

CARLTON COUNTY - GUIDELINES FOR EXCAVATING PONDS

In accordance with the Wetland Conservation Act (WCA), draining, filling and in some cases, excavating in wetlands is prohibited unless the draining, filling or excavation activity is exempt or the wetlands are replaced by restoring or creating a wetland area of at least equal public value. There are three different types of applications/permits that are typically issued for the construction of a pond in a wetland: No-Loss Decision, Wildlife Habitat Exemption and De Minimis Exemption.

NO-LOSS DECISION

The Wetland Conservation Act (WCA) does not regulate shallow excavations in either a Type 1, 2, 6, 7, or 8 wetland as long as 80% of the depth of the total excavated area is 4 feet or less, no draining of the wetland occurs, and no spoils or excavated material (including brush and roots) is placed in a wetland. The remaining 20% shall have a maximum depth of 6.5 feet (2 meters). However, it is recommended that property owners obtain a permit for "No Loss" of wetlands. Applications can be obtained from the Carlton County Zoning and Environmental Services office. This is a joint application that will notify the Army Corps of Engineers (ACOE) and Department of Natural Resources (DNR) of the project. Reason number 1 to obtain a permit: authorization from the ACOE is still needed to excavate in a Type 1, 2, 6, 7 or 8 wetlands. Reason number 2: notification of the DNR will also inform your area Conservation Officer (CO) that you are authorized to excavate in a wetland. Reason number 3 to obtain a permit: the Wetland Administrator will visit your property and can provide technical advice or assistance. To summarize, although a permit to excavate in a Type 1, 2, 6, 7 or 8 wetland is not a requirement of the WCA, it is highly recommended.

WILDLIFE HABITAT EXEMPTION

The purpose of the Wildlife Habitat Exemption is to **improve habitat for wildlife**. This exemption allows some wetland impact (filling for all wetland types and excavation for the permanent and semi-permanently flooded portion of Type 3, 4 and 5 wetlands) to occur without replacement as long as the net effect of the project is to improve wildlife habitat. To qualify for the Wildlife Habitat Exemption, the entire project should be evaluated and certified by the Soil and Water Conservation District (SWCD) or Department of Natural Resources (DNR) wildlife specialist as habitat improvement. 'Wildlife Habitat Improvements in Wetlands Guidance' document has been attached.

DE MINIMIS EXEMPTION

A De Minimis Exemption can be applied, which will allow impact from excavation, draining or filling without wetland replacement. IF fill is associated with the excavation, the **entire project**, (excavation and fill) is regulated. The amount of wetland impact allowed is variable. See attached Guide to De Minimis Exemption.

WARNING: Once a wetland is excavated to create a pond, it will be regulated as if it was a natural pond (Type 3, 4 or 5 wetland). The WCA regulates excavation in permanently and semi-permanently flooded areas of Type 3, 4, and 5 wetlands. These wetland types typically have surface water. A permit will be required and authorization will be needed from the Local Government Unit (LGU), Minnesota Department of Natural Resources (DNR) and Army Corps of Engineers (ACOE).

CONTRACTOR RESPONSIBILITY FORM

WCA requires that an agent or employee may not drain, grade, excavate or fill a wetland without first obtaining a signed statement from the landowner that all permits have been obtained or are not required, and said statement is submitted to Carlton County Zoning & Environmental Services Office. Forms are available from Carlton County Zoning & Environmental Services Office.

GENERAL POND CONSTRUCTION GUIDANCE

Existing wetlands are usually self-sustaining ecosystems that should not be disturbed or altered to create ponds for wildlife. However, the construction of wildlife ponds can be done on upland sites or occasionally in lower quality wetlands (sites with canary reed grass for an example). Higher quality sites that should generally be avoided include: forested wetlands, cedar or tag alder swamps and bogs. Assistance is available from the Carlton SWCD or DNR Wildlife Division Office.

The following general design features should be considered when constructing a wildlife pond:

1. **Size.** A wildlife pond should be between 0.25 to 0.5 acres in size. If you intend to construct a wildlife pond greater than 0.5 acres, consult the ACOE first. Also keep in mind that you need to place the spoil material on an upland site (including brush and roots) and that many cubic yards of material are generated for even small wetland ponds projects.

2. Shoreline. An irregular shoreline should be constructed because it can increase the area used by waterfowl and other wetland wildlife species and may provide more isolated bays. Creating bays will attract more wildlife and allow them to do more of their daily and seasonal activities, including feeding, loafing, mating and nesting.
3. Shape and Depth. The bottom contour of a pond should be uneven and rolling. The variable water depths allow for more diverse emergent vegetation in shallow areas throughout the pond. Emergent vegetation (plants that break the surface of the water) take up nutrients and improve water quality. The vegetation also provides food and cover for wildlife. The water depth in shallow areas should vary between 6 and 18 inches and can range from about 4 to 6.5 feet in the deeper areas. Half of the pond should be shallower than 3 feet and half deeper than 3 feet.
4. Slope. The shoreline area should have gentle slopes and allow for fingers and open bays along the edge. Slopes should only have about a foot rise (vertical) for approximately every 5 to 10 feet of run (horizontal), or between a 5:1 and 10:1 slope. Projects with 50% open water and 50% vegetation cover in the wetland pond (including the emergent vegetation and round the shoreline) will provide the greatest species richness and diversity.
5. Upland Site. Ponds on some upland sites may require a clay liner to retain water. Topsoil should be placed on the bottom these ponds to provide a more suitable substrate and improve the establishment of aquatic plants and animals. Clay lined ponds produce less vegetation, fewer invertebrates and support less waterfowl than those lined with both clay and organic soils.
6. Organic Soils. Muck soils may be available from the impacted wetland and can be placed on the bottom and slopes of the newly created pond. This soil provides a natural seed bank and is high in organic content which will provide for a better plant species diversity.
7. Buffer Areas. Buffer areas of upland grass vegetation may need to be established and maintained around the perimeter of these projects to provide nesting habitat and cover needed by waterfowl. Seed mixtures of Fox Sedge, Switch Grass, Sweet Grass, Big Bluestem, Virginia Wild Rye, Canada Wild Rye, and Indian Grass make good cover. Wildflowers such as Swamp Milkweed, Blue Vervain, Spotted Joe-Pye Weed and Wild Bergamot seed or transplants can add diversity and color. Maintenance mowing every few years will control brush and woody vegetation but should be delayed until after August 1st to avoid disturbing nesting waterfowl, upland game birds and other wildlife.

ALWAYS CALL BEFORE YOU DIG...Gopher State One-Call at 1-800-252-1166.

TABLE 1. Ideal depths in pond

Water Depth (feet)	Percent of Pond at this Depth	Likely Result
0 – 1.5	25 – 40	wet meadow and mixed emergent vegetation; usually dry by July
1.5 – 3	25 – 50	cattails and emergent vegetation/open water; dry in drought
3 – 4	< 20	mostly open water/submerged aquatic plants; dry in severe drought

FIGURE 1. Diagram of a good basin design; this design emphasizes shallow slopes and depths (each line represents one foot of depth), and good shoreline features. Adjacent uplands are seeded to native grasses.

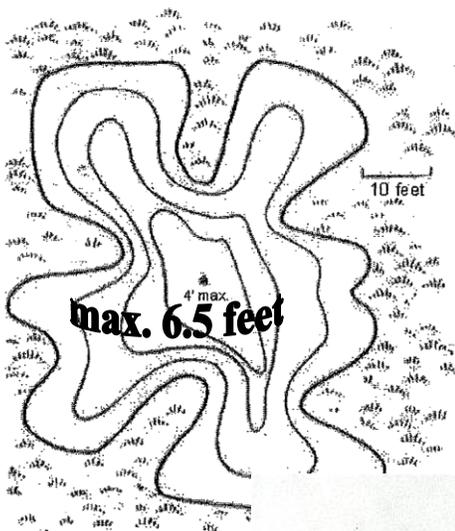
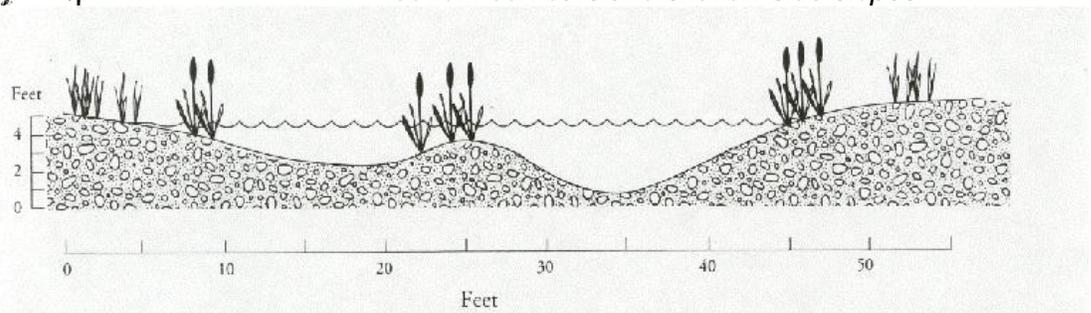


Figure 2. Cross section of wetland showing undulating bottom contours and shallow side slopes.



CARLTON COUNTY - THE WETLAND CONSERVATION ACT (WCA)

DEFINITION OF A WETLAND

Essentially, it must meet three criteria to be identified as a wetland: 1) The area must have mostly hydric soils, which are soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic (without oxygen) conditions; 2) The area must be inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support a prevalence of hydrophytic (plant adapted to grow in water) vegetation typically adapted for life in saturated soil conditions; 3) Under normal circumstances, support a prevalence of hydrophytic vegetation. Descriptions and pictures of wetland types are in the “Wetland Information Guide,” which is available at the Carlton County Zoning and Environmental Services Office.

STATUTES AND RULES

The Wetland Conservation Act was first passed in 1991 as Minnesota Laws Chapter 354, as amended (codified, as amended, as Minnesota Statutes, section 103G.222-2373 and in other scattered sections). Rules were promulgated by the Minnesota Board of Water and Soil Resources in Minnesota Rules, chapter 8420, as amended.

SCOPE OF THE ACT

Draining, grading, filling and in some cases, excavating in wetlands is prohibited unless (a) the drain, fill, or excavation activity is exempt or (b) wetlands are replaced by restoring or creating wetland areas of at least equal public value. The overall goal is no net loss of wetlands.

The local government unit (LGU) has the primary responsibility for administering WCA and for making key determinations. Generally, the LGU is the city or county. Carlton County is the LGU except in the cities of Cloquet and Wright.

WCA does not supersede other regulations such as those of the Army Corps of Engineers (ACOE) or Minnesota Department of Natural Resources (MDNR). The combined application forms should be used to notify these agencies prior to commencing a project in or near wetlands.

EXEMPTIONS

An impact is exempt from replacement if it qualifies for any one of the listed exemptions. Persons proposing to conduct an exempt activity can contact the Carlton County Zoning and Environmental Services office to verify eligibility for an exemption. A landowner intending to impact a wetland without replacement, claiming exemption, may apply to the LGU for an exemption decision before beginning the activity to verify whether the proposed impact is exempt. A landowner who does not request a decision from the LGU and proceeds with the activity may be subject to enforcement action.

1. Agricultural activities. A replacement plan for wetlands is not required for certain agricultural activities.
2. Drainage. A replacement plan for wetlands may **or may not** be required for maintenance or repair of public or private drainage systems.
3. Federal Approvals. A replacement plan for wetlands is not required for activities authorized under section 404 of the federal Clean Water Act or section 10 of the Rivers and Harbors Act.
4. Wetland Restoration. A replacement plan for wetlands is not required for activities in a wetland restored or created for conservation purposes under a contract or easement providing the landowner has the right to drain the restored or created wetland.
5. Utilities; public works. A wetland replacement plan is not needed for specific types of utility placement, maintenance, repair, enhancement or replacement of utilities or utility-type work.
6. Forestry. A wetland replacement plan is not required for certain silvicultural activities.
7. De minimis. A replacement plan for wetlands is not required for draining, excavating, or filling the following amounts of wetlands as part of a project:

- a) 10,000 square feet of a type 1, 2, 6 or 7 wetland, excluding white cedar and tamarack wetlands, outside of the shoreland wetland protection zone (1,000 feet of a lake or 300 feet of a river).
- b) 400 square feet of type 1, 2, 6, or 7 wetland, except for white cedar and tamarack wetland, outside of the building setback, but within the shoreland wetland protection zone.
- c) 100 square feet of type 3, 4, 5, or 8, and white cedar and tamarack wetland outside of the building setback zone.
- d) 20 square feet of wetland, regardless of type, inside the building setback zone.

For projects where any wetlands proposed to be impacted extend outside of the project property (multiple landowners), the applicable De minimis exemption amount is the lesser of the amount identified above, or 5% of the total wetland area within the project property, but in no case less than 400 square feet. The amounts listed above may not be combined on a project. A project is defined as a specific plan, contiguous activity, proposal, or design necessary to accomplish a goal as defined by the LGU. A project may not be combined into phases or components. When the total amount of impact exceeds the amount allowed under the applicable exemption, the impact is not exempt and the entire amount of impact must be replaced.

8. Wildlife habitat. A replacement plan for wetlands is not required for wildlife habitat improvement projects that meet certain requirements.

NO-LOSS DETERMINATIONS

A landowner can apply to the LGU (Carlton County) for a no-loss determination. Requests can be made to the LGU for activities that will result in no loss of wetlands. Typical requests for no-loss determinations include projects where the work will not impact a wetland and shallow excavation in wetland types 1, 2, 6, 7 or 8. Shallow excavation in wetland types 1, 2, 6, 7 or 8 are not considered a wetland impact as long as 80% of depth of the total excavated area is 4 feet or less, no draining of the wetland occurs, and no spoils or excavated materials (including brush and roots) are placed in the wetland.

CONTRACTOR RESPONSIBILITY FORM

WCA requires that an agent or employee may not drain, grade, excavate or fill a wetland without first obtaining a signed statement from the landowner that all permits have been obtained or are not required, and said statement is submitted to Carlton County Zoning and Environmental Services Office. Forms are available from Carlton County Zoning and Environmental Services Office and website.

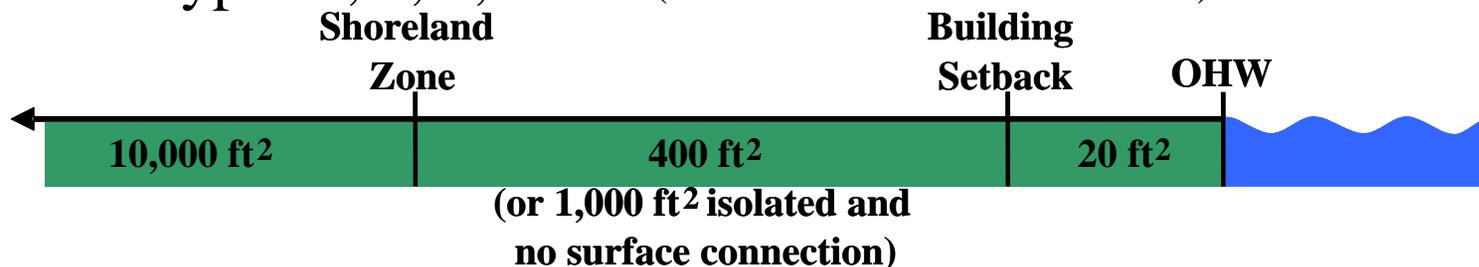
REPLACEMENT PLANS

A landowner intending to drain, excavate, or fill a wetland who does not qualify for an exemption needs to obtain approval of a replacement plan from the LGU before draining or filling activities begin. Applications can be obtained from the Carlton County Zoning and Environmental Services office and website. A person who does not do so is subject to enforcement provisions in Minnesota Statutes, section 103G.2372.

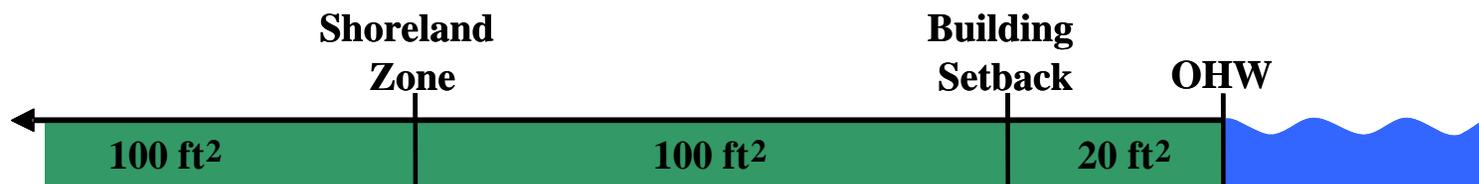
If landowners have any questions, please call the Carlton County Resource and Recycling Coordinator at 218-384-9178.

CARLTON COUNTY – GUIDE TO DE MINIMIS EXEMPTION

- Types 1, 2, 6, and 7 (excl. white cedar & tamarack)



- Types 3, 4, 5, 7 (incl. white cedar & tamarack), and 8



For projects where any wetlands proposed to be impacted extend outside of the project property (multiple landowners), the applicable De minimis exemption amount is the lesser of the amount identified above or 5% of the total wetland area within the project property, but in no case less than 400 square feet.

Wildlife Habitat Improvements in Wetlands: Guidance for Soil and Water Conservation Districts and Local Government Units in Certifying and Approving Wetland Conservation Act Exemption Proposals

Minnesota Interagency Wetlands Group
December 2000

Guidelines

All wetlands provide habitat for certain sets of wildlife species. Any alteration of the habitat is likely to improve the habitat for some species and degrade it for others. Activities authorized under the wildlife habitat exemption must improve the habitat overall, not just make it different. The Wetland Conservation Act (WCA) calls for achieving no net loss in biological diversity and increasing biological diversity by restoring or enhancing diminished or drained wetlands. Habitat exemption proposals should be evaluated in light of these goals, with consideration of biological diversity at various geographic scales.

In the absence of locally developed guidelines, soil and water conservation districts and local government units are encouraged to use the following when certifying and approving wildlife habitat exemption applications:

- X Excavations within wetlands should generally be confined to wetlands that have been previously degraded, particularly those invaded by exotic and/or invasive plants, such as reed canary grass (*Phalaris arundinacea*), purple loosestrife (*Lythrum salicaria*), or cattail monotypes (often hybrid cattail *Typha x glauca*). Excavation should generally not be allowed in wetlands having a vegetative diversity rating of “moderate” or higher when evaluated using the Minnesota Routine Assessment Method For Evaluating Wetland Functions (MnRAM).
- X Exceptions to the previous guideline may be appropriate in areas having extensive wetlands that are missing habitat components for one or more wetland-dependent wildlife species that are known to inhabit the area, provided that populations of other wildlife species are not adversely affected. The post-project wildlife habitat rating should be higher than the pre-project rating when evaluated using the MnRAM.
- X Excavations in wetlands known to be utilized by state or federally listed endangered, threatened or special concern species should not be allowed unless the habitat will be improved for such species.
- X Where feasible, excavated material should be removed from the wetland to minimize the loss of wetland habitat. Small, artificial islands should be discouraged because they are usually ineffective at protecting nesting ducks from predation and tend to contribute to nuisance Canada goose problems.

- X The wildlife habitat exemption should not be used to authorize the placement of excavated material in wetlands for the purpose of constructing roads or trails through the wetland.
- X Excavated areas should have irregular shorelines (not square or circular). This increases the amount of shoreline per unit area and will increase waterfowl use by providing isolated areas for feeding and loafing.
- X Bottom contours should be undulating to produce variable water depths. Water depth in shallow areas should be 12 - 18 inches and 3 - 6 feet in the deepest areas. The excavated area should have variable, but generally shallow side slopes (no steeper than 5:1).

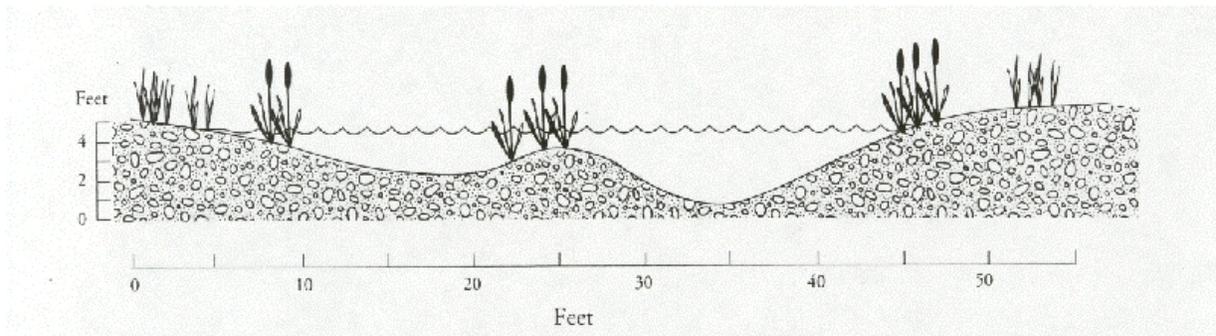


Figure 1. Cross section of wetland showing undulating bottom contours and shallow side slopes.

- X Excavated material deposited within the wetland should be vegetated immediately with a native seed mixture.
- X After operating in areas infested with exotic or invasive plant species, particularly purple loosestrife and reed canary grass, all equipment should be thoroughly cleaned to avoid transporting seeds or live vegetation to other areas. Excavated material that may be contaminated with seeds or propagules of exotic/invasive species should not be deposited within or adjacent to wetlands that have not been previously invaded.

Rationale

1.0 Introduction

The rules for implementing the Minnesota Wetland Conservation Act (WCA) establish the following exemption (Minn. Rules Ch. 8420.0122):

Subp. 10. Wildlife habitat. A replacement plan for wetlands is not required for:

(1) excavation or the associated deposition of spoil within a wetland for a wildlife habitat improvement project, if:

(i) the area of deposition, and excavation if within the permanently and semi-permanently flooded areas of type 3, 4, and 5 wetlands, does not exceed five percent of the wetland area or one-half acre, whichever is less, and the spoil is stabilized and permanently seeded to prevent erosion;

(ii) the project does not have an adverse impact on any species designated as endangered or threatened under state or federal law; and

(iii) the project will provide wildlife habitat improvement as certified by the soil and water conservation district; or

(2) duck blinds.

In order for a project to qualify for this exemption, it must meet the specified size criteria and it *must be certified by the county soil and water conservation district* (SWCD) as a wildlife habitat *improvement*. The purpose of this document is to provide guidance to SWCD staff on making habitat determinations. Ultimately, the goal is to ensure that projects authorized under the exemption are in fact improving wildlife¹ habitat and to achieve more consistency in the application of this exemption statewide.²

¹ For the purposes of this guidance, the term “wildlife” is used inclusively to refer to all indigenous wild species that utilize wetlands for all or part of their habitat requirements, including birds, mammals, amphibians and reptiles.

² Notes on application of the exemption: Wetland types 1, 2, 6, 7 and 8 – Excavation in these wetland types is not regulated under the WCA. Landowners can legally excavate any area of these wetland types without having to comply with the WCA exemption or replacement requirements *if the excavated material is completely removed from the wetland*. However, if a habitat improvement project involves deposition of fill (usually sidecasting of the excavated material), then the project is regulated under the WCA. To qualify for the habitat exemption, the area excavated is not limited, but the area *filled* must be less than five percent of the wetland area or 0.5 acre, whichever is less and the *entire* project (excavation and fill) should be evaluated and certified by the SWCD as a habitat improvement. Wetland types 3, 4, and 5 – Filling and excavation are both regulated under the WCA. The wildlife habitat exemption applies as long as the *filled and excavated* area combined is less than five percent of the wetland area or 0.5 acre, whichever is less. The entire project should be evaluated and certified by the SWCD as a habitat improvement. The WCA habitat exemption does not apply to Public Waters Wetlands regulated by the Department of Natural Resources.

2.0 Principles and Goals

A basic tenet of wildlife management is that wildlife populations are dependent on the availability of suitable habitat. It's also well known that different wildlife species have different habitat requirements (Weller 1978). For example, wood ducks are typically found in floodplain forests with an abundance of tree cavities while blue wing teal prefer prairie pothole wetlands with grassy upland cover. Furthermore, some species utilize a fairly broad range of habitats, while others have very specific habitat needs. Therefore, it's intuitive that any manipulation of habitat has the potential to benefit some species and harm others. In this context, it becomes somewhat problematic to determine whether an activity qualifies as a habitat *improvement*. Any habitat alteration is likely to improve habitat for some species and worsen it for others, making a determination of the overall effect somewhat subjective.

The subjectivity inherent in such determinations can be reduced to some extent by evaluating each proposal in light of an overall goal. The WCA establishes the following goals:

- (1) achieve no net loss in the quantity, quality, and biological diversity of Minnesota's existing wetlands;
- (2) increase the quantity, quality, and biological diversity of Minnesota's wetlands by restoring or enhancing diminished or drained wetlands;
- (3) avoid direct or indirect impacts from activities that destroy or diminish the quantity, quality, and biological diversity of wetlands; (103A.201, Subd. 2)

The criteria that follow are based on these goals.

3.0 Criteria for Evaluating Wildlife Habitat Exemption Proposals

The purpose of the wildlife habitat exemption is to allow some wetland impact (filling for all wetland types and excavation for the permanent and semi-permanently flooded portions of Types 3, 4, and 5 wetlands) to occur without replacement as long as the net effect of the project is to improve wildlife habitat. If the intent of a project is something other than wildlife habitat improvement, such as improved aesthetics, or to gain access through the wetland, then the project does not qualify for the habitat exemption. Assuming that the intent is to improve wildlife habitat, the following criteria should be considered.

3.1 Factors Affecting Wetland Quantity

By definition, the exemption allows a certain amount of wetland loss, up to 0.5 acre of fill (which will usually be dredged material) in all wetland types or, in the case of Type 3, 4, and 5 wetlands, combined excavation and fill. Even though deposition of fill in the

wetland is allowed under the exemption, applicants should generally be encouraged to remove the dredged material to an upland site if feasible to avoid the loss of wetland habitat.

Some applicants may desire to deposit the dredged material in the wetland to create waterfowl nesting islands. When islands are located too close to shore, they are easily accessed by predators, leading to recurrent nesting failure. To provide optimal nesting habitat for ducks, islands should be between 400 and 1500 feet from shore and be located within or near a wetland complex (Lokemoen and Messmer, 1994). Islands constructed under the wildlife habitat exemption will rarely be able to meet these criteria and are therefore not desirable. Distance from shore is not as critical for Canada geese because they aggressively defend their nests from predators. However, in some parts of the state, populations of resident Canada geese have reached nuisance levels. In these areas in particular, nesting islands should be discouraged.

Excavated areas should not be more than two meters deep at normal water levels. Two meters is generally recognized as the depth beyond which rooted aquatic plants will not grow and is considered to be the cutoff between wetland and deep water aquatic habitats (Cowardin et al., 1979).

3.2 Factors Affecting Wetland Quality and Biological Diversity

Generally, wetlands that are biologically diverse are considered indicative of good wildlife habitat. However, this general rule must be tempered by a consideration of wetland type and geographic scale. Some wetland types are naturally more diverse than others. For example, fewer species of plants and animals are found in northern peatlands than in prairie potholes (Mitsch and Gosselink 1993). Yet, for the wildlife species that inhabit northern peatlands, it provides perfectly good habitat. Any alteration of this habitat, conversion to open water for example, would be disadvantageous for those species while perhaps improving it for other species. The net effect would be to make the habitat *different*, but not necessarily better.

It's also important to consider that biological diversity and the quality of wildlife habitat can be measured at different geographic scales. Consider a wetland that, by itself, does not support a wide diversity of wildlife species and appears to rank low in habitat value. However, the wetland may provide particular habitat components that are important for maintaining populations of certain wildlife species over a broader area. Also, if that wetland is the only habitat in the area for the few species it supports, it's contribution to regional biological diversity would be significant. Finally, some species require large areas of unbroken habitat to maintain successful breeding populations. For any of these circumstances, alterations to enhance the diversity *within* the wetland may result in a loss of diversity and a decline in habitat quality at a larger scale.

In light of these considerations, the application of the wildlife habitat exemption should generally be confined to wetlands that have been degraded such that they no longer exhibit the biological diversity that would typically be expected of a particular type of wetland in a specified geographic area. Prime candidates for application of the exemption are wetlands that have been invaded by exotic and/or invasive plants, such as reed canary grass (*Phalaris arundinacea*), purple loosestrife (*Lythrum salicaria*), or cattail monotypes (which are often hybrid cattail, *Typha x glauca*). Such wetlands generally exhibit low plant species diversity and do not provide the quality of wildlife habitat that similar type wetlands having an undisturbed plant community would provide. These wetlands would typically have a vegetative diversity rating of "low" as measured by the Minnesota Routine Assessment Method For Evaluating Wetland Functions (MnRAM) (Minnesota Interagency Wetlands Group, 1998). Exceptions to this general rule might be justified in areas with extensive wetlands that are missing habitat components for one or more species that are known to inhabit the area. Even in these areas, excavation proposals should be carefully evaluated to ensure that other species of wildlife will not be adversely affected. Usually, the objective of excavation projects is to improve the habitat for waterfowl. The design guidelines at the beginning of this document reflect this goal, although if implemented properly should also benefit other species, including wading birds and some reptiles and amphibians. Desirable projects would generally be reflected in an improved wildlife habitat rating when evaluated using the MnRAM (Minnesota Interagency Wetlands Group, 1998).

Wildlife habitat exemption proposals should not be approved in wetlands known to be utilized by state or federally listed threatened and endangered species unless it is clear that the activity will improve the habitat. Blanding's turtles, a state threatened species whose range extends throughout much of the east central and southern portion of Minnesota, utilize a variety of wetland types, including shallow wetlands dominated by cattails and sedges (Piepgras, et al. 1998). It has also been observed that Type 6 shrub swamps are important overwintering habitat for Blanding's turtles (Piepgras, et al. 1998). The yellow rail, a state special concern species, primarily inhabits sedge meadows and fresh wet meadows (Coffin and Pfannmuller, 1988). Some SWCD offices have copies of the Minnesota Natural Heritage Program (NHP) database showing known locations of listed species. Additional information on the locations of listed species can be obtained from NHP staff at 651-296-8324.

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Excavated Ponds for Wildlife

Landowners frequently ask natural resource agencies how they can improve their land for waterfowl and other wildlife. Many people wonder if excavating ponds will help. They often inquire about excavating, or deepening existing wetlands to provide more open water. This brochure will outline when and where dug ponds, or "dugouts", can be beneficial, and provides construction guidelines for optimum wildlife benefit.

SHOULD YOU CONSIDER A DUGOUT FOR YOUR PROPERTY?

It's well known that wetlands provide excellent wildlife habitat. Many wildlife species are dependent on or otherwise utilize wetland habitats, including waterfowl, wading birds,



shorebirds and songbirds, furbearers such as beaver, muskrat and mink, and a variety of reptiles and amphibians like turtles, snakes, frogs, salamanders, and toads. It may be less understood that *all* types of wetlands, even those that don't always have standing water, provide valuable, even essential, wildlife habitat. For example, [temporary and seasonal wetlands](#) typically contain standing water only during spring and early summer or after heavy rains. Yet these wetlands are very important for waterfowl during spring migration and breeding. They are usually the first to thaw in the spring and support thriving populations of aquatic invertebrates, which are an essential food source for ducks and geese during migration and egg formation.

Seasonal and temporary wetlands are also critically important breeding areas for toads,

frogs, and salamanders. Because these wetlands generally dry up later in the growing season, they are not inhabited by fish, which prey on amphibian eggs and larvae. Other wetland types that typically do not contain standing water include [wet prairies](#), [sedge meadows](#), [scrub-shrub](#) and [forested wetlands](#). Again, these wetlands provide habitat for many wildlife species, including species of special concern such as yellow rails and bitterns. Even non-wetland wildlife such as pheasant and deer often rely on these “drier” wetland types for food and cover.

Recognizing that all wetland types have potential habitat value, when is it appropriate to consider altering an existing wetland? The best candidates are those that have been either previously altered or degraded by drainage or sedimentation, or wetlands that have become dominated by invasive plant species such as reed canary grass and hybrid cattail. Dugouts should be considered only where other wetland restoration options are not possible. Before deciding to excavate a pond in an existing wetland, landowners should determine if other options, such as ditch plugs, tile breaks, or dikes would work. Wetlands restored by reducing drainage are always preferable to dugouts. **Wetlands that have not been previously disturbed and that support characteristic native plant communities should generally not be altered.**

An alternative to altering existing wetlands is to create new wetlands by excavating in upland areas. This may be a viable option where the groundwater table is high, or the size of the surrounding watershed is large enough to maintain sufficient water levels. In the latter case, landowners should exercise caution if wetlands are already present nearby and should verify that the watershed can provide adequate runoff to support the additional wetland area.

A final factor to consider is the surrounding landscape. If the main interest is providing nesting habitat for waterfowl, dugouts should be constructed only if there are other wetlands

within one-half mile. Waterfowl use dugouts primarily for courtship and territorial sites, and must have other wetlands to fulfill feeding and brood-rearing needs. A complex of wetland types interspersed with upland nesting cover provides optimum waterfowl habitat. A mix of wetlands and uplands is also important for certain amphibians (toads, some frogs, salamanders) and for aquatic turtles, which lay their eggs in uplands.

The “Permits and Technical Assistance” section at the end contains information on who to contact for additional guidance.

CONSTRUCTION GUIDELINES

1. DEPTH AND SLOPES. Waterfowl and most other wetland wildlife species need shallow water. When filled with water, your dugout should be no more than 4 feet deep. In mid-summer, much of your dugout should be less than 3 feet deep. Your pond should generally have the following depths when it is full (as in spring):

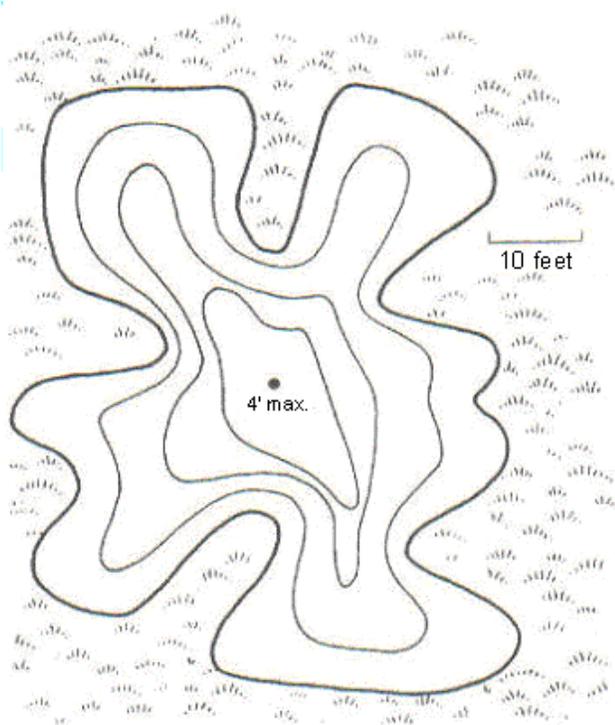
Water Depth (feet)	Percent of Pond at this Depth	Likely Result
0 – 1.5	25 – 40	wet meadow and mixed emergent vegetation; usually dry by July
1.5 – 3	25 – 50	cattails and emergent vegetation/open water; dry in drought
3 – 4	< 20	mostly open water/submerged aquatic plants; dry in severe drought

Steep slopes prohibit growth of desirable vegetation, encourage erosion, and reduce wildlife use. Grade the slopes of your basin as flat as possible, 10:1 (horizontal:vertical) or flatter if possible. The bottom of the pond should have variable, undulating depths. This allows an interspersed of vegetation and open

water, which is attractive to waterfowl. Some biologists prefer to construct dugouts with one deep side to ensure water availability and allow for viewing of waterfowl. Figure 1 shows an example of a good basin design from the perspective of slopes and depths.

2. **SIZE.** Wildlife will use all sizes of wetland, but bigger is usually better. In building a pond for waterfowl, consider a minimum size of 2500 square feet (equal to a square with 50 foot long sides). Larger, irregularly shaped ponds are preferred.

FIGURE 1. Diagram of a good basin design; this design emphasizes shallow slopes and depths (each line represents one foot of depth), and good shoreline features. Adjacent uplands are seeded to native grasses.



3. **SHORELINE FEATURES.** A pond that has an irregular shoreline and many points and bays is more attractive to waterfowl and most other wildlife than a dugout with a straight shoreline. Plan your dugout to have as much shoreline as possible, as in Figure 1.

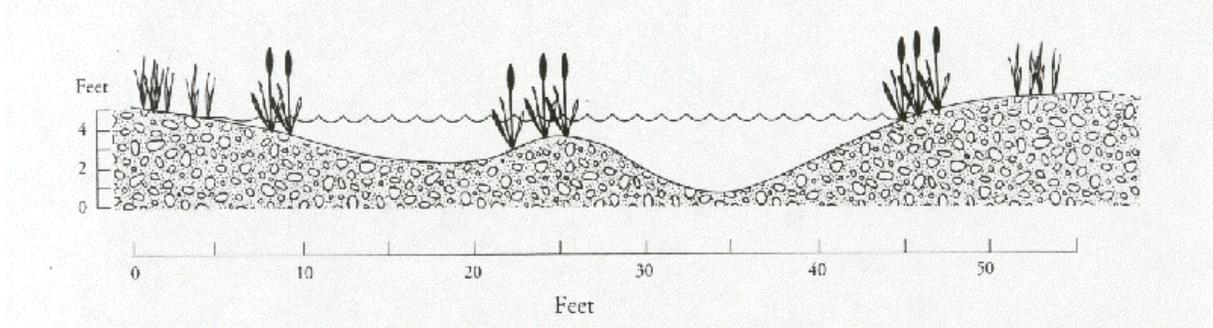
4. **NUMBER AND DISTRIBUTION.** For nesting waterfowl, your dugout should be near an existing shallow marsh for brood-rearing purposes. If you have adequate space and funding, you can consider digging more than one dugout. In general, two closely spaced small dugouts will receive more use than one larger dugout. If you construct more than one pond, space them about 100 to 300 feet apart. Ponds can be closer if tall vegetation screens the ponds from each other (breeding ducks are territorial and won't tolerate others of the same species if they can see them).

5. **ISLANDS.** Dugouts are generally too small to include an island. Studies have shown that unless islands are 300 feet or more from shore, duck nests are almost certain to be destroyed by predators. As an alternative, use nest baskets, boxes or floating rafts for nesting. A floating log, anchored in place, provides an excellent site for waterfowl and turtle loafing. (Note: Canada geese will nest successfully on small islands near shore; however, because of the current abundance of Canada geese and potential nuisance problems, the DNR does not encourage providing nest sites for this species.)

6. **SPOIL.** Excavating a pond means you end up with a lot of soil removed from the dugout; this is called "spoil". When excavating in an existing wetland, remove the spoil from the wetland. Placing the spoil in the wetland can trigger the need for a permit. Check with the appropriate agencies (see list at end) to determine if you need a permit.

The top 6"-12" will probably be black topsoil (or peat, if excavating an existing wetland), high in organic matter. This should be saved separately for later spreading over the excavated bottom (see section 7). The remaining soils should be moved to an upland site and spread evenly. It is important that this material be removed from the wetland basin and not piled adjacent to the dugout. The edge of the dugout should have a continuous slope below and above the water surface, as shown in Figure 2.

Figure 2. Cross section of wetland bottom showing smooth, shallow grade at waterline and undulating bottom contours.



Finally, all disturbed uplands and spread spoil should be seeded to native grasses for a minimum of 150 feet around the dugout. This will provide optimal cover for wildlife, minimize weed growth, and prevent the spoil from eroding back into the basin. Providing 4 acres of upland nesting cover for each acre of wetland is best for duck production. For optimal waterfowl habitat, do not plant trees near your dugout; these serve as predator perches and dens, and will reduce waterfowl use. Use nest boxes to attract wood ducks. Remember to get any necessary permits before you start digging! (See the section on Permits, below.)

7. FINAL TREATMENT. In general, the clay and sand underlying most mineral soils are less fertile and may not support adequate plant growth. In order to establish a food chain in your dugout, it may be necessary to provide an organic base (your county soil and water conservation district can provide advice). If needed, this can be accomplished by spreading 4"-6" of black topsoil over the entire excavated area. This can be the topsoil originally removed from the site when digging started. Another technique is to spread 2"-6" of clean upland hay over the excavated surface. Both can be used simultaneously. **Do not use topsoil that previously had reed canary grass or purple loosestrife growing on it. Also, do not use**

reed canary grass hay. Once covered with water, either of these bases will quickly allow vegetation and insects to grow, providing the building blocks for a desirable marsh.

It's not absolutely necessary to plant aquatic plants in your basin -- they will generally establish themselves naturally in time, given a suitable site. However, wetland plant communities left to establish on their own tend to have lower plant diversity and lower overall quality. Landowners interested in establishing a diverse, high quality wetland plant community should consider seeding and planting. See the references in the "Additional Resources" section for more information.

OTHER CONSIDERATIONS

In general, a bulldozer or scraper is best for constructing ponds as they can be fairly precise in "sculpting" the landscape. A backhoe (power shovel) or excavator can do a good job, and a dragline can produce fair results. The nature of your project will likely determine to a large degree exactly which equipment is used. Use a dozer, scraper, or backhoe for dry sites. If it's a wet site, a backhoe or dragline must be used. Minimize the disturbance to existing vegetation around the dugout or undesirable weed growth will be encouraged.

PERMITS AND TECHNICAL ASSISTANCE

Wetlands are protected by several laws, and a permit may be required for your project if you propose to alter an existing wetland. **Contact your [county soil and water conservation district \(SWCD\)](#) for guidance on the need for permits and for technical assistance.** You may also contact your [local DNR area wildlife manager](#) for technical assistance. Additional information on wetland permits is available at these web sites:

- [“Wetland Regulation in Minnesota”](#)
- [Minnesota Dept. of Natural Resources -- Public Waters Permit Program](#)
- [Minnesota Board of Water and Soil Resources – Wetland Conservation Act](#)
- [U.S. Army Corps of Engineers – Section 404 Program](#)

You may also elect to download a copy of the [“Minnesota Local/State/Federal Application Forms for Water/Wetland Projects”](#). Complete the form and submit it to the various agencies as directed on the form, and they will respond regarding the need for a permit or other approvals.

Financial assistance may be available through various government programs *for restoring drained or degraded wetlands*. Check with your [county soil and water conservation district \(SWCD\)](#). These programs are not likely to fund projects that would alter existing, undisturbed wetlands. You may also want to check with local sporting or conservation clubs for potential cost-share assistance.

ADDITIONAL RESOURCES

Guidance on Wetland Restoration, Seeding and Planting:

[“Wetland Vegetation in Restored and Created Wetlands”](#) by Dan Shaw, Minnesota Board of Water and Soil Resources, 2000.

[“Native Seed Mixes Recommendations”](#), Minnesota Board of Water and Soil Resources, 2002.

[“Restore Your Shore” CD-ROM ordering information](#), Minnesota Department of Natural Resources, 2002

[“Lakescaping for Wildlife and Water Quality”](#), by C. Henderson, C. Dindorf, and F. Rozumalski, Minnesota Department of Natural Resources, 1999

[“Landscaping for Wildlife”](#), by C. Henderson, Minnesota Department of Natural Resources, 1987.

General Wetland Information – Internet Web Sites

[U.S. Environmental Protection Agency, Office of Wetlands and Watersheds](#)

[“Wetland Plants and Plant Communities of Minnesota and Wisconsin”](#)

[“Midwestern Ephemeral Wetlands”](#)



Internet Addresses for Referenced Web Sites:

Soil and Water Conservation District Contacts:

<http://www.shorelandmanagement.org/contact/index.html>

DNR Area Wildlife Manager Directory:

<http://www.dnr.state.mn.us/contact/locator.html>

“Wetland Regulation in Minnesota” Brochure:

<http://www.bwsr.state.mn.us/wetlands/publications/wetlandregulation.html>

MnDNR Public Waters Permit Program:

http://www.dnr.state.mn.us/waters/watermgmt_section/pwpermits/index.html

Minnesota Board of Water and Soil Resources – Wetland Conservation Act:

<http://www.bwsr.state.mn.us/wetlands/wca/index.html>

U.S. Army Corps of Engineers Section 404 Program:

<http://www.mvp.usace.army.mil/regulatory/>

Minnesota Local/State/Federal Application Forms for Water/Wetland Projects:

http://files.dnr.state.mn.us/waters/forms/pub_app.pdf

“Wetland Vegetation in Restored and Created Wetlands”:

<http://www.bwsr.state.mn.us/wetlands/publications/index.html>

Native Seed Mixes Recommendations:

<http://www.bwsr.state.mn.us/wetlands/publications/nativeseedmixes.pdf>

“Restore Your Shore” CD-ROM Ordering Information:

<http://www.comm.media.state.mn.us/bookstore/viewbook.asp?stocknum=9-74>

“Landscaping for Wildlife and Water Quality” Ordering Information

<http://www.comm.media.state.mn.us/bookstore/viewbook.asp?stocknum=9-53>

“Landscaping for Wildlife” Ordering Information:

<http://www.comm.media.state.mn.us/bookstore/viewbook.asp?stocknum=9-15>

U.S. Environmental Protection Agency, Office of Wetlands and Watersheds

<http://www.epa.gov/owow/wetlands/>

“Wetland Plants and Plant Communities of Minnesota and Wisconsin”:

<http://www.npwrc.usgs.gov/resource/1998/mnplant/mnplant.htm>

“Midwestern Ephemeral Wetlands” Brochure:

<http://herps.ipfw.edu/wetlands/ephemeral/brochure.pdf>