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Report Back Provided to the Joint Standing Committee on Inland Fisheries & Wildlife



Combined Report Back On:

RESOLVE CHAPTER 49 (LD 1213) Resolve, Regarding Electronic Tagging of Big Game Animals

PUBLIC LAW 2021 CHAPTER 121 (LD 943) An Act to Improve Turkey Tagging

Provided By: The Department of Inland Fisheries & Wildlife

Date: January 10, 2022

Good morning Senator Dill, Representative Landry, and honorable members of the Inland Fisheries and Wildlife Committee,

I am Craig McLaughlin the Research & Assessment Section Supervisor for the Wildlife Division. I am here to update you on the department's effort to examine possible options, timeline to implement, costs, benefits, and concerns for implementation of an electronic tagging system for big game, including turkey.

RESOLVE CHAPTER 49 (LD 1213) does the following:

Sec. 1. Study. Resolved: IFW shall examine electronic tagging of big game. The examination must determine the direct costs of and timeline required for implementing an electronic tagging option for hunters of big game animals and must include an evaluation of whether and how electronic tagging systems can effectively be implemented and any related costs and benefits of the system options. The department shall report the department's findings and recommendations, including suggested legislation, to the Joint Standing Committee on IFW by January 3, 2022. The committee may report out a bill related to big game tagging to the 130th Legislature.

Sec. 2. Registration stations. Resolved: That IFW shall take actions necessary to increase the number of big game registration stations to meet existing needs. In taking actions under this section, the department may allow wild game processing facilities, hunting outfitters, and other appropriate hunting-related businesses to apply to be selected as registration agents and may waive any requirements in the department's rules for registration stations to operate for a minimum number of days per week or a minimum number of hours of a day or to satisfy restrictions related to location.

PUBLIC LAW 2021 CHAPTER 121 (LD 943) does the following:

1. Exempts turkeys taken during the fall open season on hunting wild turkey from tagging and registration requirements; and
 2. Requires IFW to determine the direct costs of and timeline required for implementing an electronic tagging system for wild turkey. The department is required to report its findings and recommendations to the Joint Standing Committee on IFW by January 3, 2022 and the committee is authorized to report out a bill related to turkey tagging to the 130th Legislature.
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INTRODUCTION

This report examines the costs and benefits of changing the Department's process of documenting the number of big game animals killed each year by hunters. For decades, numbers of bear, deer, moose, and wild turkeys harvested each season have been recorded through in-person reporting. Successful hunters are required to deliver their animals to Department-sanctioned registration stations where a tag is attached to the animal after information is recorded on the kill. Because both the hunter and animal are present at a registration station, much biological data (information collected from the carcass) can be obtained efficiently during the registration process. The Legislature is considering replacing in-person reporting of harvested animals with electronic registration (tagging) to ease the task of reporting for hunters. Hunters could report the details of their big game harvest either online or by telephone, thus removing the need for travel to a registration station during business hours to report their harvest. A unique registration number would be issued for each animal, becoming a virtual tag that indicates the animal has been legally registered, replacing the current tag that is affixed to an animal at a registration station.

In this document, we first describe the current big game registration process and explain the value of the information collected from hunters and their big game animals for management. We then consider the impacts of changing to electronic reporting and provide recommendations for addressing the challenges we foresee in implementing the proposed approach to monitoring big game harvests. Finally, we outline a proposed path to electronic registration and include estimates of direct costs to IFW to implement electronic registration of big game animals.

MAINE'S CURRENT BIG GAME REGISTRATION PROCESS

By law, hunters are required to deliver their animals to a registration station, generally within 18 hours of harvest, to report information on the hunter, hunting authority (appropriate license/permit), hunting method, weapon, and timing and location of kill (date, time of day, township and county; Appendix A). Registration stations are distributed throughout the state and are often connected with a service-based business (i.e., gas stations, convenience stores, sporting goods stores). As of November 1, 2021, there were 268 registration stations distributed throughout Maine to provide access to hunters along travel routes (Appendix B). Individual stations may register some or all big game species (bear, deer, moose, and wild turkey).

Registration includes the collection of biological data for each animal, including the gender and age class. Additional information is often collected during registration, varying according to individual species and as management needs change. For example, a premolar tooth is collected from each bear (to establish annual age), select stations have collected teeth and antler measurements from deer, lower canine teeth are generally collected from moose, and ovaries are often collected from female moose (to estimate pregnancy).

Hunters must register their animals within 18 hours of harvesting within organized townships; this registration period is extended to seven days for animals harvested within unorganized towns. A nominal fee is collected for each animal registered to cover the cost to process registration: \$5/bear, deer, or moose; \$2/turkey.

Recent Expansion of Availability of Registration Stations: In Section 2 of Resolve 49, the Legislature requested that IFW take steps to increase the availability of registration stations to hunters statewide. We assessed the distribution of big game registration stations within each administrative region in the fall of 2021 to identify geographic gaps in station availability and offered recommendations for locations of additional stations. Additionally, we dropped requirements of one station per town and business coverage of 8am-6pm Monday-Saturday to ease the qualifications for businesses interested in operating registration stations. This process resulted in eleven (11) stations being added in the following locations: Auburn, Brownfield, Caribou, Cornish, Jefferson, Lovell, Lyman (2nd station), Norway, Patten, Westbrook, and Whitefield (2nd station).

Turkey registration was added to three (3) current registration stations at the following locations: Canaan, Mount Chase, and Perry.

Expanded moose season coverage was added to three (3) current moose registration stations at the following locations: Kokadjo, Jackman, and Northeast Carry TWP.

Registration stations with limited hours or poor service were replaced with three (3) stations at the following locations: Allagash, Fort Fairfield, and Lincoln.

REGISTRATION OF BIG GAME IN SURROUNDING JURISDICTIONS

All eastern states and provinces register big game harvests to inform their management programs. The processes used vary, and Department staff queried managers from surrounding jurisdictions to gain additional insight and understanding of the nuances of registration systems, with a focus on deer. We discovered that most states employ electronic registration of deer harvests during a portion of their hunting seasons (Table 1). Most provide or require in-person registration of deer during selected periods to facilitate collection of biological data from the harvest; New York is the only jurisdiction that has not continued to employ in-person registration.

Table 1. Review of big game registration processes in Northeastern states and provinces (responses as of December 2021).

State/Province	Species	Electronic?	In-person?	Comments
Massachusetts	Deer	Yes (2013)	Yes	Mandatory in-person registration during first week of shotgun season (agency staffed); remainder of season can be either online or in-person
New Brunswick	Deer	Yes (2021)	Yes	Retained in-person when adding online; 15% registered online
New Hampshire	Deer	No	Yes	Currently developing online registration system
New York	Deer	Yes (2002)	No	Voice-recognition phone system, online, mobile app; checks of meat lockers show 45-50% reporting rate
Quebec	Deer, bear, moose, turkey	Yes (2020)	Yes	Both available (60% online/40% in-person 2020; 75/25 2021))
Rhode Island	Deer	Yes	On some days	In-person registration is to collect bio data
Vermont	Deer	Yes (2021; optional)	Yes	Required in-person during firearms, youth seasons to collect bio data; noticed bias in online reporting

IMPORTANCE OF REGISTRATION DATA FOR MANAGEMENT

Knowledge of the number of big game animals harvested each year is critical for monitoring the status of big game populations. Data collected during harvest registrations, and additional biological data (as collected by biological staff during meat locker visits (for deer) and field studies are critical to annual evaluations of population status including effects of harvests. This information supports IFW’s recommendations for future hunting regulations to achieve desired sex and age compositions of harvests and achieve population goals. Brief reviews for each species follow:

Bear: Since 2019, the Department has partnered with the USFWS Cooperative Fish and Wildlife Research Units at three Universities (Cornell University, University of Washington, and North Carolina State) to develop a rigorous population model that integrates extensive long-term harvest and research data to estimate abundance and monitor change over time. This new integrated population model sets Maine’s bear management ahead of other States as it integrates a variety of data (i.e., harvest, hunter effort, and population vital rates) to build a more rigorous and informed model framework. The model relies on age of harvested bears and thus requires an accurate accounting of the number of bears harvested by sex and age and accurate reporting of where the bears are harvested. Harvest data from big game registration stations are then paired with information on numbers of permit sales to provide

estimates of hunter success. Finally, survival and productivity data from monitoring radio-collared bears across the state are integrated with harvest data within the model to strengthen the statistical rigor of annual population assessments. The Department has invested considerable resources into developing a rigorous model for monitoring Maine's black bear population based on our current data. If we alter our approach for obtaining annual harvest information from bear hunters, it is imperative that this new approach ensures similarly high reporting rate by hunters. If not, estimating and correcting for lower hunter reporting rate is complex, will require significant thought, and the potential additional cost of modifying our current model framework and rigor of estimates.

Deer: Accurate accounting of the number of deer (by sex and age) taken within each Wildlife Management District (WMD) is needed to assess the impact of the harvest annually; this is the basis for managing deer population levels through regulated harvests of female deer. The number of female deer harvested each year is controlled through allocations of any-deer and/or bonus deer permits. Department staff visit registration stations and inspect registration records to gain hunter addresses for follow-up sampling of deer age and sex, and for disease surveillance (e.g., Chronic Wasting Disease). Both sampling and surveillance also occur at meat lockers where deer are processed by meat cutters.

Moose: Accurate accounting of the number of moose taken by sex and age (by township and WMD) informs trends in hunter success. The age distribution of harvested moose provides insight about the relative age distribution of the underlying population and is used to demonstrate continued availability of older-aged bulls for hunters to harvest. Additional biological data collected during the registration process provide information on moose productivity (corpora lutea within ovaries) and disease/parasite loads. Productivity metrics (number of calves/adult female; twinning rates) and counts of winter ticks provide indices of the health of the moose population. Maine's moose population has been lightly harvested; annual permit allocations remain conservative relative to population growth.

Success rates are important to moose hunters and are relevant to how moose hunters may choose where they apply for the lottery. Since moose hunting permits are issued by a random lottery, it may be more important to have accurate registration data to determine tag fill rates.

Locations of moose kills are also important to understanding the geographical distribution of the harvest within a WMD and to support law enforcement. Most moose hunting occurs within the commercial forestlands and hunters frequently have difficulty identifying the exact location of their kill. While this inaccuracy can impact the location of kill within a town, harvest location data summarized by town and WMD likely accurate.

Biological data from harvested moose are collected during the registration process, most often by the store staff. This information includes moose sex and age; weight; for males - antler spread, number of antler points, type of antler; for females - lactation status and collection of ovaries. A canine tooth is extracted from each moose and sent to the Bangor office for age determination by counts of cementum annuli.

Most moose hunters want to know the age, weight of their moose, and antler spread of a bull. Over the 40 years of moose hunting we have aged 90-95% of all moose harvested annually. No other jurisdiction does this. Moose hunters are provided with the ages of their moose on the IFW website over winter. IFW uses bull and cow age distributions to understand the age structure at the WMD population level and proportion of mature bulls in the population. This has been a hallmark of moose management since 1980 and is highly valued by the moose hunting public.

Collection of ovaries from adult females is the single most important biological sample that can be retained from moose and remains the critical data collected from the harvest each year. Ovaries provide IFW with annual information on cow productivity and the health of the moose population - a key goal and objective of the 2017 Big Game Plan.

Wild Turkey: The number of wild turkeys harvested each spring, stratified by hunting method, youth versus adult hunters, timing of harvest, age composition of the harvest, town and WMD is used to assess the impact of harvests on population trajectory. Quality of hunting experience is measured periodically through hunter surveys in which hunters rate their spring hunting experience and level of interference from other hunters.

An accurate accounting of the number of male wild turkeys taken each spring by age and by WMD provides a basis for annual assessments and for adjusting WMD bag limits in the fall wild turkey hunting season. Registration data, when paired with information on numbers of permit sales, also provide estimates of hunter success and trends in the composition and geographical distribution of harvests. In addition to harvest data, recommendations for adding WMDs to the fall season incorporate data collected in a productivity survey in August of each year.

IMPACTS OF ELECTRONIC REGISTRATION ON MANAGEMENT PROGRAMS AND POTENTIAL SOLUTIONS

Because the experiences of some other states indicates that not all hunters will register their animals under an electronic system relying on self-reporting, the current system of essentially complete accounting of harvests may be replaced by some lower proportion of harvest being reported. The reporting rate is expected to differ among species, and each will need to be estimated before projections of total harvests can be completed. The projected harvest estimates may have less certainty. If confidence in the numbers of animals harvested is eroded, IFW will likely take a conservative approach to managing harvests by prescribing lower harvests to avoid over-shooting management objectives. To ensure lower harvests, seasons may be shortened and/or numbers of permits may be reduced, resulting in less hunting opportunity. To maintain confidence in big game harvest statistics, IFW will need to develop a process to monitor hunter compliance and reporting rates for each big game species. It is important to note that these concerns may be mitigated to some degree by strict enforcement of registration requirements, but this would likely require additional staff time for Warden Service to establish check-stops and compliance checks at meatcutters. This is discussed in more detail later in the report.

Bear: Most of the bear harvest occurs within the first two months of the three-month season, but timing of harvests changes from year to year with the availability of fall food sources. The Department will need to expend additional resources to accurately estimate the number of bears harvested under any electronic reporting scenario. Various approaches may be useful, including phone or email surveys to hunters that bought bear permits during the year, surveying hunters when they purchase a bear permit (i.e., asking hunters if they hunted the previous year and whether they were successful), or phone interviews with Maine guides to determine the number of bears harvested by their clientele. These approaches could provide a means to calibrate reporting rates and generate meaningful estimates of total harvest.

Accurate counts of the number of harvested bears, age at harvest through submission of a tooth for age estimation, and accurate counts of marked bears harvested through the submission of ear tags and radio collars are crucial data inputs to the Department's bear management system and are required to run the Department's groundbreaking integrated bear population model. For statewide estimates of abundance and trend, we need accurate estimates of harvest reporting rate, submission of ear tags or collars from at least 95% of the marked bears harvested and age from at least 75% of harvested bears. Since 80% of the bears are harvested with the aid of a Maine Registered Hunting Guide with the majority of successful guided hunters being non-residents, the Department could submit tooth and ear tag envelopes to guide operations and ask for their assistance in collecting teeth and ear tags/radio collars. To ensure an adequate distribution of harvest since residents harvest just under 50% of the bears each year, Department staff could track online registration information in real time, then travel to hunter's residences to collect teeth from hunter-killed bears – this would require a group of staff dedicated to the task for a few months each year. Hunters could also be provided with instructions on how to remove teeth and ear tags from bears and mail them to IFW when they purchase their bear permit. This likely will require several mailings to hunters. The first mailing would provide the hunter with instructions, tooth envelope, and self-addressed stamped envelope to submit the tooth; a follow-up mailing would remind the hunter to submit the tooth. This approach may prove the most effective and could increase compliance with self-reporting, as there is high interest among bear hunters in obtaining the age of the bear they harvested and information about a marked bear they harvested. However, there would be some challenges to using this approach in that there are several categories of hunters that are not required to have a bear permit, making it impossible to efficiently provide them with materials for tooth submission.

Since accurate counts of harvested bears including marked bears and age at harvest are critical inputs in our integrated population model for black bears, we would need to design a study to estimate reporting rates of bears, including marked bears. Without an accurate estimate of reporting rate, uncertainty in bear abundance and population trend would increase hampering our ability to effectively set bear regulations.

Currently, bear hunters are required by law to present a tooth from the bear they harvested at registration. The registration stations have instructions on which tooth to remove, how to remove it, how to properly label the samples, and how to submit the tooth. With this system, we receive teeth

from 75-90% of the harvested bears. With the transition to self-reporting, we could see a further reduction in tooth submission and the potential bias of hunters submitting teeth from larger (older) bears, thus biasing our assessments of the age structure of harvested bears and increasing uncertainty in our modeling and reducing the credibility of our estimates. Therefore, we should monitor tooth submissions with self-reporting and take action to increase compliance if we detect bias.

In 2017, the Northeast Black Bear Technical Committee, whose members include state and provincial black bears biologists from West Virginia to Newfoundland, was charged by their wildlife administrators to investigate the cost and benefits of electronic registration of bears. We surveyed 20 eastern states and five Canadian provinces that permit hunting of black bears. Newfoundland was the only jurisdiction that does not require mandatory registration of harvested bears. Of the remaining 24 jurisdictions, 11 (46%) maintain paper registration at contractor or agency run check stations and 13 (54%) have implemented electronic registration. Seven of the 13 jurisdictions have provided the option to hunters to electronically register their game at physical check stations or retained some physical check stations (Appendix C).

Of the three approaches to registration (paper, electronic, both paper/electronic) more jurisdictions that implemented electronic registration without retaining physical stations reported that their harvest level was estimated and reported generally lower compliance with biological data from harvested bears (e.g. teeth). Conversely, jurisdictions with paper registration or electronic registration that maintained physical check stations had higher compliance with biological samples and registration of harvested bears (i.e., considered known total harvest vs. estimated). Thus, retaining physical check stations when implementing electronic registration appears to avoid the potential shortcomings of either paper registration (mainly delays in processing/summarizing data) or of hunters self-registering their game electronically.

In fall 2020, we again contacted black bear managers to get updated information on the number of jurisdictions that provide electronic registration for bear hunters. Since 2017, only one jurisdiction (Virginia) has added electronic registration for black bear. Bear hunters in Virginia are required by law to submit a tooth when they harvest a bear. Once a hunter registers a bear, the agency sends a tooth envelope and instructions to the hunter to submit the tooth. Massachusetts indicated that they continue to provide on-line registration, continue to have voluntary submission of teeth and as a result continue to have low submission rates. They recommend a hybrid system (i.e., online reporting at a physical check station) to ensure adequate biological samples are obtained from game animals – this is the registration system currently being used for bear in Maine.

Deer: Two datasets would be impacted by transitioning to electronic registration of deer: our biological dataset and our harvest dataset. Other datasets including recruitment, winter severity and mortality, and hunter effort would not be impacted.

Biological Dataset

Biological data for deer are collected by Department staff and contractors annually during the regular firearms season. Biological data from deer come from a variety of sources including in-person registration stations, meat cutters/butchers, taxidermists, and house-to-house visits. Data sources vary significantly by Region; in areas with higher deer harvest where staff can typically find large numbers of animals at meat cutters, these are the primary data source, whereas in areas with lower harvest that is more spread out through the season, registration stations provide most of the data. In 2020, the percent of biological data obtained from registration stations- either through Department staff or contractors visiting the station or the station agents collecting info- were as follows: Region A: 5-10%, Region B: 0-5%, Region C: 55-60%, Region D: 0-5%, Region E: 45-50%, Region F: 15-20%, Region G: 75-80%. In our northern and Downeast Regions, between 15-80% of our biological data may come from in-person registration in one form or another. In southern and central Maine, little or no data comes from in-person registration.

Data collected include:

- Sex-age class: Of critical importance, this information is used to estimate mortality rates, and yearling frequencies, which inform our understanding of age structure and sex ratios and are used to gauge whether these population attributes are currently conducive to achieving our management strategies; e.g., if we want to increase the deer population in a district, we will attempt to manipulate sex structure to favor does, usually by limiting allowable doe harvest.
- Incisor teeth: Of moderate importance, this information is used to estimate advanced age structure and corroborate yearling frequency estimates; these data may also be used in the future for population reconstruction efforts to estimate density and abundance.
- Yearling antler beam diameters (YABD): Of moderate importance, this information is used as an index to monitor population density relative to carrying capacity, where low YABDs suggest poor nutrition and a population nearer to carrying capacity (the maximum density of deer that the habitat can sustain) and high YABDs suggest good nutrition and a population less near carrying capacity.
- Lactation status: Of moderate importance, this information provides an additional source of recruitment data, which is used to estimate allowable mortality rates and sex ratios in a stable population.
- Antler points: Of low importance, this information is used for basic trend monitoring and for addressing information requests from the public.
- Dressed weights: Of low importance, this information is used for basic trend monitoring and for addressing information requests from the public.

In the absence of in-person registration, it would be relatively easy to collect sufficient biological data in southern and central Maine relying primarily on meat cutters, but in northern and Downeast Maine, it would be difficult or impossible to collect sufficient biological data without in-person registration. A staff of several technicians may need to be deployed to review registration data daily during the season, then phone and visit successful hunters to examine their deer and obtain the biological data.

Harvest Dataset

Harvest data are used for population trend monitoring (buck kill index and sex-age-kill density estimates), to estimate current and necessary harvest ratios (ratio of bucks to does in the harvest) to achieve a desired population objective, and to calibrate expansion factors to account for permit fill rates. **These data are of critical importance.** Accurate interpretation of the harvest data requires accurate biological data. If we transition to electronic (online) registration, mitigating impacts to the accuracy and credibility of the harvest data set will require estimation of reporting rates and will create staffing challenges developing a means of accurately projecting harvests and their impacts on population growth.

To address these issues, we would need to consider the following actions:

1. Correct harvest records with surveys or compliance checks to estimate reporting rate. We would need to assess reporting rates to determine what portion of the harvest is being reported and adjust figures accordingly. Given variables such as internet connectivity in different areas of the state, reporting rates would ideally be estimated on a per-WMD basis.
2. In lieu of a seal (tag) issued during in-person registration, some other identifier (e.g., virtual seal number) would be required to tie a registration record to an animal at the meat locker. This is needed to prove that an animal was legally harvested and so that harvest data for the animal could be joined by this identifier to the biological data. (One option: Automatically generate and issue a unique registration number to each hunter at the conclusion of his/her electronic registration action).
3. Identify ways to obtain biological data in regions where it comes predominantly by collection during in-person registration. We'd need other data sources in Northern, Eastern, and Western Maine since there is not the same concentration of deer at meat cutters to make data collection efficient in this area. Some options include:
 - a. Increased reliance on house-to-house data collection. House-to-house visits to collect data from individual deer would likely continue to be relied upon, but this method is inefficient given how harvested deer in these areas may be spread both temporally and spatially. Adding additional contract labor to conduct house-to-house searches would be a very low return on investment given the temporal and spatial spread of data; in 2021, IFW employed one contractor whose focus was on house-to-house data collection in western Maine, and they collected data from an average of just under 3 deer per day of work using that method. Returns would be lower in areas of lower harvest density, such as northern Maine.
 - b. An additional page could be included during the online registration process where a landowner can consent/request that someone visit their home to collect information, but there are potential biases associated with this.
 - c. Provide options for both online and in-person registration with in-person registration required on some days. Requiring in-person registration on the most busy days (Opening Day, Saturdays) could provide hunters added flexibility during the season while still ensuring

that some data collection may take place at registration stations on high-volume days; this strategy is currently used in Vermont and Massachusetts.

4. Encourage hunters to drop off teeth or send them to regional offices. While this may yield samples, age bias would be a major concern as hunters will be more inclined to submit teeth for aging if they harvested a larger or older deer. It is also important to collect the correct tooth and preserve the root of the tooth; educational materials would need to be developed to help hunters properly collect these samples.

In summary, IFW would lose significant biological data in northern, eastern, and western Maine that would be difficult or impossible to replace, and these are the areas where we are already struggling to get enough data to support our management. We would be better able to adapt in southern and central Maine, but these parts of the state are already well-covered in registration stations, so this wouldn't be a substantial improvement in convenience. While there are some possible means of replacing some of the lost data, the established alternatives are either inefficient or risk bias; random sampling is needed to ensure representative data, and you lose your ability to collect random sampled data when data collection is by voluntary submission.

Electronic reporting of hunter-harvested deer would result in less confidence in annual harvest summaries, due to incomplete reporting and greater potential bias in biological samples. Post-season adjustments to datasets will be required to account for reporting rates, and surveys of hunters or compliance checks should be conducted regularly to maintain high levels of confidence in harvest-based estimates. Survey costs would vary depending on frequency and survey method(s) but may range from \$5,000 to \$20,000.

Moose: With electronic reporting of moose, harvest reporting compliance rates may decline, and if this were to occur the Department would need to develop a predictive model to estimate hunter success rates. An electronic registration system should also include a process for accurately determining the town of kill, as hunters often have difficulty identifying and reporting the correct location of their harvests when hunting in unorganized towns.

Teeth, ovaries, and counts of winter tick loads from a high percentage (~80%) of annual harvests are necessary to maintain a high level of confidence in population status to inform moose management decisions and when feasible, maximize moose hunting opportunity for hunters. These data are critical to evaluating annual moose age distributions, reproduction related to winter tick impacts and to predict annual overwintering mortality of calves. We must sample and evaluate moose population dynamics at the WMD level rather than statewide, due to variation in moose densities across the state. Since we currently limit permit allocations and numerical harvest is a relatively small number, sampling of registration and biological data requires a high return rate to provide reliable data.

To acquire the critical biological data used to inform moose management, especially ovary collections and teeth from harvested moose, the Department would need to expand staffing levels during the moose hunts. The additional personnel would be needed to contact hunters rapidly, and to conduct

follow-up visits to kill sites or to successful hunters to collect the needed samples. In recent seasons, requests for hunters to collect and submit biological data from moose have met logistical challenges and with limited success (<40% submittal). When hunters are expected to collect biological samples, they must have access to specific supplies (e.g., formalin for ovaries, loess solution for teeth) to preserve and maintain the quality of the tissues. Ovary sample collection requires skill in identifying and removing both ovaries (incomplete samples containing only one ovary are unusable). Ovaries must also be placed in formalin (a hazardous liquid) to preserve the tissue before analysis. Gum tissue must be scraped from teeth soon after removal from the animal and then placed in a preservative (loess solution), or they will decay and become unusable in a few days. During recent seasons, we have provided registration stations with the materials needed to properly store ovaries and teeth, and they have served as staging areas for the biological samples before brought to the Bangor research office.

If we move to electronic registration of moose, IFW proposes to establish Department-staffed check stations at key egress points across the northern and western tier of the state to intercept hunters and achieve adequate biological samples to inform decision making. This approach will be costly, requiring additional staff, equipment, and supplies.

We would need to operate and staff a minimum of eight roadside check stations for a minimum of three days during each of the traditional hunts (September and October bull seasons, October antlerless season). This estimate does not include costs of weighing moose which is highly valued by many Maine moose hunters and provides additional biological information for management.

Wild Turkey: Recently, following recommendations from the Wild Turkey Management Plan, the Department's wild turkey program has worked with the University of Maine to improve the accuracy of estimating wild turkey harvest rates and populations at the WMD level. By marking turkeys with leg bands, recording the number of banded birds reported in the harvest, and obtaining an accurate accounting of annual spring harvest, we can estimate the wild turkey harvest rate for each WMD. This management approach relies on accurate accounting of the number of turkeys harvested each season. Electronic reporting by successful turkey hunters may result in a reduction in reporting compliance. For example, self-reporting of wild turkeys in New York state has seen an estimated 50% compliance for the spring season and a 42% compliance for the fall season.

Fall harvest information can be used to track wild turkey population trends and fall turkey hunter participation. The fall harvest has the potential to influence the population trajectory of wild turkeys, because an average 65% of fall harvests are females. Wild Turkey hunter participation has shown an increase starting in the spring of 2020. This increase in participation calls for accurate fall harvest accounting. Overharvesting females can influence the population trajectory. Harvesting more than 10% of a turkey population can cause a decreasing trend. A timely measure of fall harvest through electronic/self-reporting will allow more confidence in the Department's assessment of total annual wild turkey harvest.

Through the fall of 2020 the Department required the registration of wild turkeys at in-person registration stations. This requirement was removed for the fall season in 2021. If an electronic harvest registration system becomes operable for the spring wild turkey season, the Department would request that the requirement for registering wild turkey harvest in the fall is reinstated. This would help compensate for the loss in confidence in harvest levels that we may experience if electronic tagging is allowed for the spring season.

Recommended adjustments to monitoring turkey hunter compliance and reporting rates under electronic reporting include periodic banding with associated reward bands. Reward banding, as evidenced in waterfowl harvest reporting, incorporates monetary compensation for reporting harvested, banded wild turkeys. This can improve reporting rates to near 100% by periodically banding every other wild turkey of a sub-sample in a WMD or combination of WMDs with a dollar value band. The rate of dollar valued bands reported compared to the rate of non-dollar value bands can be assessed and the reporting rate can be estimated. This could be done every five years.

Costs Associated with a reward banding study:

- Personnel - \$12,000 for a six-week winter trapping effort (four biologist – each 20 hours a week)
- Reward Bands – \$5,000 (100 bands at \$50 each)
- Trapping related expenses (bait, equipment, vehicle costs) - \$10,000
- Total estimate for a reward banding study = \$27,000.00

Hunter surveys can be conducted periodically on a sub-sample of registered wild turkey hunters. A questionnaire would ask the location, age and number of wild turkeys harvested in the spring and the location, age, sex, and number of wild turkeys harvested in the fall. The survey results can be compared to the registration data and band reporting to evaluate reporting accuracy. In addition, questions specific to hunter effort, satisfaction and opinion can be included to monitor the quality of wild turkey hunting, a priority in managing the spring wild turkey hunt.

Costs Associated with a turkey hunter survey:

- Mail-in post card reminders for filling out an online survey - \$3,000

POTENTIAL IMPACTS TO HUNTERS

The major impact of electronic registration for hunters will be convenience in registration effort. There will be no requirement to travel or adjust the timing of registering an animal to the hours of operation of a registration station; instead, a hunter could report at any time of day. Barring any change, the timing of registration would still be bounded by existing legislation (within 18 hours in organized townships; seven days within unorganized townships).

It is important to recognize the potential loss of some services to hunters with the transition to electronic registration. The current system of a physical registration station provides the hunter with a

one stop shop for registering their game, provides instruction and support for collecting and submitting crucial biological data, and provides the hunter with additional services (e.g., weights of harvested animals, most notably moose). In addition to providing a self-reporting option, the Department will need to consider mechanisms for maintaining an adequate number of physical registration stations across the state. This will require similar financial commitment to provide materials and support to the registration stations as we provide under the current registration system, plus the additional cost to implement and maintain electronic registration. Finally, if many hunters choose to self-report their big game harvests, the number of hunters using in-person stations will decline. We expect this will cause some stations to discontinue providing registration services, and it may become more challenging to maintain an adequate network of registration stations. This would cause an inconvenience to hunters that prefer in-person registration that would have to travel further to find an open station.

The Maine moose hunt is a unique cultural experience and visiting a registration station has become part of that experience. Moose hunters and many onlookers gather in droves at moose check stations to see the event firsthand. We cannot overstate the overwhelming interest by moose hunters in registering and submitting biological data at registration stations, and expect that relatively few hunters would take advantage of an electronic reporting option.

POTENTIAL IMPACTS TO REGISTRATION STATIONS

Allowing self-reporting of harvests by hunters will have implications for the proprietors of small businesses that currently house big game registration stations, and other businesses nearby. Removal of registration stations across the northern tier of the state is expected to be detrimental to seasonal business associated with registration of big game and may result in some economic losses within Maine's rural counties. We anticipate this impact would be greatest for certain moose registration stations, some of which receive a large influx of customers that travel to the businesses specifically to view harvested moose.

ENFORCEMENT AND ACCURACY OF BIOLOGICAL DATA

If hunters are given the option to self-report their harvests, the Department anticipates that compliance with hunting laws and rules, and the accuracy of recorded biological data, may decline. Currently, in-person registration stations are required to report potential violations to the Department, and it is virtually impossible for hunters to intentionally inaccurately report the sex of a harvested animal (e.g. register a doe as a buck if the hunter doesn't have an antlerless deer permit). Registration station attendants report dozens of violations to the Department every year, and we believe the requirement to take an animal to a registration station is a major disincentive to providing incorrect information. Therefore, we believe self-reporting will make it much easier to inaccurately report the sex of a harvested animal, to register an animal harvested with an illegal implement, or for someone other than the shooter to register an animal under their name.

In order to maximize compliance with registration requirements, if electronic tagging is allowed the Department also expects it would have to spend additional staff time enforcing registration requirements and investigating potential instances of non-compliance. This would likely take the form of additional hunter check-stops or expanded compliance checks at meat cutters. If successful, this may reduce the need to develop approaches to regularly estimate reporting rates and correct harvest estimates.

PROPOSED SYSTEM FRAMEWORK

If the Department is directed to allow electronic registration of Big Game, we envision the following system framework:

- The system would be web-based, and would work with either a smartphone, tablet or computer. An internet or cellular connection would be required. The hunter would be required to have an email in their MOSES profile, or provide one at the time of registration. Registering by phone is likely not a viable option at this time.
- The hunter's license/permit would be automatically selected from their profile, if available.
- A unique virtual seal (tag) number would be assigned, which the hunter would be required to write on a tag and attach to the animal.
- Hunters would receive a confirmation email once the registration is complete.
- There would be no cost for hunters that self-report their big game harvests.
- Hunters with a paper license/permit or with an authority not in MOSES (e.g. landowner on own land) would not be able to use the electronic system and would be required to take their animal to an in-person registration station.
- The Department's current technical support for registration stations would be expanded in order to support use of the system by hunters with varying levels of technological skills. Technical support would be available ~16 hours/day during hunting seasons.
- A communications plan would be implemented to make hunter's aware of the new system. However, without significant simplification of the Department's license/permit framework, we expect many hunters will experience challenges in correctly using the system.

CHALLENGES TO IMPLEMENTATION

The statute establishing the Department's current hunting licenses and permits are extremely complex, with numerous exceptions and exemptions. This complexity currently creates challenges for our network of in-person registration stations, each of which has been trained in the use of the web-based registration platform by Department staff and receives significant technical support throughout the hunting season. Determining the license or permit under which an animal is harvested is a critical component of registration as it allows the Department to determine success rates of various hunting seasons, and reduces the need for Warden Service staff to investigate whether a hunter had the appropriate license or permit. Unless steps are taken to simplify the statutory framework for licenses

and permits, many hunters may become frustrated while learning to use an electronic registration system, which could result in lower reporting compliance rates and dissatisfaction.

The current license and permit framework will also make it extremely challenging for the Department to survey hunters to determine compliance rates and correct harvest estimates. For example, determining compliance rates for turkey registration currently requires contacting a sample of turkey permit holders as well as several categories of hunters that do not require a permit, including youth hunters, some landowners, disabled veterans, Native Americans, and senior hunters. Further, contacting holders of lifetime license holders is challenging or impossible if they have not provided updated contact information. Therefore, the Department is concerned that without some adjustments to the licensing framework, it will be extremely difficult, if not impossible, to develop accurate estimates of big game harvest.

A partial list of license and permit exceptions that would make electronic reporting challenging includes:

- Issuance of paper licenses and permits
- Landowners and family members hunting on own land without a license (license still required for moose)
- Antlerless deer permit transfers and swaps
- Turkey permit not required for youth, seniors, or some landowners
- Bear permit not required for resident hunters during firearms season on deer, youth, or seniors
- Two expanded archery permits included with youth hunting license, senior hunters, and disabled veterans
- Crossbow permit not required for youth or senior hunters
- Youth hunters that upgrade to an adult license at age 16 require all permits
- Most permits included in license for disabled veterans
- Most permits included in license for Native Americans

COSTS

System Development: The Department paid InforME \$49,038 in calendar year 2020 to maintain, revise, and develop the current web-based registration system used by registration stations. InforME receives \$1 for each animal registered. We do not anticipate additional direct costs to modify the system to be used by hunters.

Lost Revenue: The proprietors of individual registration stations currently retain \$2 for each animal registered (bear, deer, moose, or turkey). The Department receives \$3 of the registration fee for each bear, deer, or moose and collects no fee for turkeys. During the 2020 seasons, the Department received \$118,302 from registration fees. One dollar (\$1) of each deer registration fee is used to fund the Department's predator control efforts, and \$1 contributes to enhanced deer habitat. In 2020, we received \$66,318 from registration fees to enhance deer habitat. If we create an electronic registration system, we do not anticipate charging a fee to hunters that use that system to report their big game

harvests. There would be a corresponding loss in revenue to registration stations and the Department (estimate: 50-75% of current revenue or at least \$60,000; Table 2).

Technical Support: We anticipate needing two additional temporary contract staff to provide technical support to hunters using an electronic registration system, at a total annual cost of approximately \$19,200 (Table 2).

Collection of Biological Data and Estimating Reporting Rates: If an electronic registration option is established, we anticipate needing to hire additional seasonal contractors to collect biological data, and to deploy rewards bands on turkeys (Table 2). The Department will also need to develop methods to monitor rates of hunter compliance in registering animals, and subsequently generate accurate harvest estimates. These costs are difficult to predict but will most likely require additional staff time to develop means of evaluating and promoting registration compliance. These could include increased numbers of check-stops or expanded compliance-checks of animals taken to meat cutters.

Table 2. Estimated costs to implement electronic big game registration. Note that surveys may be conducted at multi-year intervals.

Species	Action	Estimated Cost
Bear	Tooth envelopes and instructions in hunting license mailing	\$1,000
	Mailing tooth envelopes to Registered Guides	\$5,000
	Tooth envelopes, self-addressed stamped return envelope, and instructions in hunting license mailing	\$10,000+ postage for return mailing
	Staff visits to hunter residences (6 individuals x 8 work weeks x \$20/hr)	\$38,400
	Staff time to design study to estimate reporting rate and make necessary adjustments to management system and integrated population model	\$10,000
	Survey (email) and analysis to determine registration compliance rate	\$5,000
	TOTAL BEAR	\$69,400
Deer	Collecting bio data in Northern, Eastern Maine – staff visits to hunter residences (12 individuals x 2 work weeks x \$20/hr)	\$38,400
	Tooth envelopes and instructions, self-addressed stamped return envelope in hunting license mailing	\$10,000+ postage for return mailing
	Survey (email) to determine registration compliance rate	\$10,000
	Staff time to design study to estimate reporting rate and make necessary adjustments to management system	\$10,000
	TOTAL DEER	\$68,400
Moose	Staffing for roadside biological check stations (8 individuals x 3 work weeks x \$40/hr)	\$38,400
	Equipment for roadside check stations	\$6,000
	Staffing for kill-site visits to collect ovaries (6 individuals x 2 work weeks x \$40/hr)	\$19,200
	Survey (email) to determine registration compliance rate	\$5,000
	Staff time to design study to estimate reporting rate and make necessary adjustments to management system	\$10,000
	TOTAL MOOSE	\$69,000
Wild Turkey	Capture/banding of birds to create a marked sample to estimate registration compliance rate	\$27,000
	Hunter survey to estimate registration compliance	\$3,000
	Staff time to design study to estimate reporting rate and make necessary adjustments to management system	\$10,000
	TOTAL TURKEY	\$40,000
Combined	InforMe to design and test web-based system (Amazon Web Services) multiple browsers supported, functional on smartphone, tablet, computer	\$ no additional cost anticipated
	Staffing of telephone lines to answer questions from hunters/assist with registration throughout fall hunts (2 individuals x 12 work weeks x \$20/hr)	\$19,200
	Lost Revenue from Waived Registration Fees	\$60,000
	GRAND TOTAL	\$316,400

CONCLUSION AND RECOMMENDATIONS

In response to the Legislature's interest in supplementing the current in-person registration of hunter-harvested big game animals with an electronic (online) registration system, IFW staff have documented the importance of data collected during the registration process. The agency will be able to adjust operations to implement electronic registration, but significant concerns remain over the potential for a decline in harvest reporting rates. Low reporting rates may lead to 1) inaccurate estimates of total harvests and the sex/age composition of harvests, and 2) difficulty in obtaining adequate biological samples from harvested animals (primarily bear, deer, and moose). All big game management programs rely on accurate assessments of harvests; if estimates of harvest size and composition become less reliable, harvest regulations may become less precise and more conservative, resulting in lessened hunting opportunity. Specific biological data collected during registration varies among Maine's big game species, but in-person registration has facilitated gathering this information. Implementation of an electronic registration will require additional seasonal staff to collect biological data from hunters. The Department has outlined actions to minimize loss of data and data accuracy during a transition to electronic registration, including estimates of costs to implement each action. Although not all costs may be accrued in a given year, and not all would be recurring, they sum to \$256,400. In addition, we anticipate an annual loss in revenue from registration fees of approximately \$60,000. The major expense in implementing self-registration of big game by hunters will be expenditures for seasonal field staff to acquire biological data from hunters and their animals. The biological data are critical components of IFW's big game management programs and provide the scientific basis to support our ongoing harvest systems.

If the Legislature would like the Department to develop an electronic reporting system, we suggest that the benefits of doing so for bear and moose are likely far outweighed by the challenges that would be associated with collecting biological data for these species. Given the relatively small annual harvest of these species, coupled with the fact that most hunters harvest these species infrequently, there would be minimal added convenience for hunters by allowing electronic tagging for moose or bear. Therefore, we suggest that a discussion around the potential to allow electronic tagging should focus on deer and turkey, both of which have higher harvest levels and for which there is the potential to collect biological data in other ways. Nonetheless, we do have concerns that it may be impossible to adequately replace the biological data collected by in-person registration stations for deer in northern Maine.

A move to electronic registration of big game is being contemplated while other significant changes to IFW's licensing process are under consideration, including a revision to antlerless deer permits, and adjustments to crossbow licensing and permit requirements. In addition, Maine's current hunting licensing system is very complex. We recognize a need to simplify the Department's license and permit framework to reduce frustration for hunters becoming familiar with an electronic registration process. Hunter frustration with a new system of self-registering harvested animals could further erode reporting rates and result in inaccurate estimates of harvest levels. Therefore, if the Legislature would like to pursue electronic registration, we recommend a phased approach to allow adequate time for developing and testing an online registration system:

- Enact proposed changes to the antlerless deer permit system in 2022.
- During 2022, the Department reviews the statutory framework for hunting licenses and permits and proposes changes to simplify during the next regular session of the Legislature in 2023.
- During 2022, the Department reviews the statutory framework for crossbows and proposes changes to align crossbows with regular archery during the next regular session of the Legislature in 2023.
- Electronic registration for wild turkey is implemented beginning in spring 2024. Registration for fall wild turkeys is reinstated beginning in fall 2024.
- Electronic registration for deer is implemented beginning in fall 2024.
- Bear and moose registration continue only at in-person stations to allow effective collection of biological data. The Department will continue to work with guides to expand their capability to register bears for their hunters.

APPENDIX A. REGULATORY LANGUAGE THAT ADDRESSES BIG GAME REGISTRATION

16.06 Registration, Data Collection and Tagging of Big Game and Furbearing Animals

1. Data Collection; Mandatory Submission of Radio Transmitters, Collars, Ear or Wing Tags & Tooth Submission

A. Deer: Mandatory Submission of Radio Collars and Ear Tags

All radio collars and ear tags found on harvested deer must be submitted to the department at the time the animal is presented for registration.

B. Moose: Mandatory Submission of Radio Collars, Ear Tags, Teeth or Lower Jaw and Ovaries or Reproductive Tract

All radio collars and ear tags found on harvested moose must be submitted along with a canine tooth or lower jaw to the department at the time the animal is presented for registration. In any WMD in which a moose hunter harvests a female moose the hunter must present the ovaries and/or reproductive tract at the first open registration station. The milk sack (udder) shall be left attached to the carcass. The reproductive tract includes the ovaries and uterus.

C. Bear: Mandatory Submission of Teeth

Whenever a bear is presented for registration a premolar tooth shall be removed from the bear and submitted to the department by the person presenting the bear for registration.

D. Turkey: Mandatory Submission of Radio Transmitters, Leg Bands, and Wing Tags

All radio transmitters, leg bands, and wing tags must be submitted to the department at the time the wild turkey is presented for registration.

E. Bobcat: Mandatory Submission of Teeth

Whenever a bobcat is presented for tagging, a lower lateral incisor, a lower canine or the lower jaw that contains the lower canine and lateral incisor shall be submitted to the department by the person presenting the bobcat for registration.

2. Registration of Animals taken by hunting

A. Moose, deer, bear, and turkey

In accordance with 12 M.R.S. §12302-A all moose, deer, bear and turkey must be presented for registration at the first open registration station for that species of big game on the route taken by the person who killed the big game animal, with exceptions as stated in statute.

B. Bobcat

All raw skins of bobcat taken during the open bobcat hunting season shall be presented for tagging, by the person who harvested the bobcat, within 72 hours of harvesting the animal.

APPENDIX B. LISTING OF BIG GAME REGISTRATION STATIONS, AS OF NOVEMBER 20, 2021.

Station Name	Location Address	Location City/Town	Animals That Can be Tagged by Station
Whiting Store	136 US Rt 1	Whiting	Bear Deer Turkey
Johnson True Value	188 North St	Calais	Bear Deer Turkey
North Haven Grocery	124 Pulpit Harbor Rd	North Haven	Deer
Brad Brown	159 Fern Ave	Long Island	Deer Turkey
Bens Trading Post	719 Main St	Presque Isle	Bear Deer Turkey
K Smith Consulting Inc.	346 Main Rd	Islesboro	Deer
M / M Garage & Services	1263 Meadow Pond Rd	Islesboro	Deer
Strawberry Patch	1883 US Rt 1	Perry	Bear Deer Moose Turkey
Alley's Hardware Store	131 Main St	Cranberry Isles	Deer Turkey
Fishermen's Friend Inc.	35 W Main St	Vinalhaven	Deer
P&J Grocery	4650 Airline Rd.	Wesley	Bear Deer Moose Turkey
Airline Lodge & SnackBar	3752 Airline Rd	Beddington	Bear Deer Moose Turkey
Wildlife Region C Jonesboro	317 Whitneyville Road	Jonesboro	Bear Deer Moose Turkey
Young's Market, Inc.	130 Route 1	Gouldsboro	Bear Deer Turkey
Pineo's True Value	292 Main St Box 113	Machias	Bear Deer Moose Turkey
Stewart's Grocery	2122 Indian River Rd	Jonesport	Bear Deer Turkey
Warden Service - Bangor HQ	650 State St	Bangor	Bear Deer Moose Turkey
Otis General Store LLC	171 Otis Rd.	Otis	Bear Deer Turkey
Hill Top Farm Meat Cutters	2060 Belfast Rd.	Lincolntonville	Bear Deer Turkey
Gott's Store	111 Bass Harbor Rd.	Southwest Harbor	Bear Deer Turkey
Brooklin General Store	4 Reach Rd.	Brooklin	Deer
JC's Variety	995 Western Ave	Hampden	Bear Deer Turkey
The Eddington Store LLC	549 Main Rd.	Eddington	Bear Deer Turkey
Old Town Trading Post	1681 Bennoch Rd	Old Town	Bear Deer Moose Turkey
Snowman's Grocery	46 Lower Main	Orland	Bear Deer Turkey
G&M Family Market	1024 Main Rd	Holden	Bear Deer Turkey
Ellsworth Marketplace	110 Downeast Highway	Ellsworth	Bear Deer Turkey
The Surry Store	1305 Surry Rd	Surry	Bear Deer Turkey
Deb's Variety	324 Stream Rd	Winterport	Bear Deer Turkey
Lamoine General Store	1007 Bar Harbor Rd	Lamoine	Bear Deer Turkey
Belfast Variety - Rt 52	6 Back Belmont Rd	Belfast	Deer Turkey
Tideway Grocery	750 US-1	Hancock	Bear Deer Turkey
Outdoor Sportsman	1044 Atlantic Highway	Northport	Deer Turkey
Maritime Farms	790 West St.	Rockport	Bear Deer Turkey
Searsmont General Store	12 Main St.	Searsmont	Bear Deer Turkey
West Custom Deer Cutting	126 Mckay Rd.	Edgecomb	Bear Deer Turkey
Jackson's Corner Store	7 Augusta Rd	Washington	Deer Turkey
Bear Hill True Value Hardware	163 Jefferson St	Waldoboro	Bear Deer Turkey
Nobleboro Village Store	255 Center St	Nobleboro	Bear Deer Turkey
Hometown Convenience	107 Eastern Ave.	Boothbay Harbor	Deer Turkey

Station Name	Location Address	Location City/Town	Animals That Can be Tagged by Station
Warren True Value Hardware	420 Camden Rd	Warren	Deer Turkey
Tenants Harbor General Store	16 Main St	Saint George	Deer
Wallace's Market	11 Harbor Rd	Friendship	Deer Turkey
Burkettville General Store	1289 Burkettville Rd	Appleton	Bear Deer Turkey
Johnson's Sporting Goods	51 Park St	Rockland	Bear Deer Turkey
Louis Doe Inc.	92 Mills Rd	Newcastle	Bear Deer Turkey
First Stop Convenience Store	85 Country Rd	Scarborough	Bear Deer Turkey
B&C Seafood/Gil LaFlamme & Son	208A New Road	Arundel	Bear Deer Turkey
Lakeside Archery	55 Cumberland Rd	Yarmouth	Bear Deer Turkey
Kittery Ace Hardware	6 Shapleigh Rd	Kittery	Deer Turkey
Saco Bay Tackle Company	977 Portland Road	Saco	Bear Deer Turkey
Bisson's Center Store	865 Main Rd.	Phippsburg	Deer Turkey
Johnson's Sporting Goods Inc.	206 Bath Rd	Brunswick	Bear Deer Turkey
Eldredge Lumber	627 US Rt 1	York	Deer Turkey
C & S Market	785 Riverside Drive	Augusta	Deer Turkey
The Depot Country Store	268 Depot St	Unity	Bear Deer Turkey
Tobey's General Store	1408 Route 3	China	Bear Deer Turkey
Orcutt's Variety and Hardware	536 Western Ave	Dixmont	Bear Deer Turkey
Etna Village Variety	239 US-2	Etna	Bear Deer Turkey
Weavers Roadside Variety	1386 Waterville Rd	Waldo	Deer Turkey
Plymouth Village Store	1935 Moosehead Trl	Plymouth	Bear Deer Turkey
Troy General Store	1125 Bangor Rd Rt 9	Troy	Bear Deer Turkey
Hussey's General Store	510 Ridge Rd	Windsor	Deer Turkey
Freedom General, Inc	27 Belfast Rd	Freedom	Bear Deer Turkey
Dresden Take Out	537 Gardiner Rd	Dresden	Deer Turkey
Butcher Boys Deer Cutting	152 John Small Rd.	Bowdoin	Deer
Four Corners General Store	1273 High Street	West Gardiner	Bear Deer Turkey
Country Corners Grocery Inc.	184 Main St	Whitefield	Bear Deer Turkey
Quik Stop	712 Main St	Richmond	Deer Turkey
Sabattus Deer Processing	435 Middle Rd	Sabattus	Bear Deer Turkey
Alna Store	2 DockRd	Alna	Deer Turkey
Village General Store	1143 E Pittston Rd	Pittston	Deer Turkey
Fuller's Market	599 Hallowell Litchfield Rd	West Gardiner	Bear Deer Turkey
Morgan's Mobil	446 US-202	Greene	Deer Turkey
Bowdoin Town Store	1076 Main St	Bowdoin	Deer Turkey
Warden Service - Gray HQ	15 Game Farm Road	Gray	Bear Deer Moose Turkey
Poland Spring Trading Post	481 Maine St	Poland	Bear Deer Turkey
Hilltop Mini Mart	1547 Roosevelt Trail	Raymond	Bear Deer Turkey
Standish Quick Stop	705 Ossipee Trail	Standish	Deer Turkey
Short Stop Variety	413 Hallowell Rd	Pownal	Deer
Howell's Gun Shop	81 W Gray Rd	Gray	Bear Deer Turkey

Station Name	Location Address	Location City/Town	Animals That Can be Tagged by Station
Country Goods and Grocery	566 Newfield Rd	Shapleigh	Bear Deer Turkey
K & D Corner Store	185 Wakefield Rd	Newfield	Bear Deer Turkey
Acton Trading Post	57 Route 109	Acton	Bear Deer Turkey
Allard's Market	68 Elm St	North Berwick	Deer
Merrill's Country Store	907 Sokokis Trl	Waterboro	Bear Deer Turkey
Springvale Hardware	489 Main St	Sanford	Bear Deer Turkey
Princeton Variety	123 Main St	Princeton	Bear Deer Turkey
Pine Tree Store	3 Water St	Grand Lake Stream Plt	Bear Deer Turkey
Waite General Store	455 Houlton Rd	Waite	Bear Deer Moose Turkey
Mcleod's Variety	2941 Airline Rd	Crawford	Bear Deer Turkey
Wildlife Region F Enfield	16 Cobb Road	Enfield	Bear Deer Moose Turkey
Ketch Automotive	1115 Main Rd.	Greenbush	Bear Deer Turkey
Whitney's Outfitters	274 Broadway	Lincoln	Bear Deer Moose Turkey
County Road Market	81 County Rd.	Milford	Bear Deer Turkey
Burlington General	37 Main Rd.	Burlington	Bear Deer Turkey
J & M Corner Store LLC	3 Water St	Howland	Bear Deer Turkey
Lagrange General Store	2 Mill Street	Lagrange	Bear Deer Turkey
General Store & More	1497 Main Rd	Brownville	Bear Deer Turkey
C & J Variety	86 Park St	Milo	Bear Deer Moose Turkey
BnW Variety Inc.	340 Main St	Passadumkeag	Bear Deer Turkey
Amherst General Store	561 Airline Rd	Amherst	Bear Deer Turkey
Exeter Country Store	1784 Exeter Rd.	Exeter	Bear Deer Turkey
Bingham General Store	409 Main St.	Bingham	Bear Deer Turkey
Labonville Inc.	514 Lakewood Rd.	Madison	Deer Turkey
The Village Market	2 Plymouth Rd.	Carmel	Bear Deer Turkey
Worster Custom Meat Cutting	12 Bear Brook Ln	Charleston	Bear Deer Turkey
Garland Country Store	3 Oliver Hill Rd	Garland	Bear Deer
Bratt's Country Store	1201 Mullen Rd	Stetson	Bear Deer Turkey
C&R General Store	4 Cambridge Rd	Harmony	Bear Deer Turkey
KC's Country Store	678 St Route 150	Parkman	Bear Deer Turkey
Snow's Saw Shop	101 S Stagecoach Rd	Atkinson	Bear Deer Turkey
A. E. Robinson Oil Co.	60 Newport Rd	Corinna	Bear Deer Turkey
Roger's Market	2335 Hudson Rd	Hudson	Bear Deer
Canaan Superette	187 Main St	Canaan	Deer Turkey
Griswold's Country Store	112B S Main St	Solon	Moose
Robinson's Mobil Mart-corinth	624 Main St	Corinth	Bear Deer Turkey
Robinson's Mobil Mart-sangerville	56 Pleasant Ave	Sangerville	Bear Deer Turkey
Skowhegan Fire Station	16 Island Ave	Skowhegan	Bear Deer Turkey
Foxbrook Variety	251 E Main St	Dover-Foxcroft	Bear Deer Turkey
Bait, Bolt And Bullets	3 S Main St	Solon	Bear Deer Turkey
Moosehead Trail Trading Post	428 Oxbow Rd	Newport	Bear Deer Moose Turkey
Warden Service - Sidney HQ	270 Lyons Road	Sidney	Bear Deer Moose Turkey

Station Name	Location Address	Location City/Town	Animals That Can be Tagged by Station
Tradewinds Variety	4 Madison Rd.	Norridgewock	Bear Deer Turkey
Chesterville Corner Store	2 Dutch Gap Rd.	Chesterville	Bear Deer Turkey
Cobbies Corner Store	672 Main St.	Wayne	Bear Deer Turkey
Sandy River Farm Supply	20 Farmington Rd	New Sharon	Bear Deer Moose Turkey
Flying Pond Variety	165 Pond Road	Mount Vernon	Bear Deer Turkey
Middle Road General Store	3535 Middle Rd	Sidney	Bear Deer Turkey
Christy's	1431 Mercer Road	Mercer	Bear Deer Turkey
D & L Country Store	573 Smithfield Rd	Oakland	Bear Deer Turkey
Audette's	22 Peck Farm Rd	Winthrop	Bear Deer Turkey
Jimbo's General Store, LLC	43 East Main St.	Denmark	Bear Deer Moose Turkey
Tilton's Market	11 Turner St	Buckfield	Bear Deer Turkey
Depot Square Hardware&Variety	9 Depot Square	Mechanic Falls	Bear Deer Turkey
Village Variety LLC	27 Federal Rd	Parsonsfield	Bear Deer Moose Turkey
Stow Corner Store	590 Stow Rd	Stow	Bear Deer Turkey
Doe's Inc.	183 Park St	Paris	Bear Deer Moose Turkey
Limerick Village Variety	32 Main St	Limerick	Bear Deer Turkey
Minot Country Store	174 Minot Ave	Minot	Bear Deer Turkey
Limington Variety	153 Ossipee Trail	Limington	Bear Deer Turkey
Jordan's Store	8 Sebago Rd	Sebago	Bear Deer Moose Turkey
Robinson's Mobil Mart-monson	32 Tenney Hill Rd	Monson	Bear Deer Turkey
Wildlife Region D Strong	689 Farmington Road	Strong	Bear Deer Moose Turkey
Steves Family Market	398 Depot St.	Wilton	Bear Deer Turkey
Valley Brook Variety	1032B Rangeley Rd.	Avon	Bear Deer Turkey
The White Elephant	26 South Main St	Strong	Bear Deer Turkey
Our Village Market	1798 New Vineyard Rd	New Vineyard	Bear Deer Turkey
Jack's Trading Post	477 Fairbanks Rd	Farmington	Bear Deer
Baker's Country Store	1255 Roxbury Notch Rd.	Roxbury	Bear Deer Moose Turkey
Brettun's Variety LLC	1743 Federal Rd	Livermore	Bear Deer Turkey
Mills Market	25 S Main St	Andover	Bear Deer Turkey
Canton Variety	17 Main St	Canton	Bear Deer Turkey
Rumford Firefighters Local1601	151 Congress Street	Rumford	Bear Deer Turkey
Lennie's Superette	2154 Medway Rd	Medway	Bear Deer Turkey
Wilderness Escape Outfitters	1257 Springfield Rd	Danforth	Bear Deer
Porter's Garage	1149 Crystal Rd	Island Falls	Bear Deer Moose Turkey
Smith's General Store	985 Main St	Springfield	Bear Deer Moose Turkey
Brookton General	340 US Hwy 1	Brookton Twp	Bear Deer Turkey
Taylor's Katahdin Gateway Shell	98 Main St	Sherman	Bear Deer Turkey
Katahdin General LLC	160 Bates St	Millinocket	Bear Deer Moose Turkey
Warden Service - Greenville HQ	19 Village St	Greenville	Bear Deer Moose Turkey
Raymond's Country Store	642 Northeast Carry	Northeast Carry Twp	Bear Deer Moose Turkey
Kokadjo Trading Post	3424 Lilly Bay Rd	Frenchtown Twp	Bear Deer Moose
Indian Hill Trading	148 Moosehead Lk Rd	Greenville	Bear Deer Turkey

Station Name	Location Address	Location City/Town	Animals That Can be Tagged by Station
Rockwood Convenience Store	3628 Rockwood Rd	Rockwood Strip T1 R1 NBKP	Bear Deer Turkey
Historic Pittston Farm	53 Pittston Farm Rd	Pittston Academy Grant	Bear Deer Moose
Pine Grove Lodge	823 Ridge Rd	Pleasant Ridge Plt	Bear Deer Turkey
Bishops Store Inc	464 Main St	Jackman	Bear Deer Moose Turkey
Berry's General Store	2933 US-201	West Forks Plt	Bear Deer Turkey
The Local Bull	15 Main St.	Phillips	Bear Deer Turkey
Bosebuck Mountain Club	2013 Paramanchenee Rd	Lynchtown Twp	Bear Deer Turkey
Rivers Edge Sports Inc.	38 Carry Rd	Rangeley	Bear Deer Turkey
Oquossoc Grocery Inc.	75 Carry Rd	Rangeley	Moose
Pines Market LLC	975 Arnold Trl	Eustis	Bear Deer Moose Turkey
Warden Service - Ashland HQ	63 Station Hill Road	Ashland	Bear Deer Moose Turkey
Keyes Trading Post	3436 US Route 2	Smyrna	Bear Deer
Mac's Trading Post	54 North St.	Houlton	Bear Deer Turkey
Gateway Variety Store	111 Garfield Rd	Ashland	Bear Deer Moose Turkey
North Country Lodge	831 Aroostook Scenic Hwy	Moro Plt	Bear
Wilderness Variety Store	1446 Shin Pond Rd	Mount Chase	Bear Deer Moose Turkey
Bradford Camps	14 Mile Pelletier Rd	T8 R10 WELS	Bear Deer
Libby's Sporting Camps	197 Haystack Rd	T8 R9 WELS	Bear Deer
Ross Lake Camps	Ross Lake Camps Rd	T10 R15 WELS	Bear Deer
Loon Lodge	Ledge Pit Rd.	T7 R14 WELS	Bear Deer
Up North Outdoors	23 West Main St	Fort Kent	Bear Deer Moose Turkey
Lake Road Grocery	10 Sly Brook Rd	New Canada	Bear Deer Turkey
Ouellette's Trading Post	200 Champlain St	Van Buren	Bear Deer Moose
Big Machias Lake Camps	Reality Rd Mile 20	T12 R8 WELS	Bear
Coffin's General Store	2084 Portage Rd	Portage Lake	Bear Deer
Joe's Country Store	1005 Main St	Saint Francis	Bear Deer
Moose Point Camps Inc.	Fish River Lake	T13 R8 WELS	Bear
Bald Eagle Store Inc.	3318 Aroostook Rd	Eagle Lake	Bear Deer
North Maine Woods /St Pamphile	Blanchette Rd and Depot Rd	T15 R15 WELS	Bear Deer Moose
Washburn Trailside	1094 Washburn Rd	Washburn	Bear Deer Turkey
Henderson & Son	1167 Foxcroft Rd.	Littleton	Bear Deer Moose
Melbys Market and Eatery	927 Valley Rd.	Waterford	Bear Deer Moose Turkey
Sport Thoma	288 Mayville Rd.	Bethel	Bear Deer Turkey
Ollies Market Inc	6 Stetson Rd.	Levant	Bear Deer Turkey
Four Corner Variety	1718 Heald Highway	Union	Bear Deer Turkey
Robert Morang	125 Harbor Rd.	Swans Island	Deer
Skoolhouse Variety	32 School St.	Weld	Bear Deer Turkey
Coxs Custom Cuts	7 Warren Rd.	Buxton	Bear Deer

Station Name	Location Address	Location City/Town	Animals That Can be Tagged by Station
Roy's Variety LLC	276 Main St.	Saint Agatha	Bear Deer Turkey
Hilltop Convenience Store	231 Belfast Rd.	Knox	Bear Deer Turkey
Albion Mini Mart	200 Unity Rd.	Albion	Bear Deer Turkey
Winn General Store	985 Route 2	Winn	Bear Deer Turkey
Bolsters Mills Country Store	4 Big Hill Road	Otisfield	Bear Deer Turkey
Northland True Value Hardware	1355 Auburn Road	Turner	Bear Deer Turkey
Kadens	135 Agamenticus Road	South Berwick	Bear Deer Turkey
Annie's Variety	2631 Middle Road	Sidney	Deer Turkey
Matagamon Wilderness LLC	2821 Grand Lake Road	T6 R8 WELS	Bear Deer
The Fayette General Store Inc	1916 Main St.	Fayette	Bear Deer Moose Turkey
Smoldering Lake Outfitters	129 Snow Road	Bridgewater	Moose
Stony Brook Outfitters	55 Morrison Hill Road	Wilton	Bear
Valley Fuel Stop LLC	74 Main St.	Madawaska	Bear Deer Turkey
Warden Service - Augusta HQ	284 State Street	Augusta	Bear Deer Moose Turkey
Athens' Corner Store	8 S Main Street	Athens	Deer Turkey
Pushaw's Trading Post Inc.	163 Main Street	Hope	Deer Turkey
More In Guns LLC	2 Averill St	Frankfort	Deer Turkey
Durham Country Store	697 Royalsborough Rd	Durham	Bear Deer Turkey
Bob's Kozy Korner	2 Johnson Mill Rd	Orrington	Bear Deer Turkey
Beals Country Store	419 US Hwy 1	Monticello	Bear Deer Turkey
Monroe Country Store	16 E. Main St.	Monroe	Deer Turkey
Charlie's Boatworks	89 E. Shore Road	Frenchboro	Deer
The Little Mountain Store	1382 North High St.	Bridgton	Bear Deer Turkey
C.H. Mathews	141 Main St.	Cherryfield	Bear Deer Moose Turkey
Dill's Outdoors LLC	1205 Broadway	Bangor	Bear Deer Turkey
Dow's General Store	58 Main St.	Albion	Deer Turkey
Hemphill & Son's Butchery	531 Woodland Center Rd	Woodland	Bear Deer Turkey
Maine Provisions Inc	363 Main St	Kingfield	Bear Deer Turkey
Seiders Variety LLC	53 Calais Road	Hodgdon	Bear Deer Turkey
Sturdy Hardware	186 Sabattus Road	Sabattus	Deer Turkey
MooseLake Market	67 Main St.	Hartland	Bear Deer Turkey
Georgetown Store Inc	769 Five Islands Rd	Georgetown	Deer Turkey
Enfield General Store Maria Kitchen	794 Hammett Rd	Enfield	Bear Deer Turkey
Hometown Gas and Grill	1498 Carl Broggi Highway	Lebanon	Deer Turkey
Bay Shakers Bakery	428 Bay Road	Brooklin	Bear Deer Turkey
Ehrhardt Groothoff	484 North Road	Chebeague Island	Deer
Pear's Ice Cream and Hoagie Shop	96 State Rte. 121	Otisfield	Bear Deer Turkey
Meserve's Market	586 Quarry Road	Wells	Bear Deer Turkey
Smithfield General Store JR Booker LLC	858 Village Road	Smithfield	Deer Turkey

Station Name	Location Address	Location City/Town	Animals That Can be Tagged by Station
Parent's Country Store Inc	1648 Van Buren Road	Caswell	Bear Deer Turkey
The Mill Yard	162 Houlton Rd	Danforth	Bear Deer Turkey
Nautilus Marine	2317 U.S. Hwy 1	Sullivan	Bear Deer Turkey
Sheepscot General	98 Townhouse Rd	Whitefield	Deer Turkey
Bob's Sport Shop	110 Presque Isle St.	Fort Fairfield	Bear Deer Turkey
Dodo's Market	539 Access Hwy	Caribou	Bear Deer Turkey
Homestead_Lodge	871 Oxbow Rd	Oxbow North Twp	Bear Deer Turkey
Harry's_Lyman	4 Goodwins Mills Rd	Lyman	Bear Deer Turkey
Harry's_Buxton	222 Narragansett Trail	Buxton	Bear Deer Turkey
Ellis Variety LLC	126 Weld St.	Dixfield	Bear Deer Turkey
Lovell Hardware Inc.	411 Main St.	Lovell	Bear Deer Turkey
Jefferson Market & General Store	242 Washington Rd	Jefferson	Deer Turkey
Allagash Guide Service	928 Allagash Rd	Allagash	Bear Deer Turkey
The Storekeepers	911 Station Rd	Hebron	Bear Deer Turkey
Vicneire's Elm St Market Inc	5 New Portland Rd	Anson	Bear Deer Turkey
Lyman Gas Variety & Pizza	301 Middle Rd	Lyman	Bear Deer Turkey
Bowdoinham Country Store_Stimpson	54 River Rd	Bowdoinham	Bear Deer Turkey
Spartan Arms and Ammo	5 Maple St	Presque Isle	Bear Deer Moose Turkey
Morey and Rowe Hill Inc	5 North Main St	Morrill	Bear Deer Turkey
S-Mart	628 Pequawket Trail	Brownfield	Bear Deer Turkey
Market 27 LLC	475 Gardiner Rd	Wiscasset	Deer Turkey
JT Reids Gun Shop	24 Garfield Rd	Auburn	Bear Deer
All Star Ridge Tag Up	627 Crockett Ridge Rd	Norway	Deer Turkey
Cornish Market and Variety	124 Main St.	Cornish	Bear Deer Turkey
Duck Pond Variety	1275 Bridgton Rd	Westbrook	Deer Turkey
KandC Quikstop and Service Center Inc	199 S. Patten Rd	Patten	Bear Deer Turkey

APPENDIX C. REVIEW OF BLACK BEAR REGISTRATION SYSTEMS IN USE BY 25 JURISDICTIONS ACROSS THE EASTERN UNITED STATES AND EASTERN CANADA, 2017 (BASED ON A 2018 SURVEY BY THE NORTHEAST BLACK BEAR TECHNICAL COMMITTEE)

Jurisdiction	Mandatory Registration	Physical Station	Type of Registration	type of electronic	Repro tracts	Teeth	How teeth collected	% of teeth collected	Avg. annual Harvest	Harvest Known or Estimated	Bear Pop Est.
Florida	Yes	Yes	Paper	n/a	No	Yes	physical check stations	100%	304	Known	4,050
Georgia	Yes	Yes	Paper	n/a	No	Yes	physical check stations		460	Known	5,100
Maryland	Yes	Yes	Paper	n/a	No	Yes	physical check stations	100%	70	Known	2,000
Michigan	Yes	Yes	Paper	n/a	No	Yes	physical check stations		2,318	Known	11,800
New Brunswick	Yes	Yes	Paper	n/a	No	Yes	physical check stations		1,705	Known	17,000
New Hampshire	Yes	Yes	Paper	n/a	No	Yes	physical check stations	100%	588	Known	6,116
New Jersey	Yes	Yes	Paper	n/a	No	Yes	physical check stations	100%	449	Known	2,650
Pennsylvania	Yes	Yes	Paper	n/a	No	Yes	physical check stations	100%	3,608	Known	20,000
Quebec	Yes	Yes	Paper	n/a	No	voluntary	physical check stations	20%	3,957	Known	89,000
Tennessee	Yes	Yes	Paper	n/a	No	voluntary	bios work a portion of stations		449	Known	5,000
Virginia	Yes	Yes	Paper	n/a	No	Yes	physical check stations	95%	2,059	Known	17,000
Kentucky	Yes	Yes	Electronic	call w/in 24 hrs	No	Yes	physical & bio checks	100%	4	Known	600
Vermont	Yes	Yes	Electronic	on-line, agent	No	Yes	physical check stations	55%	550	Known	5,400
Minnesota	Yes	Yes	Electronic	Terminal at registration station, on-line, phone	No	Yes	mailed by hunter	90%	2,474	Known	13,000
Wisconsin	Yes	Yes	Electronic	on-line, phone, or on-line at tagging station	No	Yes	physical check stations	85-86%	4,396	Known	28,900
Maine	Yes	Yes	Electronic 2018	on-line @physical station	No	Yes	physical check stations	>90%	2,902	Known	34,000
South Carolina	Yes	Yes	Electronic	online or phone w/in 24 hrs	No	voluntary	biologist check	85%	90	Known	1,000
Massachusetts	Yes	Yes	Electronic	on-line w/in 48 hrs	No	voluntary	physical check & mail	20-40%	146	Known	4,500
Arkansas	Yes	No	Electronic	online or phone	No	Yes	mail	~90%	500	Known	3,500
New York	Yes	No	Electronic	various methods w/in 7 days	No	voluntary	bios/taxidermist	60%	1,288	Estimated	7,000
North Carolina	Yes	No	Electronic	on-line, phone, agents	No	voluntary	mail, taxidermist, bios look for hunters	48.60%	2,442	Known	18,500
Nova Scotia	Yes	No	Electronic	on-line, mail	Yes	Yes	submit jaw -mail		835	Estimated	10,000
Ontario	Yes	No	Electronic	on-line, mandatory harvest questionnaire	No	voluntary	mail		5,491	Estimated	95,000
West Virginia	Yes	No	Electronic	phone, on-line, or in person to license agent	Yes	yes	physical check stations	46-50%	2,929	Known	13,000
Newfoundland	No	No		n/a	No	voluntary			686	Estimated	8,000