

Aquaculture

Interim Guide to Regulations Affecting Aquaculture Production in Delaware

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Knowing the regulations affecting aquaculture production in Delaware is a critical step for anyone interested in starting an aquaculture operation in the state. This guide is intended to serve as an *introduction* to regulations that may affect the siting, design, and operation of aquaculture production systems in Delaware. It is intended to serve only as an interim guide because aquaculture is new to Delaware. Land, water, pollution, and fisheries regulations, in general, were not written with aquaculture in mind, and the relationship between aquaculture systems and the regulated activity may not be fully understood. Since aquaculture is in the early stages of development in Delaware, evolving interpretations or clarifications of existing regulations and the adoption of new regulations that more specifically address the cultivation, production, and marketing of marine and aquatic plants and animals will require periodic updates to these guidelines.

In July 1990, Governor Castle signed the Delaware Aquaculture Act into law (Title 3, *Del. Code*, Chapter 4). One of the act's provisions was to create the Delaware Aquaculture Advisory Council to examine the impact of current laws and regulations affecting the aquaculture industry. The council's task is to "recommend methods to simplify the regulatory processes or otherwise enhance the regulatory climate with respect to the efficient siting and operation of aquaculture operations." In the meantime, however, you may need to obtain permits from a variety of agencies, which may have different goals and operating procedures.

Since regulations about natural resource use and environmental protection are the ones most likely to affect what you do, or how you can do it, the following discussion and summary of these regulations may be helpful to review and evaluate before you get too far into the planning stage.

These laws and policies are designed to protect or manage resources like fish and wildlife, soil, water supply, wetlands, and coastal areas. If you intend to raise crawfish in a small, upland farm pond, few regulations above and beyond those associated with typical agricultural activity will affect your operations. If, however, you intend to raise hybrid striped bass in excavated ponds that discharge into "waters of the state," you should be prepared to spend months obtaining permits.

Delaware's natural resource regulations and policies are administered by the Department of Natural Resources and Environmental

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Control (DNREC). Agency representatives are accessible by phone or by appointment and can provide you with detailed information about their regulatory programs. The program staff are often aware of natural resource regulations administered at the federal level and can refer you to the appropriate agency if your project requires federal permits or consultation with federal agencies.

Several categories of permits and regulations have not been included in this guide. County and municipal zoning regulations have not been addressed, but will certainly need to be considered in the siting, construction, and operation of an aquaculture project. Check with local planning offices for applicable requirements for your specific project.

The guide, likewise, does not address food or drug safety issues. Because of the potential threat of chemical contamination or pharmaceutical residues in food fish, herbicides, pesticides, and the use of therapeutic drugs in feeds, is carefully controlled by the federal government. The Food and Drug Administration's (FDA) drug approval process is lengthy and expensive. Currently, there are few

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approved therapeutic drugs for aquatic species. Check with a reputable aquaculture supplier, the EPA (pesticides), or FDA (drug use).

Finally, this guide does not specifically address the natural resource regulations of neighboring states. Fish and wildlife regulations, such as minimum size or possession of certain fish and shellfish, may affect your ability to transport or market your product in surrounding states. Check with the appropriate state's resource agency or aquaculture coordinator before finalizing your marketing plan.

Development Advisory Service

The Development Advisory Service (DAS) was established by DNREC to cut red tape for people seeking information about environmental permit requirements. The DAS is comprised of representatives of DNREC, the Department of Health and Social Services, the Department of State, the Department of Agriculture, the Delaware Development Office, and other state agencies. Officials representing these agencies can help you identify environmental permits that may be required for your aquaculture projects.

The DAS can advise applicants of permit requirements, standards, and procedures, as well as refer parties to appropriate federal, state, and local agencies. For further assistance, consult with DAS after you have developed an initial plan, but before you are financially or emotionally committed—doing so can minimize frustration and save time and money. Contact the DAS secretary to make an appointment with DAS members at their regularly scheduled meeting on the first Thursday of each month.

Regulations Affecting Aquaculture

The following statutes and regulations deserve special attention early in the planning process. They have been identified in the *Delaware Aquaculture Task Force Final Report* and by others associated with the aquaculture industry as potential roadblocks to aquaculturists because they were not developed specifically with aquaculture in mind. These points of concern should be considered in selecting the fish species, site, and type of production system.

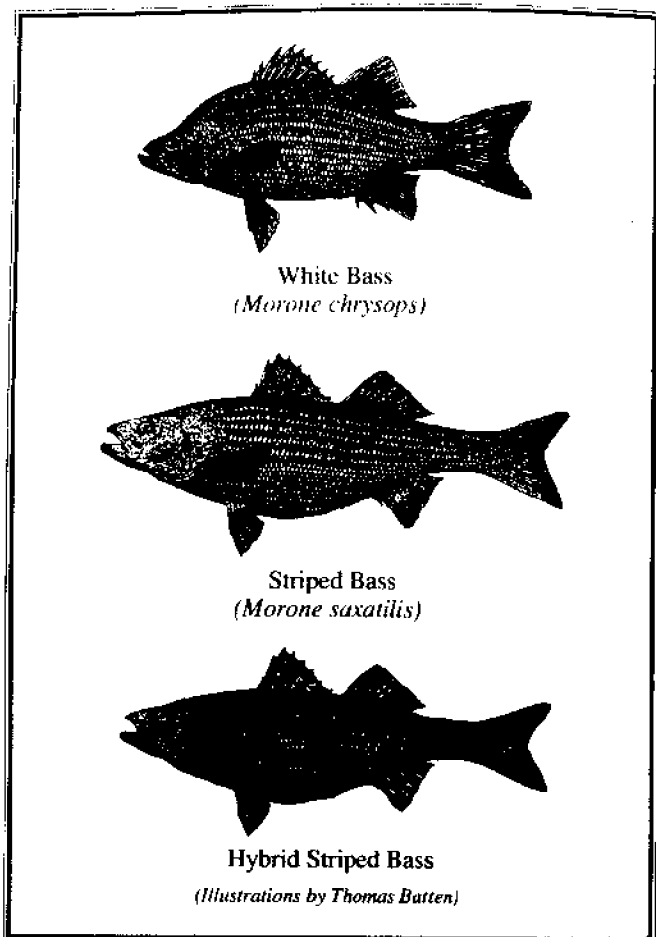
Fish and Wildlife

Unlike other forms of animal husbandry where domesticated brood stock has been developed and maintained for decades or centuries, many forms of fish culture still must rely on the capture of wild fish for brood stock. The lack of domesticated brood stock and the resulting confusion in identifying wild versus cultured fish subject aquaculturists to another set of regulations—those governing fish and wildlife conservation and management.

State and federal fish and wildlife laws and regulations are designed to protect native fish, shellfish, and other wildlife from human impact, including overharvesting, pollution, introduction of disease, and competition for food and habitat from non-native species.

In Delaware, the Division of Fish and Wildlife in DNREC enforces laws and regulations, through size and catch limits and other safeguards, to manage recreationally and commercially important fish and shellfish. Some of these laws and regulations, when applied to aquaculture, may not make sense from a producer's point of view, but the laws were written to protect wild fish. A permit is required from the Division of Fish and Wildlife to take and/or possess any game fish or food fish that otherwise would be illegal to take or possess.

For example, a moratorium on the taking of striped bass, or rockfish, was imposed in Delaware in 1984, until it was lifted to allow a limited catch in 1990. Rockfish have been the basis of important commercial and recreational fisheries for many years, and the recovery of native stocks is a very high priority for fishery managers, as



well as the public. Consequently, there are regulations that address possession limits, minimum size, closed seasons, and area restrictions. Delaware's neighboring states have similar restrictions.

If you grow and sell striped bass, you "muddy the picture" for fisheries managers and enforcement agents who may not be able to determine if the fish introduced into the market are farm-raised or have been taken illegally from Delaware state waters. While this problem is certainly not insurmountable, fishery managers do have a stake in knowing where fish come from. You will be required to develop safeguards, such as labeling or producing adequate "paper trails," to ensure that your fish are not confused with wild fish and do not mislead or misinform seafood consumers. In addition, if you are transporting live fish, either to stock ponds or to market, you may be required to certify that the fish are disease-free. If you stock non-native fish, you will need to ensure that they cannot escape and interbreed or compete with wild fish.

A very similar fish, the hybrid striped bass, is treated very differently from the striped bass under the law. The hybrid striped bass, resulting from the cross-fertilization of a striped bass female and a white bass male (see illustrations above), is believed to be the most promising candidate for intensive fish culture in the Mid-Atlantic region. Hybrid striped bass are also a prized sport fish and many state fish and wildlife agencies, including DNREC, have stocked them in lakes. In Delaware, hybrid striped bass are considered game fish, and, by law, game fish cannot be sold, except by permit from the Division of Fish and Wildlife. In addition, unlike some hybrids, hybrid striped bass are not necessarily sterile. This raises the concern that, without proper safeguards, the fish could escape into state waters and breed with the native striped bass, potentially affecting the genetic viability of these fish



Skip Bason, of Delmarva Aquatics, removes a young hybrid striped bass from a pond near Taylors Bridge to measure its growth. The hybrid striped bass is believed to be the most promising candidate for intensive fish culture in the Mid-Atlantic region. In Delaware, hybrid striped bass are considered game fish, and, by law, game fish cannot be sold, except by permit from the Division of Fish and Wildlife. Photo by Tracey Bryant.

stocks. As with striped bass, there is concern that illegally caught hybrids will be sold as aquaculture products.

Another area of concern for fishery managers is the introduction of non-native, potentially harmful species to state waters. Inadvertent and purposeful introduction of non-native species have been both successful and tragic. For example, the striped bass from the East Coast was introduced to the West Coast, where it is now a popular game fish. In the Great Lakes, the introduction of several Pacific salmon species has provided a recreational fishery that gives a strong boost to local economies. On the other hand, the opening of the Welland Canal, between Lake Ontario and Lake Erie, allowed the sea lamprey to get into the Great Lakes, where it decimated the lake trout population. And introductions of grass carp have destroyed aquatic vegetation in entire lake systems.

All of this suggests that even though some of the fish and wildlife regulations may prove to be burdensome, they do have a basis in fisheries management. No resource manager wants to be the one who "lets the cat out of the bag." If you intend to grow fish or shellfish that are protected by fish and wildlife regulations, the burden of proof will rest with you to show that you have adequately addressed the points of concern raised by fishery managers. Until aquaculture becomes more established in Delaware and a system of safeguards for it is developed, you will need to work closely and cooperatively with fishery managers to alleviate their concerns.

Aquaculture Facility Wastewater Discharges

The State of Delaware also regulates wastewater discharges into local streams and other state waters through the National Pollution Discharge Elimination System (NPDES) program. Permits are usually not necessary for closed ponds that discharge into local surface waters only during periods of excess runoff, unless water-quality impact is anticipated.

If, however, you intend to discharge wastewater from your aquaculture facility directly into surface waters of the state, you may be required to obtain an NPDES permit. Aquaculture facility discharges may contain suspended solids or excess nutrients, cause increased biological oxygen demand (BOD), or altered pH and temperature, all of which can affect the ability of the water body to maintain ecological balance.

Small operators may be exempt from the NPDES permit, but in general, if your facility exceeds the limits in the categories below and you discharge into surface waters, you *will* need a permit:

1. Cold-water fish species, such as salmon or trout, in ponds, raceways, or other similar structures that discharge at least 30 days per year and produce more than 20,000 pounds of aquatic animals per year and are fed more than 5,000 pounds of food during the calendar month of maximum feeding.
2. Warm-water fish species, such as catfish, minnows, striped bass, and other warm-water animals, in ponds, raceways, or other similar structures that discharge at least 30 days per year and produce more than 100,000 pounds of aquatic animals per year.¹

Permit limits are set to meet certain water-quality standards outlined in "State of Delaware Surface Water Quality Standards," as amended February 2, 1990, and state technology standards outlined in "Regulations Governing the Control of Water Pollution." Check with DNREC staff to review these documents.

If you intend to discharge into water bodies that have been designated as having exceptional recreational or ecological significance (called "ERES waters"), such as Rehoboth or Indian River bays, strict limits will be placed on your discharge. You will be encouraged to consider such alternatives as spray irrigation.

Permit processing can take months, so if you think you will need a discharge permit, contact DNREC's Water Pollution Control Branch as soon as you know what you intend to do.

Site Selection

The location of your site is a critical element in determining how regulations will affect your project. Federal, state, and local regulations may all affect what you can do, so before you invest too much time and money, make sure the regulatory hurdles can be overcome without undermining the project's integrity or economic feasibility.

If your proposed project will be located on an upland site zoned for agriculture, it's unlikely that site-specific regulations will impede or prohibit aquaculture activities. If, however, your proposed site is located in tidal or freshwater wetlands, public or private subaqueous lands, "waters of the state," the coastal zone, or near potential or known archaeological sites, you may be subject to a variety of regulations, multiple permits, and public hearings. The review and permit process could take months. Be prepared to allow for this when you develop a business plan. Unforeseen delays can be costly.

Wetlands

Recent changes in wetland regulations have been particularly confusing and controversial. Once regarded as worthless swamps unless filled for shopping malls and airports, wetlands are now recognized as valuable resources. They serve as water storage areas

¹ *Federal Register* (40 CFR, Chapter 1, Section 122.24).

during floods or heavy rains; improve water quality by filtering or absorbing waterborne sediments, excess nutrients, and toxic compounds; and provide valuable fish and wildlife habitat. Wetlands include not only easily recognizable areas such as salt marshes, cattail marshes, bogs, and ponds, but also wet meadows and forested wetlands. Much of Sussex County was once wetland that, over the years, was converted to farmland by ditching and draining. Some farmers believe their low-lying acreage that is relatively unproductive for conventional agriculture might be ideal for aquaculture ponds, thereby diversifying their farm operation, but still allowing the wetlands to retain important functions.

Wetlands are broadly classified as either tidal or freshwater. Both are provided protection under the law. In Delaware, tidal wetlands are regulated by the state and by the U.S. Army Corps of Engineers. Any activity such as filling, dredging, crossing with a road, or placing of a structure in tidal wetlands requires a permit from DNREC, and most activities will also require a permit from the Corps of Engineers under Section 10, Rivers and Harbors Act, and Section 404, Clean Water Act.

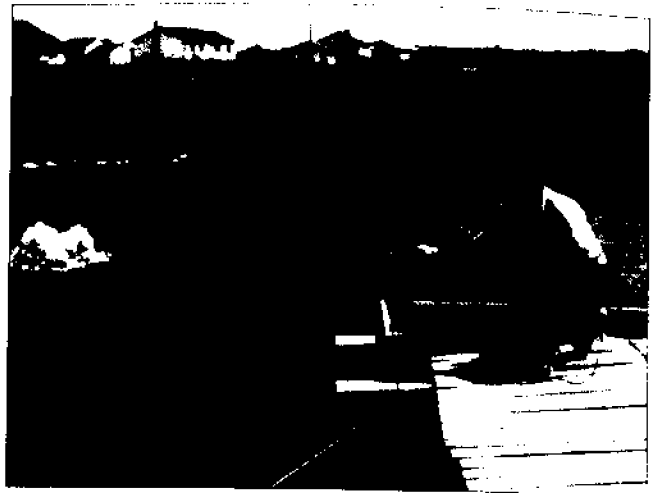
The Corps of Engineers also regulates freshwater wetlands by permit under Section 404 of the Clean Water Act and herein lies most of the controversy. The definition and delineation of some types of freshwater wetlands can be very difficult and has been the source of scientific as well as political debate. The four federal agencies involved in wetland protection and regulation (EPA, Corps of Engineers, U.S. Fish and Wildlife Service, and U.S. Department of Agriculture Soil Conservation Service) agreed on an approach in 1989 using the *Federal Manual for Identifying and Delineating Jurisdictional Wetlands*. The manual, however, has undergone a great deal of review and criticism from all sides. A three-parameter approach that evaluates wetlands by the presence of hydric (very moist) soils, aquatic or hydrophytic plants, and hydrology is used. While the general approach is agreed upon, the definitions are currently undergoing revision and field testing. A revised manual is expected to be available some time in 1992.

The placement of dredged or fill material is strictly controlled under the 404 program and while this would not seem to be of great concern to someone whose intent is to excavate a pond, there is a catch. Construction of a properly contoured production pond generally requires the use of excavation equipment, such as a bulldozer or dragline, that moves fill within the site. Even though the ultimate purpose is to excavate, the intermediate steps of moving and leveling soil may be a violation of Section 404 unless a permit is obtained. In addition, the design of a single production pond or a series of them may not follow the contour of a natural wetland. Any placement of fill for levees or banks in a wetland will require a 404 permit. Moving fill off-site is generally not economical. If, however, you intend to move fill off-site, check with DNREC and county officials for extractive-use regulations, ordinances, and permits.

If you anticipate that your ponds will be within or adjacent to freshwater wetlands, you may be able to obtain preliminary guidance through the local Soil Conservation Service office or the DNREC Wetlands and Aquatic Protection Branch, which have National Wetland Inventory Maps and County Soil Survey Maps.

If you do require a 404 permit, a detailed description of the proposed project is required. You may also need to obtain the services of a consultant specializing in wetland identification. Be prepared—the process will take months.

The State of Delaware currently does not have freshwater wetlands regulations, but some type of protective legislation will probably be enacted in the near future. The intent of the legislation, as currently proposed, would be to fill the gaps of wetland protection not covered by the 404 permit program, provide greater protection to more valuable wetlands, and transfer authority for protecting Delaware's freshwater wetlands from federal to state hands.



John Ewart, aquaculture specialist for the University of Delaware Sea Grant Marine Advisory Service, monitors the water quality of a small fish production pond near Middletown, Delaware. Photo by Tracey Bryant.

Historic Preservation

Section 106 of the National Historic Preservation Act (NHPA) requires federal agencies to take into account the effects of their activities on historic resources. Any project that has the potential to adversely affect any historic property, building, district, object, structure, or archaeological site listed or eligible to be listed in the National Register of Historic Places is subject to this review process.

If your proposed aquaculture project requires federal intervention, compliance with the NHPA is required. Federal intervention can include federal permit applications, federal reviews or technical assistance, and cost sharing from federal agencies. So if you need an NPDES permit to discharge water, or an Army Corps of Engineers permit for activity in freshwater wetlands, or you receive technical assistance from the Soil Conservation Service on pond construction, you are subject to the Section 106 review.

Of particular concern to aquaculturists in Delaware is disturbance of sites with archaeological significance. Many of Delaware's early settlers, both native American and European, chose well-drained sites near streams, and these camps, homesteads, etc., may reveal important information about their cultures and our heritage. These locations also may be good potential sites for aquaculture facilities.

If you anticipate federal agency involvement and you intend to excavate ponds, you may wish to consult with the federal agency involved or the State Historic Preservation Officer (SHPO), with the Bureau of Archaeology and Historic Preservation, as soon as you have selected your project site. The SHPO can provide you with the full details of the historic preservation review process. If your site appears to meet eligibility criteria for a historic property, additional survey work may be required, at your expense. If your project site is found to meet National Register criteria and is identified as a historic property, a judgment of the effect of your proposed project is made by the federal agency and the SHPO.

Since excavation of ponds tends to have adverse effects on archaeological sites, you will need to consult with the agency and the SHPO. You may be required to mitigate any harmful effects of your project if you decide to continue as proposed.

Section 106 requires completion of the review prior to the expenditure of federal funds or prior to the issuance of any license or permit.

Summary of Regulations and Permits

The following list describes regulations and permits that may be needed by those considering an aquaculture project. Some of these permits may not be applicable to your proposed project. You should consult with each agency for its interpretation of the regulation with respect to your project or take advantage of the "one-stop shopping" provided by the Development Advisory Service. The more details you can provide about your project, the more accurately agency staff can assess the applicability of the regulations to your project. Contacting agencies early in the process will confirm how much documentation is required. With some revisions, the list below was developed by the Delaware Aquaculture Task Force Regulatory Subcommittee. It is an initial attempt to develop a comprehensive list of environmental regulations. Depending on your particular circumstances, additional permits may be necessary. Don't wait until the last minute. Anticipate delays. Also, don't forget to obtain a business license and to make sure you conform to local zoning ordinances. Check with the State Division of Revenue and your county and city zoning offices.

State Permits

The following are permits that may be required by DNREC for aquaculture projects in the state. All statutory references are from the *Delaware Code Annotated*, Vol. 4—1991 Replacement Volume (Charlottesville, VA: Michie Company Law Publishers, 1991).

1. Sediment and Stormwater Management. *Issuing Agency:* DNREC, Division of Soil & Water Conservation. *Phone:* (302) 739-4411. *Statutory Reference:* Title 7, *Del. Code*, Chapter 40. *Regulatory Reference:* Authorized by Chapter 40. *Activities Covered:* All land-disturbing activities including agriculture.

Purpose: To control and manage erosion, sedimentation, and stormwater for rural and urban lands so as to minimize any adverse effects of stormwater runoff on the water and lands of the state.

Process: Administered through local Soil Conservation Districts in all counties, and additionally through Department of Public Works in New Castle County. Submit a sediment and stormwater management plan and obtain permit to proceed.

Note: Does not apply to agricultural land management practices unless the Conservation District or DNREC determines that the land requires a new or updated soil and water conservation plan.

2. Drainage of Lands, Tax Ditches. *Issuing Agency:* DNREC, Division of Soil & Water Conservation. *Phone:* (302) 739-4411. *Statutory Reference:* Title 7, *Del. Code*, Chapter 40. *Regulatory Reference:* Authorized by Chapter 41. *Activities Covered:* Water management and flood prevention on lands subject to overflow.

Purpose: To provide a uniform system for establishing, financing, administering, and maintaining and dissolving drainage organizations under the supervision of DNREC's Division of Soil and Water in order to conserve soil, water, wildlife, forest, and other resources of Delaware.

Process: Owners of land desiring drainage or protection from flooding may petition, through the board of supervisors of the county Soil Conservation District, for the formation of a tax ditch to the Superior Court of the county in which all of a major portion of the area to be drained or protected is located.

3. Aquaculture. *Issuing Agency:* DNREC, Division of Fish and Wildlife, Fisheries Section. *Phone:* (302) 739-3441. *Statutory Reference:* Title 7, *Del. Code*, Chapter 9, Sections 903(j) and 929(a). *Activities Covered:* Permits the artificial propagation, aquaculture, and possession of finfish that otherwise would be illegal. It provides for their immediate return to their waters after obtaining eggs and sperm, or disposal as specified. A permit stipulates the

time, area, number, and sex of brood fish and the methods of collecting fish. Minimum size possession limits are exempted. It also provides for the identification of aquaculture products.

Purpose: To provide for aquacultural practices that otherwise would be illegal.

Process: Letters of intent with specific dates, places, methods, and numbers by sex.

4. Shellfish Leases. *Issuing Agency:* DNREC, Division of Fish and Wildlife, Fisheries Section. *Phone:* (302) 739-3441. *Statutory Reference:* Title 7, *Del. Code*, Chapters 19–26.

Purpose: Title 7, *Del. Code*, Chapter 19, Section 1905, prohibits the leasing of shellfish grounds in the Inland Bays until shellfish surveys are conducted, public hearings are held, and the General Assembly approves a shellfish management plan.

5. Tidal Wetlands. *Issuing Agency:* DNREC, Division of Water Resources, Surface Water Management Section, Wetlands and Aquatic Protection Branch. *Phone:* (302) 739-4691. *Statutory Reference:* Title 7, *Del. Code*, Chapter 66. *Activities Covered:* The dredging, draining, filling, bulkheading, or construction of any kind on lands above mean low-water elevation subject to tidal action.

Purpose: To preserve and protect public and private wetlands and prevent their despoliation and destruction.

Process: Complete a detailed application and submit with filing fee to DNREC.

6. Subaqueous Lands. *Issuing Agency:* DNREC, Division of Water Resources, Surface Water Management Section, Wetlands & Aquatic Protection Branch. *Phone:* (302) 739-4691. *Statutory Reference:* Title 7, *Del. Code*, Chapter 72. *Activities Covered:* The use of subaqueous lands, defined as submerged lands and tidelands.

Purpose: To protect against uses or changes that may impair the public interest in the use of tidal or navigable waters.

Process: Complete application and submit with a filing fee to DNREC. Included must be a general report and description of the proposed project prepared by a professional engineer or other qualified person.

7. National Pollutant Discharge Elimination System (NPDES). *Issuing Agency:* DNREC, Division of Water Resources, Surface Water Management Section, Pollution Control Branch. *Phone:* (302) 739-5731. *Statutory Reference:* Federal Regs.-40, *Code of Federal Regulations*, Chapter 1, Section 122.24/Clean Water Act. *Activities Covered:* Concentrated aquatic animal production facilities, as defined below, are point-source subject to the NPDES permit program. Permit is required for discharge of pollutants into surface waters by a point source. Criteria include a hatchery, fish farm, or other facility if it contains, grows, or holds aquatic animals in either of the following categories:

Cold-Water Fish Species (such as trout and salmon) or other cold-water aquatic animals in ponds, raceways, or other similar structures that produce 20,000 lbs. per year of the species and that feed 5,000 lbs. or more per year and discharge at least 30 days per year.

Warm-Water Fish Species (such as hybrid striped bass, catfish, minnows) or other warm-water aquatic animal ponds, raceways, or other similar structures that discharge at least 30 days per year and produce 100,000 lbs. or more of aquatic animals per year. (Closed ponds that discharge only during periods of excess runoff are not included.)

Process: Apply to the DNREC, Division of Water Resources, Surface Water Management.

Other Statutory Reference: *State Regulations Governing the Control of Water Pollution*, Section 4, Part II, discharges subject

Aquaculture Memorandum of Understanding (MOU)

The following contains *excerpts* from an agreement between the Department of Natural Resources and Environmental Control (DNREC) and the Department of Agriculture (DA). The DNREC agrees to assist the DA with the enhancement of aquaculture activities by issuing permits for the possession and disposition of fishes in compliance with federal and state laws and regulations and consistent with the conditions in this agreement. (For a complete copy of the MOU, contact DNREC or DA.)

I. Important Definitions

- ◆ *Closed System* means an aquaculture facility or system with discharges that do not connect in any way to the waters of the state prior to filtration or percolation to prevent cultured aquatic stock from escaping.
- ◆ *Conditional Aquaculture Permit* means written authorization from DNREC to conduct aquaculture that is subject to DNREC inspection and approval prior to receiving possession of aquatic organisms that are subject to permit.
- ◆ *General Aquaculture Permit* means written authorization from DNREC to conduct aquaculture that is not subject to DNREC inspection and approval prior to receiving possession of aquatic organisms that are subject to permit.
- ◆ *Waters of this State* mean all the tidal waters under the jurisdiction of the state where the lunar tide regularly ebbs and flows and all nontidal waters under the jurisdiction of this state except for man-made ponds where there is no natural outfall of water to any ditch, stream, river, etc., that eventually may lead to tidal water. Waters in aquacultural facilities are not included.

II. General Aquaculture Permits

The DNREC shall issue a general aquaculture permit for the propagation, production, possession, and disposition of cultured aquatic stock, including black crappie, white crappie, striped bass, white perch, walleye, northern pike, chain pickerel, muskellunge, tiger muskellunge, rock bass, salmon and trout except Pacific salmon, sunfishes, channel catfish, yellow perch, and other food fish included in Subsection 906(28), 7, *Del. Code*. Size limits and/or creel limits shall be waived.

III. Restricted Aquaculture Permits

A. *Prohibited Species.* The DNREC shall not issue any aquaculture permits for walking catfish.

B. *Restricted Species.*

Black Bass. The agreement sets forth a strategy for selling, stocking, and propagating black bass over a six-year period. (See MOU for details.)

Grass Carp. A certificate of triploidy from the U.S. Fish and Wildlife Service is required from their authorized point of origin.

Hybrid Striped Bass and White Bass. Size limits and/or creel limits shall be waived. An aquacultural facility must be a DNREC-approved closed system. All non-native species of shellfish and finfish capable of surviving in the waters of the state may be imported into the state provided prior written authorization is granted by DNREC.

C. *Unrestricted Species*—minnows and shiners, killifish, anchovy, sand lance, mullet, and eels.

IV. Stock Certification

Shipments of finfish and shellfish imported into the state must be accompanied by a certificate of origin and health.

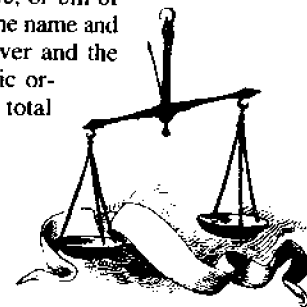
V. Brood Stock

The MOU outlines procedures for obtaining brood stock.

VI. Identification and Certification

A. Except as provided in Section III above, any aquatic organisms that have been produced in aquacultural facilities and are being transported for sale or distribution to another shall be accompanied by a bill of sale or bill of lading. Any aquatic organisms being transported by, or for, an aquaculturist and not for sale or distribution to another shall be accompanied by a copy of the valid aquacultural permit issued by the DNREC.

B. Any label, bill of sale, or bill of lading shall contain the name and address of the receiver and the identity of the aquatic organisms by species, total weight, or number.



to the requirements of NPDES (authorized under Chapter 60, Delaware Environmental Protection Act):

- ◆ Any person required to comply with the requirements of the NPDES program shall also be subject to additional requirements imposed under this section.
- ◆ Includes permit application requirements, tentative determinations, public notice, monitoring, etc.

8. Construction of Water Wells. *Issuing Agency:* DNREC, Division of Water Resources, Groundwater Management Section. *Phone:* (302) 739-4556. *Statutory Reference:* Delaware Environmental Protection Act, Title 7, *Del. Code*, Chapter 60, Section 6010.

Activities Covered: Well-construction activities from the initial penetration or excavation of the ground, through development, equipment installation, and disinfection; and carried out by persons having a valid license pursuant to provisions of regulations to licensed well contractors, well drillers, well drivers, and pump installers. A well may not be constructed until DNREC has issued a well-construction permit to the applicant or water-well contractor.

Process: Apply to DNREC, Division of Water Resources, Groundwater Management.

9. Water Allocation. *Issuing Agency:* DNREC, Division of Water Resources, Groundwater Management Section. *Phone:* (302)

Delaware Aquaculture Resource Center Aids Interested Public

If you want to learn more about aquaculture in Delaware, visit the Delaware Aquaculture Resource Center at the University of Delaware Marine Studies Complex in Lewes. The center contains a wide variety of educational materials—from reference books and technical reports to videos, equipment and supply catalogs, magazines, and newsletters. A file is maintained on “legal/regulatory” issues and references, which include the *Delaware Code*, federal statutes, and regulations in other states.

The resource center is organized like a library to allow you to locate and review information without assistance; however, the aquaculture specialist or staff assistant are available to provide help if needed. A computer modem provides access to aquaculture holdings of the University of Delaware Library System and the National Agriculture Library Aquaculture Information Center. The center is located in Cannon Laboratory and is open from 8:00 a.m. until 4:30 p.m., Monday through Friday. For more information, call John Ewart, aquaculture specialist, Delaware Sea Grant Marine Advisory Service, at (302) 645-4060.



739-4556. *Statutory Reference:* Delaware Environmental Protection Act, Title 7, *Del. Code*, Chapter 60. *Activities Covered:* Allocation of water from surface and underground sources. Anyone who withdraws more than 50,000 gallons per day must have an allocation permit. (Water withdrawals of 50,000 gallons or less in 24 hours are granted with the permits to construct the water facilities with which the withdrawals are made.)

Purpose: Equitable apportionment for beneficial uses and safe, sustainable yield.

Process: Apply to DNREC, Division of Water Resources, Ground Water Management.

10. Construction of Water Impoundments. *Issuing Agency:* DNREC, Groundwater Management Section, Water Supply Branch. *Phone:* (302) 739-4793. *Statutory Reference:* Title 7, *Del. Code*, Chapter 60, Sections 6003 and 6029. *Activities Covered (Section 6003):* Construction of any water facility, discharge of pollutant into any surface water or groundwater, withdrawal of groundwater or surface water, collection, transportation, storage, processing, or disposal of solid wastes, regardless of the geographic origin or source of such wastes.

Purpose: To conserve and protect the surface and groundwater of the state.

Process: Request application/submit application for permit to construct a water impoundment to DNREC, Water Supply Branch.

Limitation (Section 6029): Does not apply to ponds less than 60,000 square feet, constructed for the purpose of conservation, recreation, propagation, and protection of fish and wildlife, watering of stock, or fire protection.

11. Historic Resources. *Issuing Agency:* Bureau of Archaeology and Historic Preservation. *Phone:* (302) 739-5685. *Statutory Reference:* Section 106 of the National Historic Preservation Act. 36 *Code of Federal Regulations*, Part 800 (16 *U.S. Code*, Subsection 470-F). *Activities Covered:* Any undertaking that has the potential to adversely affect any historic property, building, district, object, structure, or archaeological site which is listed or eligible to be listed in the National Register of Historic Places.

Purpose: To identify and preserve significant historical properties and archaeological sites.

Process: Initiate contact with the State Historic Preservation officer before undertaking project.

12. Protection of Public Health. *Issuing Agency:* Department of Health and Social Services, Division of Public Health, Bureau of Environmental Health. *Phone:* (302) 739-4731. *Statutory Reference:* Title 16, *Del. Code*, Section 122. *Activities Covered:* Empowers the State Board of Health to provide for the production, handling, processing, transportation, and sale of shellfish; provide for the sanitary protection of water supplies; and provide for the sanitary control of public swimming and bathing places.

Purpose: Protection of public health and safety.

Process: Apply to Division of Health and Social Services, Division of Public Health, Bureau of Environmental Health.

Federal Permits

1. Dredge and Fill and Nontidal Wetlands. (Subsection 10 of the Rivers and Harbors Act and Subsection 404 of the Clean Water Act.) *Issuing Agency:* U.S. Army Corps of Engineers, Regulatory Branch. *Phone:* (215) 597-4723. *Statutory Reference:* Section 10 (33 USC 403), Section 404 (33 USC 1344). *Activities Covered:* Placement of structures, excavation, or deposition of dredge or fill material into navigable waters or waters of the United States.

Purpose: To prevent obstruction of navigable waters and to prevent the filling of wetlands.

Process: Apply to the Army Corps of Engineers. Include a project description with a site drawing of the proposed work on 8½ x 11-inch paper and quantities of fill and/or amount of dredge.

2. The Lacey Act (1900) and Black Bass Act (1925) and Amendments. *Purpose:* Prohibits the interstate shipment of illegally taken fish and wildlife. The definition includes all fish whether they were bred, hatched, or born in the wild or in captivity. Consequently, the possession of aquaculture products that are protected by federal or state law must have a permit issued by the state and be identified (required to be labeled) to comply with these acts. No permits available from federal agencies—only from state.

Penalty: Varies for different sections.

State and Federal Agencies

Delaware Department of Natural Resources and Environmental Control, Development Advisory Service, 89 Kings Highway, P.O. Box 1401, Dover, DE 19903. (302) 739-6399. (*DAS Review, Environmental Permits, Technical Advice*)

Delaware Department of Agriculture, 2320 S. DuPont Highway, Dover, DE 19901, (302) 739-4811 or 1-800-282-8685 (for New Castle & Sussex counties). (*Aquaculture Coordinator, Marketing and Product Development, Weights and Measures, Poultry and Animal Health*)

Delaware Department of Health & Social Services, Division of Public Health, Bureau of Environmental Health, Jesse S. Cooper Building, Federal & Water Streets, P.O. Box 637, Dover, DE 19903, (302) 739-4731. (*Shellfish Sanitation*)

Delaware Department of State, Bureau of Archaeology & Historic Preservation, 15 The Green, Dover, DE 19901, (302) 739-5685. (*1106 Review*)

U.S. Army Corps of Engineers, 2nd and Chestnut Streets, Custom House, Philadelphia, PA 19106. ATTN: Regulatory Branch, (215) 597-4723. (*Federal Wetland Permits*)

U.S. Environmental Protection Agency, Region III, Regional Pesticide Specialist, Air and Radiation Toxics Division, 3AT30 841 Chestnut Building, Philadelphia, PA 19107, (215) 597-9869. (*Pesticide Use*)

Food and Drug Administration, Center for Veterinary Medicine, Division of Therapeutic Drugs for Animals, 7500 Standish Place, Rockville, MD 20855, (301) 295-8740. (*Therapeutic Drugs*)

Local Permits

The New Castle County Department of Public Works, Division of Development and Licensing, 2701 Capitol Trail, Newark, DE 19711, (302) 366-7760.

The Kent County Department of Planning, 414 Federal Street, Dover, DE 19901, (302) 736-2020.

The Sussex County Planning and Zoning Office, County Courthouse, Georgetown, DE 19947, (302) 855-7880. Note that Sussex County has amended zoning provisions regarding fish farms to be included as an agricultural activity (Chapter 115, *Code of Sussex County*, Article I, Section 115-4, Subsection B).

Business Licenses

Division of Revenue, *New Castle County*—Carvel State Office Building, 820 North French Street, P.O. Box 2340, Wilmington, DE 19899-2340, (302) 571-3369. *Kent County*—Thomas Collins Building, P.O. Box 1401, Dover, DE 19903-1401, (302) 739-5251. *Sussex County*—U.S. Route 113, Georgetown, DE 19947, (302) 856-5358.

Soil and Water Conservation Programs

Conservation Districts, *New Castle County*—6 People's Plaza, Newark, DE 19702, (302) 834-3533. *Kent County*—3500 S.

DuPont Highway, Dover, DE 19901, (302) 697-6176. *Sussex County*, 408 N. DuPont Highway, Georgetown, DE 19947, (302) 856-7215.

U.S. Soil Conservation Service, 1203 College Park Drive, Dover, DE 19901, (302) 678-4175.

Aquaculture Contacts in Nearby States

Maryland, Aquaculture Coordinator, Dept. of Aquaculture, 50 Harry S. Truman Parkway, Annapolis, MD 21401, (301) 841-5724.

New Jersey, Dept. of Agriculture, Fish and Seafood Promotion, CN330, Room 204, Trenton, NJ 08625, (609) 292-2472.

New York, New York State Dept. of Agriculture and Markets, 1 Winner's Circle, Albany, NY 12235, (518) 457-2840.

Pennsylvania, Dept. of Agriculture, Agriculture Development, 2301 N. Cameron Street, Harrisburg, PA 17110, (717) 783-8462.

Virginia, Aquaculture Development Manager, Division of Marketing, Virginia Department of Agriculture and Consumer Services, P.O. Box 1163, Richmond, VA 23209, (804) 786-3951.

Conclusions

The preceding discussion is not intended to dampen your enthusiasm about becoming an aquaculturist in Delaware. Aquaculture development has occurred throughout the country, under similar constraints. It does reflect a need for improved communication among agencies and aquaculturists, a need for research and environmental monitoring to provide more information on potential environmental impacts, and a need for legislation that provides a climate for the development of an aquaculture industry while continuing to protect Delaware's natural resources through appropriate regulations and best management practices.

Several national and regional organizations now are evaluating the impacts of federal regulations on aquaculture to identify burdensome roadblocks and develop general permits for aquaculture activity. The Delaware Department of Agriculture and the Aquaculture Advisory Council are looking at ways to simplify and streamline the regulatory review process in Delaware and to regulate cultured aquatic products as livestock. Revisions to the *Delaware Code*, reflecting these changes, are expected in the near future.

You can minimize unexpected delays in the permit process by planning ahead. Communicate with resource managers before you invest significant time and money in your aquaculture operation.

References

Delaware Aquaculture Task Force, 1990. Final Report. Dover: Delaware Department of Agriculture.

Delaware Aquaculture Act, 1990. Title 3, *Delaware Code*, Chapter 4.

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