendors*

4. Including your state agency license vendors, approximately how many vendors offer HIP in your state?

_____ *number of vendors*

5. Have you compared the quality of your state license vendors' data with that of your other vendors?

☐ No → (Skip to Question 7)

☐ Yes ↓

6. Was your state data:

- ☐ Better than other vendors' data
☐ Same as other vendors' data
☐ Worse than other vendors' data

If you have a report or other analysis that compares your agency outlets with other vendors, please append it to this survey.

7. How often do you typically use the following methods to contact your vendors?

Daily Weekly Monthly or less often Never
 ▼ ▼ ▼ ▼

- Letter ☐ ☐ ☐ ☐
 Newsletter ☐ ☐ ☐ ☐
 E-mail ☐ ☐ ☐ ☐
 Automated system message ... ☐ ☐ ☐ ☐
 Agency employee . ☐ ☐ ☐ ☐
 Other ☐ ☐ ☐ ☐

If other, please specify _____

8. Does your state agency contact its vendors in the following ways:

Yes No



- ☐ ☐ With the person directly issuing licenses
☐ ☐ With the person in charge of others who issue licenses
☐ ☐ With the store owner/manager
☐ ☐ With corporate headquarters
☐ ☐ With a third party such as another agency, sheriff, county clerk, etc.

9. Please indicate if your state agency assesses the quality of vendors' HIP data using any of the following methods:

Yes No



- ☐ ☐ Look for suspicious patterns in data
☐ ☐ Systematic monitoring by agency staff
☐ ☐ Incidental observations by agency staff
☐ ☐ Follow-up on citizen complaints
☐ ☐ Other

If other, please specify _____

10. Can your state agency identify each individual vendor in your state?

- ☐ No
☐ Yes

11. Can your state agency link the HIP certification data to the vendor who issued the certification?

- ☐ No
☐ Yes

12. Does your state verify names and addresses at the time a hunter certifies with HIP?

- ☐ No
☐ Yes

13. Does your agency link HIP hunters with name and address information in a separate database (e.g., drivers license)?

- ☐ No → (Skip to Question 15)
☐ Yes

14. How frequently are individual hunter names/addresses updated in the other database?

_____ frequency of updates

15. Does your state have a penalty for vendors who do not HIP certify migratory bird hunters?

- ☐ No → (Skip to Question 19)
☐ Yes

16. How many vendors are penalized each year?

_____ number penalized

17. In general, have the penalties improved compliance?

- ☐ No
☐ Yes
☐ Don't know

18. Describe the penalties your state agency has used: _____

19. Does your state have a penalty for vendors who HIP certify hunters but do not send in HIP data (names, addresses, etc.)?

- ☐ No → (Skip to Question 22)
☐ Yes

20. How many vendors are penalized each year?

_____ number penalized

21. In general, have penalties improved compliance?

- ☐ No
☐ Yes
☐ Don't know

22. Does your state agency give vendors a separate commission for issuing HIP certification?

- ☐ No → (Skip to Question 25)
☐ Yes

23. What is the commission?

_____ dollars

24. Is there a difference between the commission for HIP certification and the standard vendor commission for issuing state licenses?

- ☐ No
☐ Yes

25. Has your state estimated the proportion of migratory bird hunters that were HIP certified?

- ☐ No → (Skip to Question 29)
☐ Yes

26. What year(s) did the estimate cover?

Year(s) _____

27. What method did your state agency use to estimate the proportion that was HIP certified?

Yes No
▼ ▼

- ☐ ☐ Survey of all hunters, including exempt hunters
- ☐ ☐ Survey of licensed hunters (not just HIP certified hunters)
- ☐ ☐ Survey of certified HIP hunters
- ☐ ☐ General population survey
- ☐ ☐ Other

If other, please specify _____

28. What percentage of each of the following types of hunters were HIP certified?

Dove hunters..... percent

Waterfowl hunters..... percent

Woodcock hunters..... percent

Rail hunters..... percent

All migratory bird hunters... percent

29. Have law enforcement personnel in your state kept track of the proportion of migratory bird hunters they checked in the field that were HIP certified?

☐ No → (Skip to Question 32)

☐ Yes



30. What year(s) were they checked?

Year(s) _____

For each year, how many hunters were checked and what percentage were HIP certified?

	Number checked ▼	Percent certified ▼
31a. Year _____		
Dove hunters.....	_____	_____
Waterfowl hunters.....	_____	_____
Woodcock hunters.....	_____	_____
Rail hunters.....	_____	_____
All migratory bird hunters...	_____	_____

	Number checked ▼	Percent certified ▼
31b. Year _____		
Dove hunters.....	_____	_____
Waterfowl hunters.....	_____	_____
Woodcock hunters.....	_____	_____
Rail hunters.....	_____	_____
All migratory bird hunters...	_____	_____

Please attach additional pages if needed.

32. After implementing HIP, did your state continue its harvest surveys for:

- ☐ All species that were previously surveyed
- ☐ Some of the species that were previously surveyed.
- ☐ None of the species that were previously surveyed. → (Skip to Question 36)

33. Since HIP was implemented in your state, has of your state harvest survey methodology changed?

☐ No —————> (Skip to Question 36)

☐ Yes

34. Was the change the result of implementing HIP?

☐ No

☐ Yes

35. If problems were encountered when changing to HIP, how were they resolved?

36. Please describe any positive and/or negative impacts HIP had on your state harvest survey(s) (e.g., cost savings, additional costs, improved efficiency, reduced efficiencies, etc.).

Positive: _____

Negative: _____

37. When a migratory bird hunter is obtaining HIP certification in your state, does the hunter supply information for the screening questions through the following methods?

Yes No

▼ ▼

☐ ☐ Internet

☐ ☐ In-person form completed by vendor

☐ ☐ In-person form completed by hunter

☐ ☐ Automated telephone system

☐ ☐ Telephone system with "live" operator

☐ ☐ Point-of-sale operated by vendor

☐ ☐ Point-of-sale operated by hunter

☐ ☐ Other by vendor

If other, please specify: _____

☐ ☐ Other by hunter:

If other, please specify: _____

39. Does your state conduct any other surveys at the time of license purchase.

☐ No

☐ Yes

40. Do vendors ask hunters screening questions when they are HIP certifying them?

☐ Our state does not utilize vendors to HIP certify hunters —————> (Skip to Question 44)

☐ No —————> (Skip to Question 44)

☐ Yes —————> (Go to Question 41)

41. Does your agency use any of the following methods to ensure that hunters going through the HIP certification process with vendors have the opportunity to verify that the answers to the screening questions are recorded completely and accurately by vendors?

No Yes

▼ ▼

☐ ☐ Have a computer monitor facing the hunter so they can see the answers as they are being recorded

☐ ☐ Provide hunters with a printed copy of the information they have provided to vendor in the screening process

☐ ☐ Other

If other, please specify: _____

42. Does your agency evaluate the effectiveness of these methods?

☐ No —————> (Skip to Question 44)

☐ Yes

▼

43. How do you evaluate the effectiveness of these methods?

44. Please check the box that best indicates your state's assessment of how well the U.S. Fish and Wildlife Service harvest estimates compare to "reality" for the following species:

	Very Close ▼	Close ▼	Distant ▼	Very Distant ▼	Don't Know ▼
Ducks.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Geese.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Doves.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Woodcock.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Snipe.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Coots.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Rails.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

45. Please check the box that best indicates your state's assessment of how well the U.S. Fish and Wildlife Service estimates of hunter numbers compares to "reality" for the following species:

	Very Close ▼	Close ▼	Distant ▼	Very Distant ▼	Don't Know ▼
Ducks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Geese	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Doves	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Woodcock ...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Snipe	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Coots	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Rails	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

46. Please check the box that best indicates your state's assessment of how well the U.S. Fish and Wildlife Service estimates of days hunted compares to "reality" for the following species:

	Very Close ▼	Close ▼	Distant ▼	Very Distant ▼	Don't Know ▼
Ducks.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Geese.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Doves.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Woodcock.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Snipe.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Coots.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Rails.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

47. How does your state determine "reality" in questions 41, 42 and 43?

48. Do you have state migratory bird hunting estimates of the following for 1998 or 1999?

	1998		1999	
	No ▼	Yes ▼	No ▼	Yes ▼
harvest information...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
hunter numbers.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
days hunted.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If you have a report or other analysis about migratory bird hunting harvest information, hunting numbers, or days hunted, for 1998 and/or 1999, please append it to this survey.

49. Please complete this matrix.

Migratory bird hunter group	Does your state exempt these migratory bird hunter groups from purchasing a hunting license	Does your state exempt these migratory bird hunter from the HIP certification process	Does your state have estimates for the number of these migratory bird hunters groups that are exempt from HIP
	YES NO	YES NO	YES NO
Seniors	<input type="checkbox"/> <input type="checkbox"/> (If yes, above age? _____)	<input type="checkbox"/> <input type="checkbox"/> (If yes, above age? _____)	<input type="checkbox"/> <input type="checkbox"/> (If yes, above age? _____)
Juniors	<input type="checkbox"/> <input type="checkbox"/> (If yes, below age? _____)	<input type="checkbox"/> <input type="checkbox"/> (If yes, below age? _____)	<input type="checkbox"/> <input type="checkbox"/> (If yes, below age? _____)
Landowners hunting on their own land	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
Other landowners	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
Veterans	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
Disabled veterans	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
Persons with disabilities	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
Other Please specify _____ _____ _____ _____	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>

If your state has any reports, analysis, or information about estimates of numbers of exempt migratory bird hunters, please append to this survey.

50. Please indicate how much your state believes the following sources of bias affect the accuracy of estimates obtained from HIP data:

	High Impact	Medium Impact	Low Impact	Don't Know
A. Not having all names and addresses in the sampling frame due to exempt hunters	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B. Not having all names and addresses in the sampling frame due to people not registering even though they are not exempt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C. Not having all names and addresses in the sampling frame due to HIP certification processing problems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D. Not having correct screening information due to agent issues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
E. Including people in the sampling frame that do not intend to hunt migratory birds	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
F. Memory bias of survey respondents selected by the U.S. Fish and Wildlife Service (e.g., this source can be due to a person including hunts from previous years or simply recording more or less birds than truly harvested) ...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
G. Non-response to all U.S. Fish and Wildlife Service mailings and follow-ups by selected persons	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
H. Errors in coding and data entry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I. Inaccuracies in analysis or inappropriate analyses	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
J. Misinterpretation of results or definitions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
K. Other sources of bias: <i>Please specify</i> _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

51. Please complete the following matrix for all of the major chain store vendors in your state (e.g., Wal-Mart, K-Mart, Bass Pro Shops, Texaco, etc.). For this table, please consider your state agency to be a major chain store.

[illegible]

52. How much does it cost your agency annually to operate the following HIP certification system(s)?

Note: Please report only those costs that are specific to HIP; costs associated with operating your state's license system should not be included.

\$ _____ Telephone
 \$ _____ Internet
 \$ _____ Separate migratory bird or HIP permit or stamp
 \$ _____ Electronic point-of-sale licensing
 \$ _____ HIP included on regular paper license or license application form
 \$ _____ Other

If other, please specify _____

53. Does your state include the following in your annual cost estimate(s)?

Yes ▼	No ▼	
<input type="checkbox"/>	<input type="checkbox"/>	Contractor fees
<input type="checkbox"/>	<input type="checkbox"/>	Telephone charges
<input type="checkbox"/>	<input type="checkbox"/>	Web site maintenance
<input type="checkbox"/>	<input type="checkbox"/>	Printing and distribution of forms
<input type="checkbox"/>	<input type="checkbox"/>	Printing and distribution of mailing envelopes
<input type="checkbox"/>	<input type="checkbox"/>	Postage fees
<input type="checkbox"/>	<input type="checkbox"/>	Maintenance of capital equipment
<input type="checkbox"/>	<input type="checkbox"/>	Supplies (for example, license stock)
<input type="checkbox"/>	<input type="checkbox"/>	License vendor compensation/fees
<input type="checkbox"/>	<input type="checkbox"/>	Help desk/hotline for license vendors
<input type="checkbox"/>	<input type="checkbox"/>	Data entry
<input type="checkbox"/>	<input type="checkbox"/>	Data formatting and data clean-up
<input type="checkbox"/>	<input type="checkbox"/>	Record keeping
<input type="checkbox"/>	<input type="checkbox"/>	Other staff time
<input type="checkbox"/>	<input type="checkbox"/>	Publicizing/explaining HIP to hunters
<input type="checkbox"/>	<input type="checkbox"/>	Publicizing/explaining HIP to vendors
<input type="checkbox"/>	<input type="checkbox"/>	Other

If other, please specify: _____

☐ ☐ Other

If other, please specify: _____

☐ ☐ Other:

If other, please specify: _____

54. About how many minutes does it take on average for a hunter to complete the HIP certification process in your state using the following methods?

_____ Telephone
 _____ Internet
 _____ Separate migratory bird or HIP permit or stamp
 _____ Electronic point-of-sale licensing
 _____ HIP included on regular paper
 _____ Other

If other, please specify _____

55. Are hunters charged a fee for HIP certification?

☐ No → (Skip to Question 58)

☐ Yes ↓

56. What is the fee charged per hunter?

_____ dollars

57. What is your state's total revenue from HIP fees?

_____ dollars

58. Do you have any recommendations for improving the performance of large chain-type stores in certifying for HIP?

Please use the spaces below to provide any comments about this survey or any additional comments on HIP.

[illegible]

- 1) The completed questionnaire;**
- 2) Any report or other analysis that compares your agency outlets with other vendors;**
- 3) Any report or other analysis about migratory bird harvest information, hunter numbers, or days hunted;**
- 4) Any report or other analysis about estimates of numbers of exempt migratory bird hunters;**
- 5) Your responses to open-ended questions that did not fit in the spaces provided.**

Richard Elden, 6152 Keeney Dr., Six Lakes, MI 49783

have any questions, please call Richard Elden 517-365

If you have any questions, please call Richard Elden, 517-365-3138.