VISITOR ESTIMATION EVALUATION AND STRATEGIES

Developing Accurate Visitation Estimation at Two Urban National Wildlife Refuges in the Mountain-Prairie Region

JESSICA JIA

DIRECTORATE RESOURCE ASSISTANT FELLOWS PROJECT

REGION 6, U.S. FISH AND WILDLIFE SERVICE

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Overview

After an 11-week project aimed at improving visitation estimation accuracy at two national wildlife refuges, we determined that:

- *The Visitor Estimation Workbook* can provide valuable guidelines on how to improve accuracy on estimating total visitation counts.

- Refuge staff can greatly improve the accuracy of their estimates by updating their numerical assumptions (i.e. “calibration”).

- Accuracy cannot be improved as easily for many of the “activity visits” because clear definitions of these activities do not exist.

- Refuge staff can improve the usefulness of their visitor estimates by keeping consistent and organized documentation of the methods they used to arrive at their visitor numbers.

INTRODUCTION

PROJECT NEED

Constrained by finite amounts of time and money, refuge staff may not invest significant amounts of time on estimating how many members of the public are being served. Visitor estimates can provide a way to assess the impact of our visitor services and validate how we are connecting with the public. The U.S. Fish and Wildlife Service (Service) recognized the need for technical guidance on visitor estimation and consequently worked with a contractor to create a manual that would provide Service staff with essential visitation estimation information. Finalized in 2005 and distributed in 2006, *The Visitation Estimation Workbook* and *Technical Supplements* became the Service standard on how to develop a visitation estimation plan and how to use standard methods to collect data.

However, challenges remain in integrating the *Visitation Estimation Workbook* at the field station level. The *Visitation Estimation Workbook* and *Technical Supplements* are both detailed and thorough – meaning that interpretation of the materials requires a focused effort. Competing priorities and demands often take precedence of staff time, and many managers find it is easier to continue ad-hoc visitation estimation methods instead of implementing Service-recommended methods outlined in the *Visitation Estimation Workbook* and *Technical Supplements*.

This project provided focused resources to two Region 6 priority urban refuges to demonstrate that the information and methods of the Visitation Estimation Workbook and Technical Supplements are feasible, and that minor changes in estimation methods can lead to significant improvement in visitor estimation accuracy.

PROJECT OBJECTIVES

Specifically, the objectives of the Visitor Estimation Evaluation and Strategies project were to provide Rocky Mountain Arsenal National Wildlife Refuge (RMA) and Bear River Migratory Bird Refuge (BRR) staff with:

- Evaluations of current visitor estimation techniques
- Recommendations for future estimation strategies
- Data-collection tools and sampling schedules

Evaluations and recommendations were based on:

- The U.S. Fish and Wildlife Service *Visitation Estimation Workbook*
- Consultation with visitor estimation experts and practicing professionals
- Feedback from refuge managers, staff, and volunteers at RMA and BRR

WHAT IS VISITOR ESTIMATION?

Visitor estimation is the act of strategically approximating (a) how many persons visit a station and (b) what they do during their visit.

INTRODUCTION

THE THREE PRINCIPLES OF ESTIMATION

1. Although some estimation methods are more accurate than others, all estimation methods contain some level of inaccuracy.
2. Significant improvements in accuracy can be made with relatively minor changes in estimation techniques.
3. Accurately estimating visitor numbers will always require some amount of time, effort, or expense.

WHY IS ACCURATE VISITOR ESTIMATION IMPORTANT?

Accurate visitor estimation is fundamental to responsible stewardship and excellent public service. As an agency devoted to the conservation and protection of natural resources for the continuing benefit of the American people, Service managers need to assess and understand the use of the lands that they protect and manage in order to best serve the public and the resource.

Visitor numbers serve to demonstrate Service accomplishments. Visitor numbers provide a unit of measurement for public service, and are consequently valuable statistics for reporting and documenting the use of a refuge visitor services programs. In *Fulfilling the Promise* (1999) the Service pledged to report public use consistently and accurately because visitor numbers demonstrate the Refuge System accomplishments to Congress and to the public. Visitor numbers also help the Service measure their ability to connect with a conservation constituency – one of the goals in *Conserving the Future* (2011).

Visitor numbers are a key metric to quantify impact on natural resources. Accurate visitor estimation is fundamental to effective resource management because many lands and waters managed by federal agencies have a maximum amount or type of visitor use that can be accommodated while still maintaining desired resource conditions. Estimating the number of individuals visiting a public land and what they choose to do during their visit helps managers make decisions that maximize visitor benefit while conserving the integrity of the resource that the visitors seek to use (Interagency Visitor Use Management Council, 2016).

Visitor numbers often guide future planning decisions. When practiced consistently over a significant length of time, accurate visitor estimation enables managers and refuge staff to:

- Identify trends in public demand
- Allocate resources to meet current needs
- Plan for future demands, and
- Justify requests for resources

The benefits of accurate visitor estimation far outweigh the cost of implementation. Visitor estimation provides Service managers the most direct tool to implement the complex mission of providing for the enjoyment of current and future generations while concurrently protecting and conserving the natural resources under their stewardship.

METHODS

PROJECT OUTLINE

The project was completed during a period of 11 weeks from May 30, 2016-August 12, 2016:

Step 1. Read *Visitation Estimation Workbook* and *Technical Supplements*

Step 2. Consulted with staff at RMA and BRR refuge stations in order to:

- Document current estimation techniques
- Understand staff goals and frustrations

Step 3. Evaluated current estimation techniques using the *Visitation Estimation Workbook*

Step 4. Reviewed alternate visitor estimation resources through:

- Review of Non-Service publications
- Consulting with Non-Service experts

Step 5. Drafted refuge estimation strategies and data collection sheets.

- Conducted data-collection trials
- Solicited RMA and BRR refuge staff feedback

Step 6. Revised refuge estimation strategies and data-collection tools based on trials and feedback. Repeated drafts of strategies and data-sheets (Step 5 and Step 6) as necessary

Step 7. Delivered final estimation strategies and data-collection tools to refuge staff by

- Explaining final strategies to staff
- Training staff on how to use data collection tools
- Delivering statistics from data collection trials

Step 8. Concluded with close-out conversations with Project Leaders at RMA and BRR refuge stations that included:

- Larger discussion on visitor estimation challenges
- Feedback on project as a whole
- Discussion on future directions

METHODS

Key Terminology

Definitions for "visitor", "visit", and "activity" are from *The Visitation Estimation Workbook*.

A **visitor** is an individual who:

- Is *not* a Service employee, volunteer, researcher, contractor, or special use permit holder
- *Stops* at a refuge to participate in at least one "activity" (see definition below)

Example: An individual traveling on a road or navigable waterway through a refuge without stopping would not be considered a visitor. However, an individual who pulls off the road to stop at a refuge kiosk, overlook, observation tower, or designated pull-out would be considered a visitor. Additionally, if the same individual stops at a refuge for an activity multiple times during a week, he or she would count as multiple visitors.

An **activity** is a legal use of a refuge related to the mission and goals of the Refuge System. Activities are outlined in Goal 5 of the Refuge Annual Performance Plan (RAPP) and encompass six main categories:

- Environmental Education
- Fishing
- Hunting
- Interpretation
- Photography
- Wildlife Observation

A **visit** is an instance of participation of an activity by a visitor

The total number of visits *always equals or exceeds* the total number of visitors – most visitors participate in more than one activity when visiting a refuge.

A **calibration** is the act of comparing the number/unit you want to measure vs. the reading on a measurement device. Calibrating a device involves gathering data to compare the number of *actual* instances to the *device* measurement (e.g. actual number of cars vs. traffic counter reading)

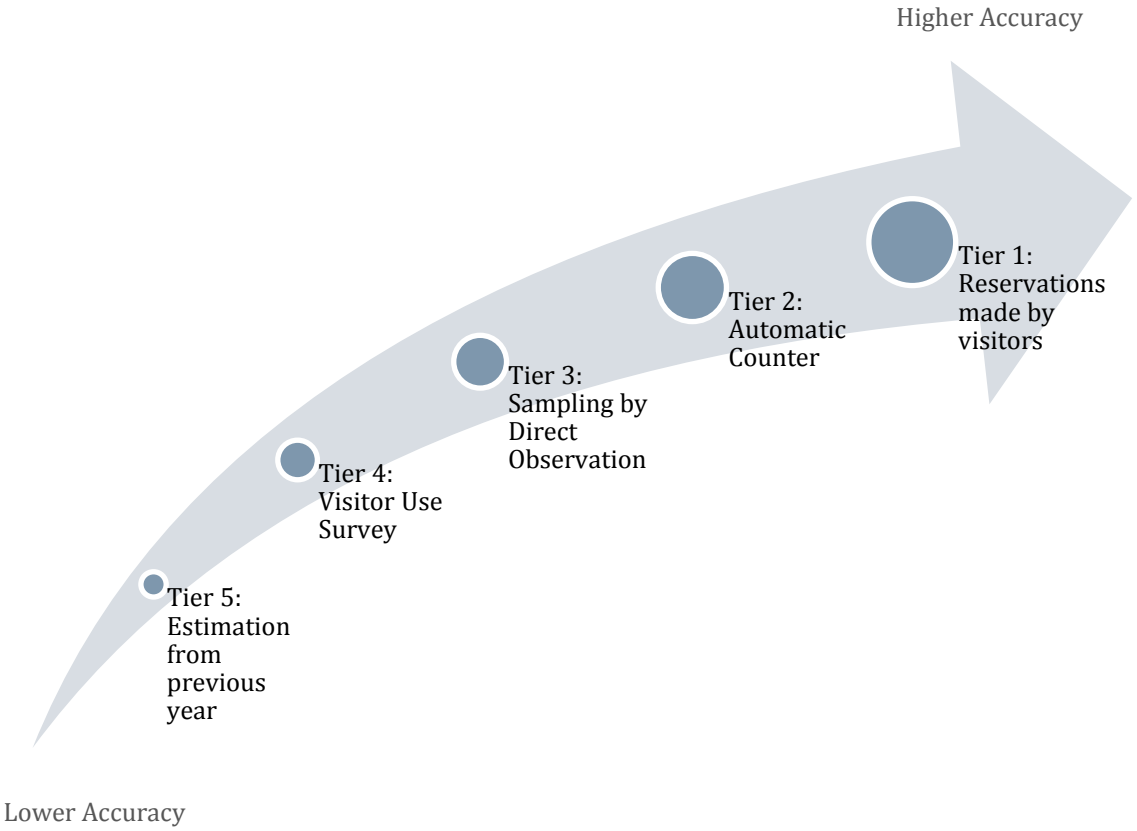
A **multiplier** is a number that represents a proportion. Multipliers estimate the numbers we expect to have based on the actual data we collect (e.g. if we count the number of vehicles, we can use a persons per vehicle multiplier to estimate a total number of individuals).

Sampling is gathering a subset of data during a specified length of time in order to get an idea of characteristics of the entire data set.

METHODS

A TIERED APPROACH TO ESTIMATION ACCURACY

In the case where the resources are not available to do the highest possible accuracy, a general approach to estimation that tiers data collection options can be used to select the best possible estimation method. The highest accuracy would be obtained if visitors must make reservations for the activity. If *no* data can be gathered, the most accurate option would be to use the same numbers as the estimate from the previous year. This tiered approach is based on the principle that the most accurate estimations are a result of taking direct measurements.



REFUGE STUDY: ROCKY MOUNTAIN ARSENAL NWR

BACKGROUND

Established in 1992, Rocky Mountain Arsenal NWR is a 15,988-acre refuge located less than 15 miles from downtown Denver, Colorado. Comprised of prairie, wetland, and woodland habitat, the refuge provides sanctuary for over 330 species of migratory and resident wildlife, including resident bison, bald eagles, and black-footed ferrets. Visitors have the opportunity to enjoy wildlife observation, drive the auto tour loop, hike multiple foot-trails, fish, engage in photography, and learn through environmental education and interpretation programs offered at the refuge.

In terms of visitor access, Rocky Mountain Arsenal NWR currently has one entrance and exit – an automobile entrance at the southwest corner managed by mechanical gate that closes after daylight hours. The refuge is currently discussing opening additional trail entrances in the future that would allow pedestrians and bicyclists to access the refuge from the eastern and southeastern boundary (Figure 1).

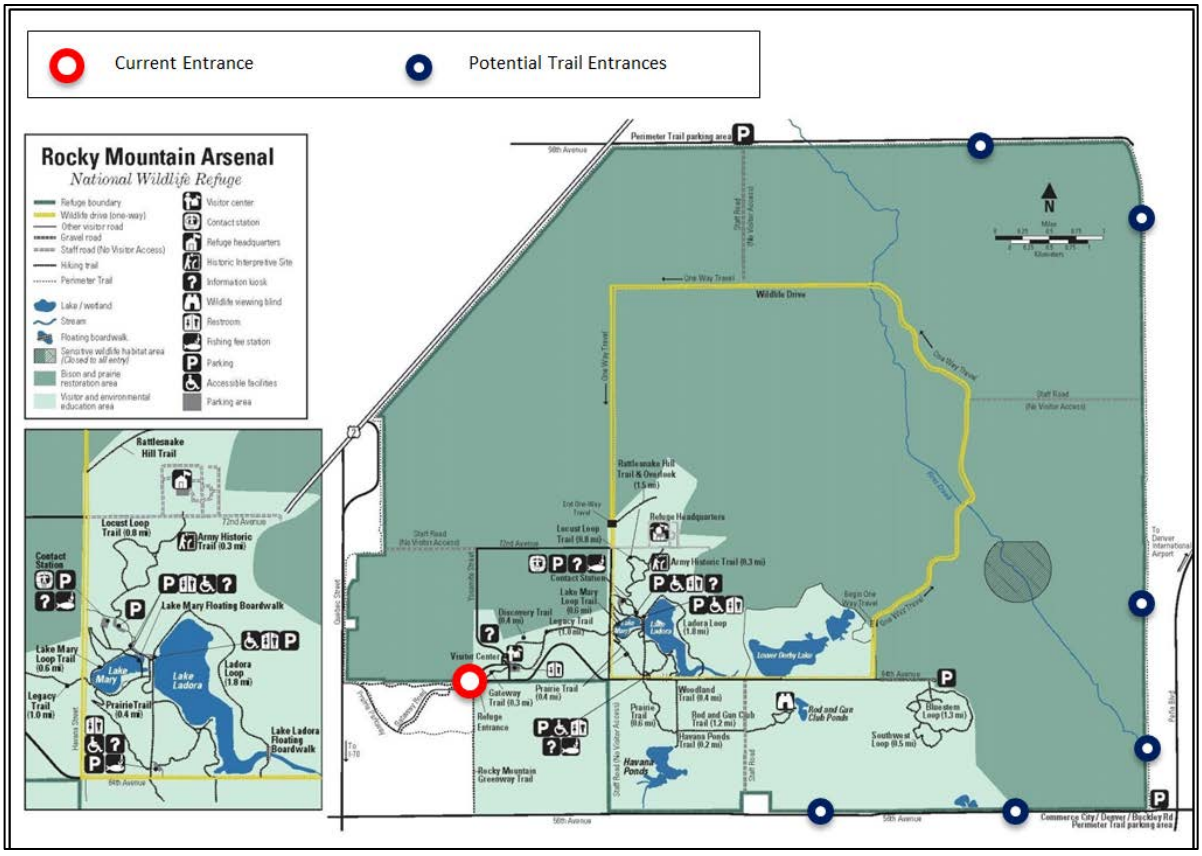


FIGURE 1: ROCKY MOUNTAIN ARSENAL OVERVIEW MAP

REFUGE STUDY: ROCKY MOUNTAIN ARSENAL NWR

OVERALL VISITATION

Current Method:

Staff at Rocky Mountain Arsenal NWR use an automated traffic counter located at the entrance gate of the Refuge to gather raw data on the number of vehicles entering and exiting the Refuge. Each week, a staff member retrieves a data logger from the automated traffic counter (TRAFx© counter) and downloads the raw data to a computer at the office. The staff member then types the daily TRAFx© counts into a Microsoft Excel document which applies an estimation formula to convert the raw data to a total estimate. The formula is as follows: divide the TRAFx© counter reading by 2 (assuming the counter reads both entering and exiting cars), multiply the estimated number of cars by 2.7 (assuming there are 2.7 persons per vehicle), and add 1400 persons per month (assuming one bus of 50 persons enters each weekday for 4 weeks per month). If the staff member believes that the TRAFx© counter vehicle count for a particular day is invalid, the number is discarded. The staff member will then average vehicle counts from that day of the week for the past 4 weeks (i.e. past 4 Tuesdays) to replace the discarded data.

Current Formula (Monthly Estimate): (TRAFx© counter /2) x (2.7) + (1400)

Strengths:

- Follows *The Visitor Estimation Handbook* method for refuge with one access point.
- Minimizes personal bias in estimating visitor numbers.

Weaknesses:

- Assumptions of persons per vehicle and number of bus occupants per month not verified.
- Current data retrieval from TRAFx© counter is time-consuming for staff members.

Key Recommendations:

It is recommended that Rocky Mountain Arsenal NWR maintain their basic technique with some adjustments to their data assumptions in order to increase the accuracy of the Overall Visitation estimate.

- Monitor and quickly address unexpected traffic counter malfunctions because all of the visitation estimates at Rocky Mountain Arsenal NWR hinge upon the automatic traffic counter data.
    - Each time data is uploaded, check hourly trend graphs to ensure counts are realistic in both time (hour of day) and magnitude (counts per hour).
    - Utilize TRAFx© Support through e-mail or telephone when erroneous data is detected.
    - Consider keeping alternative vehicle counters on hand for emergency temporary use.
    - See "Additional Comments" at the end of this section for background on this recommendation.
- Implement a peak visitation 4-hour calibration once during "high-season" and once during "low-season" to establish persons per vehicle multiplier and TRAFx© counter calibration multiplier.
    - Calibrations are conducted in 4-hour sampling periods by recording the directly observed number of vehicles and comparing them to the traffic counter report of counts to create a Calibration Multiplier. See Calibration definition in "Key Terminology."

  - Observing the vehicles entering vs. the TRAFx© counter count allows staff to assess if there is systematic over- or under- counting of vehicles by the TRAFx© counter.
  - *The Visitation Estimation Workbook* also recommends determining an average number of non-visitor vehicles (i.e. "service vehicles") to subtract from visitation estimates. However, after 16 hours of observation we determined that the number of non-visitor vehicles per day comprised of <5% of vehicles and did not warrant the amount of effort needed for incorporation into the estimation formula.
  - See Appendix A for calibration datasheet and schedule.
- Because bus occupancy and visitation frequency is unpredictable, directly add persons who enter via bus using the "Environmental Education" program log totals.
  - Take the monthly total for "Environmental Education" and add to the monthly TRAFx© counter estimate.
  - Do not add "Interpretation" programs because majority of "Interpretation" program participants arrive in passenger vehicles.
- At the current location of the TRAFx© counter where visitors might turn on Wildlife Drive without passing the TRAFx© counter, account for turning vehicles by (1) adding monthly historical averages of fishing permit data, and (2) using a "Wildlife Drive Multiplier" that can be used to estimate the number of non-fishing persons who turn on Wildlife Drive.

Supplemental Recommendations:

- Retrieve traffic counter data monthly (instead of weekly) to reduce time and cost of data collection by 75% and minimize disruption of data counting at the site.
  - Each time data is retrieved, the TRAFx© counter data-logging device is removed and the TRAFx© counter stops counting vehicles until the data-logging device is replaced.
  - If staff is interested in data at a weekly scale, the TRAFx© counter data website enables staff to compare all data.
- Utilize a new data entry form that simplifies data entry and incorporates calibration estimates.
  - The data entry form is a Google Spreadsheet that enables staff to work, edit, and collaborate easily with one another by displaying updates instantly to all staff members.
  - At the end of each fiscal year, export an electronic copy (i.e. Excel spreadsheet) of the Google Spreadsheet to keep non-modifiable electronic records of the data in the refuge network drive.
  - See Appendix A "RMA Automatic Counter Logs"

Recommended Formula:

(TRAFx© counter) x (Calibration Multiplier) x (Persons Per Vehicle) + ("Environmental Education")

- Example: For the high-visitation season, 11 hours of observation determined that for an observed 155 vehicles that should have been calculated by the counter, the TRAFx© counter reported 137 vehicle counts, creating a Calibration Multiplier of 1.13 (which is 155/137) for the counter at the new location.

- Example: Out of 16 hours of observation, 786 occupants were observed entering the Refuge in a total of 362 vehicles, creating a Persons per Vehicle Multiplier of 2.17 (which is 786/362).

Additional Comments:

Refuge staff reported that the TRAFx© counter had been chronically reporting extremely high vehicle counts (often between 500-1300 vehicles per day) since November, and staff were using historical averages (average of last 4 reported counts of that day of the week) to substitute over-count data. However, this method replaces data with past counts and does not assess actual visitation. After reviewing TRAFx© counter hourly counts of cars from 2014, 2015, and 2016 and comparing TRAFx© counter data to (1) weather data from the nearest weather station at Denver International Airport, (2) refuge hours (sunrise to sunset), and (3) TRAFx© counter installation instructions, I discovered that the TRAFx© counter at Rocky Mountain Arsenal NWR was located too close to a metal fence and a cattle guard and set to incorrect settings that resulted in conspicuous over-counting on the TRAFx© counter. Upon knowledge of this information, staff at Rocky Mountain Arsenal NWR immediately changed settings and relocated the TRAFx© counter to a new location. However, at the new location the counter began to behave erratically, often drastically over-counting and then drastically under-counting without signs of correlation to wind or other environmental contributors. Some of the specific recommendations in this section (i.e. the estimation formula) are customized for the current settings and location in the hopes that the counter issues can be resolved soon, but alternate measures will need to be taken to accommodate for the continued malfunctioning of the traffic counter.

VISITOR CENTER

Current Method:

The visitor center has a main entrance and multiple alternate entrances to the building. Refuge staff calculate the number of visitors entering the visitor center using an estimation formula that assumes that each visitor entering the main door also exits through the main door, that the door-counter is 100% accurate, and that 40 persons enter through the alternate doors each day.

Current Formula (Daily Estimate): (Door-Counter /2) + (40)

Strengths:

- Similar to *The Visitor Estimation Handbook* method for determining entries using automated counters.
- Minimizes resource expense by relying on automated door-counter.

Weaknesses:

- Assumes accuracy of door-counter without testing.
- Assumes unchanging number of visitors entering through alternate doors.

REFUGE STUDY: ROCKY MOUNTAIN ARSENAL NWR

Key Recommendations:

It is recommended that Rocky Mountain Arsenal NWR adjust the estimation method in order to increase the accuracy of the Visitor Center estimate.

- Implement a peak visitation 2-hour calibration once during "high-season" and once during "low-season" to establish one Door-Counter Multiplier that will convert the door-counter reading into an estimate of total number of persons entering the visitor center instead of adding estimates for each door.
    - Upon observation we found that current assumptions are inaccurate because (1) the automatic door-counter systematically over-counts persons by an average of 14% and (2) an average of 25% of persons entering the main door exit from an alternate door.
    - Replace the constant estimate for the alternate doors (40 persons per day) with a percentage relationship between main-door entry and alternate-door entry.
    - This new method replaces the assumption that the door-counter is 100% accurate and that all visitors who exit through the same doors in which they enter.
    - See Appendix A for calibration datasheet and schedule.

Supplemental Recommendations:

- Take actions to encourage visitors towards the main entrance because it enhances the visitor experience.
- Utilize a new data entry form. See Appendix A "RMA Automatic Counter Logs"

Recommended Formula:

(Door-Counter) x (Door-Counter Multiplier)

- Example: For the current high-visitation season, 2.5 hours of observation determined that 89 total individuals were observed entering the visitor center through all doors, and the door-counter read 141 new counts. The Door-Counter Multiplier for this season would be 0.63 (which is 89/141).
- Example: The sampler would position himself or herself at a location outside of the building where he or she could reasonably witness visitors entering and exiting from all doors.

CONTACT STATION

Current Method:

Rocky Mountain Arsenal NWR has one Contact Station facility (called "The Contact Station") which is used (1) for environmental education programs and (2) for special use by conservation organizations.

Current Formula (Yearly Estimate): Sum of persons listed on Contact Station reservations

Strengths:

- Directly counts for visitors through mandatory reservations.
- Takes minimal effort to calculate.

Weaknesses:

- Does not account for Environmental Education program use of the facility.
- Undercounts the actual usage of the facility.

Key Recommendations:

It is recommended that Rocky Mountain Arsenal NWR adjust the estimation method in order to increase the accuracy of the Contact Station estimate.

- Add the Contact Station visitors in the "Environmental Education" programs to the number of conservation organization visitors who reserve the facility.
    - Record if Environmental Education program participants use the Contact Station
    - Record the conservation organization reservations for just the Contact Station "Contact Station User Group"
    - Add both to obtain total Contact Station Estimate monthly.
- Utilize a new data entry form. See Appendix A "RMA Education Program Log"

Recommended Formula:

(Contact Station User Group) + (Environmental Education Program Contact Station Users)

INTERPRETATION

Current Method:

Currently, the refuge requires reservation for all Interpretation programs and documents Interpretation participation through the total number of reservations.

Current Formula: Interpretation Reservations

Strengths:

- The most accurate method according to *The Visitor Estimation Handbook.*
- Accurate since all Interpretation programs require advanced reservation.

Weaknesses:

- Can be inaccurate if the actual number of participants is very different than the reserved number.
- Does not account for "Interpretation" that can be participated through kiosks or other interpretive signs on the refuge.

Key Recommendations:

It is recommended that Rocky Mountain Arsenal NWR continue the current estimation method for the Interpretation estimate.

- The current estimation method is believed to be appropriate because the Service does not provide a quantifiable definition of "Interpretation Visit" and the current method is sanctioned by *The Visitor Estimation Handbook.*
- It is unclear whether participation of the "Discovery Room" (specific room of the Visitor Center) is incorporated in the Environmental Education or Interpretation totals. We believe that specific estimates of "Discovery Room" usage are unnecessary since visitation to the room does not specifically qualify as an Environmental Education or Interpretation event. If refuge staff specifically want to monitor "Discovery Room" usage for refuge purposes, we recommend to install an automated-door counter at the threshold of the room and calibrate the counter annually – comparing the observed number of entering persons to the door counter reading to form a calibration multiplier.

Supplemental Recommendations:

- Because most visitors do not know the definition of "Interpretation", we do not recommend using visitor-use surveys for estimating Interpretation participation.
- Record the number of participants at the start of each program.
- Utilize a new data entry form. See Appendix A "RMA Education Program Logs"

ENVIRONMENTAL EDUCATION

Current Method:

Currently, the refuge requires reservations for all Environmental Education programs and documents Environmental Education participation through the total number of reservations.

Current Formula: (Environmental Education Reservations)

Strengths:

- The most accurate method according to *The Visitor Estimation Handbook.*
- Accurate since all Environmental Education programs require advanced reservation.

Weaknesses:

- Can be inaccurate if the actual number of participants is very different than the reserved number.

Key Recommendations:

It is recommended that Rocky Mountain Arsenal NWR continue the current estimation method for the Environmental Education estimate. Because most visitors do not know the definition of "Environmental Education", we do not recommend using visitor-use surveys for estimating participation.

Supplemental Recommendations:

Utilize a new data entry form. See Appendix A "RMA Education Program Logs"

REFUGE STUDY: ROCKY MOUNTAIN ARSENAL NWR

FISHING

Current Method:

The refuge is open to fee-based fishing on Tuesdays, Saturdays, and Sundays from mid-April to mid-October. Daily fishing passes and season fishing passes are available for purchase at the refuge visitor center or at self-pay stations. Currently, refuge staff estimate fishing participation by counting the total number of passes sold at the end of the season.

Current Formula: (Total Fishing Passes)

Strengths:

- Provide valuable source of data about visitation trends.
- Accurate when law enforcement presence established, which is accurate for this refuge.

Weaknesses:

- Underestimates for fishing visits per seasonal pass.
- Underestimates for participants who do not stop to pay fee.

Key Recommendations:

It is recommended that Rocky Mountain Arsenal NWR continue the current estimation method for the Fishing estimate. The current method of mandatory permits is recommended by *The Visitation Estimation Workbook* and should be accurate if there is reason to believe that a high percentage of total fishing participants purchase permits. The method could be further improved by the following:

- Law enforcement staff on patrol can record the number of fishing participants with permits and the number of fishing participants without permits. These numbers could determine a ratio that could be used to estimate the number of fishing participants who do not purchase permits.
- Incorporate the estimate of non-permit participants if the proportion of non-permit participants is >10% of the number of permit-purchasing fishing participants.

Supplemental Recommendations:

- Consider including a question on the seasonal fishing pass application that asks purchasers to estimate the number of fishing trips they may make that season. E.g. “In order to better serve you…please indicate the number of fishing visits you hope to make this season.”
- Utilize a new data entry form. See Appendix A “RMA Fiscal Year Visitor Logs”

Recommended Formula:

(Fishing Permits) + (Estimate of Non-Permit Participants)

REFUGE STUDY: ROCKY MOUNTAIN ARSENAL NWR

AUTO TOUR

Current Method:

Because majority of the activities and facilities at Rocky Mountain Arsenal NWR are accessed via the same road as the Auto Tour Loop, staff estimates that 90% of all visitors will drive on the Auto Tour Loop and that 10% of visitors visit the Visitor Center only without driving on the Auto Tour Loop drive.

Current Formula: (Overall Visitation) x 90%

Strengths:

- Similar to *The Visitor Estimation Handbook* method for estimating an activity using a predetermined activity ratio to compare the activity to overall visitation based on professional judgment.
- Minimizes resource expenses.

Weaknesses:

- Professional judgment lacks ground truth data about whether the assumed ratio is accurate.
- A quantifiable definition of "Auto Tour Visit" is not provided by the Service and must be defined by the refuge staff (e.g. is an Auto Tour Visit only an individual who completes the entire loop by intention or anyone who is observing wildlife on the loop while traveling to another activity).

Key Recommendation:

Document the definition and method for determining "Auto Tour Visits" so that future staff can reliably interpret and contribute to Auto Tour Visit estimates.

Supplemental Recommendations:

- In order to test the current estimation percentage, place a temporary automatic traffic counter once a year at the Auto Tour Loop drive and leave the counter for a day. Compare the vehicle counts to the TRAFx© counter at the refuge entrance.
    - Make sure both traffic counters are calibrated for accuracy.
    - Use the ratio of the temporary traffic counter to the entrance traffic counter to create an activity ratio of vehicles driving on the Auto Tour Loop drive, updating or confirming the current assumption of 90%.
- Consider outsourcing a refuge roads network study to a contractor or another research resource in order to determine the ratio of vehicles that drive on the Auto Tour Loop compared to total number of vehicles entering the refuge.

Recommended Formula:

(Overall Visitation) x (Auto Tour Loop Ratio)

- The recommended formula replaces the 90% estimate for the Auto Tour Loop with a ratio that is calibrated once a year based on a day of data gathering.

REFUGE STUDY: ROCKY MOUNTAIN ARSENAL NWR

HIKING

Current Method:

Rocky Mountain Arsenal NWR has numerous pedestrian trails that meander and often connect on the refuge. Because staff resources are low, refuge staff use professional judgment to estimate that 70% of visitors use hiking trails during high-visitation months and 40% of visitors use hiking trails during low-visitation months.

Current Formula (Yearly):
(Overall Visitation of November-April)*(40%) + (Overall Visitation of May-October)*(70%)

Strengths:

- Similar to *The Visitor Estimation Handbook* method for determining entries using predetermined activity ratios based on method of professional judgment.
- Minimizes resource expenses.

Weaknesses:

- Professional judgment lacks ground truth data of whether the assumed ratio is accurate.
- A quantifiable definition of "Foot Trail/Pedestrian Visit" is not provided by the Service and must be defined by the refuge staff (e.g. if someone going fishing walks on a trail to get to the fishing pier, is he or she also a Hiking Visit?).

Key Recommendations:

Document the definition and method for determining "Hiking Visits" so that future staff can reliably interpret and contribute to Hiking Visit estimates.

Supplemental Recommendations:

- Develop an estimation percentage at the front desk. Staff can keep a tally of the number of hiking visitors they speak to and a tally of the total number of visitors who stop at the front desk to develop a hiking activity ratio.
    - Update the activity ratio estimate during one day during high-visitation season, and during one day during low-visitation season.
    - The new method updates assumptions without asking staff to do sampling at the hiking sites or the parking sites because other sampling methods would require significantly more resource expense.
- Consider alternate sources of data gathering for assessment of Hiking because the refuge will likely have trail/pedestrian entrances in the future.
    - Alternate sources of data, as recommended by *The Visitor Estimation Handbook*, include guest books, trail patrols, automated trail counters, and direct observation surveys to estimate the number of trail users compared to the overall refuge visitation.

  - Note: the use of automated trail counters necessitates time investment to calibrate the trail counters and estimate a ratio of how much each trail counter relates to total Hiking participation.
- Alternatively, consider using results from the refuge's most recent National Wildlife Refuge Visitor Survey which lists the percentage of respondents who report participating in different refuge activities over the past year. This is applicable if you consider Hiking Visits to be an activity reliably self-reported by visitors.
- Utilize a new data entry form. See Appendix A "RMA Fiscal Year Visitor Logs"

Recommended Formula:

(Overall Visitation of November-April)*(Low-Season Hiking Activity Ratio)
+ (Overall Visitation of May-October)*(High-Season Hiking Activity Ratio)

BICYCLING

Current Method:

Rocky Mountain Arsenal NWR allows bicycling only up to the Visitor Center from the refuge mechanical gate. All other bicycling is currently prohibited on the refuge because of the danger to bicyclists upon entering the bison enclosure. Staff appear to use a constant estimate of 100 bicyclists for RAPP reports.

Current Formula (Yearly): 100 Bicyclists

Strengths:

- Minimizes resource expenses.

Weaknesses:

- Professional judgment lacks ground truth data of whether the assumed number is accurate.
- Does not track for changes in bicycling visitation.
- A specific and quantifiable definition of "Bicycle Visit" is not provided by the Service and must be defined by the refuge staff (e.g. Is a person who enters the refuge on a bicycle and only stops at the Visitor Center without bicycling other roads or trails considered a "Bicycle Visit"?).

Key Recommendations:

It is recommended that Rocky Mountain Arsenal NWR conduct data sampling in order to increase the accuracy of the Bicycling estimate.

- Record the number of observed Bicycle entries while performing the vehicle counter calibration observation.
  - Observe the number of bicycle visits while calibrating the automatic vehicle traffic counter.
  - Multiply the sample number of bicycle visits by days in the month and months in the season.
  - See Appendix A calibration sheets and schedule.

    - Example: 3 bicyclists were observed during a 4-hour vehicle counter calibration done in July and 0 bicyclists were observed during a 4-hour vehicle counter calibration done in November. If you assume there are 30 days per month and consider high-visitation season to be May-October and consider low-visitation season to be November-April, then the estimated Bicycle Visits would be 540 (which is 3 x 30 x 6) + 0 (which is 0 x 30 x 6) = 540 Bicycle Visits for the year.
- Refuge staff are strongly encouraged consider posting explicit and noticeable signage prohibiting bicycling at the entrances to the bison enclosure, citing danger via proximity to bison. Multiple bicycling visitors shared that they misunderstood bicycle regulations until they found themselves on their bicycles face to face with bull bison, and only then did they look harder at refuge regulations to see that bicycling was prohibited.
- Document the definition and method for determining "Bicycle Visits" so that future staff can reliably interpret and contribute to Bicycle Visit estimates. There could be an argument that a visitor who bicycles to the Visitor Station but does not ride to other areas of the refuge is using the bicycle as a means of transportation, but not as an activity.

Supplemental Recommendations:

- Because no method is currently undertaken for gathering data on the number of persons riding bicycles on the refuges, and trail entrance accessibility may be added to the Refuge in the future, refuge staff should strongly consider determining the best method for sampling for bicycle activity in the refuge.
- The most accurate data collection would be from bicycle automated traffic counters placed at a location where staff suspect majority of bicyclists travel.
    - The recommended traffic counter product would be EcoCounter© TUBE System which reports separate counts for vehicles and bicycles on paved roads.
    - Bicycle counters require significant investment (>$2000) and the use of automated counters necessitates time investment to calibrate the counters.
- It is not recommended to use the National Wildlife Refuge Visitor Survey except as a reference of long-term data trends because the National Wildlife Refuge Visitor Survey is not updated frequently enough to reflect the annual trends in visitation that the refuge might want to analyze after opening trail access entrances.
- Utilize a new data entry form. See Appendix A "RMA Fiscal Year Visitor Logs"

Recommended Formula:

(Observed Sample of Bicyclists) x (Days in High-Visitation Season)
+ (Observed Sample of Bicyclists) x (Days in Low-Visitation Season)

REFUGE STUDY: ROCKY MOUNTAIN ARSENAL NWR

WILDLIFE OBSERVATION

Current Method:

Refuge staff members estimate that 90% of visitors are Wildlife Observation Visits because wildlife is the main attraction for visitors to Rocky Mountain Arsenal NWR.

Current Formula (Yearly): (Overall Visitation)*(90%)

Strengths:

- Similar to *The Visitor Estimation Handbook* method for determining entries using predetermined activity ratios based on method of professional judgment
- Minimizes resource expenses

Weaknesses:

- Professional judgment lacks ground truth data of whether the assumed ratio is accurate
- A quantifiable definition of "Wildlife Observation Visit" is not provided by the Service and must be defined by the refuge staff (e.g. Is every individual entering considered a "Wildlife Observation Visit" because they saw prairie dogs as they drove to the Visitor Center?)

Key Recommendations:

Document the definition and method for determining "Wildlife Observation Visits" so that future staff can reliably interpret and contribute to Wildlife Observation Visit estimates.

Supplemental Recommendations:

- Refuge staff could consider Wildlife Observation Visits as the sum of Hiking Visits, Auto Tour Visits, and Bicycle Visits since those activities are nested under the heading "Wildlife Observation" in the RAPP report.
    - Because many visitors will participate in more than one activity, i.e. drives on the Auto Tour loop and then walks a trail, the total number of Wildlife Observation visits using this method might exceed the total number of visitors. In that case, staff may choose to also determine a means for estimating the percentage of persons who participate in more than one activity during each visit.
    - See Bear River Migratory Bird Refuge "Wildlife Observation" for strengths and weaknesses of this method.
- Alternatively, refuge staff could consider using results from the refuge's most recent National Wildlife Refuge Visitor Survey which lists the percentage of respondents who report participating in different refuge activities over the past year.
    - This is applicable if you consider Wildlife Observation to be an activity reliably self-reported by visitors.
    - Because no method is available for gathering data on the number of persons observing wildlife on the refuge, this method may be the only method grounded in sampled data.

Recommended Formula:

(Overall Visitation) x (National Wildlife Refuge Visitor Survey Wildlife Observation Activity Ratio)

PHOTOGRAPHY

Current Method:

Rocky Mountain Arsenal NWR has numerous opportunities to photograph wildlife. Refuge staff use professional judgment to estimate that 80% of visitors use a camera to capture images during their visit to the refuge.

Current Formula (Yearly):
(Overall Visitation)*(80%)

Strengths:

- Similar to *The Visitor Estimation Handbook* method for determining entries using predetermined activity ratios based on method of professional judgment.
- Minimizes resource expenses.

Weaknesses:

- Professional judgment lacks ground truth data of whether the assumed ratio is accurate.
- A quantifiable definition of "Photography Visit" is not provided by the Service and must be defined by the refuge staff (e.g. how does one attempt to measure "Photography Visit"?)

Key Recommendations:

Document the definition and method for determining "Photography Visits" so that future staff can reliably interpret and contribute to Photography Visit estimates.

Supplemental Recommendations:

- Refuge staff could consider using results from the refuge's most recent National Wildlife Refuge Visitor Survey which lists the percentage of respondents who report participating in different refuge activities over the past year.
    - This is applicable if you consider Photography to be an activity reliably self-reported by visitors.
    - Because no method is available for gathering data on the number of persons observing wildlife on the refuge, this method may be the only method grounded in sampled data.

Recommended Formula:

(Overall Visitation) x (National Wildlife Refuge Visitor Survey %)

REFUGE STUDY: ROCKY MOUNTAIN ARSENAL NWR

RECOMMENDATION SUMMARY

Refuge staff could take the following steps to greatly increase the accuracy of visitor estimation at Rocky Mountain Arsenal NWR:

- Maintain accuracy of automated traffic counters through calibration and sampling once a season.
- Update numerical multiplier and ratios based on surveys or samples.
- Account for buses in overall visitation estimates by incorporating environmental education totals.
- Document estimation methods and activity definitions.

REFUGE STUDY: BEAR RIVER MIGRATORY NWR

BACKGROUND

Established in 1928, Bear River Migratory Bird Refuge is a 76,000-acre refuge located in northern Utah approximately 45 miles north of Salt Lake City. Protecting some of the largest freshwater wetlands of the Great Salt Lakes ecosystem, the refuge provides critical habitat for over 250 species of migratory and resident birds that flock to rest and feed in the wetland oasis. Recently, a conservation easement on a 30-acre portion of land near Unit 4 (Figure 2) was donated to the Service, establishing the Bear River Watershed Conservation Area as the 565th national wildlife refuge.

Bear River Migratory Bird Refuge is mainly accessed by road. Although vehicle transportation is the most popular means of access, many visitors choose to bicycle or walk to refuge lands. The majority of the Refuge is accessed using West Forest Street, a paved road co-managed by the Service and Box Elder County, Utah (Figure 2). Visitors enjoy wildlife observation, driving the auto tour loop, hunting, hiking, boating, fishing, photography, and learning through environmental education and interpretation programs offered at the refuge.

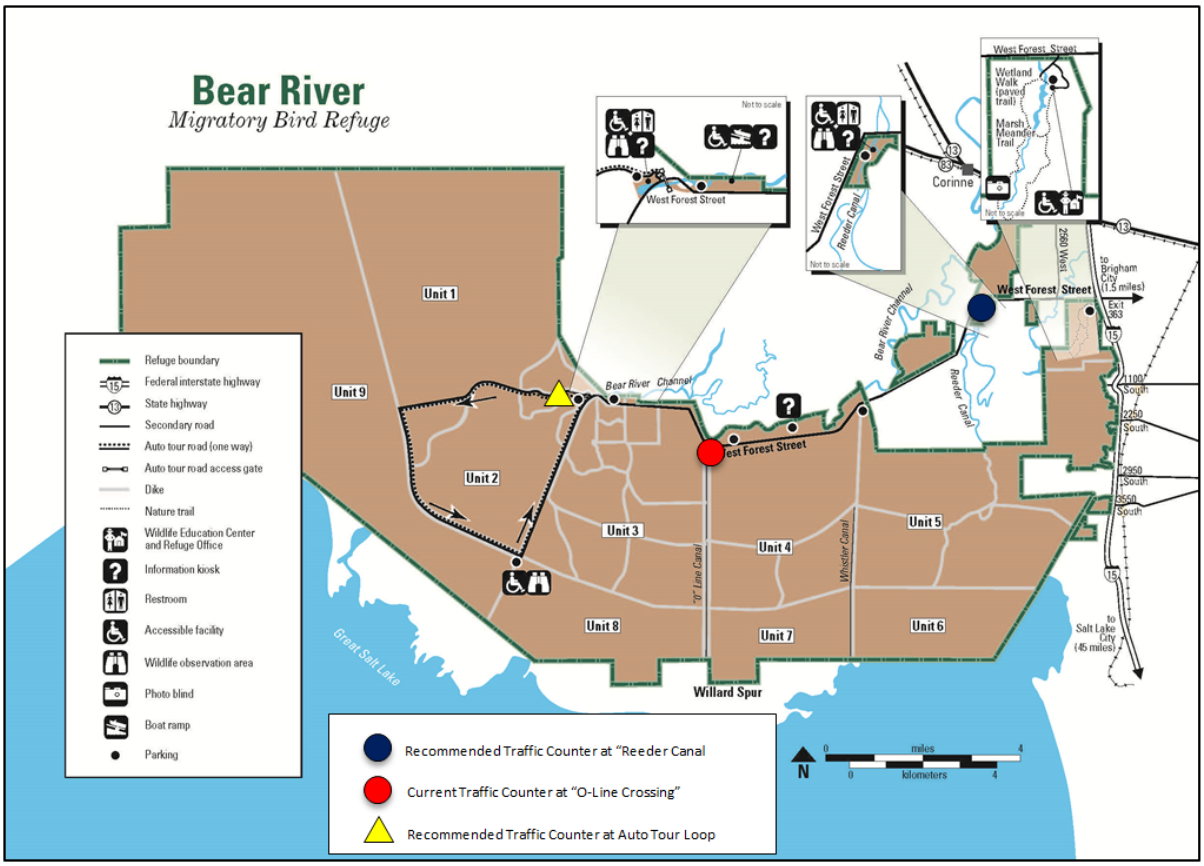


FIGURE 2: BEAR RIVER MIGRATORY BIRD REFUGE OVERVIEW MAP

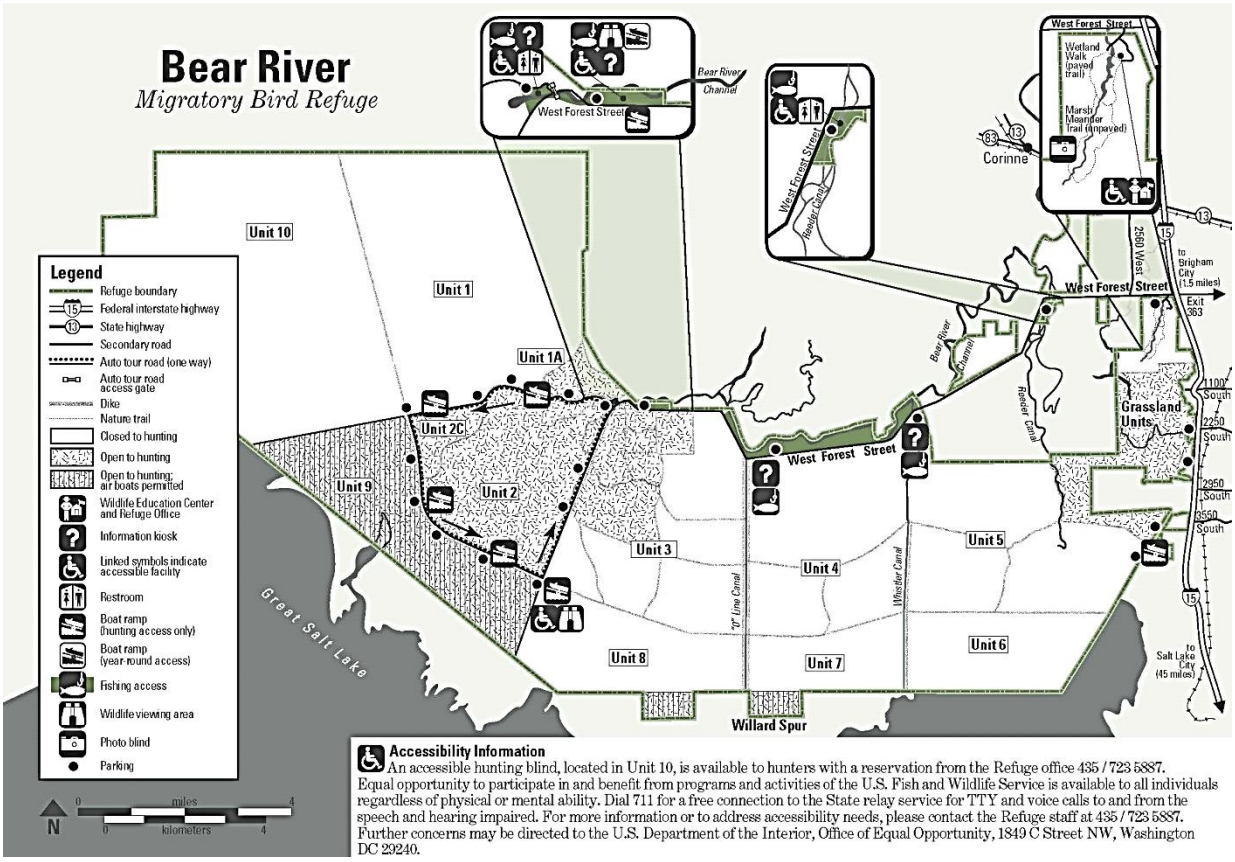


FIGURE 3: BEAR RIVER HUNTING/FISHING MAP

REFUGE STUDY: BEAR RIVER MIGRATORY NWR

OVERALL VISITATION

Current Method:

Bear River Migratory Bird Refuge has multiple access points and limited resources for gathering visitation data. Refuge staff members use the sum of estimates from multiple activities to create an Overall Visitation estimate. Records from the Environmental Education numbers, Interpretation numbers, Visitor Center hand tallies, estimates from a temporary traffic counter placed at the Grasslands Units (Perry Unit) during hunting season, and the traffic counter at the O-Line Canal are first rounded up to the nearest 1,000 and then added to extrapolated estimates of Fishing, Bicycling, Walking, and Bus entry. Fishing, Bicycling, Walking, and Bus extrapolations are numbers generally rounded to the nearest 1,000 with no estimation formula. Currently refuge staff use the multiplier of 4.0 persons per vehicle for both traffic counters.

Current Formula:
(Environmental Education)+(Interpretation)+(Visitor Center)+(Traffic Counter at O-Line Canal)x(4.0) +(Traffic Counter at Perry Hunting Unit)x(4.0)+(Fishing Extrapolation)+(Bicycling Extrapolation)+(Walking Extrapolation)+(Bus Extrapolation)

Strengths:

- The basic concept of adding component parts is strategic for a refuge with multiple entrances.

Weaknesses:

- The absence of data collection for the Fishing Extrapolation, Bicycling Extrapolation, Walking Extrapolation, and Bus Extrapolation invalidates the total visitor estimate.
- Assumptions of persons per vehicle not verified.
- Rounding up each component number between calculations greatly alters accuracy.
- The formula is not applied consistently – in 2015 the Fishing Extrapolation, Bicycling Extrapolation, Walking Extrapolation, and Bus Extrapolation were each added twice into the Overall Visitation estimate.
- Visitor numbers are mathematically contradictory – see Additional Comments at the end of this section.

Key Recommendations:

It is recommended that Bear River Migratory Bird Refuge install traffic counters at new locations and develop a consistent mathematical formula. This will greatly improve Overall Visitation estimation.

- Permanently place a vehicle traffic counter at the Reeder Canal crossing to capture a more accurate number of visitors entering refuge boundaries (see Figure 2).
    - This could be done by moving the current counter located at the O-Line Canal crossing to the Reeder Canal crossing on the refuge.

  - Because of winter weather and winter maintenance conditions at this Refuge, only in-road traffic counters (devices that are cut into and placed under the road) can be used permanently.
  - The traffic counter should be calibrated and reliable - see Rocky Mountain Arsenal Overall Visitation Recommendations for instructions on how to calibrate traffic counters.
  - This traffic counter placement would directly count vehicles entering for Fishing Visits.
- Update the Persons per Vehicle multiplier once a year using the average group size of the past years records in the Visitor Center Guestbook.
  - Refuge staff were previously applying a persons per vehicle multiplier of 4.0 to estimate how many persons on average were in each vehicle because of Utah's reputation as a state with large household size. However, this multiplier is inaccurate. Refuge Guestbook data steadily reports significantly lower groups sizes for all visitors and for Utah visitors.
  - According to 1,427 refuge Guestbook entries between January-December 2015, visitors traveled in an average group size of 2.7. Of these Guestbook entries, 41% (594) were from Utah and their average group size was 3.1 persons. These group sizes remain the same in 2016 January-June statistics. According to 527 refuge Guestbook entries between January-June 2016, visitors again traveled in an average group size of 2.7, and of these Guestbook entries, 49% (259) were from Utah with an average group size of 3.1 persons.
- Capture data on special event visitors by placing a temporary tube road counter at the Visitor Center during special events. Multiply vehicles by the Guestbook Utah persons per vehicle average (e.g. 3.1) if it is believed that a significant majority of the visitors are from Utah.
- Because bus occupancy and visitation frequency is unpredictable, directly add persons who enter via bus using the "Environmental Education" program log totals.
  - Take the yearly total for "Environmental Education" and add to the yearly Overall Visitation estimate.
  - Do not add "Interpretation" programs because majority of "Interpretation" program participants arrive in passenger vehicles.
- Improve data collection methods for estimating Bicycling and Hiking visitation.

Supplemental Recommendations:

- If a permanent vehicle traffic counter cannot be placed at the Reeder Canal crossing, temporarily place a tube vehicle counter at the Reeder Canal crossing and gather vehicle numbers to establish a ratio of the number of total visitors compared to the O-Line traffic counter reading.
  - Both traffic counters must be accurate (temporary tube counter and the permanent O-Line location counter). See Rocky Mountain Arsenal Overall Visitation Recommendations on how to perform a calibration.
  - Gather data for one or two weeks and create a ratio of the total number of vehicles passing the Reeder Canal counter compared to the total number of vehicles passing the O-Line Canal counter. This number can be used as a multiplier to estimate the total number of visitor vehicles entering refuge property.
  - Example: During the same week, the temporary counter at Reeder Canal crossing records 1,500 vehicles and the permanent counter at the O-Line Canal crossing records 920

vehicles. The multiplier is 1.63 (which is 1,500/920). For the rest of the year, when the temporary counter is no longer used, multiply the readings of the O-Line canal counter by 1.63.

- Utilize a new data entry form that simplifies data entry and incorporates calibration estimates.
    - The data entry form is a Google Spreadsheet that enables staff to work, edit, and collaborate easily with one another by displaying updates instantly to all staff members.
    - At the end of each fiscal year, export an electronic copy (i.e. Excel spreadsheet) of the Google Spreadsheet to keep non-modifiable electronic records of the data in the refuge network drive.
    - See Appendix A "BRR Automatic Counter Logs", "BRR Fiscal Year Visitor Logs", and "BRR Guestbook Logs"

Recommended Formula:

(Traffic Counter at Reeder Canal)x(Guestbook Persons per Vehicle)+(Special Event Visitors) +(Environmental Education)+(Bicycling)+(Visitor Center Hand Tally) +(Traffic Counter at Perry Unit)x(Guestbook Utah Persons per Vehicle)+(Hiking)

Additional Comments:

Weaknesses of the current method are concluded from analyses of recent RAPP reports. The Bear River Migratory Bird Refuge 2014 RAPP report states 200,000 Total Visitors, however, the sum of participants in all activities is 144,660 visitors, implying that at least 55,340 visitors came to the refuge but did not participate in any activities. The same mathematical paradox is displayed in 2015 RAPP reports which reports 186,000 Total Visitors but the sum of the participants in all activities is 174,022, implying that at least 11,978 visitors came to the refuge but did not participate in any activities. Because the definition of a visitor is a person who stops to participate in an activity, and majority of visitors participate in more than one activity, the sum of activity participation must equal or exceed total visitation. Either total activity visits or the total visitation estimates are highly inaccurate.

VISITOR CENTER

Current Method:

The Visitor Center at Bear River Migratory Bird Refuge is connected to staff offices and a large conference room used for training programs. Staff at the front desk of the Visitor Center use a hand tally counter to record the number of "general visitors" to the visitor center and keep a record of the number of individuals who come to the building to attend meetings.

Current Formula (Daily Estimate): (Visitor Center Hand Tally)+(Meeting Attendees)

Strengths:

- Direct observation is a method recommended by the *Visitation Estimation Handbook*.

Weaknesses:

- The hand tally method often undercounts visitors when visitation is high.
- Necessitates staff diligence and presence at all times at the front desk.

Key Recommendations:

It is recommended that Bear River Migratory Bird Refuge install door chimes on all visitor entrances to notify staff when visitors arrive. Door chimes would increase the chance of staff tallying visitor numbers during hours of severely limited front desk staffing and/or high visitation. Door chimes can also greatly increase staff safety if there is only one staff member attending the building. Staff expressed safety concerns especially for post-daylight hours in the winter months when the sun sets before the Visitor Center closes.

Supplemental Recommendations:

- If majority of Environmental Education students also visit the Visitor Center, include the Environmental Education (on-site) totals to the Visitor Center estimate.
- Make sure that staff and volunteers at the front desk emphasize the importance of Guestbook sign-in for all visitors because the Guestbook serves to sample valuable visitor statistics.
- Utilize a new data entry form. See Appendix A "BRR Education Program Logs" and "BRR Daily Visitor Logs".

Recommended Formula:

(Visitor Center Hand Tally)+(Meeting Attendees)+(Environmental Education)

INTERPRETATION

Current Method:

Currently, the Refuge requires reservations for Interpretation programs and otherwise, staff use direct observation to record the number of estimated visitors at interpretive events (e.g. "Eagle Day" and "Swan Day" special events).

Current Formula: (Interpretation Reservations) + (Special Event Participation)

Strengths:

- Mandatory reservations and direct observation are the most accurate methods of estimation according to *The Visitor Estimation Handbook.*

Weaknesses:

- Can be inaccurate if the actual number of participants is very different than the reserved number.
- Does not account for "Interpretation" that can be participated through kiosks or other interpretive signs on the refuge.

REFUGE STUDY: BEAR RIVER MIGRATORY NWR

Key Recommendations:

It is recommended that Bear River Migratory Bird Refuge continue the current estimation method and consider incorporating General Meeting Attendees for the Interpretation estimate. If General Meeting Attendees are included in Overall Visitation, add the General Meeting Attendees to the Interpretation total if the individuals always receive a welcome overview about the refuge when they visit for meetings. The attendees must also be accounted for in RAPP activities.

Supplemental Recommendations:

- The current estimation method is believed to be appropriate because the Service does not provide a quantifiable definition of "Interpretation Visit" and the current method is sanctioned by *The Visitor Estimation Handbook.* Because most visitors do not know the definition of "Interpretation", we do not recommend using visitor-use surveys for estimating Interpretation participation.
- Utilize a new data entry form. See Appendix A "BRR Education Program Logs" and "BRR Daily Visitor Logs".

Recommended Formula:

(Interpretation Reservations) + (Special Event Participation)+(General Meeting Attendees)

ENVIRONMENTAL EDUCATION

Current Method:

Currently, the refuge requires reservation for all Environmental Education programs and documents Environmental Education participation through the total number of reservations.

Current Formula: (Environmental Education Reservations)

Strengths:

- The most accurate method according to *The Visitor Estimation Handbook.*
- Accurate since all Environmental Education programs require advanced reservation.

Weaknesses:

- Can be inaccurate if the actual number of participants is very different than the reserved number.

Key Recommendations:

It is recommended that Rocky Mountain Arsenal NWR continue the current estimation method for the Environmental Education estimate. Because most visitors do not know the definition of "Environmental Education", we do not recommend using visitor-use surveys for estimating participation.

Supplemental Recommendations:

Utilize a new data entry form. See Appendix A "BRR Education Program Logs".

REFUGE STUDY: BEAR RIVER MIGRATORY NWR

FISHING

Current Method:

Most of the areas open to fishing on the Refuge are located along West Forest Street between Reeder Canal and the Auto Tour Loop. Staff members have difficulty assessing Fishing visitation in these areas because the Refuge vehicle traffic counter is placed at the O-Line Canal (See Figure 2 and Figure 3). Currently, refuge staff have no formula for estimating Fishing visits, numbers reported are a result of estimation without methodology.

Current Formula: None

Strengths:

- Minimizes resource expenses.

Weaknesses:

- The absence of data collection for Fishing also invalidates the refuge Overall Visitation estimate.
- Fishing visitor numbers are contradictory between the refuge records and RAPP reports.

Refuge documents for 2015 record an estimated extrapolation of 12,000 fishing visits. This number was used as a component to estimate 2015 RAPP Total Visitors (i.e. Overall Visitation). However, the 2015 RAPP Report states 2,000 fishing visits and the 2014 RAPP Report states 1,000 visits. This implies that there is inconsistent application of estimation formulas.

Key Recommendations:

It is recommended that Bear River Migratory Bird Refuge install traffic counters at new locations and develop a consistent mathematical formula to greatly improve Fishing estimation.

- It is highly recommended that a vehicle traffic counter be placed at the entrance to the refuge boundary at the Reeder Canal crossing location and another vehicle traffic counter be placed along the Auto Tour Loop (Figure 2).
    - Subtract the Auto Tour Loop vehicles from the Reeder Canal vehicle count to estimate number of vehicles stopping for fishing.
    - Both traffic counters must be accurate and reliable. See Rocky Mountain Arsenal Overall Visitation Recommendations.
- Use the Guestbook average on Utah group sizes to estimate the persons per vehicle if it is reasonable to assume most vehicles are from Utah and follow the same group size patterns. If not, use the Guestbook average of all visitor group sizes.

Supplemental Recommendations:

- If the current traffic counter is relocated to the Reeder Canal location and no other counters are on the roads, temporarily place a tube counter at the Auto Tour Loop location (see the Overall Visitation Recommendation) to estimate the number of vehicles stopping for fishing.

    - Use one or two weeks of data on fishing vehicles to determine a "Fishing Ratio" of fishing stops compared to total vehicles.
    - Use the ratios only for subsequent estimates during fishing season months.
- If the O-Line Counter cannot be moved, temporarily place a tube counter at the Reeder Canal location (see the Overall Visitation Recommendation) to estimate the number of vehicles stopping for fishing between the Reeder Canal and the O-Line Canal.
    - This method is less accurate because some percentage of vehicles will drive past the O-Line Canal for fishing.
    - Use those one or two weeks of data to determine a "Fishing Ratio" of fishing stops.
    - Use the ratios only for subsequent estimates during fishing season months.
- If no data can be gathered on the visitors crossing at the Reeder Canal location, use the National Wildlife Refuge Visitor Survey to estimate fishing visits.
    - While this recommendation is not ideal due to sampling bias of the visitor survey, this method is preferred if refuge staff cannot collect fishing data on the ground.
- Utilize a new data entry form. See Appendix A "BRR Automatic Counter Logs"

Recommended Formula:

Ideal: (Reeder Canal Traffic Counter) – (Auto Tour Loop Traffic Counter)

Alternate: (Permanent Traffic Counter) x (Guestbook Utah Average Group Size) x (Fishing Ratio)

HUNTING

Current Method:

Hunting is a popular activity at Bear River Migratory Bird Refuge and is available at two major locations: along the Auto Tour Loop area and the Grassland Units (See Figure 3). Because of the popularity of hunting on the Refuge, staff estimates that 100% of cars that drive on the Auto Tour Loop are hunters from October-January. An additional number of hunters that hunt on the Grassland Units (Perry Unit) of the refuge are estimated through the use of a temporary tube counter placed at the Perry Unit during hunting season. For these estimates, refuge staff members assume 4.0 persons per vehicle.

Current Formula: (O-Line Traffic Counter October-January) x (4.0) + (Traffic Counter at Perry Unit) x (4.0)

Strengths:

- Similar to *The Visitor Estimation Handbook* method for estimating an activity by adding separate areas of usage.

Weaknesses:

- No data collection is done to confirm assumption that 100% of Auto Tour Loop users are hunters.
- Hunting visitor numbers are contradictory between the refuge records and the RAPP reports.

REFUGE STUDY: BEAR RIVER MIGRATORY NWR

Refuge documents for 2015 record traffic counter numbers that total 40,413 hunting visits. This number was used to estimate 2015 RAPP Total Visitors (i.e. Overall Visitation). However, the 2015 RAPP Report states 20,750 hunting visits. This implies that there is inconsistent application of estimation formulas.

Key Recommendations:

It is recommended that Bear River Migratory Bird Refuge assess non-hunting visitation and employ a consistent mathematical formula to greatly improve Hunting estimation.

- Subtract the visitor center tally of "General Visitors" from the O-line traffic counter estimate from October-January to accommodate for the non-hunting wildlife observation visits that occur during the winter season.
    - Wildlife observation visits do not stop completely during the winter. Without going out to sample in person, refuge staff can assume that visitors at the Visitor Center also visit the Tour Loop.
    - Not all visitors at the visitor center visit the tour loop, not all visitors on the tour loop visit the visitor center. This should help balance the assumptions of this method.
- Use the Guestbook Utah persons per vehicle multiplier for hunting vehicles if you assume most hunters are from Utah.

Supplemental Recommendations:

- Consider more direct sources of data gathering for assessment of Hunting because hunting is such a popular activity at the Refuge.
    - Alternate sources of data, as recommended by *The Visitor Estimation Handbook*, include parking lot patrols and direct observation surveys to estimate the number of hunters.
    - Note: In order to gather enough data, the use of patrols and direct observation necessitate an increase in law enforcement staff or volunteers at the Refuge during hunting season.
    - In the advent that additional staff members are available in the future, see Appendix A "BRR Patrol Log – Optional" for data-collection sheets.
- Utilize a new data entry form. See Appendix A "BRR Fiscal Year Visitor Logs"

Recommended Formula:

(O-Line Traffic Counter October-January)x(Guestbook Utah Persons per vehicle)
+(Traffic Counter at Perry Unit)x(Guestbook Utah Persons per vehicle)
– (Visitor Center Hand Tally October-January)

REFUGE STUDY: BEAR RIVER MIGRATORY NWR

AUTO TOUR

Current Method:

The Auto Tour Loop at Bear River Migratory Bird Refuge is located at the end of West Forest Street about 12 miles away from the Visitor Center. Refuge staff members assume that all vehicles that pass the current traffic counter, located at the O-Line Canal crossing (see Figure 2), during February-September are driving to the Auto Tour Loop. Currently, refuge staff members estimate that the average number of persons per vehicle is 4.0.

Current Formula: (O-Line Traffic Counter February-September) x (4.0)

Strengths:

- Similar to *The Visitor Estimation Handbook* method since there is only one automobile entrance to the Auto Tour Loop.

Weaknesses:

- Assumes no non-hunting visitors drive the Auto Tour Loop from October-January.
- Assumes all of the vehicles that cross the O-Line canal are Auto Tour Loop visitors.
- A quantifiable definition of "Auto Tour Visit" is not provided by the Service and must be defined by the refuge staff (e.g. is an Auto Tour Visit only an individual who completes the Auto Tour Loop or anyone who drives any refuge road observing wildlife).

Key Recommendations:

Document the definition and method for determining "Auto Tour Visits" so that future staff can reliably interpret and contribute to Auto Tour Visit estimates.

Supplemental Recommendations:

- Place a vehicle traffic counter at the one-way beginning of the Auto Tour Loop to explicitly measure the number of vehicles who drive on the Auto Tour Loop.
    - This resolves the inaccuracy of assuming all vehicles that pass the O-Line Canal visit the Auto Tour Loop.
    - Recommended "Diamond Traffic Products Road Runner 3" pneumatic tube counter.
    - This also increases accuracy and simplifies Fishing and Hunting estimation.
    - See Figure 2 for location recommendation.
    - The traffic counters must be calibrated and reliable. See Rocky Mountain Arsenal Overall Visitation Recommendations for instructions on how to calibrate traffic counters.
- Update the persons per vehicle multiplier using the Guestbook average group size from the past annual year.
- For the winter months of October-January, use the "Visitor Center Hand Tally" to estimate non-hunting Auto Tour Loop visitation. See the Hunting recommendations for explanation.
- Utilize a new data entry form. See Appendix A "BRR Automatic Counter Logs"

Recommended Formula:

(O-Line Traffic Counter February-September) x (Guestbook Persons Per Vehicle)
+ (Visitor Center Hand Tally October-January)

BOAT LAUNCH

Current Method:

Majority of boat launch visits occur during hunting season by hunting participants. Because boat launches are considered a relatively low proportion of visitation, refuge staff members do not employ a formulaic approach for estimating Boat Launch visits.

Current Formula: None

Strengths:

- Minimizes resource expenses.

Weaknesses:

- Estimation lacks ground truth data to indicate whether the assumed number is accurate.
- A quantifiable definition of "Boat Launch Visit" is not provided by the Service and must be defined by the refuge staff (e.g. is a Boat Launch visit any individual on a boat, or only a non-hunting individual since it is under the category "Wildlife Observation" in the RAPP Report).

Key Recommendations:

Document the definition and method for determining "Boat Launch Visits" so that future staff can reliably interpret and contribute to Boat Launch Visit estimates.

Supplemental Recommendations:

Because the resources for data gathering are severely limited, consider placing launch guestbooks at the primary boat launch locations. This would help refuge staff gather more data on boat launch visitation throughout the year. For example, in July 2015, two vehicles transporting kayaks were observed entering the Auto Tour Loop in the early morning. These visitors may be part of a large sub-category of kayaking wildlife observation visits. Without means of monitoring, staff members would not know to accommodate for this user group.

Recommended Formula:

(Boat Guestbooks)

REFUGE STUDY: BEAR RIVER MIGRATORY NWR

HIKING

Current Method:

Most of the areas open to hiking on Bear River Migratory Bird Refuge lack data collection tools and staff members have difficulty assessing visitation in these areas. Currently, refuge staff members do not employ a formulaic approach for estimating Hiking visits.

Current Formula: None

Strengths:

- Minimizes resource expenses.

Weaknesses:

- The absence of data collection for Hiking undermines the accuracy of Overall Visitation estimates.
- Estimation lacks ground truth to indicate whether the assumed number is accurate.
- Does not track for changes in Hiking visitation.
- Hiking visitor estimations are contradictory between the refuge records and the RAPP reports.
- A quantifiable definition of "Foot Trail/Pedestrian Visit" is not provided by the Service and must be defined by the refuge staff (e.g. if someone going fishing walks on a trail to get to the fishing pier, is he or she also a Hiking Visit?)

Data collection provides significant insight because professional judgment can be highly unreliable. For example, one staff member was sure that many visitors walk the Grassland Units, while another staff member was sure that almost no visitors walk the Grassland Units. Collaboration is critical to developing an optimal visitor estimation strategy because each staff member can contribute information to create a better overall picture of visitor usage.

Key Recommendations:

It is recommended that Bear River Migratory Bird Refuge gather data and develop a consistent mathematical formula to greatly improve Hiking estimation.

- Because the resources for data gathering are severely limited, consider using results from the refuge's most recent National Wildlife Refuge Visitor Survey which lists the percentage of respondents who report participating in different refuge activities over the past year.
    - Use the Overall Visitation estimate from the previous fiscal year and multiply with the National Wildlife Refuge Visitor Survey results to determine an estimate of Hiking visits for the current year.
    - This method should only be used if no other data-gathering method is available.
    - The visitor-use survey is applicable if you consider Hiking Visits to be an activity reliably self-reported by visitors.
    - The new method updates assumptions without asking staff to do sampling at the hiking sites or the parking sites because other sampling methods would require significantly more resource expense.

- Document the definition and method for determining "Hiking Visits" so that future staff can reliably interpret and contribute to Hiking Visit estimates.

Supplemental Recommendations:

- Alternate sources of data, as recommended by *The Visitor Estimation Handbook*, include guest books and automated trail counters to estimate the number of trail users.
    - The use of automated trail counters necessitates time investment to calibrate the trail counters and estimate a ratio of how much each trail counter relates to total Hiking participation.
    - Consult with staff for the ideal locations of trail counters on the existing established trails by the visitor center. Ideally, one trail counter would be placed near the parking lot and one near the visitor center to account for all visitors on the trails.
- Utilize a new data entry form. See Appendix A "RMA Fiscal Year Visitor Logs" and "RMA Automatic Counter Logs"

Recommended Formula:

(Previous Year's Overall Visitation) x (National Wildlife Refuge Visitor Survey %)

BICYCLING

Current Method:

Bear River Migratory Bird Refuge is a popular destination for road bicyclists and often is a location for private organized large-events whose organizers often coordinate with the refuge staff. However, aside from large event numbers, refuge staff have no formula for estimating bicycling visits, and appear to use a constant estimate of 1,500 bicyclists for RAPP reports.

Current Formula (Yearly): 1,500 Bicyclists

Strengths:

- Minimizes resource expenses.

Weaknesses:

- The current method lacks ground truth data of whether the assumed number is accurate.
- Does not track for changes in bicycling visitation.
- Bicycling visitor estimations are contradictory between the refuge records and the RAPP reports.
- A specific and quantifiable definition of "Bicycle Visit" is not provided by the Service and must be defined by the refuge staff (e.g. Is a person who enters the refuge on a bicycle and only stops at the Visitor Center without bicycling other roads or trails considered a "Bicycle Visit").

Refuge documents for 2015 record an estimated extrapolation of 10,000 Bicycling visitors. This number was used as a component to estimate 2015 RAPP Total Visitors (i.e. Overall Visitation). However, the 2015 RAPP Report states 1,500 Bicycle Visits. This implies that there is inconsistent application of estimation formulas.

REFUGE STUDY: BEAR RIVER MIGRATORY NWR

Key Recommendations:

It is recommended that Bear River Migratory Bird Refuge conduct data sampling and develop a consistent mathematical formula to greatly increase the accuracy of the Bicycling estimate.

- Record the number of observed Bicycle entries while performing vehicle counter calibration observations.
    - Use observed periods of time to estimate seasonal bicycle visitation.
    - Refer to Rocky Mountain Arsenal "Bicycling" key recommendations for instructions.
- Document the definition and method for determining "Bicycle Visits" so that future staff can reliably interpret and contribute to Bicycle Visit estimates.

Supplemental Recommendations:

- The most accurate data collection would be from bicycle automated traffic counters placed at the first bathroom parking lot on West Forest Street (colloquially called the "Yates Parking Lot")
    - The recommended traffic counter product would be EcoCounter© TUBE System.
    - Because bicycle counters require significant investment (>$2000) and the use of automated counters necessitates time investment to calibrate the counters, this method is not recommended.
- If the resources for data gathering are severely limited, consider using results from the refuge's most recent National Wildlife Refuge Visitor Survey which lists the percentage of respondents who report participating in different refuge activities over the past year.
    - Use the Overall Visitation estimate from the previous fiscal year and multiply with the National Wildlife Refuge Visitor Survey results to determine an estimate of Bicycling visits for the current year.
    - This method should only be used if no other data-gathering method is available.
    - The visitor-use survey is applicable if you consider Bicycling to be an activity reliably self-reported by visitors.
- Utilize a new data entry form. See Appendix A "BRR Fiscal Year Visitor Logs" and "BRR Automatic Counter Logs"

Recommended Formula:

If staff calibrate automatic traffic counters once per season:

(Observed Sample of Bicyclists) x (Days in High-Visitation Season)
+ (Observed Sample of Bicyclists) x (Days in Low-Visitation Season)
+ (Private Organized Large-Event Bicyclist Report)

If staff cannot calibrate automatic traffic counters:
(Previous Year's Overall Visitation) x (National Wildlife Refuge Visitor Survey %)
+ (Private Organized Large-Event Bicyclist Report)

REFUGE STUDY: BEAR RIVER MIGRATORY NWR

WILDLIFE OBSERVATION

Current Method:

Refuge staff take the sum of Bicycle Visits, Boat Launch Visits, Auto Tour Visits, and Hiking Visits to estimate Wildlife Observation Visits because these four activities are listed under the heading "Wildlife Observation" in RAPP reporting forms.

Current Formula (Yearly): (Bicycle Visits)+(Boat Launch Visits)+(Auto Tour Visits)+(Hiking Visits)

Strengths:

- This method makes strong logical sense because the RAPP report lists these activities under the heading "Wildlife Observation."

Weaknesses:

- Depends on the accuracy of the individual activity estimations.
- Inaccuracy can occur when visitors participate in more than one activity in order to observe wildlife.
- A quantifiable definition of "Wildlife Observation Visit" is not provided by the Service and must be defined by the refuge staff (e.g. Is an individual who sees a bird on their way to the Visitor Center automatically a "Wildlife Observation Visit" because they observed an animal).

Key Recommendations:

Document the definition and method for determining "Wildlife Observation Visits" so that future staff can reliably interpret and contribute to Observation Visit estimates.

Supplemental Recommendations:

- Increase the accuracy of Bicycle Visit, Boat Launch Visits, Auto Tour Visits, and Hiking Visit estimations since they contribute to the Wildlife Observation Visit estimation.
- Alternatively, refuge staff could consider using results from the refuge's most recent National Wildlife Refuge Visitor Survey which lists the percentage of respondents who report participating in different refuge activities over the past year.
    - This is applicable if you consider Wildlife Observation Visits to be an activity reliably self-reported by visitors.
    - Because no method is available for gathering data on the number of persons observing wildlife on the refuge, this method may be the only method grounded in sampled data.

REFUGE STUDY: BEAR RIVER MIGRATORY NWR

PHOTOGRAPHY

Current Method:

Bear River Migratory Bird Refuge has numerous opportunities to photograph wildlife. Because no quantifiable definition of "Photography Visit" is provided by the Service, Refuge staff use a static estimate of 500 visitors per year to report photography participation.

Current Formula (Yearly): 500 Photography Visits

Strengths:

- Minimizes resource expenses.

Weaknesses:

- This number lacks ground truth data of whether the assumed number is accurate.
- The number of Photography Visits does not fluctuate with fluctuations in total visitation.
- A quantifiable definition of "Photography Visit" is not provided by the Service and must be defined by the refuge staff (e.g. how does one attempt to measure "Photography Visit"?)

Key Recommendations:

Document the definition and method for determining "Photography Visits" so that future staff can reliably interpret and contribute to Photography Visit estimates.

Supplemental Recommendations:

Refuge staff could consider using results from the refuge's most recent National Wildlife Refuge Visitor Survey which lists the percentage of respondents who report participating in different refuge activities over the past year. This is applicable if you consider Photography to be an activity reliably self-reported by visitors. Because no method is available for gathering data on the number of persons observing wildlife on the refuge, this method may be the only method grounded in sampled data.

Recommended Formula:

(Overall Visitation) x (National Wildlife Refuge Visitor Survey %)

REFUGE STUDY: BEAR RIVER MIGRATORY NWR

RECOMMENDATION SUMMARY

Refuge staff could take the following steps to greatly increase the accuracy of visitor estimation at Bear River Migratory Bird Refuge:

- Install a vehicle traffic counter at the intersection of the Reeder Canal and West Forest St. road.
- Adopt and consistently apply equations for estimating buses, hiking, and bicycling.
- Maintain accuracy of automated traffic counters through calibration sampling once a year.
- Document estimation methods and activity definitions.

IMPLICATIONS

This project was created on the assumption that improving the accuracy of visitor estimation depends on the method or technique applied for estimating a Refuge visitation. Two major issues surfaced, while completing this project that must be addressed in order to understand the limitations of *The Visitor Estimation Handbook* and the recommendations provided in this study.

DEFINE VISITOR SERVICES ACTIVITIES

Accuracy implies that a standard value exists which one is trying to measure. Accuracy in estimating visitor activities therefore requires specific definitions of the activities. Improving the accuracy for estimating the number of participants engaged in Interpretation, Auto Tour Visits, Hiking, Photography, Bicycling, or Wildlife Observation (see Goal 5 activities of the RAPP report) requires developing standard and specific definitions for these activities. For example, is every individual automatically a "Wildlife Observation Visit" because they happened to see a living creature? Is an individual driving on an Auto Tour road on the way to an environmental education program also considered an "Auto Tour Visit"?

It was determined during this project that a critical argument revolves around the question of whether an activity is defined by intention or incident. Recommendations for activity visits were developed based on a collaborative discussion about the goals of the refuges, the dichotomy of whether an activity should be defined by intention or incident, and how one would approach measuring each intention or incident in a systematic manner based on the resources available. If the Service intends to improve the accuracy of visitor estimates for each activity then what constitute an activity visit must be concretely defined.

DEVELOP CONSISTENCY AMONG REFUGES

Visitor estimation data must be consistent within a refuge and among refuges if any reliable conclusions are to be drawn from analyses of visitor numbers at regional or national levels. Comparing inconsistent data, in colloquial terms, is like "comparing apples and oranges". One refuge might report the number of oranges, another might report the number apples, and yet another might report the sum of apples and oranges. No inferences can be made when data lacks consistency. Visitor estimates fall under this same principle.

The Service can improve the usefulness of visitation estimation by aiming for precision (consistency in what is being measured). At the refuge-level, refuge staff, managers and project leaders should preserve documentation that specifies (1) what they choose to count as an activity visit, (2) what methods, formulas, and ratios they choose to apply, and (3) the date when any of these key attributes are modified. At a Service-wide level, multiple options could address the issue of inconsistency in visitor number reporting. Further discussion is needed, but a few steps could be a starting point: (1) define visitor service activities in explicit terms in the reporting form (2) allocate resources to specifically provide guidance for estimating visitation. Consistent methods and documentation of visitor service activities would allow refuge staff and managers to reliably understand trends displayed within their visitation data and confidently defend their visitor estimations

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CONTACT INFORMATION

JESSICA JIA REGION 6, DFP PROGRAM VISITOR SERVICES INTERN	DIANE EMMONS REGION 6 DIVISION CHIEF, EVS
	

U.S. Fish and Wildlife Service
Mountain-Prairie Region (Region 6)
Division of Education and Visitor Services
134 S. Union Blvd. Lakewood, CO 80228
https://www.fws.gov/mountain-prairie/

APPENDIX A. STANDARD FORMS AND DATA SHEETS

A-1: Sampling Schedule
A-2: Calibration Data: Vehicle
A-3: Calibration Data: Visitor Center
A-4: RMA Automatic Counter Logs
A-5: RMA Education Program Logs
A-8: RMA Fiscal Year Visitor Log
A-11: BRR Automatic Counter Logs
A-12: BRR Education Program Logs
A-14: BRR Daily Visitor Logs
A-16: BRR Fiscal Year Visitor Log
A-19: BRR Patrol Logs – Optional
A-21: BRR Guestbook Logs

Sampling Schedule

Instructions:

The calibration sampling schedule was developed to maximize sampling efficiency. Observers are recommended to sample during the busiest times of the season in order to gathering the greatest amount of information during the least number of sampling hours. Determine the busiest hours of the season using historical knowledge from past years.

Recommended Calibration Sampling Schedule			
Repeat	Sample Length	Number of Samples	Total Sampling
Every Year	4 Hours/Sample	2 Samples/Year	8 Hours/Year
High-Season (May-October)		Low-Season (Nov- April)	
Busiest 4-Hours		Busiest 4-Hours	

Increasing the number of sampling periods will lead to more accurate statistics.

Optional Calibration Sampling Schedule			
Repeat	Sample Length	Number of Samples	Total Sampling
Every Year	4 Hours/Sample	4 Samples/Year	16 Hours/Year
High-Season (May-October)		Low-Season (Nov- April)	
Busiest Mon-Thurs 4-Hours	Busiest Fri-Sun 4-Hours	Busiest Mon-Thurs 4-Hours	Busiest Fri-Sun 4-Hours

Calibration Data: Vehicle

Use this data sheet to determine persons per vehicle, traffic counter calibration, and bicyclist multipliers.

Location: _____ Observer: _____

Date: _____ _ M _T _W _Th _F _Sat _Sun

*Recommended 4-hours Start: _____ Stop: _____

Instructions: Observer should record from a location where all vehicles (and number of occupants) passing the traffic counter can be observed. **If there is a non-visitor vehicle, observer should mark "SER" in both columns**. "SER" stands for "service vehicle" and includes FWS employees, contractors, etc. (1): Record for only vehicles entering and passing the traffic counter.

Calibration Data Sheet: Vehicle Traffic Counter

Time	Type of Vehicle "P" or "SER"	Type of Vehicle Occupants or "SER"	Notes	Time	Type of Vehicle "P" or "SER"	Type of Vehicle Occupants or "SER"	Notes

Total P-Vehicles Observed	A1	Total Occupants Observed in P-Vehicles	A2	Persons Per Vehicle (A2/A1)	C1	Traffic Counter Count	D1
Total SER-Vehicles Observed	B1	Total Bicycles Observed	B2	Calibration Multiplier ((A1+B1)/D1)			E1

Calibration Data: Visitor Center

Use this datasheet to determine a door-counter multiplier for a visitor center or other building.

Location: _____ Observer: _____

Date: _____ _ M _T _W _Th _F _Sat _Sun

*Recommended 2-hours Start: _____ Stop: _____

Instructions: Observer should record from a location where all visitor entrances are easily observable.

Calibration Data Sheet: Building with One Door-Counter					
Total Persons Oberved Entering Building			A1	**Door-Counter Multiplier (A1/B3)**	C1
Door Counter Reading at Start	B1	Door Counter Reading at Stop	B2	Door-Counter Counts (B2-B1)	B3

Explanation: The Door-Counter multiplier is formed by observing the number you want to know (A1) and dividing it by the Door-Counter reading (B3). This forms a ratio to convert future Door-Counter readings into the numbers you want to know.

Data-Collection Sheets: Rocky Mountain Arsenal NWR

RMA Automatic Counter Logs

Use these spreadsheets to record and correct data from automatic traffic counting devices.

Instructions:

- The data entry form is a Google Spreadsheet facilitating staff to work, edit, and collaborate easily with one another by displaying updates instantly to all staff members.
- At the end of each fiscal year, export an electronic copy (i.e. Excel spreadsheet) of the Google Spreadsheet to keep non-modifiable electronic records of the data in the refuge network drive.
- In Google Drive, hover over any cell that displays a triangle to read a "Note" explaining the cell.
- Gray colored cells are optional numbers/future cells.

Workbook Title: RMA Automatic Counter Logs
Sheet Title: "Traffic Counter Log"

Fiscal Year	Rocky Mountain Arsenal Automatic Counter Logs				
FY16					
Welcome Sign Counter			**Visitor Center Door Counter**		
High Season (April-October)			High Season (April-October)		
Date Calibrated			Date Calibrated		
Persons per Vehicle			Correction Multiplier		
Correction Multiplier					
(Temporary) Turning Correction	Monthly Fishing				
1.25	322				
Low Season (November-March)			Low Season (November-March)		
Date Calibrated			Date Calibrated		
Persons per Vehicle			Correction Multiplier		
Correction Multiplier					
(Temporary) Turning Correction	Monthly Fishing				
1	0				
Month	Raw Total	Corrected Total	Month	Raw Total	Corrected Total
Oct 2015		322	Oct 2015		0
Nov 2015		0	Nov 2015		0
Dec 2015		0	Dec 2015		0
Jan 2016		0	Jan 2016		0
Feb 2016		0	Feb 2016		0
Mar 2016		0	Mar 2016		0
Apr 2016		322	Apr 2016		0
May 2016		322	May 2016		0
Jun 2016		322	Jun 2016		0
Jul 2016		322	Jul 2016		0
Aug 2016		322	Aug 2016		0
Sep 2016		322	Sep 2016		0

Data-Collection Sheets: Rocky Mountain Arsenal NWR

RMA Education Program Logs

Use these spreadsheets to record for any environmental education, interpretation, special event, contact station or related activities that facilitate education and outreach.

Instructions:

- The data entry form is a Google Spreadsheet facilitating staff to work, edit, and collaborate easily with one another by displaying updates instantly to all staff members.
- At the end of each fiscal year, export an electronic copy (i.e. Excel spreadsheet) of the Google Spreadsheet to keep non-modifiable electronic records of the data in the refuge network drive.
- In Google Drive, hover over any cell that displays a triangle to read a "Note" explaining the cell.

Workbook Title: Education Program Logs
Sheet Title: "On-Site Env Ed"

FY16	On-Site Environmental Education								
	"Environmental Education" programs are curriculum-based and designed with specific goals to meet state/national academic standards.								
Date	School	School District	Teacher	Grade	# Participants	Hours	Program	Contact Station (Y/N)	Notes

Workbook Title: Education Program Logs
Sheet Title: "Off-Site Env Ed"

FY16	Off-Site Environmental Education							
	"Environmental Education" programs are curriculum-based and designed with specific goals to meet state/national academic standards.							
Date	School	School District	Teacher	Grade	# Participants	Hours	Program	Notes

Data-Collection Sheets: Rocky Mountain Arsenal NWR

Use these spreadsheets to record for any environmental education, interpretation, special event, contact station or related activities that facilitate education and outreach.

Workbook Title: Education Program Logs
Sheet Title: “On-Site Interpretation”

FY16	On-Site Interpretation				
	"Interpretation" programs do not have to follow a specific academic standard and have audiences that are free to leave whenever they want.				
Date	Event	# Participants	Hours	Contact Station (Y/N)	Notes

Workbook Title: Education Program Logs
Sheet Title: “Off-Site Interpretation”

FY16	Off-Site Interpretation			
	"Interpretation" programs do not have to follow a specific academic standard and have audiences that are free to leave whenever they want.			
Date	Event	# Participants	Hours	Notes

Data-Collection Sheets: Rocky Mountain Arsenal NWR

Use these spreadsheets to record for any environmental education, interpretation, special event, contact station or related activities that facilitate education and outreach.

Workbook Title: Education Program Logs
Sheet Title: "Contact Station User Group"

FY16	Contact Station User Group		
	Groups that specifically reserve the Contact Station.		
Date	Organization	# Participants	Notes

Workbook Title: Education Program Logs
Sheet Title: "Meetings/Trainings-Optional"

FY16	Meetings/Trainings		
	Record number of participants who visit the refuge for work-related trainings or meetings. These metrics are beneficial for internal records.		
Date	Training/Meeting	# Participants	Notes

Data-Collection Sheets: Rocky Mountain Arsenal NWR

RMA Fiscal Year Visitor Log

Use these spreadsheets to total estimations at the end of the fiscal year.

Instructions:

- The data entry form is a Google Spreadsheet facilitating staff to work, edit, and collaborate easily with one another by displaying updates instantly to all staff members.
- At the end of each fiscal year, export an electronic copy (i.e. Excel spreadsheet) of the Google Spreadsheet to keep non-modifiable electronic records of the data in the refuge network drive.
- In Google Drive, hover over any cell that displays a triangle to read a "Note" explaining the cell.
- Gray colored cells are optional numbers/future cells.

Workbook Title: Fiscal Year Visitor Logs
Sheet Title: "FY16"

Fiscal Year	Fiscal Year Visitor Log											
FY16	(Source: Daily Visitor Log)		(Source: Education Program Log)						(Source: Automatic Counter Logs)			
	Visitor Center		Special Events		On-Site		Off-Site		O-Line Counter	Perry Counter	Reeder Counter	Fishing Estimate
Month	General Visitors	Meeting/Training Attendees	# Events	Special Event Participants	Environmental Education	Interpretive	Environmental Education	Interpretive	Persons	Persons (Hunting)	Persons	Persons
Oct 2016												
Nov 2016												
Dec 2016												
Jan 2017												
Feb 2017												
Mar 2017												
Apr 2017												
May 2017												
Jun 2017												
Jul 2017												
Aug 2017												
Sep 2017												
Log Totals	0	0	0	0	0	0	0	0	0	0	0	0

Workbook Title: Fiscal Year Visitor Logs
Sheet Title: "FY16 Alternate"

Fiscal Year	Fiscal Year Visitor Log														
FY16	(Source: Daily Visitor Log)		(Source: Education Program Log)						(Source: Automatic Counter Logs)						(Source: Patrol Log)
	Visitor Center		Special Events		On-Site		Off-Site		O-Line Counter	Perry Counter	Reeder Counter	Yates Counter		Auto Tour Loop Counter	Estimate
Month	General Visitors	Meeting/Training Attendees	# Events	Special Event Participants	Environmental Education	Interpretive	Environmental Education	Interpretive	Persons	Persons (Hunting)	Persons	Persons (Fishing)	Persons (Bicyclists)	Persons	Persons (Hunting)
Oct 2016															
Nov 2016															
Dec 2016															
Jan 2017															
Feb 2017															
Mar 2017															
Apr 2017															
May 2017															
Jun 2017															
Jul 2017															
Aug 2017															
Sep 2017															
Log Totals	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Data-Collection Sheets: Rocky Mountain Arsenal NWR

Use these spreadsheets to total estimations at the end of the fiscal year.

Workbook Title: Fiscal Year Visitor Logs
Sheet Title: "FY16"

Fiscal Year					
FY16	RAPP				
General Visitation					
Total Number of Visitors	Number of Special Events hosted on- and off-site	Number of participants in special events on- and off-site	Visitors to the Visitor Center or Contact Station		
RAPP 5.04	RAPP 5.05	RAPP 5.06	RAPP 5.07		
0	0	0	0		
Hunting Management					
Waterfowl Hunt Visits	Other migratory bird hunt visits	Upland game hunt visits	Big game hunt visits	Total hunting visits	Total other recreational participants
RAPP 5.11	RAPP 5.12	RAPP 5.13	RAPP 5.14	RAPP 5.15	RAPP 5.51
0	0	0	0	0	N/A
Fishing Management					
Fishing visits					
RAPP 5.21					
0					
Wildlife Observation					
Number of Foot Trail/Pedestrian visits	Number of Auto Tour visits	Number of Boat Trail/Launch Visits	Number of Bicycle Visits	Total Wildlife Observation visits	
RAPP 5.25	RAPP 5.26	RAPP 5.27	RAPP 5.28	RAPP 5.29	
0	0	0	0	0	
Wildlife Photography					
Number of Photography participants					
RAPP 5.35					
0					
Environmental Education			Interpretation		
Number of env. ed. participants on- and off-site			Number of interpretation particpants on- and off-site		
RAPP 5.41			RAPP 5.47		
0			0		

Data-Collection Sheets: Rocky Mountain Arsenal NWR

Use these spreadsheets to total estimations at the end of the fiscal year.

Workbook Title: Fiscal Year Visitor Logs
Sheet Title: "FY16"

Station	Refuge Visitor Survey Results	Professional Judgment				
BRR						
Participation	2012 Survey Result %	High Season %	Low Season %	Source (First Initial, Last Name)	Date Updated	Notes
Special Event	9%					
Visitor Center	72%					
Bird Hunting	17%					
Upland/Small Game Hunting	2%					
Fishing	7%					
Hiking	11%					
Auto Tour	62%					
Boating	8%					
Bicycling	7%	3 per day				
Wildlife Observation	65%					
Photography	49%					
Environmental Education	10%					
Interpretation	17%					

Data-Collection Sheets: Bear River Migratory Bird NWR

BRR Automatic Counter Logs

Use these spreadsheets to record and correct data from automatic traffic counting devices.

Instructions:

- The data entry form is a Google Spreadsheet facilitating staff to work, edit, and collaborate easily with one another by displaying updates instantly to all staff members.
- At the end of each fiscal year, export an electronic copy (i.e. Excel spreadsheet) of the Google Spreadsheet to keep non-modifiable electronic records of the data in the refuge network drive.
- In Google Drive, hover over any cell that displays a triangle to read a "Note" explaining the cell.
- Gray colored cells are optional numbers/future cells.

Workbook Title: BRR Automatic Counter Logs
Sheet Title: "Automatic Counter Logs"

Fiscal Year: FY16

Bear River Migratory Bird Refuge Automatic Counter Logs

O-Line Counter			Perry Counter			Reeder Counter			Auto Tour Loop Counter			Yates Counter					Fishing Estimate		
												Bikes			Cars				
Date Calibrated			Date Calibrated			Date Calibrated			Date Calibrated			Date Calibrated					Date Calibrated		
Persons per Vehicle			Persons per Vehicle			Persons per Vehicle			Persons per Vehicle			Persons per Vehicle					Persons per Vehicle		
Correction Multiplier		1	Correction Multiplier		1	Correction Multiplier			Correction Multiplier		1	Correction Multiplier					Fishing Multiplier or Ratio		
Month	Raw Total	Corrected Total	Month	Raw Total	Corrected Total	Month	Raw Total	Corrected Total	Month	Raw Total	Corrected Total	Month	Raw Total	Corrected Total	Raw Total	Corrected Total	Month	Raw Total	Corrected Total
Oct 2015		0	Oct 2015		0	Oct 2015		0	Oct 2015		0	Oct 2015					Oct 2015		0
Nov 2015		0	Nov 2015		0	Nov 2015		0	Nov 2015		0	Nov 2015					Nov 2015		0
Dec 2015		0	Dec 2015		0	Dec 2015		0	Dec 2015		0	Dec 2015					Dec 2015		0
Jan 2016		0	Jan 2016		0	Jan 2016		0	Jan 2016		0	Jan 2016					Jan 2016		0
Feb 2016		0	Feb 2016		0	Feb 2016		0	Feb 2016		0	Feb 2016					Feb 2016		0
Mar 2016		0	Mar 2016		0	Mar 2016		0	Mar 2016		0	Mar 2016					Mar 2016		0
Apr 2016		0	Apr 2016		0	Apr 2016		0	Apr 2016		0	Apr 2016					Apr 2016		0
May 2016		0	May 2016		0	May 2016		0	May 2016		0	May 2016					May 2016		0
Jun 2016		0	Jun 2016		0	Jun 2016		0	Jun 2016		0	Jun 2016					Jun 2016		0
Jul 2016		0	Jul 2016		0	Jul 2016		0	Jul 2016		0	Jul 2016					Jul 2016		0
Aug 2016		0	Aug 2016		0	Aug 2016		0	Aug 2016		0	Aug 2016					Aug 2016		0
Sep 2016		0	Sep 2016		0	Sep 2016		0	Sep 2016		0	Sep 2016					Sep 2016		0

Data-Collection Sheets: Bear River Migratory Bird NWR

BRR Education Program Logs

Use these spreadsheets to record for any environmental education, interpretation, special event, contact station or related activities that facilitate education and outreach.

Instructions:

- The data entry form is a Google Spreadsheet facilitating staff to work, edit, and collaborate easily with one another by displaying updates instantly to all staff members.
- At the end of each fiscal year, export an electronic copy (i.e. Excel spreadsheet) of the Google Spreadsheet to keep non-modifiable electronic records of the data in the refuge network drive.
- In Google Drive, hover over any cell that displays a triangle to read a "Note" explaining the cell.

Workbook Title: Education Program Logs
Sheet Title: "On-Site Env Ed"

FY16	On-Site Environmental Education							
	"Environmental Education" programs are curriculum-based and designed with specific goals to meet state/national academic standards.							
Date	School	School District	Teacher	Grade	# Students	Hours	Program	Notes

Workbook Title: Education Program Logs
Sheet Title: "Off-Site Env Ed"

FY16	Off-Site Environmental Education							
	"Environmental Education" programs are curriculum-based and designed with specific goals to meet state/national academic standards.							
Date	School	School District	Teacher	Grade	# Participants	Hours	Program	Notes

Data-Collection Sheets: Bear River Migratory Bird NWR

Use these spreadsheets to record for any environmental education, interpretation, special event, contact station or related activities that facilitate education and outreach.

Workbook Title: Education Program Logs
Sheet Title: “On-Site Interpretation”

A	B	C	D	E
FY16	On-Site Interpretation			
	"Interpretation" programs do not have to follow a specific academic standard and have audiences that are free to leave whenever they want.			
Date	Event	# Participants	Hours	Notes

Workbook Title: Education Program Logs
Sheet Title: “Off-Site Interpretation”

FY16	Off-Site Interpretation			
	"Interpretation" programs do not have to follow a specific academic standard and have audiences that are free to leave whenever they want.			
Date	Event	# Participants	Hours	Notes

Data-Collection Sheets: Bear River Migratory Bird NWR

BRR Daily Visitor Logs

Use this spreadsheet to electronically document numbers from the Visitor Center front desk.

Instructions:

- One document "Daily Visitors by Month" is in Google Spreadsheets for data entry and easy computation. This sheet can also easily format a template to make the other document "Daily Visitor Log."
- The other document "Daily Visitor Log" is a Word Document to be printed for the Front Desk.
- The other is a data entry form is a Google Spreadsheet facilitating staff to work, edit, and collaborate easily with one another by displaying updates instantly to all staff members.
- At the end of each fiscal year, export an electronic copy (i.e. Excel spreadsheet) of the Google Spreadsheet to keep non-modifiable electronic records of the data in the refuge network drive.
- In Google Drive, hover over any cell that displays a triangle to read a "Note" explaining the cell.

Workbook Title: Daily Visitor Log
Sheet Title: "Daily Visitors by Month"

Bear River Migratory Bird Refuge Daily Visitor Log						
July 2016	General Visitors	Meeting/Training Attendees		August 2016	General Visitors	Meeting/Training Attendees
Fri. July 1				Mon. August 1		
Sat. July 2				Tue. August 2		
Sun. July 3				Wed. August 3		
Mon. July 4				Thu. August 4		
Tue. July 5				Fri. August 5		
Wed. July 6				Sat. August 6		
Thu. July 7				Sun. August 7		
Fri. July 8				Mon. August 8		
Sat. July 9				Tue. August 9		
Sun. July 10				Wed. August 10		
Mon. July 11				Thu. August 11		
Tue. July 12				Fri. August 12		
Wed. July 13				Sat. August 13		
Thu. July 14				Sun. August 14		
Fri. July 15				Mon. August 15		
Sat. July 16				Tue. August 16		
Sun. July 17				Wed. August 17		
Mon. July 18				Thu. August 18		
Tue. July 19				Fri. August 19		
Wed. July 20				Sat. August 20		
Thu. July 21				Sun. August 21		
Fri. July 22				Mon. August 22		
Sat. July 23				Tue. August 23		
Sun. July 24				Wed. August 24		
Mon. July 25				Thu. August 25		
Tue. July 26				Fri. August 26		
Wed. July 27				Sat. August 27		
Thu. July 28				Sun. August 28		
Fri. July 29				Mon. August 29		
Sat. July 30				Tue. August 30		
Sun. July 31				Wed. August 31		
Total	0	0		Total	0	0

Data-Collection Sheets: Bear River Migratory Bird NWR

Print this page and place at the Visitor Center front desk for staff and volunteers to fill out.

Workbook Title: Daily Visitor Log
Sheet Title: "Daily Visitors by Month"

Bear River Migratory Bird Refuge – Daily Visitor Log

July 2016	General Visitors	Meeting/Training Attendees
Fri. July 1		
Sat. July 2		
Sun. July 3		
Mon. July 4		
Tue. July 5		
Wed. July 6		
Thu. July 7		
Fri. July 8		
Sat. July 9		
Sun. July 10		
Mon. July 11		
Tue. July 12		
Wed. July 13		
Thu. July 14		
Fri. July 15		
Sat. July 16		
Sun. July 17		
Mon. July 18		
Tue. July 19		
Wed. July 20		
Thu. July 21		
Fri. July 22		
Sat. July 23		
Sun. July 24		
Mon. July 25		
Tue. July 26		
Wed. July 27		
Thu. July 28		
Fri. July 29		
Sat. July 30		
Sun. July 31		

Data-Collection Sheets: Bear River Migratory Bird NWR

BRR Fiscal Year Visitor Log

Use these spreadsheets to total estimations at the end of the fiscal year.

Instructions:

- The data entry form is a Google Spreadsheet facilitating staff to work, edit, and collaborate easily with one another by displaying updates instantly to all staff members.
- At the end of each fiscal year, export an electronic copy (i.e. Excel spreadsheet) of the Google Spreadsheet to keep non-modifiable electronic records of the data in the refuge network drive.
- In Google Drive, hover over any cell that displays a triangle to read a "Note" explaining the cell.
- Gray colored cells are optional numbers/future cells.

Workbook Title: Fiscal Year Visitor Logs
Sheet Title: "FY16"

Fiscal Year	Fiscal Year Visitor Log													
FY16	(Source: Automatic Counter Logs)		(Source: Education Program Log)							(Source: Fishing Permits)	(Estimate)	(Source: Automatic Counter Logs)		(Source: Patrol Log)
	Welcome Sign Counter	Visitor Center Door Counter	Special Events		On-Site		Off-Site		Contact Station Total Users	Fishing	Hiking	Trail Counter 1	Trail Counter 2	Estimate
Month	Corrected Total	Corrected Total	# Events	Special Event Participants	Environmental Education	Interpretive	Environmental Education	Interpretive	Persons	Permits	Persons	Persons	Persons	Persons (Hiking)
Oct 2015														
Nov 2015														
Dec 2015														
Jan 2016														
Feb 2016														
Mar 2016														
Apr 2016														
May 2016														
Jun 2016														
Jul 2016														
Aug 2016														
Sep 2016														
Log Totals	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Data-Collection Sheets: Bear River Migratory Bird NWR

Use these spreadsheets to total estimations at the end of the fiscal year.

Workbook Title: Fiscal Year Visitor Logs
Sheet Title: "FY16"

Fiscal Year	RAPP				
FY16					
General Visitation					
Total Number of Visitors	Number of Special Events hosted on- and off-site	Number of participants in special events on- and off-site	Visitors to the Visitor Center AND Contact Station		
RAPP 5.04	RAPP 5.05	RAPP 5.06	RAPP 5.07		
0	0	0	0		
Hunting Management					
Waterfowl Hunt Visits	Other migratory bird hunt visits	Upland game hunt visits	Big game hunt visits	Total hunting visits	Total other recreational participants
RAPP 5.11	RAPP 5.12	RAPP 5.13	RAPP 5.14	RAPP 5.15	RAPP 5.51
N/A	N/A	N/A	N/A	N/A	N/A
Fishing Management					
Fishing visits					
RAPP 5.21					
0					
Wildlife Observation					
Number of Foot Trail/Pedestrian visits	Number of Auto Tour visits	Number of Boat Trail/Launch Visits	Number of Bicycle Visits	Total Wildlife Observation visits	
RAPP 5.25	RAPP 5.26	RAPP 5.27	RAPP 5.28	RAPP 5.29	
0	#DIV/0!	N/A	540	#DIV/0!	
Wildlife Photography					
Number of Photography participants					
RAPP 5.35					
0					
Environmental Education			Interpretation		
Number of any. ed. participants on- and off-site			Number of interpretation participants on- and off-site		
RAPP 5.41			RAPP 5.47		
0			0		

Data-Collection Sheets: Bear River Migratory Bird NWR

Use these spreadsheets to total estimations at the end of the fiscal year.

Workbook Title: Fiscal Year Visitor Logs
Sheet Title: "FY16"

Station RMA	Visitor Survey Results	Professional Judgment				
Participation	2012 Survey Result %	High Season %	Low Season %	Source (First Initial, Last Name)	Date Updated	Notes
Special Event	18%					
Visitor Center	86%					
Bird Hunting	0%					
Upland/Small Game Hunting	0%					
Fishing	17%					
Hiking	50%					
Auto Tour	36%					
Boating	0%					
Bicycling	3%	3 per day				
Wildlife Observation	69%					
Photography	45%					
Environmental Education	17%					
Interpretation	21%					

Data-Collection Sheets: Bear River Migratory Bird NWR

BRR Patrol Logs - Optional

Use these sheets to determine usage estimates based on parking areas periodically or incidentally patrolled by staff.

Instructions:

- The "Patrol Log" sheet would be printed and kept in vehicles used by Law Enforcement, staff members, or other volunteers who have the opportunity to visit parking spaces. Staff would fill the sheet each time they had a chance to visit a parking lot.
- The "Patrol Estimate" sheet helps calculate the number of visitors that use the parking space each year.
- Vehicle Turnover Rate is how often new vehicles fill the parking lot each day, i.e. how often staff expects the area to have completely new vehicles per day.
- At the end of each fiscal year, export an electronic copy (i.e. Excel spreadsheet) of the Google Spreadsheet to keep non-modifiable electronic records of the data in the refuge network drive.
- In Google Drive, hover over any cell that displays a triangle to read a "Note" explaining the cell.
- Gray colored cells are optional numbers/future cells.

Workbook Title: BRR Patrol Logs – Optional
Sheet Title: "Patrol Log"

Fiscal Year	Bear River Patrol Log				
16					
Observer:					
Date	Time	Location Name	Vehicle Turnover Rate	# Vehicles	# Persons per Vehicle

Data-Collection Sheets: Bear River Migratory Bird NWR

Use these sheets to determine usage estimates based on parking areas periodically or incidentally patrolled by staff.

Workbook Title: BRR Patrol Logs – Optional
Sheet Title: "Patrol Estimate"

Fiscal Year	Bear River Patrol Estimate	Sum of Patrolled Locations
16		Total: 2304

Fiscal Year	Example "Tour Lot West 1"	Fiscal Year	Enter Location Name	Fiscal Year	Enter Location Name
16		##		##	
Notes:		Notes:		Notes:	
Average # Vehicles per Patrol	6	Average # Vehicles per Patrol	0	Average # Vehicles per Patrol	0
Average Persons per Vehicle	3	Average Persons per Vehicle	0	Average Persons per Vehicle	0
Average Vehicle Turnover Rate	2	Average Vehicle Turnover Rate	0	Average Vehicle Turnover Rate	0
Total Days in Season	64	Total Days in Season	0	Total Days in Season	0
Estimated # Participants	2304	Estimated # Participants	0	Estimated # Participants	0

Fiscal Year	Enter Location Name	Fiscal Year	Enter Location Name	Fiscal Year	Enter Location Name
##		##		##	
Notes:		Notes:		Notes:	
Average # Vehicles per Patrol	0	Average # Vehicles per Patrol	0	Average # Vehicles per Patrol	0
Average Persons per Vehicle	0	Average Persons per Vehicle	0	Average Persons per Vehicle	0
Average Vehicle Turnover Rate	0	Average Vehicle Turnover Rate	0	Average Vehicle Turnover Rate	0
Total Days in Season	0	Total Days in Season	0	Total Days in Season	0
Estimated # Participants	0	Estimated # Participants	0	Estimated # Participants	0

Data-Collection Sheets: Bear River Migratory Bird NWR

BRR Guestbook Logs

Instructions:

- The data entry form is an Excel Spreadsheet facilitating staff enter and analyze guestbook statistics quickly and efficiently.
- The data is formatted so that staff can enter Guestbook data quickly. A two-letter code for "Place" will automatically populate the "Country" as "US" and anything other than a two-letter code for "Place" will automatically populate the "Country" as "Other".
- The Pivot Graphs are easy to modify to display any time of data. These charts are made with Microsoft Office Pivot Tables and Pivot Charts. See Pivot Table and Pivot Chart help on Microsoft Office Support online.
- At the end of each fiscal year, duplicate the to worksheet page, rename the page to the new year, and delete the data entries.

Workbook Title: BRR Guestbook
Sheet Title: "2015"

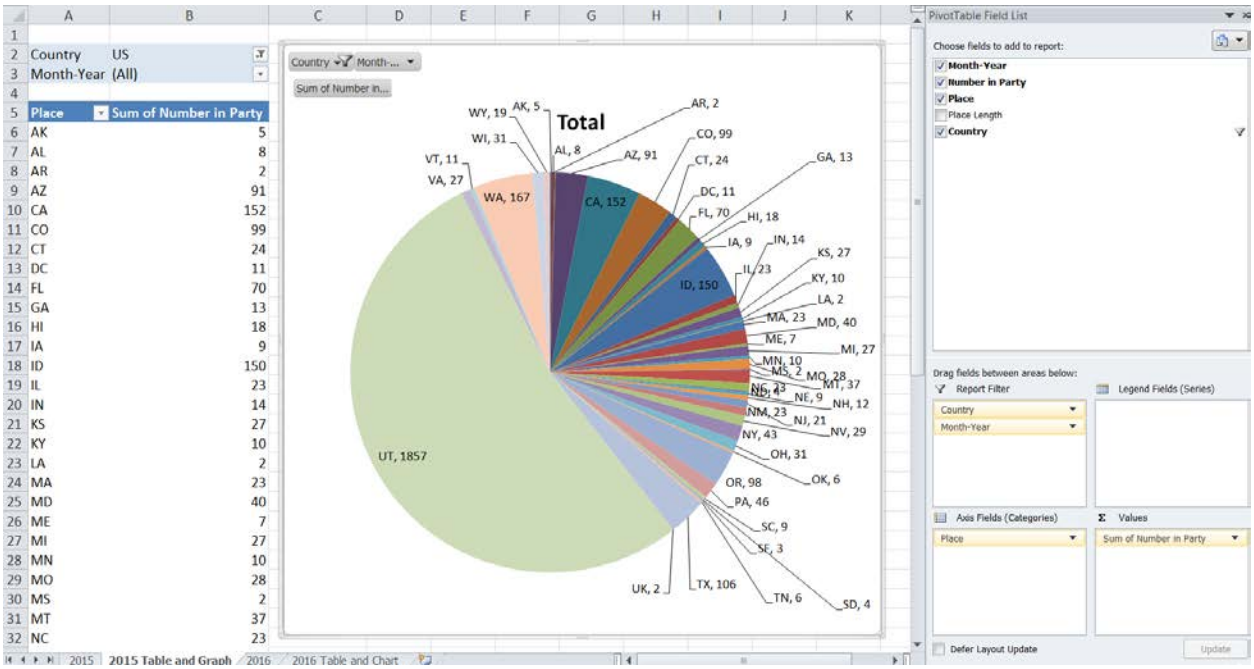
This is an example of the data entry sheet for 2015 Guestbook data. The grey boxes will automatically populate when the Place column is written. In the document, Column D "Place Length" will be hidden from view.

	A	B	C	D	E
1	Month-Year	Number in Party	Place	Place Length	Country
1371	Nov-15	2	FL	2	US
1372	Nov-15	1	UT	2	US
1373	Nov-15	3	Co	2	US
1374	Nov-15	2	OH	2	US
1375	Nov-15	2	NY	2	US
1376	Nov-15	7	UT	2	US
1377	Nov-15	1	OR	2	US
1378	Nov-15	1	NM	2	US
1379	Nov-15	1	CO	2	US
1380	Nov-15	1	Austria	7	OTHER
1381	Nov-15	1	MI	2	US
1382	Nov-15	2	WA	2	US
1383	Nov-15	3	Australia	9	OTHER
1384	Nov-15	3	NY	2	US
1385	Nov-15	1	WY	2	US
1386	Nov-15	1	OR	2	US
1387	Nov-15	5	UT	2	US
1388	Nov-15	2	FL	2	US
1389	Nov-15	4	UT	2	US
1390	Nov-15	8	UT	2	US
1391	Nov-15	1	Canada	6	OTHER
1392	Nov-15	2	CO	2	US
1393	Nov-15	2	PA	2	US
1394	Nov-15	1	Germany	7	OTHER
1395	Nov-15	1	UT	2	US
1396	Nov-15	2	DC	2	US
1397	Nov-15	1	CO	2	US

Data-Collection Sheets: Bear River Migratory Bird NWR

Workbook Title: BRR Guestbook
Sheet Title: "2015 Table and Chart"

This is an example of the Pivot Chart being used to show the total number of visitors from each state based on 2015 Guestbook numbers.



Workbook Title: BRR Guestbook
Sheet Title: "2016"

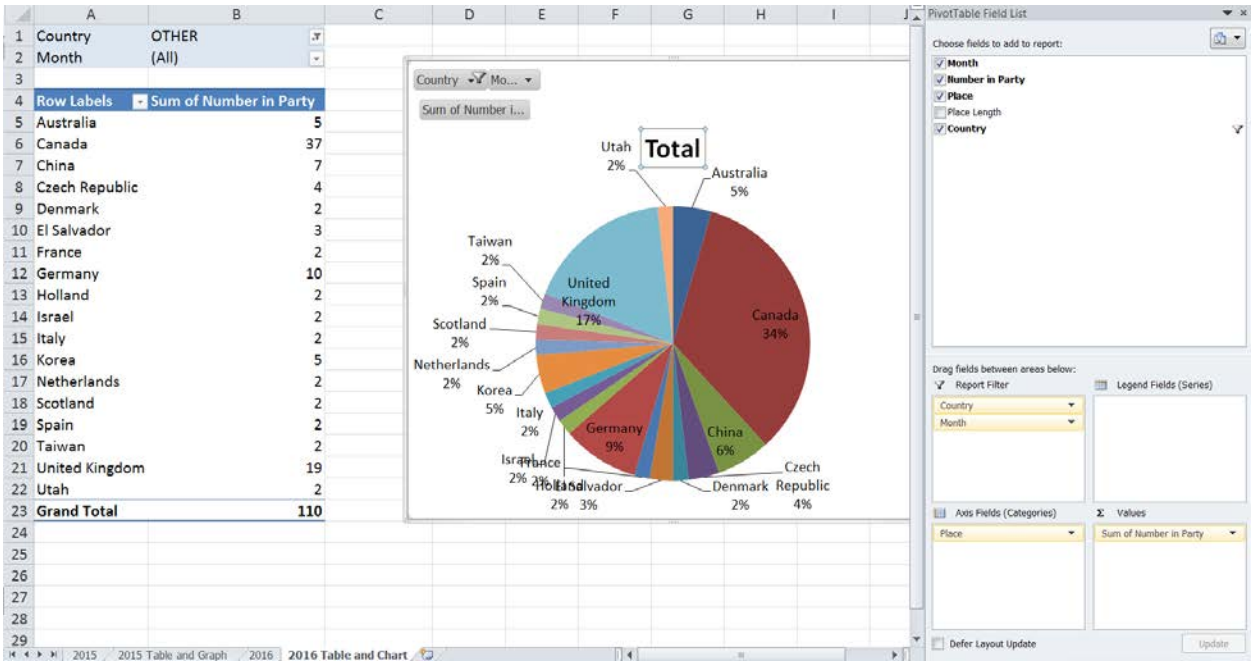
This is an example of the data entry sheet for 2016 Guestbook data. The grey boxes will automatically populate when the Place column is written. Note how Column D "Place Length" is hidden from view.

	A	B	C	E
1	Month	Number in Party	Place	Country
2	Jan-16	2	Canada	OTHER
3	Jan-16	1	UT	US
4	Jan-16	1	UT	US
5	Jan-16	3	UT	US
6	Jan-16	2	UT	US
7	Jan-16	2	UT	US
8	Jan-16	1	UT	US
9	Jan-16	2	MD	US
10	Jan-16	2	UT	US
11	Jan-16	1	UT	US
12	Jan-16	1	Australia	OTHER
13	Jan-16	4	UT	US
14	Jan-16	2	UT	US
15	Jan-16	2	UT	US
16	Jan-16	3	UT	US
17	Jan-16	6	UT	US
18	Jan-16	2	NY	US
19	Jan-16	2	UT	US
20	Jan-16	1	WA	US
21	Jan-16	3	ND	US
22	Jan-16	4	UT	US
23	Feb-16	3	UT	US
24	Feb-16	3	Korea	OTHER
25	Feb-16	4	OR	US

Data-Collection Sheets: Bear River Migratory Bird NWR

Workbook Title: BRR Guestbook
Sheet Title: “2016 Table and Chart”

This is an example of the Pivot Chart being used to show the foreign country visitor percentages based on 2016 Guestbook numbers.



Country	OTHER
Month	(All)

Row Labels	Sum of Number in Party
Australia	5
Canada	37
China	7
Czech Republic	4
Denmark	2
El Salvador	3
France	2
Germany	10
Holland	2
Israel	2
Italy	2
Korea	5
Netherlands	2
Scotland	2
Spain	2
Taiwan	2
United Kingdom	19
Utah	2
Grand Total	110