

7

**FRESHWATER AQUACULTURE IN THE UNITED STATES:
COMPLYING WITH ENVIRONMENTAL PROTECTION LAW & POLICY**

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Martha L. Noble présente ici les principes qui gouvernent les relations entre la pisciculture en eau douce et les nombreuses réglementations de protection de l'environnement aux Etats-Unis. La pisciculture en eau douce, secteur de l'agro-alimentaire qui y connaît la plus forte croissance, regroupe une très grande variété de mode de production, ainsi que des espèces élevées, depuis la truite, en passant par l'écrevisse, jusqu'à l'alligator.

Le Droit qui s'applique à cette activité varie ainsi en fonction de l'espèce, du milieu naturel dans lequel elle s'insère, de la nature des rejets, mais aussi et surtout de l'Etat dans lequel elle est installée. En effet, l'auteur explique comment les origines différenciées des productions aquacoles aux Etats-Unis ont conduit au développement d'une organisation administrative très complexe. Ce n'est pas moins de 23 administrations fédérales qui sont compétentes à différents niveaux pour gérer les activités piscicoles d'eau douce. Même si, depuis 1985, un comité commun sur l'aquaculture dépendant directement du "ministère" de l'agriculture (l'aquaculture est considérée comme une activité agricole) coordonne les différentes réglementations. Cette complexité sur le plan fédéral est encore accentuée par les modes d'intervention très variés dans chaque Etat.

Sont ensuite successivement analysés les rapports qu'entretiennent les pisciculteurs avec le Droit de l'eau, le Droit de l'environnement au sens large (depuis les zones humides jusqu'aux troubles de voisinages, en passant par la protection des espèces protégées), ou encore avec le Droit Rural ("right-to-farm"). L'auteur a eu le souci d'illustrer ces différents points par des exemples législatifs, réglementaires ou jurisprudentiels.

Aquaculture is one of the fastest growing food production sectors in the United States. The most economically important freshwater species raised for food in aquaculture systems include catfish, trout, crayfish, and *Tilapia* species. Numerous other species, such as minnows used as baitfish, aquarium fish, alligators, and game fish destined to stock freshwater lakes and streams, are also raised in freshwater aquaculture systems.¹

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This presentation addresses environmental and natural resource law applicable to freshwater aquaculture production systems. These production systems vary greatly. Facilities such as cages placed directly in lakes or streams are slight modifications of natural systems. In contrast, aquaculture operations may be confined in buildings with recirculating water and closely controlled temperature and light regimes. This presentation provides an overview of environmental law issues of general concern to freshwater aquaculturists. Specific regulations and permit programs that apply to a particular facility will depend on the relevant state law, the location of the facility, the type of organism cultivated, and the amount and nature of wastes generated by the facility.

FEDERAL & STATE ADMINISTRATIVE FRAMEWORKS

Aquaculture enterprises in the United States have developed from three major origins: ² mariculture operations which enhanced or replaced commercial harvesting of wild stocks; ³ freshwater aquaculture systems which developed from farm ponds or as an alternative or supplement to other crop production systems, such as rice cultivation; and fish hatcheries which provided young animals to replenish depleted native game stocks or to facilitate introduction of game fish species. Because of this diversity of origins, the current administrative framework for regulating aquaculture is relatively complex. This complexity is compounded by the fact that the United States is a federal system and that the national government and the governments of the fifty states regulate and promote aquaculture. At both the federal and state levels, however, the trend is to view aquaculture, particularly freshwater aquaculture, as a form of agriculture.

Federal government administration of aquaculture

No single federal government agency administers all programs and regulations applicable to freshwater aquaculture operations. Instead, about 23 federal government agencies have responsibilities related to aquaculture. Under the National Aquaculture Act of 1980, as amended by the National Aquaculture Improvement Act of 1985, two these agencies are coordinated through the Joint Subcommittee on Aquaculture, which is within the President's Office of Science and Technology Policy. The Secretary of Agriculture is the permanent chair of the Subcommittee and the Department of Agriculture is the lead federal agency for the coordination and dissemination of aquaculture information.⁴

2 The Economic Research Service of the U.S. Department of Agriculture publishes an *Aquaculture Situation and Outlook* report twice a year. The report is available by subscription from the ERS-NASS, P.O. Box 1608 Rockville, MD 20849-1608. This report provides a comprehensive overview of aquaculture production in the United States~

3 United States Code §§ 2801-2810.

4 Other federal agencies represented on the Subcommittee include the Department of Commerce, the Department of Interior, the Department of Energy, the Department of Health and Human Services, the Environmental Protection Agency, the Army Corps of Engineers, the Small Business Administration, the Agency for International Development, the Tennessee Valley

FRESHWATER AQUACULTURE IN THE UNITED STATES

Many Department of Agriculture programs for the general promotion and regulation of agriculture also apply to aquaculture. For example, in 1992, in the wake of the destruction of Hurricane Andrew, aquaculture operations as a category of agriculture became eligible for federal disaster funds for the first time. The Department also provides information to aquaculturists through the Cooperative Extension Service. In addition to incorporating aquaculture into general agricultural initiatives, the Department of Agriculture has an Office of Aquaculture. The Department of Commerce has significant aquaculture responsibilities, many of which are carried out through the National Sea Grant College Program. This Program funds research and educational activities in universities in the freshwater Great Lake states, as well as the marine coastal states. The Food and Drug Administration of the U.S. Department of Health and Human Services has the primary responsibility for the regulation of animal drugs and feeds, including those used in aquaculture operations. The U.S. Fish and Wildlife Service of the Department of the Interior maintains a system of fish hatcheries and research centers and has a specific responsibility to encourage the development of private aquaculture in a manner compatible with natural resource stewardship. The U.S. Environmental Protection Agency regulates water pollutants and pesticides at the federal level and, with the U.S. Army Corps of Engineers, regulates use of wetlands - the site of many aquaculture operations.⁵

State government administration of aquaculture

State governments have taken a variety of approaches to direct regulation and promotion of aquaculture. Some states have not yet adopted legislation specifically concerning aquaculture or have adopted legislation which simply declares that aquaculture is a branch of agriculture⁶. As might be expected, these states do not have a well-developed aquaculture industry.

States may split regulatory duties among two or more state agencies. This dual jurisdiction reflects concerns for aquaculture development and for the protection of native, wild aquatic resources. For example, Illinois law provides that the state Department of Agriculture is responsible for coordinating the promotion and marketing of aquaculture products and for facilitating the acquisition of permits required for aquaculture operations⁷. The state Department of Conservation is responsible for registering aquaculture operations and for

Authority, the National Science Foundation, the Farm Credit Administration and other Federal agencies as are deemed appropriate by the Director of the Office of Science and Technology Policy, after consultation with the coordinating group. 16 United States Code § 2805.

5 For a comprehensive description of federal programs affecting aquaculture, see UNITED STATES DEPARTMENT OF AGRICULTURE, NATIONAL AGRICULTURAL LIBRARY, AQUACULTURE: A GUIDE TO THE FEDERAL GOVERNMENT PROGRAMS (MAY 1991).

6 See for example, Indiana Statutes Annotated § 4-4-3.8-2. which defines aquaculture as a form of agriculture that is the controlled cultivation and harvest of aquatic plants and animals.

7 Illinois Statutes, Chapter 20, § 215/5.

aquaculture law enforcement⁸. Both these agencies are authorized to coordinate their regulatory efforts with other state agencies.

States with well-developed freshwater aquaculture sectors often have extensive legislation which provides that aquaculture is an important agricultural enterprise. Mississippi, a major producer of farm-raised catfish, has defined domesticated fish both as cultivated crops and as livestock⁹. In 1989, the state of Texas transferred regulation of both marine and freshwater aquaculture from the Department of Parks and Wildlife to the state Department of Agriculture. Texas has also adopted an extensive program for the regulation of aquaculture¹⁰. Moreover, Texas state agencies that regulate aquaculture must do so in a manner to benefit the industry to the greatest extent possible¹¹.

In contrast to Texas, the state of Alaska is hostile to aquaculture operations. In 1990, the state legislature enacted a nearly complete ban on finfish farming - described as growing or cultivating finfish in captivity or under positive control for commercial purpose. "The Alaska Department of Fish and Game is authorized to regulate other aquaculture facilities. Alaska state law requires that aquatic farming be regulated in a manner that ensures protection of the state's fish and game resources. The Alaska Fish and Game Commissioner may issue permits for aquatic farming on the basis of criteria which include the following among others: (1) the proposed farm or hatchery may not require significant alterations in traditional fisheries or other existing uses of fish and wildlife resources; and (2) the proposed farm or hatchery may not significantly affect fisheries, wildlife, or their habitats in an adverse manner¹². The ban on finfish farming and the high priority given to wild fish and game reflects the concerns of the state's commercial salmon fishing industry and the state's general economic dependence on commercial and sport fishing. Legislative findings supporting the ban on finfish farming included the finding that serious risks are posed by commercial finfish farming, including the spread of disease among wild fish by farmed fish, genetic intermingling of wild fish stocks with genetically manipulated farmed fish, degradation of water quality near finfish farms, and land use conflicts over the siting of commercial finfish farms¹³. Note also that Alaska lacks a vigorous agricultural sector.

In addition to state agencies that directly regulate or promote aquaculture operations, other state agencies, such as those which regulate water pollution, may impose legal constraints or requirements on freshwater aquaculture operations.

8 Illinois Fish & Aquatic Life Code § 20-90.

9 Mississippi Code Annotated § 69-7-501.

10 See Texas Agriculture Code Annotated Chapter 134.

11 There are two exceptions to Alaska's ban on finfish farming: (1) a nonprofit corporation that holds a salmon hatchery permit under state law may sell salmon returning from natural waters and salmon eggs; and (2) ornamental pond and aquarium fish may be cultivated and sold. Alaska Statutes § 16.48.210.

12 Alaska Statutes § 16.40.105.

13 1990 Alaska Session Laws Chapter 91.

FRESHWATER AQUACULTURE & WATER RIGHTS

Obviously, the primary requirement of a freshwater aquaculture operation is an adequate supply of good quality freshwater. Most eastern states allocate water through a riparian rights system, in which land owners adjacent to bodies of water have the primary rights to use the water. Many states, particularly those in arid and semi-arid areas of the United States have well-developed legal systems for the appropriation and use of surface water or groundwater, which do not necessarily depend on proximity to the water body. In the Western states, many surface waters are entirely appropriated, requiring that a person who wishes to start a new aquaculture operation must obtain water rights from another water user¹⁴.

Water use by at least one aquaculture operation, a catfish farm in Texas, has made headline news. The farmer has requested that he be permitted to withdraw 55.3 million gallons of groundwater per day from the Edwards Aquifer. The Edwards Aquifer is also the water source for the city of San Antonio and the amount of water requested by the catfish farm equaled almost 25 % of the daily water use of the entire San Antonio metropolitan area. Initially, the farmer drew up about 44 million gallons of water per day, an amount which had an appreciable effect on his neighbor's wells. After failing to convince the courts that the state legislature had authorized state agencies to regulate the groundwater withdrawals, state agencies closed down the fish farm because of water pollution problems¹⁵. Texas has subsequently adopted legislation to regulate use of Edwards Aquifer water.

FRESHWATER AQUACULTURE & WETLANDS REGULATION

The establishment of freshwater aquaculture facilities may require dredging or filling of wetlands. Under Section 404 of the federal Clean Water Act¹⁶, the U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency share responsibility for a wetlands regulation program. Section 404 provides that dredge and fill activities which result in the discharge of pollutants to the waters of the United States cannot be conducted without a Section 404 permit.

The Section 404 regulations define wetlands as: ". . . those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas"¹⁷.

14 For a comprehensive discussion of water rights in the United States, see WILLIAM GOLDFARS, *WATER LAW* (Lewis Publishers, 2d Ed. 1988).

15 *Water Commission Delays Vote On Aquifer Discharge Permit*, BUREAU OF NATIONAL AFFAIRS, STATE DAILY ENVIRONMENT REPORTER (Mar. 11, 1993).

16 33 United States Code § 1344.

17 40 Code of Federal Regulations § 230.3(t) (U.S. Environmental Protection Agency's regulation); 33 Code of Federal Regulations § 328.3(b) (U.S. Army Corps of Engineers regulation).

A wetlands determination basically involves assessment of three parameters - hydrology, soils, and vegetation - of the area suspected to be wetland. The exact nature of the assessment is at the center of major controversy over wetlands regulation, particularly in situations where vegetation has been disturbed or soil saturation is intermittent. In 1989, four federal agencies attempted to resolve differences in their technical methodologies for defining wetlands. The resulting technical manual proved very controversial and was withdrawn from use by these agencies. The United States Congress is currently considering whether to adopt proposed legislation which will significantly amend the Section 404 program. Some legislative proposals would require greater protection of all wetlands. Other proposals would exempt significant wetland acreage from the Section 404 program.

The process for obtaining a Section 404 permit can be rather lengthy and complicated. Persons other than the applicant may request a public hearing. Individual permits must also undergo an administrative review which considers alternative sites, minimizing wetlands destruction at the site of the project, and measures for restoring or protecting wetlands off the site of the project. The Army Corp of Engineers also conducts a public interests review of the proposed use of the wetlands, in which the value of the project is weighed against public interests in protecting the wetlands.

This Section 404 permit process has been simplified in one region of the United States the lower Mississippi Delta region. In that area, the regional district office of the Army Corps of Engineers has issued a general permit for impoundments, including fish ponds, in cleared wetland areas. This permit establishes a less complicated process for applicants whose aquaculture operations fit within the project parameters of the permit. In issuing the General Permit, the Army Corps of Engineers makes a determination that the use of wetlands for the specified type of aquaculture project will not result in significant destruction of wetlands. The U.S. Army Corps of Engineers considered, but rejected, the option of establishing a nationwide general permit for small scale aquaculture operations.

Section 404 general permits or individual permits are usually issued to aquaculture operations without too much delay. Operators who undertake dredge and fill activities without seeking a Section 404 permit, however, may incur significant fines and penalties, including the possibility of imprisonment.

Many coastal states have wetland laws that protect tidal wetlands. A few inland states, for example Minnesota, have regulatory programs protecting their freshwater wetlands. Aquaculturists may need a state permit as well as a federal permit to site their operations in wetlands.

FRESHWATER AQUACULTURE & WATER QUALITY REGULATION

Water discharged to surface waters from aquaculture operations may contain uneaten food, animal excretory products, or antibiotics and pesticides. The temperature of the discharge water may also vary greatly from that of the receiving waters. The contents of this waste water may deplete oxygen in the receiving waters or add nutrients which change the ecology of the receiving waters. A longterm load of drugs or pesticides may lead to acute or chronic problems in wildlife that inhabit the receiving waters or depend on them for food.

The U.S. Environmental Protection Agency views aquaculture operations as potentially significant sources of water pollution. The agency has established regulations for aquatic animal production facilities that discharge effluent directly into the surface waters of the United States. If such a facility meets minimum production or effluent discharge criteria or if a facility is determined to be a significant contributor of pollution to the waters of the United States, the facility is designated as a "concentrated aquatic animal production facility" which must obtain a National Pollutant Discharge Elimination System permit (*see federal regulations on the following page*). This permit is issued either directly by the U.S. Environmental Protection Agency or by an agency of a state which has received the U.S. Environmental Protection Agency's approval to administer this permit program. The permit specifies limits on the concentrations of pollutants allowed in the facility's discharge water. Limitations may be very stringent if the facility discharges to water of high quality such as trout streams. Under the Clean Water Act, states may adopt permit requirements that are more stringent than federal requirements.

The state of Florida is working on a General Permit for aquaculture facilities whose discharge has only minimal adverse environmental effect. The General Permit is drafted on a species-specific basis and requires that the aquaculturist apply best management practices to control pollutant discharge¹⁸.

Aquaculturists who fail to comply with Clean Water Act requirements are subject to severe penalties. For example, a Minnesota fish farm discharged waste water from its trout and salmon facility with levels of phosphorus and oxygen-depleting material in excess of the limits in its discharge permit. The Minnesota Pollution Control Agency fined the farm \$135,000 dollars for its violations. The fish farm was also required to install a waste water collection and treatment system to deal with the water pollution problems¹⁹.

18 For more detailed description of this proposed General Permit see Ronald J. Rychiak & Ellen M. Peel, *Swimming Past the Hook: Navigating Legal Obstacles in the Aquaculture Industry*, 23 ENVIRONMENTAL LAW 837 (1993).

19 Minnesota Fines Fish Farm for Water Act Violations, BUREAU OF NATIONAL AFFAIRS, CURRENT DEVELOPMENTS, STATE BRIEFS (Oct. 2, 1992).

A hatchery, fish farm, or other facility is a concentrated aquatic animal production facility if it contains, grows, or holds aquatic animals in either of the following categories:

- (a) Cold water fish species or other cold water aquatic animals in ponds, raceways, or other similar structures which discharge at least 30 days per year but does not include:
 - (1) Facilities which produce less than 9,090 harvest weight kilograms (approximately 20,000 pounds) of aquatic animals per year; and
 - (2) Facilities which feed less than 2,272 kilograms (approximately 5,000 pounds) of food during the calendar month of maximum feeding.
- (b) Warm water fish species or other warm water aquatic animals in ponds, raceways, or other similar structures which discharge at least 30 days per year, but does not include:
 - (1) Closed ponds which discharge only during periods of excess runoff; or
 - (2) Facilities which produce less than 45,454 harvest weight kilograms (approximately 100,000 pounds) of aquatic animals per year.

"Cold water aquatic animals" include, but are not limited to, the Salmonidae family of fish; e.g., trout and salmon.

"Warm water aquatic animals" include, but are not limited to, the Ameiuridæ, Centrarchidae and Cyprinidae families of fish; e.g., respectively, catfish, sunfish and minnows.

40 Code of Federal Regulations Part 122, Appendix C.

The Director of a Regional Environmental Protection Agency Office may also determine on a case-by-case basis that an aquatic animal production facility is a concentrated aquatic animal production facility requiring a permit. The Director may designate any warm or cold water aquatic animal production facility as a concentrated aquatic animal production facility upon determining that it is a significant contributor of pollution to waters of the United States. In making this designation the Director shall consider the following factors:

- (i) The location and quality of the receiving waters of the United States; (ii) The holding, feeding, and production capacities of the facility;
- (iii) The quantity and nature of the pollutants reaching waters of the United States; and (iv) Other relevant factors.

A permit application shall not be required from a designated concentrated aquatic animal production facility until the Director has conducted on-site inspection of the facility and has determined that the facility should and could be regulated under the permit program.

40 Code of Federal Regulations § 122.24.

Aquaculture operators may choose to land apply the sludge, or settled solids, from aquaculture operations. Land application of aquaculture waste does not require a National Pollutant Discharge Elimination Permit. The aquaculture waste may serve as excellent fertilizer. At least one state, North Carolina, has taken steps to assist aquaculture operators who wish to land apply aquaculture waste. The North Carolina Division of Environmental Management has established fairly strict permit limits on discharge of solids from trout farms into the state's surface waters. For a modest fee, the North Carolina Department of Agriculture will analyze the nutrient content of trout aquaculture waste. The Department will give

individual growers who land apply the waste up to \$4 per 1000 gallons of applied settled solids to help defray the costs of land application. To be eligible for these funds, the grower must have the nutrient levels of the solids and the soil analyzed and must follow proper agronomic management practices. The funds are provided from the North Carolina Agricultural Cost-Share Program.

FRESHWATER AQUACULTURE & WILDLIFE LAWS

Restrictions on Introduced / Exotic Species

A federal government Aquatic Nuisance Species Task Force has reported that the introduction of aquatic species into the United States contributed to 68% of the native aquatic species extinctions which occurred in the last century. Introduced aquatic species also contributed to the decrease in population of 70% of the native fish species currently listed as endangered species. Aquatic species introduced from other states or countries may carry diseases which infect and deplete native species populations. Introduced species may also decrease populations of native species by preying on native species or by competing for resources more efficiently. The federal government and state governments have passed laws to prohibit or control introduction of aquatic species.

These laws may apply to introduction of species which have been successfully cultured in other regions. For example, many states ban importation of *Tilapia* or grass carp. Some states provide for selected importation of introduced aquaculture species. North Carolina law provides that holders of aquaculture permits issued by the state Department of Agriculture may import and propagate certain species, including various species of sunfish, trout, and crayfish, without special permission from the state Wildlife Resources Commission, as long as disease control requirements are met. Exotic species not included on the list of unrestricted exotic aquaculture species may not be imported into the state, unless written permission is obtained from the Wildlife Resources Commission²⁰.

Restrictions on Sale or Possession of Wild Animals

Aquaculturists often cultivate individual organisms which are genetically similar to wild populations of the species. A general rule of wildlife law is that wild animals, or *ferae naturae*, are held in trust by the state for the people of the state. States have the authority to regulate the sale or possession of wild animals or plants. State wildlife agency officials have seized animals from aquaculture operations claiming that the animals are wild animals and charging that the operator has violated state wildlife laws. The aquaculturist must prove that the animals were obtained and held legally. Seizure of the animals may occur even if the individual animals seized were bred and raised in an aquaculture facility.

20 North Carolina Statutes § 106-761.

In order to avoid this result, some state legislatures have passed legislation providing special protection for aquaculturists. For example, in 1992, the state of Georgia passed a law providing that animals which live in a captive or tame state and which lack a genetic distinction from members of the same taxon living in the wild are presumptively wild animals - *except* that lawfully obtained farmed fish indigenous to Georgia or fish which have been recognized prior to 1992 as having an established population in Georgia waters other than private ponds and which are held in confinement in private ponds shall be known as and considered to be "domestic fish."²¹

Federal Restrictions on Interstate Transport of Fish and Wildlife

A federal statute known as the Lacey Act gives federal "teeth" to state conservation laws. The Lacey Act regulates the taking, possession, transportation, and sale of fish and wildlife in interstate commerce. Under the Act it is a federal offense for any person to import, export, transport, sell, receive, acquire, or purchase in interstate or foreign commerce any fish or wildlife taken, possessed, transported, or sold in violation of any law or regulation of any State or in violation of any foreign law. The Lacey Act also makes it a federal offense to import, export, transport, sell, receive, acquire, or purchase any fish or wildlife in violation of any law, treaty or regulation of the United States or in violation of any Indian tribal law²².

Wildlife conservation laws

Aquaculture operations may lose significant numbers of fish or other organisms to predation by wildlife. Both the federal and state governments regulate harms to wildlife. Bird predation may be a significant problem for freshwater fish or crayfish pond operators. Migratory birds are protected by the federal Migratory Bird Treaty Act.²³ Before a fish farmer can trap or kill migratory birds, such as egrets or cormorants, the fish farmer must obtain a depredation permit from the United States Fish and Wildlife Service and from any appropriate state agency. In general, government agencies are reluctant to issue these permits if other predator control methods are available. For example, in the lawsuit *Aqua-Life, Inc. v. Pennsylvania Game Commission*,²⁴ the state agency refused to issue a permit to a fish farmer to hunt and kill herons because the agency found that other fish farms controlled heron predation by using hanging nets. The nets cost about \$40,000 to install. Failure to obtain a permit or to comply with permit limits may result in a criminal conviction.

21 Georgia Statutes § 27-1-2.

22 16 United States Code § 3372.

23 16 United States Code §§ 703-712.

24 620 A.2d 654 (Penn. 1993)

FRESHWATER AQUACULTURE IN THE UNITED STATES

Aquaculturists may wish to locate their operations in areas inhabited by species listed as threatened or endangered under the federal Endangered Species Act.²⁵ This Act generally prohibits federal agencies from permitting activities which jeopardize the continued existence of endangered species. The Act also prohibits any person from harming or harassing endangered animal species. Some courts have interpreted this provision to mean that habitat critical to the endangered species cannot be destroyed. Application of the Endangered Species Act may also limit introduction of exotic species which might interbreed with an endangered species population. For example, federal agencies have indicated concern about the introduction of the of the white sturgeon (*Acipenser transmontanus*), a fish native to the Pacific coast, into aquaculture systems in the southeastern United States. The concern is that the white sturgeon may interbreed with wild populations of the Gulf sturgeon (*Acipenser oxyrinchus*), a species which is listed as threatened under the Endangered Species Act.²⁶ Note that many states have also adopted their own version of the endangered species act which may require restrictions on species introduced into the state for cultivation in aquaculture systems.

PRIVATE RIGHTS: COMMON LAW NUISANCE

An aquaculture facility may produce odor, water pollution, or other results which are unpleasant to the facility's neighbors. Such results may constitute a nuisance under state common law. A nuisance is generally defined as an *unreasonable* interference with the use and enjoyment of property. The determination of "reasonableness" is a balancing process which looks at the gravity of the harm caused to the neighboring property owner balanced against the social value of the conduct causing the harm. Factors considered in the balancing process include: the extent of the harm involved; the character of the harm involved; the social value which the law attaches to the type of use or enjoyment invaded; the suitability of the particular use or enjoyment invaded to the character of the locality; and the burden on the person harmed of avoiding the harm. The social value of the defendant's conduct is also a consideration in balancing the equities.

If an aquaculture operation is adjudged to be a nuisance, a court can choose from alternative remedies. The court may order the facility to cease operations. This remedy is rarely used unless the conduct giving rise to the nuisance is an uncommon or highly dangerous activity. More likely, the court will order the facility to take specific actions to alleviate the conditions giving rise to the nuisance, either by limiting the scope of its operations or incorporating measures to control the unpleasant effects of the operation. For example, in the

25 16 United States Code §§ 1531-1544.

26 Department of Commerce, National Oceanic and Atmospheric Administration & Department of the Interior, Fish and Wildlife Service, Endangered and Threatened Wildlife and Plants: Threatened Status for the Gulf Sturgeon, 56 Federal Register 49653 (1991).

case *Barras v. Hebert*,²⁷ a court ordered an alligator farm in to install air locks to limit the odors coming from a buildings where alligators were raised. Over thirty neighbors had complained that the odors were nearly unbearable. Under some circumstances, courts will order that the owner of the property affected by the nuisance be awarded monetary compensation for the loss in value of the property which is attributable to the nuisance.

All fifty states have adopted “right-to-farm” statutes which provide farmers with a defense to nuisance lawsuits. In general, these statutes prohibit lawsuits if the farm operation has been established for one year or more and is operated according to sound agricultural practices. This defense blocks nuisance lawsuits by those who move to rural areas and are offended by the less savory, but normal, aspects of agriculture. These “right-to-farm” statutes extent protection to aquaculture operations in states that define aquaculture as a form of agriculture. For example, the South Carolina “right-to-farm” statute includes aquaculture facilities in the definition of agricultural facilities protected by the statute.²⁸

LOCAL GOVERNMENT LAND USE REGULATIONS

Many states grant local governments broad authority to regulate land uses. Freshwater aquaculture facilities are often categorized as an agricultural land use and are subject to the same regulation as other agricultural uses. For example, many local governments do not allow agricultural uses in residential or commercial zones. Even in agricultural zones, a new aquaculture facility may be subject to local administrative review to ensure its compatibility with surrounding land uses and to ensure that the facility has a plan for proper disposal of wastes.

Even if there are no land use restrictions, an aquaculturist should examine neighboring land uses to ascertain if they are compatible with the proposed aquaculture operation. The use of pesticides by neighboring farmers poses potential harms to aquaculture operations, particularly if the pesticides are applied by air. Drifting pesticides may land in aquaculture ponds and other facilities, killing cultivated organisms or rendering them unfit for human consumption. The harm from drifting pesticides is well documented in court cases from the southeastern states. In this region, large scale cotton and soybean operations are in close proximity to large scale, open-air aquaculture operations. Damages can be extensive. For example, in *Kentuck~ Aerospray, Inc. v. M~ys*,²⁹ the court found that pesticide which had drifted from aerial spraying of a tobacco field destroyed 150,000 to 170,000 minnows in a neighboring commercial fish farm pond. The pond was only 110 ten feet from the field. In *D & W Jones, Inc. v. Collier*,³⁰, the court found that the cumulative effects of small amounts of pesticide

27 602 So.2d 186 (La. Ct. App. 1992)

28 South Carolina Statutes § 46-45-20.

29 251 S.W.2d 460 (Kentucky Court of Appeals 1952).

30 372 So. 2d 288 (Mississippi 1979).

FRESHWATER AQUACULTURE IN THE UNITED STATES

drift from pesticide applications by more than one neighboring farmer caused the death of catfish in nearby aquaculture ponds. Pesticides may also run off into waterways which contain aquaculture facilities.

Some commentators have suggested that this contamination problem could be alleviated by the creation of aquaculture zones in which pesticide use would be limited. Perhaps, aquaculture operations and organic farms could be permitted in the same zone. In the absence of such land use protection, aquaculturists should investigate neighboring agricultural crops and practices before establishing an aquaculture facility.

CONCLUSION

If not properly located and managed, freshwater aquaculture operations have the potential to adversely affect environmental quality. The regulatory framework for minimizing or preventing environmental harm is rather complex. State cooperative extension services do provide some guidance to aquaculturists in coping with the regulatory system. In addition, the legislatures of many states have directed that state agencies coordinate regulatory procedures that apply to aquaculture.

The Mississippi legislature has gone further by requiring that the all governmental entities involved in the regulation and enforcement of aquaculture activities develop a coordinated procedure for one-stop permitting applicable to aquaculture activities. Under this system, an aquaculturist fills out a joint application form and deposits it with any one of the regulatory agencies. The agency with which the application is deposited is required to forward the copies of the joint application to appropriate agencies for review and expeditious action. The one-stop permitting procedure document includes time schedules for review of the joint application and for action by the agencies after the permit has been received and dated³¹. Perhaps such a procedure will enable aquaculturists to consider and incorporate sound environmental practices into their plans and operations with a minimum of frustration and expense.

31 Mississippi Statutes § 79-22-19. This provision is part of the Mississippi Aquaculture Act of 1988. The state of South Carolina has requires that state agencies develop a single permit application form for persons seeking to start an aquaculture operation. South Carolina Statutes § 46-51-20.