Maine Golden Eagle Study



Trail Camera Protocol

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Introduction

Thank you for taking part in this effort! By maintaining baited trail cameras and sharing complete photo batches, hunters, volunteers, and partners provide the vital information needed to understand this species. Following this protocol will increase your chances of documenting a golden eagle and maximize the value of your contribution.

If you prefer to only share specific photos of a suspected golden eagle rather than a full photo batch, please fill out the Maine Golden Eagle Observation Form on the Maine Golden Eagle Study webpage. Before submitting, review page 6 of this document, the Maine Eagle Identification, on the study webpage. You can also post your images to MAINE Birds Facebook group to help confirm identification.

Please email erynn.call@maine.gov with any questions after reviewing this protocol.

Quick Start Guide

1. **Camera test and settings:** Test the camera before placing it in the field to ensure it works and has the correct date and time. Set the camera to take motion-sensing photos with a 1-minute delay, 24 hours/day, 7 days/week. Take a photo on the first day the camera is set up at the site, or if the camera has already been set up, when you start sharing photos with the project.
2. **Find the site:** You need a site that is easy to deliver bait regularly but not disturbed by people or pets. Look for a 30- to 60-ft small forest opening with adjacent large trees and (optionally) at a higher elevation than the surrounding area. A two-track will work if it's not often used.
3. **Find bait:** After you find a site, you need to obtain lead-free bait such as roadkill deer or beaver (not harvested or dispatched with lead ammunition). Avoid small animals, birds, predators (e.g., coyotes, bobcats), farm animals that may have been exposed to chemicals or diseases, or remnants from meat processors where animals were or may have been harvested with lead ammunition.
4. **Site setup:** Place bait 10-30 ft from the forest edge, but not in the center of the clearing. Secure the carcass with wire and stakes. Face the camera north, 6 to 10 ft away from the carcass, with the lens about 18-24" from the ground or snow. You can mount the camera on a fence post. A post pounder or mallet helps secure the bait and post for the camera. Remove vegetation that may trigger the camera. For cameras with SD cards, two per camera makes it easier to swap out and share photos.
5. **Site maintenance:** Maintain bait continuously from January through March to detect winter resident eagles, as this is the primary focus. You are welcome to run sites in November, December, and April to document migratory eagles if you choose. Always verify that the camera's date and time settings are accurate during site visits.
6. **Golden eagle identification:** Make sure to review the photos and let us know if you see any goldens. Review pages 6-10 to improve your identification skills.
7. **Reporting – share ALL photos taken by camera:** Visit the Maine Golden Eagle Study webpage to learn how to sign up as a trail camera volunteer, register your site, and share your photos. You will receive a link to a folder where you can share all your photos (whether goldens were observed or not). This maximizes the value of your contribution. If you have a cell camera, you can also share it with us to enable real-time project review.

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Selecting A Site

Locate a suitable, accessible site.

Accessibility: To maintain bait consistently at your site, you need to get there easily and regularly (depending on how long your bait lasts and what type of game camera you use). Make sure the site is relatively easy to access and that you can deliver bait, even in deep snow. A drive-in site is generally best, unless you like a good workout! You can also use a sled to drag in carcasses.

Small clearings: Golden eagles seem to prefer small clearings. A 30–60-foot diameter is suitable, but a 500-foot diameter is likely too large. Goldens prefer to perch in large trees near a carcass and watch it for a while before coming in, so it is helpful to have a few large trees around the bait site.

Elevation: Golden eagles may prefer slightly higher elevations than the surrounding area, but this is secondary and optional when selecting your site.

Moving your site: If you don't detect goldens at a site after two weeks, you may move to a different site if you have another suitable option or continue at the same site. If you move the site more than 250 ft or to a separate forest opening, it's considered a new site (different site name).

Bait For Your Site

Once you have identified a suitable site, you need to source lead-free bait. Please reach out if you need additional assistance locating bait.

What to use: Make sure carcasses are lead-free (i.e., not harvested or dispatched with lead ammunition). Deer carcasses work well for eagles. Do not use domestic or wild bird species or animals smaller than a beaver as bait. Birds can transmit avian influenza to eagles, and small animals will not persist. It may also be advisable to avoid using predators such as coyotes, foxes, or bobcats, as they may deter eagles. Any farm animals should be free of medications, barbiturates, and disease. Ideally, bait lasts for at least a week. If many scavengers visit the site, replenish carcasses more often.

Where to find bait: Contact meat-processing facilities to ask whether they have renderings from animals harvested without lead ammunition or chemical euthanasia (e.g., barbiturates). Local trappers or animal damage control agents may have lead-free carcasses, such as beaver. Local Facebook groups may be a good way to connect. Law enforcement or transportation departments may provide information on roadkill. If you know someone who already places bait for hunting, ask whether they would like to get involved in the project or work with you. Depending on project resources and your location, we may be able to help you find bait and connect you with local resources.

Placement of bait: Place the carcass about 10-30 feet from the edge of the trees, but not in the center of the clearing. Wire the carcasses to a rebar stake or two; otherwise, scavengers may drag them out of the camera's field of view. Wrapping a wire around a foreleg and another around a hind limb, stretching them slightly, and staking them is effective.

It is usually a good idea to make a single cut along the back, neck, or hind leg to provide easier access. Bait will last longer with only a single cut, so avoid opening it up too much if possible.

Maintain bait: Maintain bait continuously between January and March when goldens are more likely to be winter residents. If you would like to run sites during migration (November, December, April), maintain bait as you can. Our primary focus is documenting winter residents, but migratory presence is valuable, too if you are up for it.

Make sure you have enough bait to feed eagles! A small carcass can disappear in a day. If you have a cellular game camera, you can replenish bait as needed based on what remains in the camera view. If you only have a non-cellular game camera, you may need to check on the amount of bait once a week, depending on how fast scavengers are consuming it.

Trail Camera Setup and Monitoring

Once you have chosen your site and found a bait source, a few key elements will help you set up and maintain the camera.

Testing the trail camera before deployment: If your camera is not already in use in the field, test it. Place it in your backyard or another location where you can take photos, then return in a few days to download and review the photos.

Camera setup at the site:

- **Camera mount:** a small tree, a metal stake, or a wooden stake. Make sure it's sturdy enough that if a bird lands on the camera (or the stake), it will not fall over or change the field of view. A post-pounder is helpful.
- **Camera distance from carcass:** 6 to 10 feet
- **Camera lens height:** 18-24" from the ground (or above the snow). This is the perfect picture angle and height for identification.
- **Camera orientation: Face the camera NORTH** if possible; this ensures that the sun is to the side or behind the camera. South-facing cameras often produce washed-out pictures.

Camera settings: Please follow the specified settings and the overall camera trap protocol to ensure consistency. Set the camera to capture images (not video) in response to motion, with a **1-minute delay, 24 hours/day, 7 days/week**. Although goldens won't scavenge at night, learning more about interactions between mammalian scavengers and eagles is valuable. This interval provides multiple images of a single individual without filling the memory cards too quickly.

Batteries: Lithium batteries seem to work better in cold weather than regular alkaline.

Contact information and landowner permission: Always include your name and contact information on the trail camera and obtain written permission from the landowner (email is sufficient).

Camera function: Check the positioning, condition, camera date and time, and settings (1-minute motion-delay photos, 24/7) when setting up and whenever you visit the site.

Camera presence at site: Stand in front of the camera to take a photo when you initially set it up, swap cards for uploading photos, or remove the camera from the site. This helps us track when the camera is present in the field. To reiterate, ensure the camera captures at least one photo on the first day it's deployed at a site, and again when the camera card is swapped out for image sharing, or when the camera is removed from the site. These dates are essential to our analysis.

Privacy and Photo Sharing Guidance

Photo sharing privacy and permissions: We will not share your site's location publicly. With your permission, photo submissions may be used in outreach materials or reports, but site locations remain confidential.

How often should I share my trail camera photos? How often you share your trail camera images depends mainly on your camera's capabilities and the need to consistently maintain bait. Our goals are to 1) document the presence or absence of golden eagles through full-batch photo downloads and 2) identify golden eagle activity at the site in real time. Knowing as quickly as possible when a golden eagle is visiting your site regularly is critical, as it informs our ability to coordinate trapping and attach telemetry tags (pending your approval).

If you are using a non-cellular camera, we recommend visiting your site every 7 to 10 days to maintain bait and swap SD cards for submission. For those with cellular cameras, we encourage you to share the camera's live feed with the study (erynn.call@maine.gov) in addition to providing full batch downloads. Sharing the live feed allows us to monitor activity in real time, while the full monthly download provides the complete dataset needed for our analysis. Always monitor your SD card's capacity to ensure you swap cards before they are full. Since the process for sharing cellular access varies by brand, please reach out if you need assistance with your specific camera settings.

Camera Type	Real-time viewing	Full-batch download	MDIFW Support
Non-cell	Not available	Every 7-10 days	May provide a cell cam
Cell with SD card	Share camera access	Once per month (or when SD card is full)	Assist with camera sharing
Cell with no SD card	Share camera access	Often not possible, depends on manufacturer	Assist with cam sharing and may provide non-cell to capture full batches

Avoid submitting photo duplicates: When sharing a whole batch of photos for download, do not submit duplicates from a previous download. Make a note of the last submission date to prevent overlap, and clear SD cards after submission.

Reviewing your photos: If possible, please review your photos each time you submit them and let us know if you see any potential golden eagles at your site. Review the identification resources on pages 6 - 10 to improve your golden eagle identification skills.

How to share your full batch trail camera photos: Visit the Maine Golden Eagle Study webpage to sign up as a trail camera volunteer. You will then receive information on how to register your trail camera site and share full batches of photos. This means you are sharing all photos taken by the trail camera, whether golden eagles are present or not. This maximizes the value of your contribution.

How to share only images of suspected golden eagles: If you want to share *only images of suspected goldens (as opposed to full batches of photos from your trail camera)*, you can get help with identification by reviewing

identification resources (pgs. 6-10 of this document, also as a PDF on Maine Golden Eagle Study Downloads), if possible post to MAINE Birds Facebook group, and then fill out the Maine Golden Eagle Study – Photo Observation form on the Maine Golden Eagle Study webpage.

Photo sharing options	Guidance
Share **all trail camera photos,** complete download of SD card (preferred if possible).	Visit the Maine Golden Eagle Study webpage to learn how to sign up as a volunteer, register your site, and share full batches of trail camera photos.
Share **a few suspected golden eagle photos** (not a full download of a trail camera SD card).	Review pages 6 -10 of this document. If possible, submit to the Facebook MAINE Birds group for ID confirmation. Then, fill out the Maine Golden Eagle Study – Photo Observation form on the Maine Golden Eagle Study webpage. You can email erynn.call@maine.gov (make sure to include the exact location and date for each photo).

Golden Eagle Identification

Distinguishing Bald and Golden Eagles – learn more at [Cornell All About Birds, Golden Eagle]

Size – Golden vs. Bald Eagle

Golden Eagles and Bald Eagles are about the same size. Female eagles are 30% larger than males. Eagles from northern regions are larger than eagles from the southern areas, and both can be found in Maine. Young eagles with new feathers that are not worn over time can appear longer and thus even bigger. Because of the common size misconception and similar color plumage (see next page), juvenile Bald Eagles are often mistakenly identified as Golden Eagles.



Adult Bald Eagles. Photo by Laura Zamfirescu



Juvenile Bald Eagle. Photo by Deb Powers

Left photo above: The adult female Bald Eagle (left) is larger than the adult male (right). Right photo above: Juvenile Bald Eagles are often mistaken for Golden Eagles. Photo below: Golden and Bald Eagles are about the same size.

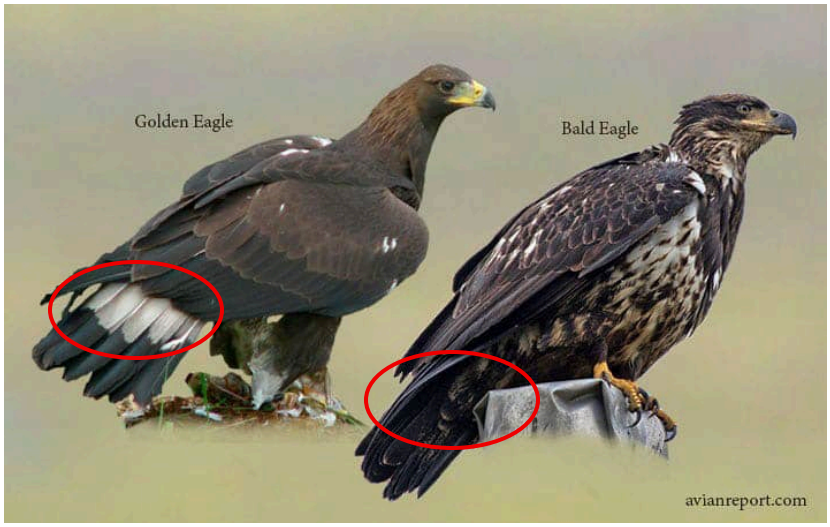


Golden Eagle. Photo by Randy Flament

Juvenile Plumage – Golden vs. Bald Eagle

Bald Eagles do not have completely white heads and tails until they are five years old. As they develop, they have varying amounts of white feathers on their wings and bodies. The white mottling is not specific to patches, as in the case of the Golden Eagle.

Goldens do not develop their adult plumage until four to five years of age. Both juveniles and adults have a golden hue on their heads and napes. Juvenile Goldens have white patches on their wings and a broad white band on their tail that changes to dark brown as they mature.

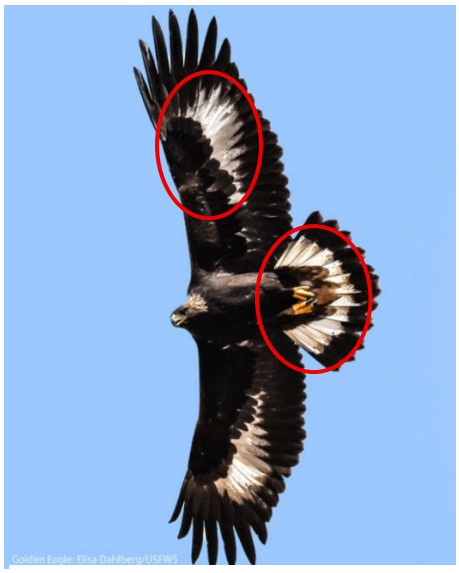


Juvenile Golden Eagle left, sub-adult Bald Eagle right. Note the distinct white and black banded tail of the Golden and mottled appearance of the Bald Eagle. Photo by Avianreport.com



Juvenile Golden Eagle at a camera trap site, note the uniform chocolate brown color and wide white tail band. Photo by Albert Ladd





Juvenile Bald Eagle top with white mottling in the underwing versus juvenile Golden Eagle below with distinct white patches on the wings and a distinct wide white tail band. Photos by Benjamin Hack (above) and Elisa Dahlberg

Juvenile Plumage – Golden Eagle




Two sub-adults (left) and an adult (right). Sub-adult wings are more adult-like, but they continue to show white in some of the tail feathers, which is generally absent in adults. Photos by the Eastern Golden Eagle Working Group



Juvenile Golden Eagle, note the white wing patches on the underwing (left) and bicolored tail (right). Photos by Laura Zamfirescu




Sub-adult Golden Eagles, note the white band on the tail. Photos by Chris Martin (left) and Albert Ladd (right)

Adult Plumage – Golden Eagle

Juveniles and adults have light-colored golden feathers on the head and nape. The white tail and wing patches of the juvenile Golden change to dark brown as they mature at 4 to 5 years of age. Adult Goldens can appear similar to a juvenile Bald Eagle (see them side-by-side in the bottom left photo below, and two Goldens side-by-side in the bottom right photo).













Adult Golden Eagles have light gold plumage on the head and nape. Most adults completely lack the white in the wing or tail, although old, faded feathers may appear white. Photos by (top to bottom, left to right), Randy Flament, Mike Lanzone, Todd Katzner/Eastern Golden Eagle Working Group, Don Dunbar, Dana Valleau, and Chris Martin

Feet – Golden vs. Bald Eagle

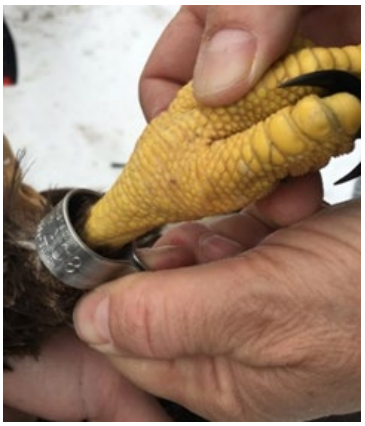
Although it may be difficult to distinguish the eagle's legs and feet, which may not be visible, Golden Eagles' legs are feathered to the foot, whereas Bald Eagles are not.





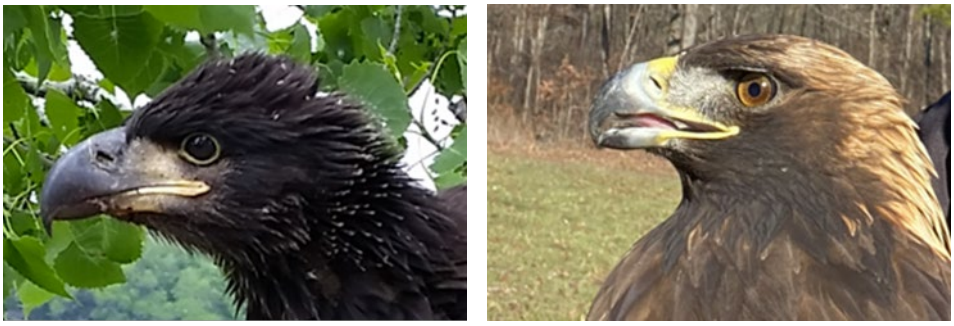
Golden Eagles have feathers down to the toes (above) and Bald Eagles do not (below). Photos by Randy Flament, Tricia Miller (above left and right), Blair Dudeck, Tricia Miller (below left and right)





Head and Beak – Bald vs. Golden Eagles

Another feature that may be difficult to distinguish in trail camera images is the overall small head size and beak of the Golden Eagle versus the Bald Eagle.



Bald Eagles have a relatively larger head and beak (left) than a Golden Eagle (right). Photos by Tricia Miller