DELTA WATERFOWL

HEN HOUSE
CONTRACTOR MANUAL

INTRODUCTION

This manual provides detailed information and guidance for contractors that will be installing and maintaining Delta Waterfowl Hen Houses (HH). Hen Houses are a type of duck nest structure that provide a safe place for mallards to nest where most predators cannot reach them. If deployed properly, HHs are one of the most effective duck production tools available.

Please carefully review all sections to ensure you fully understand how to perform HH installations and maintenance. Keep this manual handy while working in the field to ensure you are adhering to all guidelines and reach out to a Delta staff member if you have any questions. Proper preparation and adherence to these instructions will help ensure Delta's HH program is effective, while helping our contractors work safely and efficiently in the field.

1. GETTING STARTED

Field work will include selecting and securing sites, installing HHs, and maintaining the structures in the following years. The work is rewarding but requires a significant investment in time and equipment to be successful. To be eligible for a Delta HH contract, each contractor must be able to complete the tasks described in this manual. Please read this section to see if the work of a Delta HH contractor is the right fit for you.

LOCATING SUITABLE HEN HOUSE INSTALLATION SITES

Contractors must be able to gain access to properties with suitable locations for HHs. Review Section 2 of this document for more details on suitable sites for HH installation.

REQUIRED EQUIPMENT AND TOOLS

Hen House field work typically occurs during winter, when wetlands are solidly frozen. Contractors must be equipped to access remote wetlands, often traveling across snow and ice while transporting heavy equipment and supplies.

- **Transportation:** Truck, trailer, and snowmobile with sled or an ATV/ORV with tracks to haul tools and HH components.
- **Tools:** Power auger with earth bit to drill a hole in the ice and frozen mud, fence post pounder to drive the HH post solidly into the wetland bottom, and linesman or needle-nose pliers for cutting wire and securing the HHs to the cradle.
- **Technology:** Smartphone with the Delta QuickCapture app (QC) for GPS data collection and structure tracking. Each Delta contractor will have a unique QC profile to collect information about the HHs they install and maintain.
- **Nest material:** Contractors will need to locate a source of flax straw or a suitable alternative to complete HH maintenance. Delta staff or other contractors may be able to assist in procuring nest material.

Each contractor must own or have access to the above equipment, as well as any other necessary tools and equipment, to be eligible for an HH contract. Consult your Delta contract to determine if assistance may be available to help secure specialized tools.

PHYSICAL REQUIREMENTS AND SAFETY

Installing Hen Houses requires lifting heavy components, operating power tools, pounding in posts, and enduring harsh winter weather. You will likely have to walk through, and at times shovel, deep snow. Delta encourages contractors to dress in multiple layers, wear insulated boots, gloves, and eye protection, and always follow proper ice safety protocols. Contractors are responsible for assessing conditions and their own safety while conducting HH work.

TIME COMMITMENT

Most contractors working alone can install 10–20 HHs per day, so a 100-house contract typically requires six to ten full workdays. Due to unpredictable weather, a contractor will likely need several more 'contingency' days to ensure they have plenty of opportunity to complete work. Many contractors choose to work with a partner to increase efficiency and safety.

When you sign a Delta HH contract, you agree to complete the assigned installations and/or maintenance prior to the upcoming waterfowl breeding season. If unforeseen circumstances prevent you from completing your assigned number of structures, notify a Delta biologist immediately so your work can be transferred to another contractor. You will be compensated for any work you have completed.

2. SELECTING AND SECURING SITES FOR HEN HOUSES

Selecting suitable HH locations is the first and likely most critical step for HH and contractor success. Locations with high wetland densities, like Figure 1, have plenty of wetlands to attract mallard pairs and serve as sites for nest structures, thereby maximizing duck production while maintaining HH installation and maintenance efficiency. Delta staff will work with contractors to identify properties like this within your work area, primarily using satellite photos. Contact a Delta staff member for site approval before installing HHs in previously undiscussed locations.

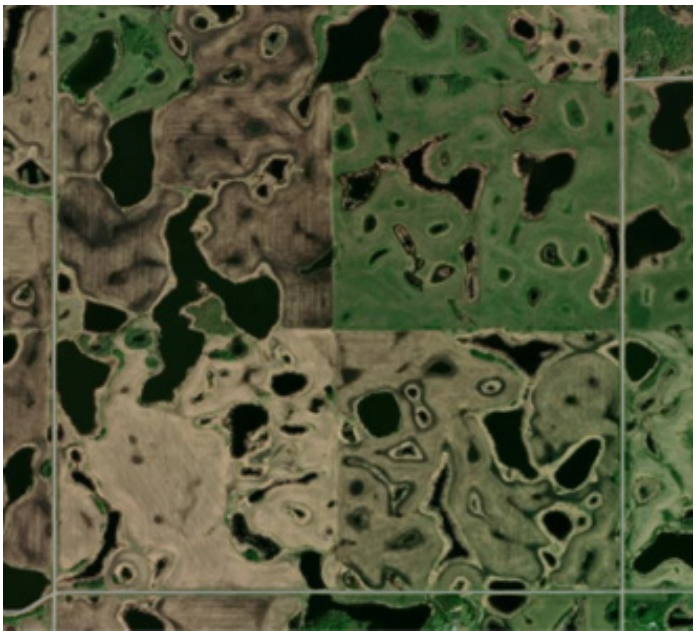


Figure 1. *Section of land with numerous wetlands to attract breeding mallards. This would be an excellent site for installing Hen Houses.*

WETLAND IDENTIFICATION

Hen Houses work best in small (<5 acres/2 ha), shallow (<4ft/1.3m) wetlands with consistent water levels. These semi-permanent wetlands will have water except during extreme drought. Cattail or bulrush along the edge is a good indicator of a semi-permanent wetland. If the wetland dries up during the summer each year, it's likely a seasonal wetland and not suitable for HHs. Hen Houses must be directly over open water to encourage use by nesting ducks, so avoid wetlands that are overgrown with vegetation (Fig. 2).

Contractors can install HHs within larger wetlands (>5 acres/2ha), but should avoid lakes or other large, deep bodies of water, with shorelines subject to strong winds and wave action. Hen Houses in these locations are more susceptible to damage by the ice as it melts in spring. When working on larger wetlands, the best locations are protected coves or bays. Do not install HHs in lakes or wetlands deep enough to support northern pike or bass.

Avoid any wetlands that have rapid changes in water level. This includes rivers, creeks, and streams, and wetlands connected by them, as they will have increased flow during springtime. Ice or other objects moving downstream will damage HHs, and any HHs flooded by high water are usually destroyed or damaged enough to discourage use by nesting hens.

Figure 2. *Hen Houses surrounded by vegetation have very low occupancy rates.*

HEN HOUSE AGREEMENTS

Once properties with suitable wetlands have been identified, the next step is securing written authorization to access lands with wetlands suitable for HH installation.

- Private Land: Most suitable wetlands are on private land, so contractors are responsible for discussing the project with landowners and securing permission for access to install/maintain HHs. Delta has created a simple Conservation Agreement for this purpose. This 10-year agreement is non-binding for landowners and can be canceled at any time, but a signed agreement ensures each contractor has authorization for entering the property to complete HH work.

Contractors must secure signed Conservation Agreements covering every parcel of private property where they will be installing HHs. A copy of each agreement must be provided to Delta before receiving payment for their HH work.

- Public or Non-Governmental Organization (NGO) Lands: Contractors may install HHs on public or other NGO lands, but written authorization is required from the agency or entity responsible for managing the property. In some cases, the limitations or reporting requirements make working on these lands extremely difficult. Contractors must consult with Delta staff before entering any HH agreement with NGOs or state, provincial, and federal agencies.

3. GENERAL HABITAT AND PLACEMENT CONSIDERATIONS

Mallard pairs are territorial during the spring breeding season, with each pair defending their wetland (or a portion of a larger wetland) to avoid competition from other mallards. As a result, HHs must also be deployed strategically to match pair densities and maximize production. While mallard hens are not as protective of nest sites, their territoriality means that each HH has a limited number of hens locally available to nest in it.

Recognizing that HHs were effective at increasing nest success, Delta studied HHs deployment strategies to maximize duck production. Based on decades of this research, Delta developed guidelines for installation density and spacing. Contractors must adhere to these guidelines while installing HHs to ensure optimal duck use. Following Delta guidelines for placement will also help limit damage to structures. The following are Delta's guidelines for HH installation density and locations:

- In small wetlands (<5 ac/2 ha), install two HHs. Typically place one HH in each end of the wetland, along the west shore or in the most sheltered locations.
- In larger wetlands (>5 ac/2 ha), install 1-2 HHs in each sheltered cove or shallow, open pockets of emergent vegetation. It's better to have two HHs in close proximity within a sheltered location than spread them out and place one or more in locations vulnerable to ice damage.
- In the best habitat, there may be up to 30 mallard pairs per square mile. Contractors may install no more than 25-30 Hen Houses per square mile, essentially matching the number of mallard pairs for that size of area.
- Use the aerial photos/installation strategy maps at the end of this document to help plan installation of HHs in your area.

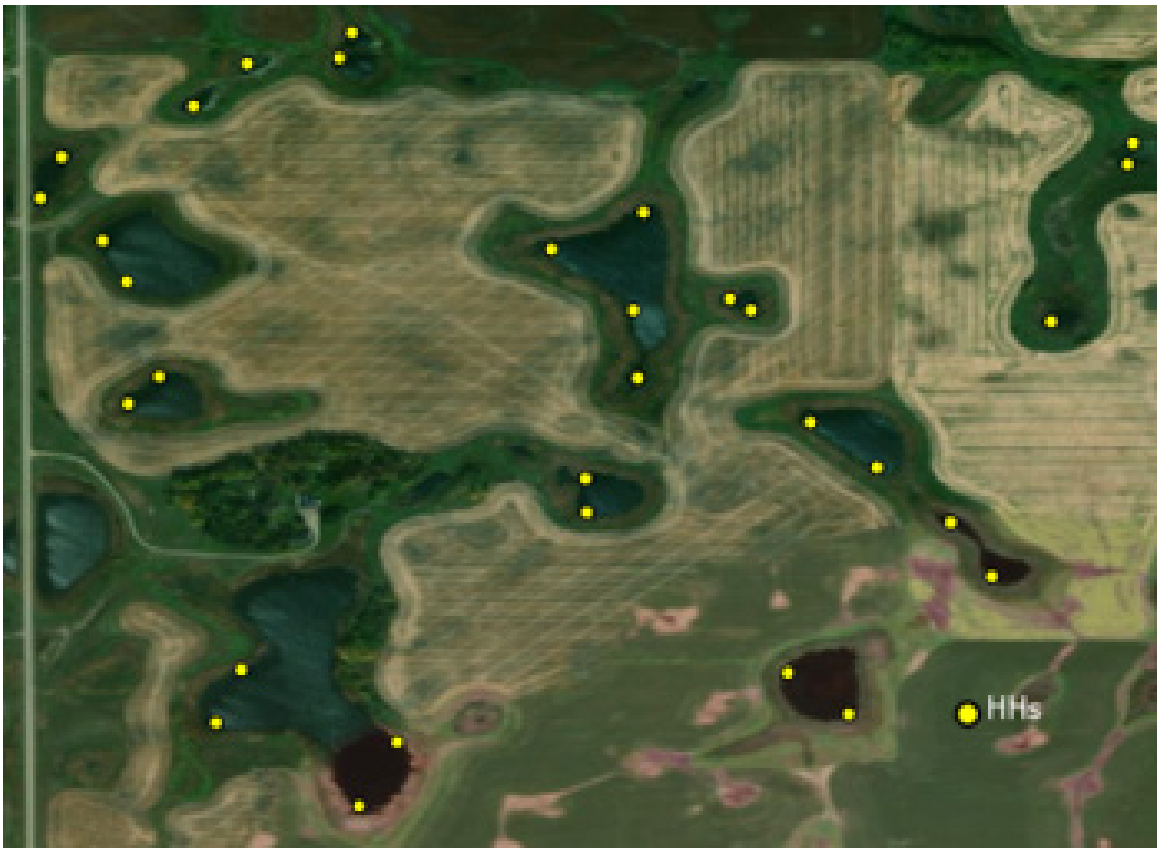


Figure 3. *Example of really good Hen House spacing and placement within wetlands.*

4. HEN HOUSE INSTALLATION PROCESS

Before beginning your HH field work, be sure to download the QuickCapture app and login with the credentials provided by Delta Waterfowl.

Check out the photos of the installation process at the end of this manual. Here are the steps:

1. Select a site over open water roughly 8-10 feet (2-3m) from cattail or other vegetation. The water depth should be less than 4 feet (<122 cm) deep.
2. Drill through the ice with a power auger to create a hole for the post.
3. Insert the bottom of the post (end without a hole for height adjustment) into the ice hole and orient the post so the tunnel openings will face northeast–southwest to reduce wind exposure.
4. Pound the post 2–3 feet (90 cm) into the wetland bottom using a post pounder until secure. It's solid when the post is only driven 1/3 inch (<1 cm) or less into the soil for several hits in a row.
5. Insert the cradle and set its height using a wire-lock pin or bolt so the tunnel will sit 2–3 feet (90 cm) above water.
6. Place the tunnel in the cradle and secure it with wire ties at each corner.
7. Ensure the tunnel is filled at least 50% with nesting material and is level throughout. Hens will not bring nest material to the tunnel, as they use what is available at the HH.
8. Log the installation in the QC app under 'HH Installed → New Structure'. Entries must be made at the installation site to ensure Delta staff receive the correct GPS coordinates. If cellular service is unavailable, the QC app will log the GPS coordinates and send them once service is restored.

COMMON HEN HOUSE INSTALLATION MISTAKES

These are some of the most common mistakes contractors make while installing HHs.

- Hen Houses require annual visits for maintenance, so keep this in mind when selecting locations for installation. If the structure site will be very difficult to reach in some years due to snow, unsafe ice, or other factors, it is probably best to look for an alternate site.
- It is important to consider the current water levels when installing HHs. If the installation area is experiencing drought, water levels will likely be lower than normal. With heavy snowmelt, water may rise 3 ft (1 m) or more, potentially flooding new HHs. The opposite can also be true, leaving HHs surrounded by vegetation once levels return to normal.
- Cattle like to rub against trees, fence posts, and other objects including HHs. They can do significant damage to the structures, especially in winter when they can walk on the ice. It's best to avoid placing HHs in pastures used for winter cattle feeding or in wetlands where cattle cool down during the summer.
- Contractors frequently fail to properly utilize the QC app to mark the HH installation site.

- Contractors often think that HHs should be evenly spaced around a large wetland. The aerial map on the right (Fig. 4) is a better distribution of HHs, utilizing small wetlands and prioritizing protected coves in large wetlands.

Figure 4. *The Hen House deployment in the photo to the right will have a higher usage and the structures will be less likely to suffer ice damage.*

- The left aerial map in Figure 4 also exhibits poor HH placement. In large wetlands, avoid eastern shorelines that may be impacted by prevailing west winds, which push ice sheets into the Hen Houses.

- Occasionally contractors will install an extremely high number of HHs in one large wetland (Fig, 5). It may be tempting to save time, but it is simply a waste of funds and effort.

Figure 5. *This photo illustrates an extremely excessive number of Hen Houses installed in a large slough. Most of these structures will not be used by ducks and have a larger likelihood of ice damage.*

5. MAINTENANCE

Every HH must be visited annually to be sure the structure is ready and available for nesting hens, and to evaluate usage/productivity to help Delta manage the program. We refer to this annual visit as "HH maintenance" and it should be conducted, like installations, during mid to late winter when ice is safe. In areas with a significant number of HHs, 50 or more can be maintained in an 8-hr day.

To complete this work, contractors will need flax straw, some extra HH tunnels (to replace damaged tunnels), standard HH field work tools, and your smartphone with access to the QC app. Please be sure the map on your app profile (Fig. 6) shows your HH locations as well as their ID number before hitting the field.

The following are steps of the evaluation and maintenance process:

1. Physically visit each location on your map.
    a. If no HH is present, open QC app and select the "Other" drop down menu and "HH Missing" icon. Enter the ID number of the missing HH. Missing HHs will be removed from your map for future maintenance.
        i. If a structure had been in place and productive for many years, contractors should place a replacement structure in the same location. Select the "Replacement" icon in the "HH Installed" drop down menu.
        ii. If the structure is lost within the first year or two after installation, there is a good chance it will happen again in that location. Seek a better location for a replacement HH.
    b. If HH is present but unusable (e.g., damaged, surrounded by cattail, etc.), select the appropriate icon under the "HH Unusable" drop down menu. Take a photo of the structure to show the repairs needed.

Figure 6. *Map of Hen House locations, with ID numbers from the QuickCapture App.*

2. If HH is present and in good condition, visually inspect it for signs of nesting activity. Signs include a down-lined nest bowl (Fig. 7), egg shells, and unhatched duck eggs.
    - If one duck nest is detected, select "Used" within the "HH Maintained" drop down menu. Select "Multiple Use" if more than one nest is detected. Enter the HH number.
    - If you find no duck nest evidence, select "Not Used". Also select "Not Used" if you find other types of bird nests (e.g., blackbirds, tree swallows), as they are not the target species.
    - If the nesting material is missing, or you are unsure of the usage status for other reasons, select "Unknown Use".
3. Once the evaluation and QC app reporting is complete, remove all nest remains (e.g., feathers, eggs, egg shells, etc.) from the HH. If unused, but the nesting material inside is dirty or moldy, remove it as well.
4. If the HH has been maintained annually, they usually require minimal time to maintain. Repair the exterior of the tunnel by stuffing additional flax straw (or substitute) in between the layers of wire fencing. A short piece of lath or a broken hockey stick handle works well for pushing in the straw. The tunnel exterior should be very difficult to see through when complete.
    a. If the tunnel is in extremely poor condition (Fig. 8), replace it by removing the wire ties at each corner and installing a new tunnel.
5. Replenish the grass hay or flax straw in the interior of the tunnel for nest material. The tunnel should be 50-60% full of material but level and open at the top. Fresh straw increases the likelihood of use by hens.

Figure 7. *Mallard Nest with down and eggs in a Hen House.*

Figure 8.*Example of a tunnel that is in poor condition and should be replaced.*

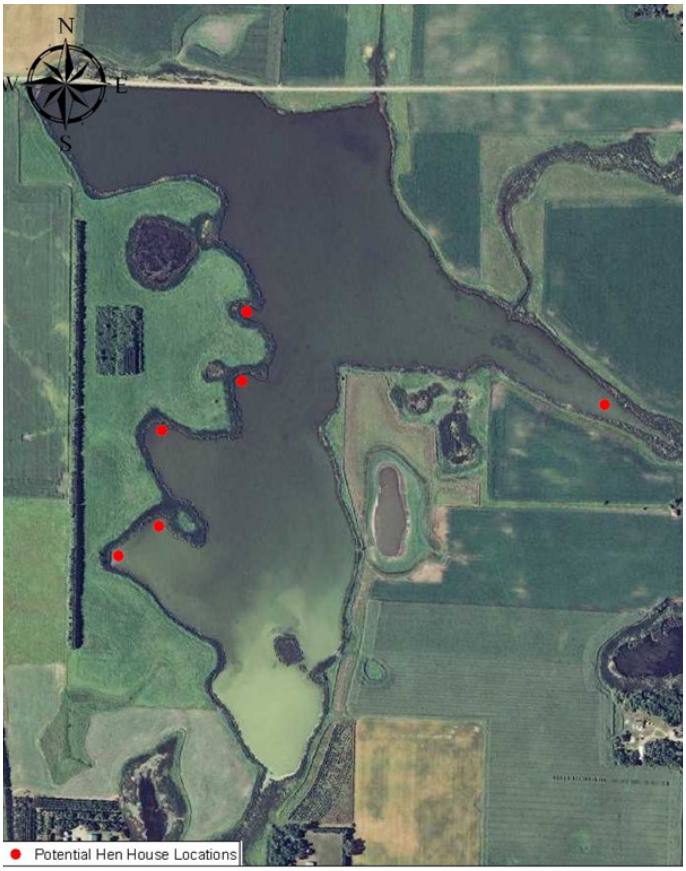
6. SUMMARY

Proper preparation, careful site selection, accurate installation, and annual maintenance are essential for successful Hen House programs. Following these practices supports Delta Waterfowl's mission to increase duck nesting success across North America.

7. INSTALLATION STRATEGY MAPS

- **Small wetlands (potholes) are great locations for Hen Houses because ice movement and damage are much less likely to occur. Initially install two Hen Houses per wetland.**

- **In shallow marshes, small coves and pockets of vegetation provide good wind and ice protection for structures. There are typically more pairs of breeding mallards in large wetland, so monitor occupancy rates to determine if more Hen Houses are needed.**



- In large open wetlands, place Hen Houses in protected coves, especially those on the upwind side of wetlands where ice and wind damage will be minimized. In the prairies, this is typically the west side of wetlands because prevailing winds are from the northwest, west, or southwest.

8. INSTALLATION PROCESS

- Find a good location in a wetland, roughly 8-10 ft (3m) from cattail over open water. Best spots are along the western shoreline or in wind-protected spot. Drill a hole in the ice.

- **Pound the base pipe/post at least 2-3 (1m) feet into the muck at the bottom of the wetland.**

- **Insert the cradle into the base pipe. Use pin to adjust height as needed for Hen House to be 2-3 ft (1m) above anticipated water level after spring snow melt.**

- **Place the Hen House in the cradle and secure it using fencing wire.**

- **Make sure the interior of the Hen House is at least 50% full of nest material.**

- **Use QuickCapture app to transmit location coordinates to Delta.**