

**NATURAL RESOURCES CONSERVATION SERVICE**  
**CONSERVATION PRACTICE STANDARD**  
**AQUACULTURE PONDS**

(Ac.)

**CODE 397**



**DEFINITION**

A water impoundment constructed and managed for farming of freshwater and saltwater organisms including fish, mollusks, crustaceans and aquatic plants.

**PURPOSE**

To provide a favorable aquatic environment for producing, growing, and harvesting aquaculture crops.

**CONDITIONS WHERE PRACTICE APPLIES**

This practice applies to all impoundments that store water and are managed for commercial aquaculture purposes.

**CRITERIA**

**General Criteria.** Aquaculture ponds shall meet the requirements of all Federal, State, and local laws, rules, or regulations. Any required permits will be obtained prior to construction and stocking. In particular, requirements for Rule 5L-3, Florida Administrative Code (F.A.C.) and Florida Department of Agriculture and Consumer Services (FDACS) Aquaculture Best Management Practices Rules will be met.

Impact to cultural resources, wetlands and Federal and state protected species shall be evaluated and avoided or minimized to the extent practicable during planning, design and implementation of this conservation practice in accordance with established National and Florida policy, General Manual (GM) Title 420-Part 401; Title 450-Part 401, Title 190-Parts 410.22 and 410.26, National Planning Procedures Handbook (NPPH) Florida Supplements to Parts 600.1 and 600.6, National Cultural Resources Procedures Handbook (NCRPH), National Food Security Act Manual (NFSAM), and the National Environmental Compliance Handbook (NECH).

A thorough aquaculture resource assessment shall be made to determine the feasibility of the project prior to design.

Aquaculture ponds may be: (1) embankment ponds that intercept and store surface runoff water, or (2) off-channel impoundments or excavated ponds that are filled by pumping ground water or diverting surface runoff.

The site must be protected from flooding, sedimentation, and non-sediment contamination. For restricted non-native species, the aquaculture pond shall be protected to a level at least one foot above the 100-year flood elevation. For all other aquaculture ponds constructed within the 100-year flood zone, FDACS Division of Aquaculture should be contacted for approval of the facility plan prior to design and construction. For a list of restricted non-native species, see Rule 68A-23.008(2)(a) F.A.C. All ponds shall be designed to prevent the escape of restricted non-native species to downstream waters.

The soils within the pond area, as well as those in the contributing drainage area, must be checked for residues of pesticides and other

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service.

harmful chemicals if there is any possibility of contamination.

Acid soils within the pond area shall be limed to achieve a neutral condition or the desired pH level for best production.

When multiple ponds are installed, each pond shall be arranged so that it can be managed independently of the others to facilitate harvesting and the control of parasites and disease.

All ponds shall be designed to prevent the escape of non-native or otherwise harmful species to adjacent surface water bodies especially downstream and upstream of streams and rivers.

**Water supply.** Any available water source may be used if the quality and quantity are adequate. A consumptive use permit shall be obtained, if required, prior to construction.

If water is pumped from rivers and streams or other sources where undesirable fish, pesticide residue, fish disease, and parasites may be introduced, filters must be installed in the pumping system.

Evaporation rates, fish-stocking densities, and cultured species requirements shall be used in establishing required incoming flow rates.

**Water quality.** Water entering the pond shall be aerated to increase dissolved oxygen and dissipate harmful gases, if needed. The minimum dissolved oxygen level in ponds is 3 to 5 parts per million. Supplemental aeration within the aquaculture pond shall be included, as necessary to maintain desired dissolved oxygen.

Water temperature and water chemistry shall be suitable to meet the species requirements and the planned production level.

Incoming water shall be added as far away from outlet drain as possible to prevent the rapid removal of fresh water from the pond.

Provide for the collection, harvest and utilization of wastes from the cultured organisms.

Provisions shall be made for any needed treatment of water released downstream from the aquaculture impoundment structure. Production water discharged will be treated in accordance with the Florida Department of Agriculture and Consumer Services, Division of Aquaculture, *Aquaculture Best Management Practices Manual*.

#### **Design Criteria - Embankment Ponds.**

Earthfill dams and embankments shall meet or exceed the requirements for embankments specified in Florida NRCS conservation practice standard Pond, Code 378.

The minimum top width of the embankment shall be 14 feet, where it is to be used as a road for harvesting, feeding, and management purposes and is nonpublic.

**Design Criteria - Excavated Ponds.** Ponds established by excavating and constructing an embankment around their outer perimeter that excludes outside runoff shall have either an auxiliary spillway or have a principal spillway pipe installed with sufficient capacity to remove a 10-year-24-hour direct rainfall amount in 48 hours or less. A minimum 8-inch diameter pipe shall be used.

Embankment construction shall include the required embankment settlement to the minimum freeboard requirements. A minimum berm width of 10 feet shall be provided between the outside toe of dike and top of bank of the outlet drainage ditch.

**Pipes and conduits.** Pump discharge through embankments shall be installed above the expected high water level, and provisions shall be made to prevent pump and motor vibrations from being transmitted to discharge conduits.

Interior embankments constructed for division of water or to direct water flow for circulation shall have adequate cross section to ensure stability and function for its intended purpose.

Adequate provisions must be made to protect earth surfaces from turbulent water at pipe inlets and outlets.

**Pond size and depth.** The pond shall be constructed to the recommended size and depth for the species to be grown.

**Drains.** All ponds shall have facilities for complete as well as partial drawdown. Turn-down pipes, quick-release valves, bottom-water release sleeves, pumps or other devices for water level control and pond management are to be included in the design and construction of the impoundment. Conduit design and seepage control shall meet or exceed the requirements specified in Florida NRCS conservation practice standard Pond, Code 378.

**Pond bottom.** Where organisms are harvested by seining, the pond bottom shall be smooth and free of all stumps, trees, roots, and other debris.

Existing channels and depressions in the pond area shall be filled and smoothed. The edges of the pond should be deepened to provide at least 3 feet of water.

Where crawfish are harvested by trapping, complete clearing and removal of trees, stumps, and other vegetation is not required.

The pond bottom shall be sloped to the outlet at a gradient of at least 0.2 foot per 100 feet.

**Access and safety.** Provisions shall be made for access to the site as well as access for operation and maintenance. Ramps shall have a grade for equipment access of 4 horizontal to 1 vertical (4:1) or flatter.

Appropriate safety features shall be made available nearby to aid people who may fall into the pond and devices installed to prevent such accidents.

Fences shall be installed as necessary to exclude livestock and unwanted traffic.

**Vegetative cover.** A protective cover of vegetation shall be established on all exposed soil surfaces that have been disturbed in accordance with Florida NRCS conservation practice standard Critical Area Planting, Code 342. If soil or climatic conditions preclude the use of vegetation, other protection methods shall be used.

## CONSIDERATIONS

The Florida Department of Agriculture and Consumer Services, Division of Aquaculture, or the Institute of Food and Agricultural Sciences should be consulted for recommendation on pond size, water depths, and adapted commercial aquatic species.

Consider any adverse impact to cultural resources when planning for aquaculture ponds.

The visual design of ponds should be carefully considered in areas of high public visibility and those associated with recreational fishing.

Consider the effects on water quality and on the volume of downstream flow or aquifers that might cause undesirable environmental, social, or economic effects and contribute to water table decline from pumping groundwater or diverting surface flows.

Consider downstream impacts resulting from potential flooding or breach of the ponds impoundment on federal and state protected species. Evaluations should include impacts

from discharge of water, sedimentation, and escape of non-native species.

Measures to avoid depredation by birds or other animals should be included in the design.

## PLANS AND SPECIFICATIONS

Plans and specifications for constructing aquaculture ponds shall be in keeping with this standard and shall describe the site specific requirements for applying the practice to achieve its intended purpose.

As a minimum the plans and specifications shall include, but not limited to, the following items:

- A site location map with topographic information.
- Typical cross sections of the pond(s) showing the elevations and dimensions.
- Structure size, location, material type, and elevations.
- Disposal of any excess excavated material.
- Location and type of fence, if required.
- Areas to be vegetated and vegetative requirements.

## OPERATION AND MAINTENANCE

A site specific operation and maintenance (O&M) plan shall be prepared and reviewed with those responsible for the system. The O&M plan shall provide for inspection, operation, and maintenance of vegetation, pipes, valves, spillways, roads, and other parts of the system.

The pond(s) should be inspected periodically and especially after heavy rains to determine whether it is functioning properly or if repairs are needed. Embankments should be inspected for erosion. Rills shall be filled with suitable material, compacted, seeded and fertilized as needed.

Appurtenances such as trashracks, outlet structures, and valves shall be kept free of trash and replaced when needed.

The vegetative cover of the embankment and earth spillway shall be maintained by mowing and fertilizing or burning when needed. Trees can cause leaks and safety hazards and should not be permitted on the embankment or in the auxiliary spillway.

## REFERENCES

- Florida Administrative Code
  - Rule 5L-3
  - Rule 68A-23.008(2)(a)
- Florida Department of Agriculture and Consumer Services, Division of Aquaculture,  
*Aquaculture Best Management Practices Manual.*
- Florida NRCS Conservation Practice Standards
  - Critical Area Planting, Code 342
  - Pond, Code 378
- General Manual
  - Title 420-Part 401
  - Title 450-Part 401
  - Title 190-Parts 410.22 and 410.26
- National Cultural Resources Handbook
- National Environmental Compliance Handbook
- National Food Security Act Manual
- National Planning Procedures Handbook
  - Florida Supplements to Parts 600.1 and 600.6