CANADA GOOSE EGG ADDLING PROTOCOL

The Humane Society of the United States
Wild Neighbors Program

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Introduction

Addling means "loss of development." It commonly refers to any process by which an egg ceases to be viable. Addling can happen in nature when incubation is interrupted for long enough that eggs cool and embryonic development stops. People addle where they want to manage bird populations. Population management should be only one component of a comprehensive, integrated, humane program to resolve conflict between people and wild Canada geese (see *Humanely Resolving Conflicts with Canada Geese: a Guide for Urban and Suburban Property Owners and Communities* available online at humanesociety.org/wildlife).

A contraceptive drug, nicarbazin sold under the brand name OvoControl (online at ovocontrol.com), reduces hatching to manage populations humanely. Geese who consume an adequate dose during egg production lay infertile eggs. Managing populations with OvoControl requires less labor than addling as you do not have to find and treat individual nests. The U.S. Environmental Protection Agency has registered this drug in the United States. A U.S Fish and Wildlife Agency (USFWS) permit is required. Potential users should also check to see if their state wildlife agencies require an additional permit. Complete contact information for the supplier is at the end of this Protocol.

This Protocol is for Canada geese (*Branta canadensis spp.*) only. Other species of birds have different nesting chronologies and incubation periods that make appropriate addling different. Addling for any other species requires a protocol developed for that species.

Information and training is essential for a successful egg-addling program. Program organizers and addlers must learn how to addle effectively, humanely, and legally. Understanding goose behavior and what works for other addling programs will help. Following sections of this protocol covers information on these topics. Program organizers and addlers may need to refer to additional sources for specific information on some topics. In particular, this protocol only covers legal authority in the United States. It does not cover the legal status of Canada geese and legal requirements or permissions needed in any other country.

This document is general guidance to assist in stabilizing Canada goose populations where people find they cause conflicts. However, this document is not exhaustive or all-inclusive, but contains suggestions as to addling procedures. It is open-ended and subject to revision and amendment as we learn more about humane approaches to solving problems with Canada geese. **As with all potential interactions with wildlife, it is your responsibility to exercise care and caution when attempting any procedure described here.**

Legal Authority

The federal Migratory Bird Treaty Act and its amendments protect virtually all native bird species, including Canada geese. Protected birds, their nests, and their eggs cannot be "taken" (harmed) in any way without permission from the USFWS. For most bird species, anyone desiring to addle must apply to USFWS for a depredation permit for their site.

However, for so-called "resident" Canada geese, the USFWS has established a Nest and Egg Depredation Order that allows property owners and managers to addle on their own property without applying for an individual depredation permit. "Resident" geese are defined as those

Canada geese that nest within the lower 48 States and the District of Columbia in the months of March, April, May, or June, or reside within the lower 48 States and the District of Columbia in the months of April, May, June, July, or August. The full text of the Order is available in USFWS regulations at: http://www.gpoaccess.gov/fr/index.html (search for Federal Register of August 10, 2006, Vol. 71, No. 154, pages 45964-45993 and Federal Register of August 20, 2007, Vol. 72, No. 160, pages 46403-46409).

Under the Order, landowners and managers do not need a permit from UWFWS but they **MUST** register their property with USFWS online before addling each season and report their activity (total numbers of nests and eggs) at the end of the season. Homeowners associations and municipal governments may register their entire association or jurisdiction, get landowner permission for addling on individual properties, and report the season's outcome for the association or jurisdiction. Register at https://epermits.fws.gov/eRCGR/geSI.aspx.

The USFWS Order removes the requirement for an individual federal permit but does not remove each state's authority to regulate addling within its borders. Addling programs **MUST** check their state's requirements. At this time, 22 states accept USFWS registration with no additional requirement. Eight states accept USFWS registration but with additional state requirements. Eleven states do not accept USFWS registration but authorize addling themselves. In seven states and the District of Columbia there are no regulations in place at this time. The Order is not applicable in Alaska or Hawaii. The most comprehensive summary on states' current requirements is available at https://epermits.fws.gov/eRCGR/DOC/eRcgrSCL.pdf.

Anyone seeking to addle the eggs of any bird is responsible for complying with all applicable laws and regulations including registering with appropriate agencies and obtaining any necessary permits before proceeding. How to register and how to apply for permits is not described here in detail but these are vital first steps before the information in this protocol can be applied.

Species Biology

For an addling program to be successful, it is essential to understand the birds' biology and behavior since these guide addling timing and methods. It also ensures that other species are not affected and Canada geese are not harmed.

Canada geese are easy to recognize by their size, color and markings, and—of course—their distinctive "honking" calls. Canada geese tend to eat and loaf in grassy areas with open sight lines and access to a body of water. Sexual maturity is usually not until three years of age and geese can live up to 20 years, although the average life expectancy of a wild goose is much shorter. Both parents defend the nest and goslings until they are approximately 10 weeks old and can fly. You may wish to supplement this brief summary by referring to field guides and reference works for more details on the biology and natural history of this species.

Nesting Chronology

For addling to be effective and for developing embryos to be treated humanely, it is critical to know the timing of nesting and egg laying in your area. Geese start nesting at slightly different dates in different areas; earlier in southern areas and later in northern areas, ranging from March

through June with peak activity in April and May in most of the United States. Weather conditions also impact nesting dates with slightly earlier nesting in warmer years.

Since they tend to start nesting about the same time each year in any particular area, annual records of *nest initiation* dates (dates geese begin nesting) are very helpful. Addling programs should record these dates but it is not necessary to wait until an addling program starts to begin noting nest initiation dates. Also note the dates at which geese *incubate* (sit on the eggs to keep them warm). If you have not been noting nest initiation and incubation dates, ask knowledgeable local experts about goose nesting periods. State waterfowl biologists and local wildlife rehabilitators frequently have good insight into nesting chronologies.

In addition to these sources of information, the geese themselves will offer insight. Begin checking for mating behavior and nesting activity very early in the spring. Outside of nesting season, people mainly see flocks forage and rest together. Early in spring, mated pairs will begin to stay together near their preferred nest site and defend that site against other geese. When you begin to see pairs of geese "hanging around" one spot and chasing other geese away, note that location because they may have or soon will start a nest near that spot. When you later see only one goose "hanging around" there, it is very likely that his mate is sitting on that nest nearby.

Locating Nests

Geese prefer nest sites near water with a good view of the surrounding area, especially on islands and peninsulas. Where these sites are not available or are already defended by other geese, they often nest on or near the shores of ponds, lakes, and other water bodies. They also prefer sites where a natural or human-built barrier prevents approach on one side and a good view of the remaining area allow easy defense of the nest. Therefore, nests are frequently found very near buildings and fences, and at the edge of mowed grassy areas where vegetation changes to taller plants. Geese will also nest in less-than-ideal places such as landscaped areas in parking lots, planters next to busy building entrances, or flat roofs. In more natural setting, look for nests on muskrat houses and beaver lodges, elevated platforms of vegetation, stumps, and other raised, protected areas.

Geese tend to nest where they nested before. Some seem to nest exactly at or within feet of their earlier nest sites. Therefore, keeping good records of exactly where nests were found will make work easier in subsequent years.

Once the goose (or hen) begins to incubate, the male (or gander) will adopt the role of sentinel and will be the only conspicuous one. Although the male will not usually be immediately near the nest, he will be within a few hundred feet at most. A search of the area in which an alert and watchful bird is "standing guard" will generally lead to the discovery of a much less noticeable bird on a nest. She will be crouched low to the ground and may be hard to see. The most conspicuous feature of a sitting goose is often the white cheek patch.

Goose nests are round or oval and made from vegetation, mulch, or similar material. The female lines the nest with downy feathers from her breast to protect the eggs. Scattered downy feathers on the ground may be a clue to a nest nearby. When a sitting goose leaves her nest to eat and drink, she covers the eggs with nest material to keep them warm and hidden while she is gone. If

you find a nest without a goose sitting, touch the eggs. If they are warm, she has started to incubate. Cold eggs, especially if the nest is not yet lined with down, indicate the goose is not finished laying or has abandoned this nesting effort.

Geese lay an average of five to six eggs per *clutch* (all the eggs laid and incubated together by one goose) at about the rate of one egg a day, but you may find nests with anywhere from two to 12 eggs, or rarely even more. The goose completes her clutch over several days and then begins to incubate when her clutch is complete. While eggs are being laid, but before incubation, the pair will spend little time near the nest to avoid attracting potential predators. Eggs do not begin to develop until the goose incubates; this allows all goslings in a clutch to hatch about the same time. Sometimes despite this general rule, a sitting goose (whose clutch should have been complete) has been found with new eggs a week or two later.

If you find a cold nest, it can be noted and revisited within a week. Alternatively, cold eggs can be addled but the nest should still be revisited very soon to be sure additional eggs are treated.

Egg Development

Knowing how eggs develop is also essential to a successful, humane addling program. ***It is imperative to addle eggs early in development.*** Humane treatment of developing embryos becomes an issue when an air sac develops inside the egg. An air sac forms as the developing embryo use the egg's stored food and air, passing through the porous shell, fills the space. At that point development is typically advanced enough that the procedures described in this Protocol may not be humane.

In Canada geese, eggs that have been incubated less than 14 days can be addled humanely. Beyond that time, and when the eggs first begin to float when placed in water, humane treatment of the developing embryo must be considered. The simplest way to deal with this concern is to return eggs incubated more than 14 days (eggs that float, details below) to the nest without addling them. Note where and when these eggs were found for next year.

Approaching the Nest

Addling active nests is not a solo activity. Even experienced wildlife professionals do not attempt to deal with both the eggs and the parents alone. Work in small teams. Three or four people are a good number. Experienced addlers find that they can manage with just two for most nests. With larger teams, addlers can specialize and work quicker. Having someone dedicated to recording data speeds work. A younger helper such as a teenager can be suited for this task, as well as acting as nest spotter and go-fer. We do not recommend that minors take roles that put them in contact with wild birds.

When searching for nests, be prepared to come upon nests and defending geese as soon as you enter the site (perhaps as soon as you step out of your vehicle or building). Once a nest is located, approach cautiously. For most potential addlers, their most pressing question is how they will get defending geese to stay far enough away from the nest for them to addle the eggs. How to fend geese off is discussed below.

Geese are active defenders of their nests and challenge people who approach their nests. Some even challenge vehicles approaching too near. As you approach a nest, the geese will be very noisy. Some geese will simply leave the nest before or just as you get close, although they will generally stay nearby honking and may return to challenge you for the nest before you finish addling. If the gander is not immediately obvious, be watchful for his return, perhaps by air, in response to his mate's calls.

Marking and Recording the Nest Site

Depending on the addling technique chosen and the goals of the program, once addlers find a nest they often need some way to find it again. Nests found early in the spring may be lost within a couple of weeks under rapid vegetation growth. New nests can be confused with nests found previously, especially where geese cluster nests at preferred location such as islands. It will not be easy to tell nests or geese apart a week or two later.

One option is to mark the nest site either before you move the geese off the nest or after you have completed addling. Plastic surveyors' tape, flags, surveyors' spray-on marking paint, or some other system can leave a distinguishing mark. It is ***not*** recommended that marking be placed immediately next to the nest anywhere the public may have access. Curiosity about the markings tends to draw people to the site, and possibly some egg predators such as crows. Use an agreed distance and direction (e.g., north of the nest at 20 feet) for markings and make note of it.

Marking material can be unsightly and, depending on the material used, require an additional trip to the site to retrieve. In high traffic, public areas marking may draw people into conflicts with defending geese. Given these considerations, addlers may decide to leave nests unmarked. However, addling teams will often still need to find treated nests again. In these situations, very thorough notes with sketch maps, perhaps supplemented by photos, can help teams find nests again. Place something in the photo to label each nest (i.e. note with nest site and number) to help identify nests in photos. Such notes, maps, and photos are helpful even where nests are also marked. Global Positioning Systems (GPS) can give approximate locations. The nature of each site and the precision of the readings will determine the usefulness of these position readings.

Fending Geese Off Nests

Some geese will remain sitting or standing over the nest, hissing, honking, and flapping as people approach. These geese will have to be gently moved off their nests and may need to be fended off during addling. While it is often the male who most vigorously defends the nest, in some pairs the female may be the stronger defender and in some pairs both may defend vigorously.

Goose defensive behavior is primarily honking, hissing, flapping wings, and running towards approaching threats. Rarely, a goose will make physical contact and actually strike with flapping wings, bump with body, or peck with beak. These are large birds and can cause bruises or knock someone off balance, leading to a fall. Have means of defense to hold birds at bay.

Umbrellas, trash can lids, brooms, or anything similar can hold birds off. Poles such as swimming pool cleaning poles with brush or net on the end are used with success. Programs using these tools find most geese will move away when the pole is simply pointed at them.

Cheap umbrellas, the kind without pointed ends, have several advantages for fending. Carried closed and opened near the goose with some shaking and noise, there is an element of surprise when a solid visual barrier springs opens in front of the geese. (The advantage of using cheap umbrellas is that geese do break some.) A goose can be gently pushed off her nest with the open umbrella canopy, if necessary. Open umbrellas can be placed around the nest as addlers work to discourage return.

Depending on the pair's behavior, you may need two fending tools, one in each hand of the person assigned to fend. Some geese circle around on the ground and challenge the addling team while they are working. A very few fly at addlers who will need to be alert for this possibility. If both members of the pair are strong defenders and move at the nest from different directions, two fenders may be needed.

It is imperative not to strike at, harm, or attempt to harm any protected bird. Injury to any federally protected species is a criminal offense. Legal permission to addle does not include permission to harm the parent birds.

Before you approach the nest, organize so you are ready to addle quickly as soon as the hen is off the nest. Have tasks assigned to team members and needed materials at hand before moving her off. For geese and addlers' sakes, hold the bird off her nest for the shortest time needed to complete addling. It is better to mark nest sites, take notes and record data, and take reference photos and GPS locations before a bird is fended off or after addling is completed and the bird has been allowed to return.

Before approaching the nest, also determine what direction you will "push" the geese and make sure all team members are working to move the birds in the same direction. Always try to push them towards an open space or a route to such space. You will be hard pressed to complete work at a nest if you have pushed the parents into the bushes at your back where they are stuck between brambles and your umbrella. If possible, push them into or towards the water. Once they are swimming, they are less likely to come back at addlers.

Marking Eggs and Data Collection

If using the oiling method to addle (described further below), some addling programs find it helpful to mark each egg. After the goose is off the nest, simply write on them, either a simple mark or a more elaborate code (for example, 1-1 for the first egg in the first nest). A wide variety of pens and pencils, including number 2 pencils, indelible markers of various kinds, grease pencils, and livestock tag markers, are used for egg marking. Unfortunately, none is reported to be universally successful.

Each goose turns her eggs in the nest and rubs against them as she incubates. This may cause marks to rub off some eggs. Some eggs are rather dirty after a couple of weeks' incubation and marks can be hidden. Marks on the short ends of eggs, rather than on the sides, tend to hold up a little better. Several marks can be put on each egg so that it is more likely at least some will still be visible when the nest is revisited. It may help to mark the dry eggs before floating to determine age (described below). We suggest oiling programs mark eggs but be aware they may not be able to rely on marking alone to determine if a nest or an egg was previously treated.

Also consult notes, maps, photos, and GPS positions if addlers need to determine whether a particular nest or egg has been oiled. Be aware that the float test (described below) will not help determine this. An oiled egg may float, just like a developing egg, due to decomposition gasses inside the oiled egg.

If there are enough people in the team, one member can now begin recording data while others fend and addle. A data sheet should be used to record: 1) the date, 2) the location and number of the nest, 3) the number of eggs in the clutch, 4) the method of addling used, 5) the number of eggs treated if different from the number in the clutch, 6) the addlers, and 7) any other information specific to this nest and site. While USFWS only requires that total numbers of nests and eggs be reported, recording more detailed information will be very helpful if the team will visit the site again in the same season and in finding nests next season. This data will also help measure progress over time and provide information for the community.

Addlers should record data on each nest as they work. Depending on the number of team members and how many are needed to fend the geese at a particular nest, one member may record data while another addles. If this is not practical, record data for each nest as soon as work at that nest is finished. Since most geese are eagerly reminding addlers that they want their nest back, finish the actual addling quickly (while still being careful and thorough) and then move back while you complete the data for that nest.

Determining Incubation

Feel the eggs; if they are warm, incubation has started. If they are cold, the clutch is not complete and the nest can be marked and/or noted and revisited within two weeks. Alternatively, cold eggs can be addled but the nest should be revisited within two weeks to treat additional eggs.

Determining Egg Age

Before any addling procedure, the eggs must be aged. For Canada goose eggs, the "float test" or immersion test is an excellent indicator of incubation age. Eggs that have been incubated less than 14 days can be addled humanely. It is the incubation age that is important here, not the number of days since an egg was laid. For eggs incubated longer than 14 days, the addling procedures described below **may not be humane.** Eggs that are pipped (the gosling has begun hatching by breaking a small hole through the shell) **cannot be legally addled.** Eggs that are not pipped, but where movement or sounds are being made by the gosling **also cannot be addled.**

The Humane Society of the United States recommends that Canada goose eggs that have been incubated longer than 14 days, at the stage at which they begin to float in water, be returned to the nest to complete development. Remove floating eggs from the water quickly and do not dry them off. Rubbing the wet eggs can remove the outermost protective cuticle layer from the shell, potentially allowing germs to enter through the shell pores.

Look at the last page of this protocol for an illustration of the float test. It illustrates how eggs will act in water at different developmental stages, **counting from the beginning of incubation (not from laying).** Be sure you have a container of water with enough room and enough water that eggs can float freely. At many sites, you can simply fill a bucket from the pond next to the

nest but at some sites you may need to bring water with you. Place eggs in the water. Some addlers float every egg; at a minimum float two or three from each nest. Remove eggs from the water and proceed based on test results.

You may also be able to determine incubation age by careful observation over time. If you regularly observe the geese on your site beginning before nests are initiated and keep good records of specific pairs, their nest sites, and their activities, you may be able to determine the incubation age simply from the date incubation began. To use this method to age eggs, you will need to start observing early in the season and keep good records that allow you to differentiate pairs of geese and their nests or mark nest sites (see above) so that observations can be accurately related to the correct nests. All nests in an area will not be on exactly the same schedule. You must observe and record activity for each nest. This can work well where staff are onsite every day attending to other duties and can check on the geese frequently.

Addling Procedures

Several procedures can stop egg development effectively and humanely at an early stage. Of these, the procedures that physically impede development, specifically piercing and shaking, are more difficult to learn and do correctly and completely than oiling, egg replacement, and nest destruction (egg removal). Incorrect or incomplete piercing and shaking can leave the embryo alive but deformed. Therefore, these addling procedures are not recommended. There are advantages and disadvantages to each of the three recommended procedures that should be weighed in selecting the most appropriate for a site, program, or nest.

Regardless of addling method, teams will need:

- proof of federal registration (printed out from the USFWS website),
- state permit if required in your state,
- proof of property owner's permission if you are not the property owner,
- data sheets,
- material for marking nest (if they will be marked),
- something to write with,
- fending tools (umbrellas or others), and
- bucket or similar container and water for float test.

Other useful supplies for all methods are:

- clipboard (to write data on),
- sheet protector (to keep data sheets and other paperwork dry),
- camera,
- GPS,
- disposable gloves,
- public education handouts, and
- this addling protocol—especially the float-test diagram.

Nest destruction (egg removal) method. After assuring eggs are young enough to addle humanely, remove nests and eggs and dispose of as directed by USFWS or your state wildlife agency. Make sure the eggs cool and stay cool so that incubation stops; don't leave them in the sun inside dark plastic bags or in the back of a car, for example. Put them in a cool place for a

few days before disposing. Eggs must be disposed of; it is illegal to keep, consume, use, sell, or trade eggs. You can remove or scatter the nesting material to discourage the geese from reusing the nest for a second clutch. The nest material and eggs from several nests may be bulkier and heavier than you expect. Be prepared with plenty of sturdy containers. If using trash bags, we suggest you double the bags and close securely.

This method is simple and used extensively in some states. Some pairs build new nests and lay additional eggs. How many geese renest is not known, but there is some information suggesting that if eggs have been incubated for a week the tendency to renest may be significantly diminished.

You will need to make repeated visits to find and remove new nests to be highly successful. Given this consideration, nest destruction may be a good choice where addlers will be frequently on-site for other duties and the number of pairs to keep track of is not very large. It may also be the method of choice for a site with a very large number of nests. The time needed to oil many nests may simply be impractical and acquiring an adequate number of replacement eggs difficult and expensive.

Visit nest sites no more than 14 days apart due to the 14-day limit on humanely addling eggs. If visits are longer apart than 14 days, it is much more likely addlers will find some eggs too old to disturb. The ideal timing would be to remove nests between 7 and 14 days of incubation, long enough incubation to reduce renesting but not so long that eggs are too old to remove.

In addition to the supplies needed for all addling methods, teams will needed:

- containers for the eggs.

Oiling Method. Oiling is a widely used addling method with a long record of success. Coat eggs that are young enough to addle humanely with corn oil. This keeps air from passing through the shell so the embryo cannot develop. Oiling is reported to be highly effective (between 95 and 100 percent) in studies. However, in field use oiled nests have hatched goslings on rare occasions.

Only use 100-percent food-grade corn oil to oil eggs. This is a USFWS regulation. Although they may seem more convenient, do not use aerosol spray cooking oil, even corn oil. These products have other ingredients added so the oil will not clog the spray head and will spread over the cooking surface. These additional ingredients may interfere with the oil's effectiveness in blocking air movement through the shell. Since these spray products are not 100 percent corn oil, they do not comply with USFWS regulation.

Addlers can rub oil onto eggs, dip eggs in a container of oil, or spray oil from pump-type (non-aerosol) containers. If spraying, be sure to oil all surfaces of each egg, not just the exposed surface as the egg lies in the nest. You will need to turn each egg to expose and spray the entire surface. Disposable gloves are very useful to keep hands clean when applying oil. **Change them between nests to prevent spreading disease between birds.** Whatever coating method you use, the goal is an even coat with a light to moderate amount of oil over the entire egg.

Eggs need to be thoroughly dry after the float test so the oil adheres. Bring plenty of rags or towels and oil eggs in the same order you floated them. This way eggs will have the maximum opportunity to air dry before oiling. **However, if eggs float and must be returned to the nest untreated, do not dry them.** Rubbing the wet eggs can remove the outermost protective cuticle layer from the shell, potentially allowing germs to enter through the shell pores.

Visits nest sites no more than 14 days apart due to the 14-day limit on humanely addling eggs. If visits are longer apart than 14 days, it is more likely addlers will find some eggs too mature to oil. Oiling requires addlers spend more time at each nest than nest destruction or replacement but they are likely to have fewer eggs to treat in total over the season. Returning the oiled eggs to the nest tricks the goose into continuing to incubate nonviable eggs instead of laying additional eggs. Rarely, additional eggs are found when oiled nests are revisited. If you revisit within 14 days, these eggs are clearly young enough to addled. If you revisit after 14 days; you can float test any eggs that are clearly new. However, be aware that it can be difficult to distinguish eggs oiled previously from newer eggs if markings on oiled eggs do not hold up well (see section on Marking Eggs above).

In addition to the supplies needed for all addling methods, oiling teams will need:

- 100% food-grade corn oil (from any grocery store),
- lots of rag or towels to dry eggs between floating and oiling,
- marking pen or pencil for eggs, if marking eggs, and
- disposable gloves.

Removal and Replacement Method. Like oiling and returning eggs to the nest, placing dummy eggs in the nest can also trick the goose into continuing to incubate and prevent her from laying additional eggs. Addlers simply remove real eggs young enough to be removed humanely and replace them with dummies. In clutches with five or fewer eggs, three dummy eggs will suffice; for larger clutches, use four. The removed eggs do not need to be further addled; by being removed from incubation and allowed to cool, they will stop developing. Make sure the eggs cool and stay cool so that incubation stops; don't leave them in the sun inside dark plastic bags or in the back of a car, for example. Put them in a cool place for a few days before disposing of as directed by USFWS regulations (on your registration information from the USFWS website) or your state wildlife agency. Eggs must be disposed of; it is illegal to keep, consume, use, sell, or trade eggs.

Addling programs must obtain dummy eggs that are about the same size, color, and weight as real eggs in quantity, retrieve them from nests at the end of the nesting season, clean them, and store them for next season. Finding a source for appropriate dummy Canada geese eggs is difficult. These supply and handling considerations limit the use of this method. At this time, we are aware of only one source of handcrafted wooden eggs used by GeesePeace St. Louis. The supplier's contact information is at the end of this protocol.

As with other methods, visits to nest sites need to be no more than 14 days apart due to the 14-day limit on humanely addling eggs. If visits are longer apart than 14 days, it is more likely addlers will find some eggs too old to replace. In theory, sitting geese should not lay additional

eggs after replacement. However when revisited, some nests are found with both replacement and real, developing eggs.

In addition to the supplies needed for all addling methods, teams doing replacement will need:

- dummy eggs and
- containers for both dummy and real eggs.

Revisiting Nests and Sites

Depending on the addling procedure and the program's goal, it may be either desirable or necessary to revisit treated nests and revisit sites to check for new nests. In the normal course of work, addlers can revisit nests destroyed or treated early in the season as they search for new nests. Where eggs are replaced, addlers will need to collect dummy eggs at the end of the season.

How many revisits you make depends on your goals and on logistical considerations. Maximum reproductive control requires multiple revisits. Start early and continue until all nesting activity is done for the season, including renesting by geese whose first nest failed, to prevent as much hatching as possible. Some programs may need to balance this goal with logistical considerations and/or resources available. Focusing visits during the peak nesting period can achieve a significant degree of control, albeit not as great as the control possible if revisits continue until the end of the nesting season.

Geese tend to nest around the same time each year, with some variation due to weather conditions, and around the same time as each other. There is a strong peak in new nests within a few weeks. Focus on those few weeks of peak nesting to capture the great majority of nests if resources do not permit maximum revisits. The exact dates of peak nesting will be somewhat different in different regions of the continent. In southeast Michigan, peak *clutch initiation* (date first egg is laid) is the last part of March through the middle of April with a strong peak about April 1st. More than half the clutches are started in the two weeks at the end of March and the beginning of April. Therefore, Michigan's nest destruction program focuses activity on the middle of April. In central Maryland, volunteers always find very few completed nests in March and the greatest number of completed new nests during the first weekend of April, with new nests tapering off through the season. Therefore, visits on the first and third weekends of April yield the greatest returns, with additional visits continuing at two-week intervals as long as nests and volunteers' willingness holds out. Where revisiting will be limited, oiling may be the method of choice because renesting should be limited and no dummy eggs will need to be retrieved.

While oiling and replacement are supposed to prevent geese from laying additional eggs, real geese sometimes do not act just as the scientists say to expect. Sometimes oiled nests and nests with dummy eggs are found with new eggs when revisited. Perhaps the sitting goose laid more eggs or another goose dumped eggs in her nest. However it happens, these new eggs can be treated in the same way as the eggs in the original clutch. Determine incubation age by float or observation, if possible, and oil, remove, or replace. In oiled nests, you may have trouble determining which eggs are new and which were oiled previously if marks on oiled eggs did not hold. In this case, you may have to simply leave all the eggs without additional treatment.

If there are any goslings on the site when you revisit, it is rare that they can be traced to specific nests. Do not consider a small number of goslings a failure. As with any form of population management, addling cannot completely eliminate reproduction. A nest or two may have been very well hidden. Goslings do rarely hatch from oiled nests. Some geese whose eggs were removed will lay more eggs; and some of those second clutches may be missed. Parents may lead goslings as far as two miles to grass and water if their nest site does not offer them. So, goslings at your site could come from nests offsite. If you think this is the case, reach out to neighboring property owners so they can be included next season.

In the past, we recommended addlers revisit oiled nests after two weeks and remove oiled eggs. This was based on a concern that some geese might sit on nonviable eggs well beyond the natural incubation period. Several years' experience of many addling programs does not support this concern. Geese tend to abandon oiled nests just as they do nests that fail for other reasons such as flooding or poor incubation. Additionally, determining whether any particular egg was oiled has been problematic when markings do not hold up. The rare occurrence of oiling failure worried some addlers that they might inadvertently remove developing eggs too old to remove humanely. Compounding these concerns, the float test does not distinguish eggs with developing embryos from previously oiled eggs. Both can float; the developing egg from an air sac and the oiled egg from decomposition gasses. For all these reasons, we no longer recommend routine removal of oiled eggs after a set period.

If oiled eggs must be removed later, be aware that nonviable eggs may have spoiled to a point where they have or are about to burst. Be careful handling and be prepared for offensive smells. Double bag and dispose as directed by USFWS regulations or your state wildlife agency. It is generally best simply to leave oiled eggs for nature to recycle.

Cautions for Operators

Addlers must be aware of risks to their own safety. Any outdoor task done under varying weather conditions at many types of sites presents some risks. Preferred nesting sites are commonly near water so, water safety is a particular concern for many addling programs especially if boats are needed to reach island nests. It is beyond the scope of this protocol to cover boating, water, and outdoor safety beyond this reminder. Learn and follow appropriate safety rules.

Droppings can potentially contaminate eggs and nesting material. Take sensible steps to avoid disease transmission. Disposable gloves, changed between each nest to avoid spreading germs between birds, also protect addlers. Wash hands thoroughly after handling any potentially contaminated material. Until soap and water are available, waterless hand sanitizer can be used in the field. Take care to avoid contaminating equipment and supplies.

For the safety of all, addlers and geese, children should not addle. Supervised teenagers may be helpful members of addling teams for locating nests, recording data, and similar tasks that do not require directly handling eggs or birds.

Record Keeping and Reporting

Federal regulations require reporting the total numbers of nests and eggs treated each season. Other record keeping and reporting may be stipulated by state agencies. It is a good idea to collect as much information as possible beyond the required data to aid and improve the addling program from year to year.

Public Education

When addlers are working in public places, people may approach them with questions or concerns (either for or against the geese). It is very helpful for addling programs to be prepared with an educational component. This can be someone on each team willing to explain the program or a simple factsheet that team members can hand out to the public. Contact information to get more information is a particularly good item to include on such a handout.

The public can be very protective of their geese and, either because they do not understand what you are doing or because they disagree with it, may approach to object. Also, addlers may simply prefer not to add public education to their fieldwork. Scheduling site visits to avoid curious people, such as early in the morning, can leave more time to attend to the work at hand. You may also get lucky and find the goose is off the nest for her breakfast.

Scheduling to avoid a large audience may be justified, however, we strongly recommend against cloaking addling activity in secrecy. Nothing will get conspiracy theories circulating quicker than public perception that the community is being mislead or denied information. The negative consequences of misleading information or stonewalling will be much greater than the hassle of dealing with questions, concerns, and disagreement early and openly.

Informing the public as early as feasible usually pays off in avoided problems down the road. Community outreach such as information in the local media, homeowners' association and employee newsletters, and other outlets about both the addling program and other efforts to resolve human-goose conflicts without killing wild birds can help create community support for the program.

Contact Information

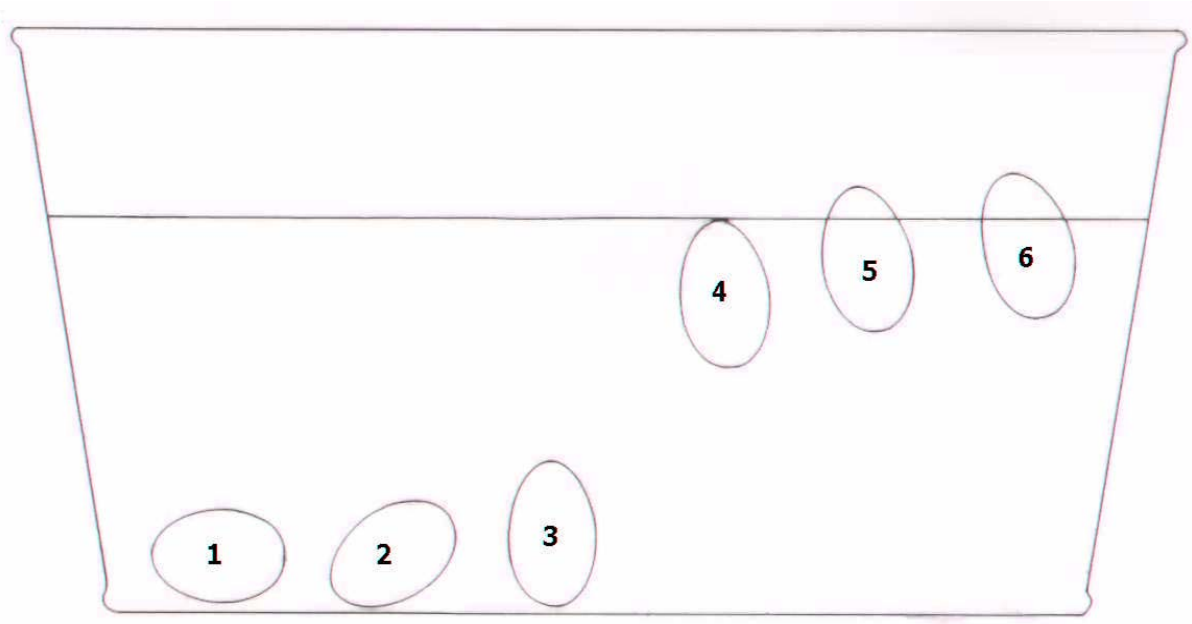
Wooden replacement eggs are available from:
Nancy Marron
GooseWorks
314-984-9524
314-518-8629 cell
Nancy38@earthlink.net

Information about OvoControl goose contraceptive is available from:
Erick Wolf
Innolytics, LLC
848-759-8012
Erick.wolf@cox.net
Ovocontrol.com

Authorship and Acknowledgements

This protocol was written by Maggie Brasted, Director of Urban Wildlife Conflict Resolution for The Humane Society of the United States. It is based on information and materials developed by John Hadidian, Ph.D., Director of Urban Wildlife for The Humane Society of the United States with technical expertise contributed by Patrice Klein, DVM. Many addling programs and community volunteers have also contributed invaluable information about their experience; what worked and didn't work for them in the field with real wild geese. Of these, we particularly acknowledge David Feld of GeesePeace, Jan Herbert of Rockford Park District and GeesePeace of Rock River Valley, Julie Oakes of the Michigan Department of Natural Resources, Nancy Schnell of GeesePeace St. Louis, and Roberta Shields of Harding Area Humane Solutions for their long commitment to humane addling and humane treatment of wild birds.

Float Test Illustration



Age in days: **0-3** **4-8** **9-13** **14-18** **19-23** **24-27**
(Approximate, from beginning of incubation)

Interpreting this chart: It pictures a cross-section through a large container of water with eggs of various ages. The line across the container represents the water level. Eggs at the very beginning of incubation (number 1 on the left), lay *on* the bottom of the container, clearly not floating. By about 13 days of incubation, eggs will turn upright in the water (as number 3 on the chart) but will remain at the bottom of the container. At about 14 to 18 days of incubation, eggs will be clearly floating near the top of the water, although they may not break the surface of the water. **Non-floating eggs (like numbers 1, 2, or 3 in the chart) are young enough to be addled humanely.**

Chart based on materials provided by the U.S. Fish and Wildlife Service and the Department of Agriculture's Wildlife Services. Illustration by Lori Baker.