

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD**

AQUACULTURE PONDS

**(Ac.)
CODE 397**

DEFINITION

A water impoundment constructed and managed for commercial aquaculture production.

PURPOSE

Provide a favorable aquatic environment for producing, growing, harvesting, and marketing commercial aquaculture crops.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to:

- All impoundments that store water and are managed for commercial aquaculture purposes.
- Embankment impoundments that do not exceed the requirements for Class (a) dams having a product of storage times effective height of dam less than 3,000 acre-ft² and effective height of dam less than 35 feet, as defined in conservation practice standard 378, Pond.

CRITERIA

General Criteria

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 spring or stream flows.

The site must be protected from flooding, sedimentation, and non-sediment contamination.

The soils within the pond area, as well as those in the contributing drainage area, must be checked for residues of pesticides and other harmful chemicals if there is any possibility of contamination.

Acid soils 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 minimize the escape of fishery species to upstream and downstream waters.

A protective cover of vegetation shall be established on all exposed soil surfaces that have been disturbed. If soil or climatic conditions preclude the use of vegetation, other protection methods shall be used.

All federal, State and local regulations will be followed and necessary permits will be obtained prior to construction and stocking.

Water supply. Any available water source may be used if the quality and quantity are adequate. 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 species requirements shall be used in establishing specific 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.

Water temperature and water chemistry shall be suitable for use for fish-stocking density and species requirements in the planned aquaculture production. Water quality requirements for trout and catfish are shown in Table 1.

Table 1 – Water quality requirements

Quality parameter		Species	
		Trout	Catfish
Dissolved oxygen	Desirable	8 ppm or >	5 ppm or >
	Minimum	5 ppm	3 ppm
Temperature	Desirable	12.8 - 17.8 °C (55 - 64 °F)	23.9 - 28.9 °C (75 - 84 °F)
	Minimum/ maximum	7.2/21.1 °C (45/70 °F)	15.5/32.2 °C (60/85 °F)
pH	Desirable	7.0 – 8.5	7.0 – 8.5
	Minimum/ maximum	6.5/9.0	6.5/9.0
Hardness	Desirable	> 50 ppm	20-200 ppm
Salinity	Desirable		<5000 ppm
Carbon dioxide	Desirable	2 ppm or <	5 ppm or <
	Minimum*/ maximum	0/3 ppm	0/10 ppm

*Toxicity varies with dissolved oxygen concentration and temperature

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

Provisions shall be made for any needed treatment of water released downstream from the aquaculture impoundment structure.

Design Criteria – Embankment Ponds.

Earthfill dams and embankments around

excavated ponds shall meet or exceed the requirements for embankments specified in Conservation Practice Standard, Pond, 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 a principal spillway pipe installed with sufficient capacity to remove a 10-year/24-hour direct rainfall amount in 48 hours. A minimum 8-inch diameter pipe shall be used.

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

Pipes and conduits. Pump discharge through levees shall be installed above 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, or other devices for water level control and pond management are to be included in the construction of the drawdown facility as appropriate. Conduit design and seepage control shall meet or exceed the requirements specified for Conservation Practice Standard, Pond, 378.

Pond bottom. Where fish 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. The access ramps, if provided, shall have a grade for equipment access of 4 horizontal to 1 vertical 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.

CONSIDERATIONS

Contact the State of Idaho Fish and Game or appropriate State University or research institution for recommendation on pond size, water depths, and adapted commercial aquatic species.

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

Other planning considerations include the following:

- 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 the volume of downstream flow or aquifers that might cause undesirable environmental, social, or economic effects and contribute to water table decline from heavy pumping.
- 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.

OPERATION AND MAINTENANCE

A plan for operation and maintenance shall be prepared for use by those responsible for the system. This plan shall provide for inspection, operation, and maintenance of vegetation, pipes, valves, spillways, roads, and other parts of the system.