

ANALYZING BONUS POINT ACCURACY
DEPARTMENT OF FISH, WILDLIFE & PARKS
APRIL 2023

23P-01

Focused Evaluation
A report to the Montana Legislature



**LEGISLATIVE AUDIT
COMMITTEE**

REPRESENTATIVES

LYN HELLEGAARD
Lyn.Hellegaard@legmt.gov

SJ HOWELL
SJ.Howell@legmt.gov

EMMA KERR-CARPENTER
Emma.KC@legmt.gov

TERRY MOORE
Terry.Moore@legmt.gov

JERRY SCHILLINGER
Jerry.Schillinger@legmt.gov

LAURA SMITH
Laura.Smith@legmt.gov

SENATORS

DAN BARTEL
Dan.Bartel@legmt.gov

JASON ELLSWORTH
Jason.Ellsworth@legmt.gov

PAT FLOWERS
Pat.Flowers@legmt.gov

DENISE HAYMAN
Denise.Hayman@legmt.gov

KATHY KELKER
Kathy.Kelker@legmt.gov

TOM MCGILLVRAY
Tom.McGillvray@legmt.gov

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§5-13-202(2), MCA

FRAUD HOTLINE
(STATEWIDE)
1-800-222-4446
(IN HELENA)
444-4446
LADHotline@legmt.gov
www.montanafraud.gov

PERFORMANCE AUDITS

Performance audits conducted by the Legislative Audit Division are designed to assess state government operations. From the audit work, a determination is made as to whether agencies and programs are accomplishing their purposes, and whether they can do so with greater efficiency and economy.

We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives. Members of the performance audit staff hold degrees in disciplines appropriate to the audit process.

Performance audits are conducted at the request of the Legislative Audit Committee, which is a bicameral and bipartisan standing committee of the Montana Legislature. The committee consists of six members of the Senate and six members of the House of Representatives.

This report is distributed as required under §5-13-304 (3), MCA, to members of the Legislative Audit Committee and other interested parties. This report contains a written response from the Department of Fish, Wildlife & Park and we wish to express our appreciation to department staff for their cooperation and assistance during our audit.

Respectfully submitted,



Angus Maciver, Legislative Auditor

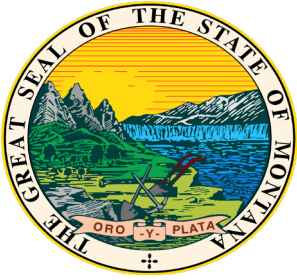
AUDIT STAFF

SARAH CARLSON
AUSTIN POWELL

WILLIAM SOLLER

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MONTANA LEGISLATIVE AUDIT DIVISION

FOCUSED EVALUATION

A report to the Montana Legislature
Angus Maciver, Legislative Auditor

BACKGROUND

The Department of Fish, Wildlife & Parks (FWP) manages the state's hunting licensing and permitting functions, including 13 special permit drawings. These limited and often highly sought-after opportunities are obtained through random drawings when the number of applications exceed quota set by the commission. Hunters and anglers may increase their chances of selection by purchasing a species-specific bonus point. Bonus points increase the number of chances a hunter has in the drawing. However, bonus points do not guarantee selection, as the drawings are random.

ANALYZING BONUS POINT ACCURACY

FWP accurately calculates and consistently applies bonus points as required by law and rule. However, we identified improvements in data quality protection, use of historical data, and communications needed to ensure ongoing success. The improvements will protect the integrity of bonus point processes and offer clear descriptions of bonus points to the public and within the department.

What We Did

We designed this audit to determine if FWP accurately calculates and consistently applies bonus points as required by law and rule. The methods used to answer this question include reviewing the computer system code related to bonus point procedures. We also reviewed law and rule related to bonus points. We then compared those requirements to bonus point behavior in drawing data from the 104 drawings using bonus points occurring from 2014-2021. We simulated millions of draws to determine if the results for bonus point holders aligned with expected probabilities. We also conducted several statistical tests to determine if the random number generator was operating as intended. We reviewed the controls FWP has in place for both the bonus point data and the system processing the draws. In addition, as a successful public-facing program must be understood by the public, we reviewed materials available to hunters and the public regarding bonus points and interviewed hunters and stakeholder groups about their understanding of bonus points.

What We Found

All tests of FWP's process revealed bonus points behaving as law and rule require. However, to ensure accurate and consistent drawings continue, we found improved process controls are necessary. Specifically, to reduce the risk of bonus point errors, the department needs to increase controls related to the Automated Licensing System (ALS), the computer system housing all bonus point data and processing the permit

drawings. We found an increased risk in the following areas: manual data changes, verifying accrual of points, and computer code descriptions.

“All tests of FWP’s process revealed bonus points behaving as law and rule require.”

We also found the clarity and consistency of communications regarding the bonus point program need improvement. We found varying knowledge levels among FWP staff regarding important bonus point facts. In addition, information available to the public regarding bonus points is confusing. Some hunters are unclear about the calculation process and how bonus points increase their chance of selection in a permit drawing.

Bonus Points Widely Used

In 2022, FWP received more than 314,000 applications for license/permits in draws with bonus points. Most drawings discussed throughout this report are for a license and permit. However, since bonus points are usually related to permits, we will use the term “permit” to refer to the license/permit combination. As hunters and anglers commonly apply for more than one species, we estimate the number of individual applicants using bonus points in 2022 to be between 275,000 and 300,000. Table 1 illustrates more details regarding bonus point use in 2022.

Table 1
The Number of Bonus Points Used in 2022 Drawings Was 936,658 With a Value of More Than \$4,600,000

| Species | Residency | Applicants | Bonus Points |
|---------------------|--------------|----------------|----------------|
| Antelope | Resident | 62,505 | 70,212 |
| | Non-Resident | 11,463 | 16,504 |
| Deer | Resident | 44,265 | 92,848 |
| | Non-Resident | 6,292 | 6,278 |
| Elk | Resident | 83,454 | 164,430 |
| | Non-Resident | 9,921 | 14,969 |
| Moose | Resident | 31,058 | 172,764 |
| | Non-Resident | 3,337 | 23,040 |
| Sheep | Resident | 26,731 | 177,568 |
| | Non-Resident | 7,483 | 66,979 |
| Goat | Resident | 18,497 | 101,461 |
| | Non-Resident | 3,532 | 25,829 |
| Mountain Lion | Resident | 412 | 967 |
| | Non-Resident | 56 | 191 |
| Paddlefish | Resident | 3,932 | 1,392 |
| | Non-Resident | 156 | 31 |
| Swan | Resident | 981 | 1,068 |
| | Non-Resident | 166 | 127 |
| Totals | Resident | 271,835 | 782,710 |
| | Non-Resident | 42,406 | 153,948 |
| Grand Totals | | 314,241 | 936,658 |

Source: Compiled by the Legislative Audit Division from department records.

ALS Implements Bonus Point Life Cycle

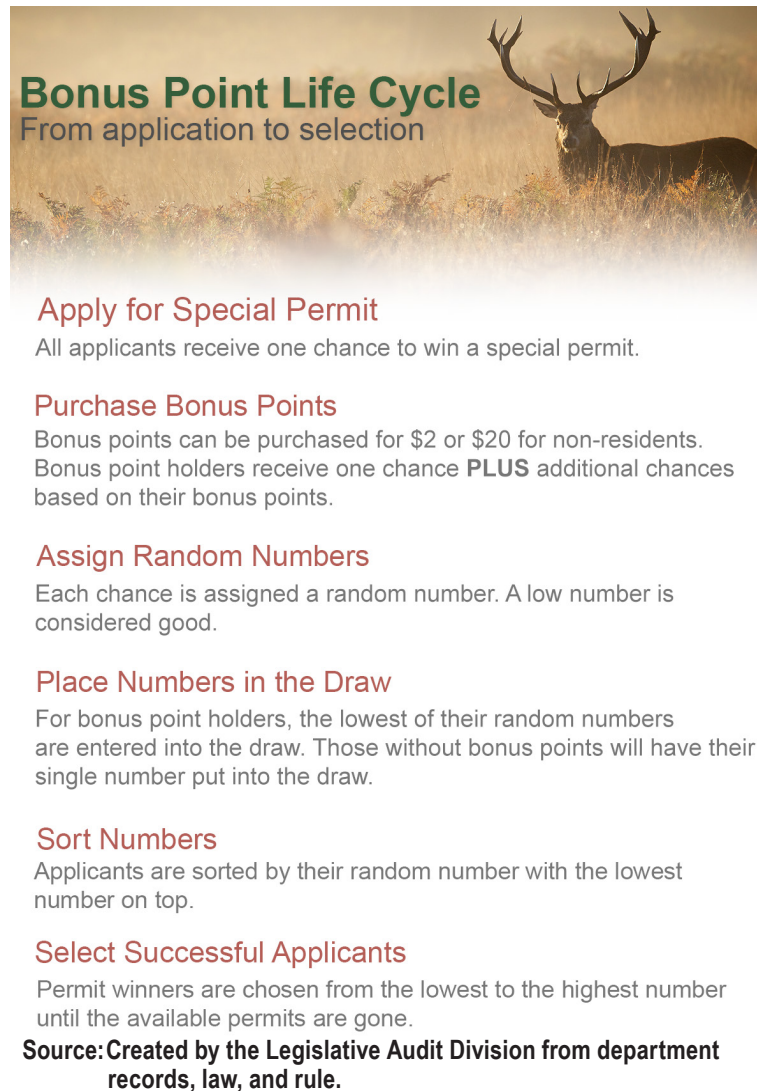
To further explain the required behavior of bonus points, Figure 1 describes their life cycle from a hunter's or angler's perspective during one season's draw process.

As shown in Figure 1, the bonus point life cycle has many interrelated steps. We found these and other processes used by FWP to implement the bonus point program are based on requirements in law and rule.

The requirements include:

- ◆ An applicant may purchase only one bonus point per species per year.
- ◆ Bonus points may be purchased at time of application or between July 1 and September 30.
- ◆ The number of chances an applicant has in a drawing is 1+(their bonus points)².
- ◆ Bonus points accumulate over time. Those purchased in previous years can apply the next time the hunter or angler applies for a permit.
- ◆ If an applicant is successful in a permit drawing, their bonus points for that species drops to zero.
- ◆ A hunter loses all bonus points for every species when their hunting privileges are suspended or revoked.

Figure 1



Numerous and Diverse Tests of ALS

Our work aimed to assess the ability of FWP’s system to meet legal requirements related to bonus points. Figure 2 describes where LAD ran tests to check if the system was operating as intended.

When examining the system code, we determined the overall procedure for performing the draw was the same across all species. Nevertheless, we tested a variety of draws, such as mountain lion, moose, sheep, and others, to assess if the processes were working as intended, and we found they were. Table 2 provides more detail regarding the specific tests we ran related to FWP’s bonus point process.

Figure 2



✓ Systems Tested

We tested the computer system's assignment of chances and found all applicants received the correct number of chances.

✓ RNG Tested

We tested FWP's random number generator and found no predictable patterns.

✓ Code Tested

We tested the system code and found it performs these procedures correctly.

✓ Win Rates Tested

We tested applicant win rates and found they align with theoretical expectations.

Source: Compiled by the Legislative Audit Division from department records, law, and rule.

Table 2
Diverse Tests Found Bonus Point Behavior as Required by Law and Rule

| Key Question | Data Tested | Tests Performed | Result |
|--|--|---|--|
| Do applicants receive the correct number of chances based on their bonus points? | 2022 moose drawing data | Compared results of calculations required by law to applicant's actual number of chances to determine if they are the same. | Applicants receive correct number of chances ✓ |
| Does FWP's random number generator produce predictable patterns in numbers? | Set of 1 million random numbers generated by FWP | Monobit Test Block Frequency Test Runs Test Fourier Analysis Poker/Five Value Test | No predictable patterns appear in random numbers ✓ |
| Do applicant win rates align with theoretical expectations? | The 2022 mountain lion, moose, sheep, and other species drawings were simulated up to 1 million times. | We statistically compared simulation results with theoretical probabilities using a 99 percent confidence level. | Applicant win rates align with theoretical expectations ✓ |
| Does FWP's computer system correctly perform bonus draw procedures? | FWP's Computer System Code | We determined if the required procedures would result from how the system was coded. | FWP computer system correctly performs all draw procedures ✓ |

Source: Compiled by the Legislative Audit Division.

Bonus Points Provide Additional Chances

The purpose of the bonus point program is to benefit applicants purchasing and accumulating bonus points. Successful applicants are chosen from the lowest to the highest assigned random number. Consequently, all applicants want to be assigned a low random number. If an applicant has bonus points and chooses to use them, they receive additional chances for a low number. The number of additional chances is based on their number of bonus points and the formula required in law, $1+(\text{bonus points})^2$. To further describe the relationship between the number of bonus points and chances to be assigned a low random number, Figure 3 compares three persons with different numbers of bonus points.

Figure 3
Purchasing and Accumulating Bonus Points

| Person A | Person B | Person C |
|--------------------------------|----------------------------------|------------------------------------|
| 0 accumulated points + | 2 accumulated points + | 9 accumulated points + |
| 0 purchased points = | 1 purchased point = | 1 purchased point = |
| 0 total points | 3 total points | 10 total points |
| 1 chance $1 + (0)^2$ | 10 chances $1 + (3)^2$ | 101 chances $1 + (10)^2$ |

Source: Compiled by the Legislative Audit Division from department records, law, and rule.

Our Conclusion

All tests of FWP's process confirmed bonus points behave as law and rule require. We conducted tests on FWP's bonus point processes from initial application to selection of successful applicants. The number of chances an applicant has is determined correctly based on their bonus point total. The random number generator operates appropriately, and the simulated win rates match theoretical expectations. The computer system code conducts the draw procedure with bonus points as intended and selects winners based on a standard sorting process. FWP's bonus point process is accurate, consistent, and in accordance with law and rule. Hunters, anglers, and policymakers can depend on the accurate selection of permit draw winners.

More Work on Controls, Risk Identification, and Communications Needed

While we determined the bonus point process is currently working as intended, further effort is needed to ensure accurate and consistent drawings continue. We make three recommendations related to the specific areas we found needing improvement: data quality and process protection, identifying accrual risk, and communications. Specifically, we reviewed manual changes to bonus point data, computer code descriptions, the use of historical bonus point data, and the clarity and consistency of communication regarding the bonus point program.

Additional Protection Against Errors Needed

To protect the quality of data and processes, the federal Standards for Internal Control, Montana Operating Manual, and industry standards state complex computer systems need the responsibilities of each position interacting with the system to be distinctly identified and well understood by the individual in the position and management. Documentation of this material assists management in designing overall protections for the system and mitigates the risk of this knowledge being limited to a few staff. Due to other priorities in the large permitting and licensing programs, FWP has not taken steps to formalize needed data quality and system controls such as reconciliation of data change requests and code descriptions.

Bonus Point Eliminations Lack Centralized Tracking Method

A risk to ALS data is the informal process for removing bonus points due to court action. When a hunter loses hunting privileges due to enforcement action, they also lose all accumulated bonus points for all species. FWP's process for tracking this action and removing bonus points involves sending emails from enforcement administration to three licensing staff. One makes the change manually and keeps the email on their computer as a record. No policy requires a centralized record of the requests, nor is there a way to periodically reconcile enforcement requests with ALS changes. Data quality in the ALS would benefit from formalized tracking of enforcement requests.

Code Descriptions Needed

We determined the ALS system code currently works as intended to conduct draws, but further effort is needed to ensure continued functionality. When reviewing the ALS system code with FWP's Technology Services Division, we found the code contains limited descriptions of its procedures and the relationships between procedures. We also found legacy code no longer applicable to draws but kept in case a law or rule reverts back to a previous version. Accurate descriptions of code are an industry best practice. Without description, staff unfamiliar with the code and its history may incorrectly modify the coded procedures. The department is migrating the draw procedure to a new system and not relying on a specific coding language. As part of this process, the department will rebuild sections of the code and report in the new system annually. Given this migration, it does not make sense for the department to use resources now describing old code slated for rebuilding. However, the need to describe procedures and relationships in the new system remains.

Decreased Protection Against Errors

While we did not identify any errors by FWP's systems, the absence of formally established protections for bonus point data quality and code descriptions increases the risk of errors. In addition, informal controls and limited code descriptions increase risk in other ways such as loss of organizational knowledge.

Recommendation #1

We recommend the Department of Fish, Wildlife & Parks improve its bonus point protection structure in the Automated Licensing System by developing, documenting, and implementing:

- A. A process to periodically reconcile bonus point change requests from enforcement and
 - B. A process for describing all draw code and procedures as part of the department's ongoing migration process.
-

Risk Assessment and Management Improvements

The federal government's Standards for Internal Control and the COBIT Governance and Management Objectives framework indicate an organization should identify and collect relevant data to enable effective computer-related risk identification, analysis, and reporting. Also, an organization needs to keep and analyze sufficient historical data to satisfy organizational and regulatory requirements. Guidance regarding how this can be accomplished includes using policies and processes compelling analysis and controlling access and modifications to historical data.

Enhanced Controls Needed for Manual Changes

The department currently keeps all changes made to each applicant's bonus points. This includes remarks for changes made to bonus point data. Routine changes to bonus point data auto-generate remarks explaining the change. However, some changes to the data must be made manually. These remarks do not have a consistent format, making this control not as effective as it could be. In addition, the system does allow a blank remark field. Although we only found one instance of this in our work, it increases the risk of manual changes without a listed reason. A consistently used format and a prohibition of blank remark fields would better protect the data's quality. It would also create a more useful historical data resource for the department because it would be easier to spot patterns and anomalies. ALS automatically creates another historical data resource, but the value of this control is greatly diminished because it is not reviewed by management. ALS creates a log of any manual changes. It records the user, date, and time of each manual change.

Process to Identify Potential Risks in Bonus Point Behavior Needed

We determined there are potential risks in bonus point accrual that we, and the department, are unable to identify. The department must calculate each applicant's bonus point amount for each draw by reconstructing all historical bonus point changes. However, the department does not have a process to consistently review bonus point accrual, either retroactively by checking applicants' bonus point amounts for each draw or by checking point changes during each draw. A review process would help ensure that bonus points are accruing appropriately.

Potential Error Risk Increased

Inconsistent manual adjustment comments, limited processes to identify accrual risks, and a lack of manual change review increase the potential for undetected errors. Our work found no evidence of undetected errors or incorrect manual changes. However, the potential risk of incorrect manual changes, manual changes for personal gain, or inaccurate bonus point accrual remains without a review of these processes. Any of these risks would undermine the consistency and fairness of bonus points and the draw procedure.

Recommendation #2

We recommend the Department of Fish, Wildlife & Parks increase its risk identification and management in the permit draw and bonus point data structures by developing, documenting, and implementing:

- A. Consistent formatting for manual adjustment remarks,
 - B. A review process for manual adjustments, and
 - C. A process to identify risk in bonus point accrual.
-

Clearer Communication Needed

The federal government and industry standards provide guidance for successful organizational communication. All indicate management should communicate information to achieve an organization's objectives. Specifically, management should select appropriate methods to communicate externally and internally based on the audience and the purpose of the information. If lost, there is no simple answer for how government can keep or recapture public trust. However, communicating simply with repeated, consistent messaging is necessary for any successful government communication effort. Regarding communication within the department, research indicates the successful exchange of information between organizational divisions is beneficial to the organization. It avoids internal confusion and mixed messages to public.

Bonus Point Public Information Unclear

The internal and external communication efforts for permitting draws and bonus points are underdeveloped. We found some information regarding bonus points, both online and in the hard copy regulations booklet, difficult to understand. In addition, we found instances when the public could receive different information about bonus points from different FWP divisions. Some aspects of FWP's communication efforts are sound. The Web page is straightforward, and it is easy to find information about bonus points. The regulations booklets are familiar to hunters. However, some of the information needs to be explained more clearly and thoroughly. For example, the FWP Web page directs the public to a "Bonus Point Drawing Statistics" report that is designed to explain the success of bonus point holders for a certain species and year. This public-facing report is a spreadsheet with ten columns and often thousands of rows of data. The data is not described other than the 2- to 3-word column titles. In addition, there are no instructions regarding how to search or generally navigate the large spreadsheets.

Underdeveloped Communication Creates Confusion

The underdeveloped bonus point communication results in an inaccurate understanding of bonus point processes in the department and among the public. We interviewed FWP wardens, unaware that revocation or suspension of hunting privileges eliminates all bonus points. This could result in inconsistent bonus point information being provided to the public. We also found some hunters unaware of how exactly bonus points increase their chances in a draw. This could create unrealistic expectations of hunters.

Bonus Point Messaging Needs Attention

The department has not often reviewed its internal nor external bonus point communications to determine if there are ways to improve its clarity and consistency. It is not focused on assessing the current information for the public about bonus points and determining if there is a way to improve it. While they run and post statistical reports regarding the use of bonus points, they have not assessed the ability of the public to understand the reports.

Clear and Consistent Message Increases Stakeholder Confidence

FWP must consider the clarity and consistency of its messages about bonus points, which is necessary for successful communication. Our work found confusing public-facing information. We also found no consistent message across all divisions regarding how bonus points work. In addition, FWP has communication professionals in the department who could provide expertise related to successful messaging, consistency, and distribution of the bonus point message.

Recommendation #3

We recommend the Department of Fish, Wildlife & Parks:

- A. Implement an on-going strategy to improve the clarity and consistency of bonus point information available to the public, and
 - B. Distribute new bonus point information to public-facing FWP staff likely to interact with hunters and anglers.
-

DEPARTMENT RESPONSE
DEPARTMENT OF FISH, WILDLIFE & PARKS



Director's Office
PO Box 200701
Helena, MT 59620-0701
(406) 444-3186
Fax (406) 444-4952
Ref: D0018-2023
April, 26, 2023

Angus Maciver
Legislative Auditor
Office of the Legislative Auditor
State Capitol, Room 160
Helena, MT 59620-1705

RECEIVED
April 26, 2023
LEGISLATIVE AUDIT DIV.

Re: Focused Evaluation of Analyzing Bonus Point Accuracy

Dear Mr. Maciver:

The Department of Fish, Wildlife and Parks appreciates the opportunity to respond to the *Focused Evaluation Analyzing Bonus Point Accuracy* completed by the Legislative Audit Division. The Department has reviewed the recommendations set forth in this report and provided responses and corrective action plans for each recommendation below.

Recommendation #1

We recommend the Department of Fish, Wildlife & Parks improve its bonus point protection structure in the Automated Licensing System by developing, documenting, and implementing:

- A. A process to periodically reconcile bonus points change request from enforcement and

Concur - The Licensing Bureau and Enforcement Division staff will coordinate to develop a process to log individual action requests each license year. The established process will reconcile the deletion of bonus points in the Automated Licensing System and improve the bonus point protection structure.

- B. A process for describing all draw code and procedures as part of the department's ongoing migration process.

Concur - Technology Services Division staff will document draw codes and procedures as the business logic is migrated into the new system.

Recommendation #2

We recommend the Department of Fish, Wildlife & Parks increase its risk identification and management in the permit draw and bonus point data structures by developing, documenting, and implementing:

- A. Consistent formatting for manual adjustment remarks,

Concur - The Licensing Bureau and Technology Services Division staff will coordinate in creating a limited selection of standard rational options to be used as justification for any manual adjustments to bonus points.

- B. A review process for manual adjustments, and

Concur-The Licensing Bureau staff will create a procedure to be used for any/all manual adjustments to bonus points, including reason for the adjustment and logging staff member identification and date and time of any changes.

- C. A process to identify risk in bonus point accrual.

Concur - The Licensing Bureau and Technology Services Division staff will coordinate to create a risk identification process for the manual adjustment to customer bonus points. The risk identification process will include processes to query and compare customer's bonus points pre and post drawing to ensure points are removed or retained based on their participation in the bonus point program for that drawing and their drawing status.

Recommendation #3

We recommend the Department of Fish, Wildlife & Parks:

- A. Implement an on-going strategy to improve the clarity and consistency of bonus point information available to the public, and

Concur - The Licensing Bureau, Communication and Education Division and Technology Services Division staff will coordinate to create a statewide outreach strategy to better inform FWP's customers regarding bonus points. Including, the purpose and benefit of purchasing and using bonus points from a customer perspective.

- B. Distribute new bonus point information to public facing FWP staff likely to interact with hunter and anglers.

Concur - The Licensing Bureau and Communication and Education Division staff will coordinate to create statewide educational materials to better inform FWP staff regarding bonus points. This will allow public-facing staff to provide improved customer services as it relates to bonus points.

Sincerely,



Dustin Temple, Acting Director
Department of Fish, Wildlife and Parks

cc: Robin Graham, Operations and Financial Services Division Administrator
Jessica Plunkett, Technology Services Division Administrator
Emily Cooper, Licensing Bureau Chief