



Natural Resources Conservation Service
CONSERVATION PRACTICE STANDARD
WETLAND WILDLIFE HABITAT MANAGEMENT

CODE 644

(ac)

DEFINITION

Retaining, developing or managing wetland habitat for wetland wildlife.

PURPOSE

This practice is used to accomplish the following purpose:

- To maintain, develop, or improve wetland habitat for waterfowl, shorebirds, fur-bearers, or other wetland dependent or associated flora and fauna

CONDITIONS WHERE PRACTICE APPLIES

On or adjacent to wetlands, rivers, lakes and other water bodies where wetland associated wildlife habitat can be managed. This practice applies to natural wetlands and/or water bodies as well as wetlands that may have been previously restored NRCS Conservation Practice Standard (CPS) Wetland Restoration (Code 657), enhanced NRCS CPS Wetland Enhancement (Code 659), and created NRCS CPS Wetland Creation (Code 658).

CRITERIA

General Criteria Applicable to All Purposes

Disturbed areas will be vegetated according to a re-vegetation plan. Use CONSERVATION COVER (327) unless the area is subject to frequent overflows or spillway protection is needed, then CRITICAL AREA PLANTING (342) will be used. Native plants will be used whenever possible.

The landowner shall obtain all necessary local, state and federal permits that apply.

The habitat elements fulfilling the food and cover requirements for wildlife and their management must be identified in the management plan.

Application of this practice shall remove or reduce limiting factor(s) in their order of significance, as indicated by results of the habitat evaluation.

Application of this practice alone, or in combination with other supporting and facilitating practices, shall result in a conservation system that will enable the planning area to meet or exceed the minimum quality criteria for wildlife habitat established in Section III of the FOTG.

Identify wildlife species management goals and objectives. For the desired species, identify the types, amount and distribution of habitat elements and the management actions necessary to achieve the management objectives.

Native plants will be used wherever possible.

NRCS reviews and periodically updates conservation practice standards. To obtain the current version of this standard, contact your Natural Resources Conservation Service State office or visit the Field Office Technical Guide online by going to the NRCS website at <https://www.nrcs.usda.gov/> and type FOTG in the search field.

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Sites containing hazardous waste will be cleaned prior to the installation of this practice.

Invasive plant species and federally/state listed noxious and nuisance species shall be controlled on the site.

This standard does not attempt to list all possible wildlife habitat development and management practices. Other practices may be recommended by an NRCS Biologist or other technical wildlife agency.

Criteria For Species or Habitat Assessment

1. When the client's objective is a specific wildlife species, the following habitat criteria will be used:
 - a. A habitat index rating of >0.5 for the planned condition using the appropriate U.S. Fish and Wildlife Service HEP Species Model, or
 - b. The following general habitat requirements:

WATERFOWL

Types of waterfowl:

Dabbling Ducks (Teal, Mallard, Pintail etc)

A habitat index rating of > 0.5 for the planned condition using the reference "Evaluating Factors Limiting Dabbling Duck Production" (NRCS Biology Technical Note #5).

A maximum of 20% of the area will have water depths from 3-4 feet deep; 30% of the area 1.5 -3 feet deep, and the remainder in areas less than 1.5 feet deep. Side slopes will vary from 8:1 to 16:1. An irregular shoreline is preferred.

Ideally, water levels will be manipulated to achieve long term vegetation to open water mix of 50:50.

Refer to CONSERVATION COVER (327) for establishing nesting cover.

Avoid using chemicals near wetlands that could eliminate submerged aquatic plants or aquatic organisms important to waterfowl.

Refer to "NRCS Fish and Wildlife Habitat Management Guide sheet - Shallow Water Management for Dabbling Waterfowl" for additional information.

Diving Ducks (Canvasback, Redhead etc)

Brood Cover. Provide at least 1 wetland basin that is either semi-permanent or permanent wetland, with no more than 50% in emergent vegetation.

Nest Cover. Provide dense emergent vegetation or shrubby vegetation on seasonal and semi-permanent wetlands.

Avoid using chemicals near wetlands that could eliminate submerged aquatic plants or aquatic organisms important to waterfowl.

Cavity Nesting Ducks

Refer to "NRCS Fish and Wildlife Habitat Management Guide sheet - Wood Duck" for additional information.

SHOREBIRDS OR WADING BIRDS

Shorebirds feed predominantly on invertebrate chironomid larvae (blood worms) found on mud flats and very shallow water during the time of an early to midseason drawdown. Therefore, managed shallow water areas can be a very important source of food for shorebirds during their spring migration.

Managing a wetland complex to create different habitat types by drawdown and flooding increases the diversity of foods available to migrating and resident water birds. When this food diversity occurs within a wetland, several water bird guilds will use the area simultaneously.

A key to managing habitat for migrating shorebirds is to encourage invertebrate production and then make invertebrates available to the birds throughout the spring and summer/fall migratory periods. Delay cropping temporary and seasonal wetlands until mid June.

For many breeding shorebirds, landscape context of varying wetland complexes and habitats is important. Management of adjacent grasslands can create essential upland habitat for breeding shorebirds through practices such as prescribed grazing, mowing or prescribed burning.

Refer to “NRCS Fish and Wildlife Habitat Management Guide sheet - Shallow Water Management for Shorebirds” for additional information.

AMPHIBIANS AND REPTILES

Many species spend their adult life in terrestrial habitats but require aquatic habitats for breeding.

Amphibians and reptiles have small home ranges, thus appropriate terrestrial habitat and a diversity of wetland habitats of differing hydro periods must be available in relatively close proximity.

Water: A diversity of within wetland habitat conditions is important. A wetland with a diverse topography that supports a variety of mud flat, emergent and submergent vegetation zones can support abundant populations.

A maximum of 20% of the surface water area will have water depths from 3 to 5 feet deep, and at least 50% of the area will be less than 1.5 feet deep at design level.

Basking structures such as semi submerged logs, stumps and log piles at a rate of 5 per surface acre will be installed if needed.

Amphibians and reptiles are very sensitive to pesticides; therefore utilize grass FILTER STRIP (393) and PEST MANAGEMENT (595) practices.

Refer to “NRCS Fish and Wildlife Habitat Management Guide sheet Link- “Habitat Management for Amphibians and Reptiles of the Midwest” for additional information.

WETLAND FURBEARERS

A favorable land use pattern (within 80 acres) consisting of at least 5% of shallow emergent habitats, 5% of other undisturbed wetland habitats and the remainder in various land uses.

Key habitat needs include permanent water, dry banks for den sites and adequate winter habitats.

Water:

With Water Control Structure

Maintain water level at 6 to 12 inches during the growing season to encourage growth of emergent vegetation. Water depths may be increased to 3 feet to 5 feet in the fall and maintained at stable levels over winter.

Without Water Control Structure

At least 20% of the surface water area will have permanent water depths from 3 to 5 feet deep with the remainder of the area less than 3 feet deep at design level. Side slopes will vary from 3:1 to 16:1.

Refer to “NRCS Fish and Wildlife Habitat Management Guide sheet – Wetland Mammals” for additional information.

2. When the client’s objective is managing wetland habitat complexity, diversity and quality, a wetland habitat index rating of > 0.5 for the planned condition using the Minnesota Wildlife Habitat Evaluation System - WHES (NRCS Biology Technical Note #4), or an approved functional assessment evaluation will be used to assess wetland habitat.

Criteria For Development and Management of Wildlife Habitat

See the Federal, State and Local Laws section of this standard for information regarding permit requirements.

As indicated by the appropriate evaluation tool, certain elements may be weak or missing, including under represented wetland types or classes. Management or development of habitat to provide for, or strengthen the weak or missing elements, may be accomplished by the following conservation practices or measures.

- Retain and manage existing habitat of value or develop new habitat for the desired species.
- Establish or install appropriate habitat elements that are lacking through planting, construction, or other appropriate activities.
- Preserve habitats of special value as food, cover, or water.
- The plan must include the development, planting, or management required to maintain and/or improve the identified species habitat.

SHALLOW WATER DEVELOPMENT

Impoundment with Water Level Control

Generally, a site should be selected that maximizes the interspersion of habitat types for the greatest diversity of wildlife species. Consider the effects of the management objectives on non-target species including at risk species. Tradeoffs may have to be considered when deciding management objectives.

The developed area will be at least ten acres in size. Larger areas will afford efficient management and attract and hold more wetland wildlife species.

Various types of water control structures are available and should be selected based on the type of wetland developed and the level of management that is anticipated.

Because of the extreme importance of timing, consult with a NRCS, USFWS, or MDNR Biologist for a recommended plan before attempting a drawdown.

Water control structures should be of a size to pass normal summer water flow through the ponded area.

Impoundments will be designed according to the ENGINEERING FIELD HANDBOOK CHAPTERS 6 AND 13, and practice standards STRUCTURE FOR WATER CONTROL (587) and WETLAND RESTORATION (657).

CONTROL OF CATTAILS OR OTHER AQUATIC VEGETATION

Management guidelines are directed towards controlling cattails (*UTypha sppU.*) with the ultimate goal of providing food and cover for optimum production of wetland wildlife.

Emergent marshes provide winter cover for resident birds and mammals, particularly in the agricultural region of the state. Consideration must be given to local and regional winter habitat conditions before undertaking cattail control measures.

As a general rule, cattail control is only recommend in wetlands of shallow (<12") or intermediate (12"-30") depths, >20.0 acres in size, and are 90 -100% choked with cattails. Cattail control in any given wetland should be limited to 50% of the cattail acreage or less.

Control may be achieved through one or a combination of the following methods;

1. Water Level Manipulation - where possible, water level manipulation is the most effective method for controlling cattails. Flood cattails to a depth of 24"-30" throughout the growing season.
2. Biological (muskrats) - muskrats are an effective biological control; however their usefulness is limited to the intermediate zone. Shallow zones routinely freeze to the bottom excluding muskrat activity. Refer to the wetland furbearer section of this standard for management recommendations

3. Mechanical (cutting or crushing) - Cutting cattail stems below the water or on ice can be successful in both shallow and intermediate zones. Crushing and below water cutting should take place in late July. More permanent control is achieved when applied annually, or 3" - 6" of water is maintained over the cut/crushed stubble throughout the next growing season.
4. Herbicides - herbicides should be used as the method of last resort. Application may be difficult in the intermediate zone without specialized equipment. To optimize waterfowl use, flatten stems soon after they are dead. Always apply according to label directions.

These techniques should not be undertaken unless they are thoroughly evaluated by the landowner and guided by the local area wildlife manager. Also; biological, mechanical and chemical techniques can be applied with far superior results to wetlands which possess a water control structure.

Technique Applicability

Water Depth	Water Level	Biological	Mechanical	Herbicide
1 - 12"	x		x	x
12 - 30"	x	x	x	

In certain instances, intensive livestock grazing may be used to control cattails and other emergent wetland vegetation in the shallow zone. A detailed management plan is required.

For recommendations regarding control of other invasive aquatic species contact an NRCS Biologist or the MDNR Area Wildlife Manager.

ISLANDS

Islands can provide loafing, nesting and resting sites. New islands may be constructed, or existing islands managed to benefit migratory birds.

A. Constructed Islands

Island construction should be restricted to semi-permanent and permanent wetlands >10.0 acres in size providing an adequate season long open-water barrier to mammalian predators.

1) Nesting Islands

Nesting islands must be within 1.0 mile of a wetland complex containing both seasonal and semi-permanent wetlands.

Develop 1.0 acre of constructed islands per square mile of pothole habitat. Where sufficient habitat exists, construct 2-3 islands totaling 1.0 acre. Islands should be separated by at least 300 feet.

Nesting islands are not appropriate where the normal water depth exceeds 3-4 feet.

Nesting islands will be located a minimum 300'-400' from shore, and away from existing emergent vegetation.

Constructed islands shall have the following characteristics:

1. Islands should be built in an oval, kidney, or peanut shape with natural rounded outlines.
2. Island should be at least 15 feet in width, and the base shall be as high as the average water level and constructed with 10:1 side slopes.
3. The tops of each island should be at least 6 feet in width, rise 1-3 feet above the base and have 4:1 side slopes. Where moderate wave action is a concern, 6:1 or 8:1 side slopes are acceptable.
4. Fill shall be taken from the wetland immediately adjacent to the construction site or from an upland

borrow area. Excavated borrow areas in the wetland should be no more than 1-2 feet deeper than the wetland bottom and a 10:1 or gentler slope.

5. Topsoil should be removed from the borrow area and stockpiled for later use. Spread stockpiled topsoil 4-6 inches deep across the surface of the island.
6. Seed islands to nesting cover according to CONSERVATION COVER (327) and exclude livestock grazing.

2) Submerged Islands

Submerged islands provide visual breaks within the basin and shallow flats interspersing open water with vegetation providing additional cover.

Construct submerged islands that range 6"-18" below the anticipated water level. Dimensions and specifications shall follow those of nesting islands.

B. Existing Nesting Islands

If necessary, existing islands can be enhanced by revegetating to high quality nesting cover. See CONSERVATION COVER (327) for recommendations.

Remove tall shrubs or trees (>4 feet) by cutting or spraying with approved herbicides. Exclude livestock grazing.

ESTABLISHMENT OF ANNUAL VEGETATION

This practice addresses the establishment of annual (non-persistent) vegetation on temporary and seasonal wetlands. This practice is typically used to reduce soil erosion, reduce soil quality degradation, improve water quality and develop wildlife habitat as part of a habitat management system.

Often times this scenario is utilized to temporarily provide cover or forage while permanent vegetation is being established. Vegetation will be established utilizing conventional methods including disking, herbicide application and seeding. Fertilization will **NOT** be required.

Recommended Species	Full Drilled Rate/Acre	Full Broadcast Rate/Acre
Japanese Millet	20.0	25.0
Buckwheat	45.0	55.0
* Seeded individually at full seeding rate, or species may be mixed at on half of the full seeding rate		

WILD RICE SEEDING

A wild rice bed established through hand seeding on an appropriate site to benefit waterfowl and other wetland dependent wildlife. It is also fed upon by muskrats, deer and other herbivores. Wild rice beds can be important nursery areas for young fish and amphibians.

Apply this practice to wetland and open water habitats suitable to wild rice production that currently may support scattered individual wild rice plants, but does not support a wild rice bed. Care should be taken not to seed an area that has produced a crop in the past five years as a viable seed bank may exist.

Refer to Biology Job Sheet #14 - "Wild Rice Seeding Guidelines" for additional criteria and specifications

MANAGEMENT AND MONITORING

Site management will include managing/monitoring the site to provide food and cover for wetland wildlife species on cropland converted to permanent cover. Natural regeneration may be used if site conditions indicate that it can develop into a diverse native wetland plant community.

Federal, State and Local Laws

All wetland management activities including vegetation management shall comply with all federal, state, and local laws, rules or regulations governing wetland related activities.

The landowner or agent is responsible for securing all required permits before commencement of restoration or management activities.

This standard does not contain the text of the federal, state, or local laws governing wetland restoration. Contact the administering agency for requirements.

Interagency coordination of wetland project site selection, planning, and approvals early in the planning process are essential to meet the various requirements of technical and regulatory agencies.

CONSIDERATIONS

- Consider effects of management on non-target fish and wildlife species, including trout streams and Threatened and Endangered Species.
- Consider effects on downstream flows or aquifers that would affect other water uses or users.
- Establishing vegetative buffers on surrounding uplands can reduce the delivery of sediment and soluble and sediment-attached contaminants carried by runoff and/or wind.
- The nutrient and pesticide tolerance of the species planned should be considered where known nutrient and pesticide contamination exists.
- Consider effects on temperature of water resources to prevent undesired effects on aquatic and wildlife communities.
- Soil disturbance associated with the installation of this practice may increase the potential of invasion by unwanted species.
- Adding dead snags, tree trunks or logs can provide structure and cover for wildlife and serve as a carbon source for food chain support.
- For discharge wetlands, consider underground upslope water and/or groundwater source availability.
- When determining which species to plant, consider micro topography and different hydrology levels.
- Consider effects of management actions on compliance with state and federal hunting regulation (e.g., baiting).
- Water level draw-downs may increase the potential for turtle mortality.
- Consider effects of livestock grazing on runoff, infiltration, wetland vegetation and nesting success.
- Adding artificial nesting structures that are appropriate for the region can increase utilization of these areas.
- Locating this practice adjacent to existing wetlands and other water bodies will provide connectivity to these cover types.
- The improved habitat that results from the installation of this practice may lead to increased crop depredation by wildlife on adjacent cropland.
- Consider adjacent wetlands or water bodies that contribute to wetland system complexity and diversity, decrease habitat fragmentation, and maximize use by wetland-associated wildlife.

PLANS AND SPECIFICATIONS

Document how habitat needs will be provided for the desired kinds of wildlife:

- required depth of water during the different seasons;
- types and sizes of structures required;
- desired native plant species and the means of establishing and maintaining them.

Specific information may be provided using appropriate job sheets or written documentation in the conservation plan.

NRCS staff is encouraged to work closely with the NRCS Biologist, US Fish and Wildlife Service Biologist or MDNR Area Wildlife Manager in developing site specific plans and specifications. These documents are to specify the requirements for installing the practice, such as the kind, amount or quality of materials to be used, or the timing or sequence of installation activities.

OPERATION AND MAINTENANCE

A plan for operation and maintenance at a minimum should include monitoring and management of structural and vegetative measures.

Haying and livestock grazing plans, if haying or livestock grazing is used as a needed wildlife management tool, will be developed to allow the establishment, development and management of wetland and associated upland vegetation for the intended wetland and/or wildlife purpose.

Biological control of undesirable plant species and pests (e.g., using predator or parasitic species) shall be implemented where available and feasible.

Added water depth and duration may be utilized as a method to control unwanted vegetation (e.g., reed canary grass).

The following activities will be addressed in the plan:

1. timing and level setting of water control structures required for establishment of desired hydrologic conditions or for management of vegetation;
2. inspection schedule of embankments and structures for damage assessment;
3. depth of sediment accumulation allowed before removal is required;
4. management needed to maintain vegetation, including control of unwanted vegetation; and
5. acceptable uses and timing (e.g., grazing and haying)

REFERENCES

Beule, John D. 1979. Control and Management of Cattails in Southeastern Wisconsin Wetlands. Technical Bulletin No. 112. Department of Natural Resources. Madison WI. 39 pp.

Eldridge, Jan. 1990. Management of Habitat for Breeding and Migrating Shorebirds in the Midwest, 13.2.14 Fish and Wildlife Leaflet 13, Waterfowl Management Handbook. U.S. Fish and Wildlife Service. Washington D.C. 6 pp.

Fredrickson, Leigh H. 1991. Strategies for Water Level Manipulations in Moist-soil Systems, 13.4.6 Fish and Wildlife Leaflet 13, Waterfowl Management Handbook. U.S. Fish and Wildlife Service. Washington D.C. 8 pp.

Fredrickson, Leigh H. and Frederic A. Reid. 1988. Waterfowl Use of Wetland Complexes, 13.2.1 Fish and Wildlife Leaflet 13, Waterfowl Management Handbook. U.S. Fish and Wildlife Service. Washington D.C. 6 pp.

Fredrickson, Leigh H, and Taylor, T.S. 1982. Management of Seasonally Flooded Impoundments for Wildlife. Resource Publication 148, US Fish and Wildlife Service, Washington D.C. 29 pp.

Helmets, D.L., 1992. Shorebird Management Manual. Western Hemisphere Shorebird Reserve Network, Manomet, MA. 58 pp.

Knighton, M.D. 1985. Water Impoundments For Wildlife: a Habitat Management Workshop. Gen. Tech. Rep. NC-100. North Central Forest Experiment Station. 136 pp.

Lokemoen, John T. and Terry A. Messmer. 1994. Locating, Constructing and Managing Islands for Nesting Waterfowl. USFWS, Branch of Extension and Publications, Arlington VA., and the Berryman Institute, Logan UT. 20pp.

Ringelman, James K. 1990. Managing Agricultural Foods for Waterfowl, 13.4.3 Fish and Wildlife Leaflet 13, Waterfowl Management Handbook. U.S. Fish and Wildlife Service. Washington D.C. 4 pp.

USDA, NRCS. Wetland Protection Policy. General Manual, Title 190, Part 410 NEPA and Related Environmental Concerns.

USDA-NRCS. 2000. Fish and Wildlife Habitat Management Guide sheets. St. Paul, MN.
Uwww.mn.nrcs.usda.gov/wild/guide.html.

USFWS. 1988. Waterfowl Management Handbook. Fish and Wildlife Leaflet 13. Washington, DC.

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