

## DEPARTMENT OF THE INTERIOR

## Fish and Wildlife Service

## 50 CFR Part 21

RIN 1018-AE11

**Migratory Bird Permits; Proposed Depredation Order for the Double-Crested Cormorant****AGENCY:** Fish and Wildlife Service, Interior.**ACTION:** Proposed rule.

**SUMMARY:** The U.S. Fish and Wildlife Service (hereinafter Service) proposes to implement a depredation order for the double-crested cormorant. In those States in which double-crested cormorants have been shown to be seriously injurious to commercial freshwater aquaculture, and when found committing or about to commit depredations upon aquaculture stock, persons engaged in the production of aquaculture commodity stocks would be allowed, without a Federal permit, to take or cause to be taken such double-crested cormorants as might be necessary to protect aquaculture stocks.

**DATES:** Comments must be submitted on or before August 22, 1997.

**ADDRESSES:** Comments may be mailed to Chief, Office of Migratory Bird Management (MBMO), U.S. Fish and Wildlife Service, Department of the Interior, ms 634—ARLSQ, 1849 C Street, NW, Washington, D.C. 20240. Comments will be available for public inspection during normal business hours in room 634, Arlington Square Building, 4401 N. Fairfax Drive, Arlington, Virginia.

**FOR FURTHER INFORMATION CONTACT:** Paul R. Schmidt, Chief, MBMO, U.S. Fish and Wildlife Service, (703) 358-1714.

**SUPPLEMENTARY INFORMATION:****Background**

Double-crested cormorant populations are at an all-time high in the modern era, and commercial aquaculturists (especially catfish farmers) in many parts of the country are experiencing economic losses due to cormorant depredation. Three avenues currently are available to aquaculturists for dealing with cormorant depredation problems: (1) birds can be harassed (with shotgun blasts, fire crackers, propane cannons, or other scare devices) without a Federal permit; (2) ponds can be fitted with physical barriers (or exclusionary devices) such as wire or mesh netting that prevent birds from landing; and (3) private aquaculturists and State-operated fish

hatcheries can apply to the Service for a permit to kill cormorants.

The Service is the Federal agency with the primary responsibility for managing migratory birds. The Service's authority is based on the Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703-711), which implements conventions with Great Britain (for Canada), the United Mexican States (=Mexico), Japan, and the Soviet Union (=Russia). The double-crested cormorant is afforded Federal protection by the 1972 amendment to the Convention for the Protection of Migratory Birds and Game Animals, February 7, 1936, United States—Mexico, as amended, 50 Stat. 1311, T.S. No. 912, as well as, the Convention Between the United States of America and the Union of Soviet Socialist Republics [=Russia] Concerning the Conservation of Migratory Birds and Their Environment, November 26, 1976, 92 Stat. 3110, T.I.A.S. 9073 (16 U.S.C. 703, 712). The take of double-crested cormorants is strictly prohibited except as may be permitted under regulations implementing the MBTA. In addition to, Federal statutes, the double-crested cormorant may also be protected by State regulations.

Regulations governing the issuance of permits for migratory birds are authorized by the MBTA and subsequent regulations (Title 50, Code of Federal Regulations, Parts 13 and 21). Regulations in Subpart D of Part 21 deal specifically with the control of depredating birds. Section 21.41 outlines procedures for issuing permits. Sections 21.43 through 21.46 deal with special depredation orders for specific species of migratory birds to address particular problems in specific geographical areas, establishing a precedent for species and geographic treatments in the permitting process. Service policies for issuing depredation permits for aquaculture were described by Trapp et al. (1995).

Federal responsibility for the management of injurious wildlife, including migratory birds, lies with the Animal Damage Control (ADC) program of the U.S. Department of Agriculture's Animal and Plant Health Inspection Service. The primary authority for ADC activities is the Animal Damage Control Act of 1931, as amended, 46 Stat. 1468 (7 U.S.C. 426-426c). Animal Damage Control activities are conducted at the request of, and in cooperation with, other Federal, State, and local agencies; private organizations; and individuals. Management responsibilities of ADC in the cormorant-aquaculture conflict were reviewed by Acord (1995).

**Commercial Aquaculture Industry**

Aquaculture, the cultivation of finfish and invertebrates in captivity, has grown exponentially in the past several decades (Price and Nickum 1995). The five principal aquaculture fish species in the United States are catfish, trout, salmon, tilapia, and hybrid striped bass. There are also two categories of non-food fish: baitfish and ornamental fish (U.S. Department of Agriculture 1995). While each of these industries has its own unique set of bird depredation problems, they all share a basic concern for developing and implementing the best methods for protecting fish stocks from predation.

The market for channel catfish (*Ictalurus punctatus*) is the largest segment of the aquaculture industry, and the one which is perhaps most susceptible to predation by cormorants. The catfish accounts for about one-half of the value of aquaculture in the United States.

The number of catfish farms in the United States increased 44 percent between 1982 and 1990 (from 1,494 to 2,155). Most of this increase occurred between 1982 and 1987. Growth was fairly steady throughout the 1980s, with production leveling off in the past few years. Production was estimated at 224,875 metric tons (247,933 short tons, or 496 million pounds, or 225 million kilograms) worth \$353 million in 1993 and is expected to expand 5-7 percent annually due to increasing sales prices.

Mississippi is the center of catfish production, producing 75-80 percent of the United States output. Alabama, Arkansas, and Louisiana are also major producers. California, Florida, Illinois, Kentucky, Missouri, North Carolina, Oklahoma, South Carolina, Texas, and Virginia also produce catfish and all have, or will have, problems with fish-eating birds. In the four principal catfish-producing States, the number of farms increased 67 percent between 1982 and 1992 (from 794 to 1,193); increases in individual States were 24 percent in Alabama (327-405), 40 percent in Mississippi (316-442), 67 percent in Arkansas (115-191), and 330 percent in Louisiana (36-155).

The more than 64,300 hectares (158,840 acres) of catfish ponds in the United States in 1995 represented a 2.3-fold increase from about 28,300 hectares (69,900 acres) in production in the 1970s. The four principal catfish-producing States accounted for 93 percent of the total area, with Mississippi alone accounting for about 60 percent. Catfish ponds range in size from 4-14 hectares (10-35 acres) each, with a mean size of 5 hectares (12

acres). Farms with 100 hectares (247 acres) in production are not uncommon, and many are more than 400 hectares (990 acres). In the Delta region of Mississippi, catfish farms average about 100 hectares (247 acres) of ponds, with a typical rectangular pond size of 8 hectares (20 acres); ponds are shallow, ranging from 1–2 meters (3.3–6.6 feet) deep. The large size of the ponds makes them highly visible to fish-eating birds from the air, and the high stocking levels (from 5,000 to more than 150,000 fish/hectare [or 2,000 to more than 60,700 fish/acre], Glahn and Stickley 1995) make them especially attractive to cormorants. The catfish industry's practice of using large ponds developed in the early 1970s when cormorant numbers were low.

The physical dimensions of the ponds are the secret to the catfish farmers' success (as well as the source of today's predation problem). The most efficient production ponds are circular, but they can not be harvested as easily. So, the ponds are generally rectangular and can be as wide as 80–95 meters (262–312 feet). At harvest time, crews drag 100 meter (325 foot) wide seine nets strung between tractors on both sides of the rectangular ponds along the length of each pond. Undersize fish slip through the mesh and are harvested the next year. Because catfish farmers stock more than one year class of fish in a pond, it is not possible to drain the ponds and to reconfigure them to a size and shape that can be covered easily with bird-excluding nets. Also, the levees between the ponds are not wide enough to install extensive net structures and yet leave room for tractors to maneuver. Thus, several economic factors (e.g., low profit margin, the cost to modify the ponds, and a heavy investment in current harvest technologies) combine to preclude major changes in pond shape and size at the present time.

#### **Population Status of the Double-crested Cormorant**

The size of the North American breeding population of the double-crested cormorant was recently estimated at about 360,000 pairs (Hatch 1995). Using values derived from the published literature of 1–4 nonbreeding birds for each breeding pair yields an estimated total population of about 1–2 million birds (Hatch 1995).

The double-crested cormorant breeds widely throughout much of coastal and interior North America. As of 1992, it had been found breeding in 40 of the 50 United States, all 10 Canadian provinces, and in Mexico, Cuba, and the Bahamas (Hatch 1995). However, it is not uniformly distributed across this

broad area. Sixty-one percent of the breeding birds belong to the Interior population, while another 26 percent belong to the Atlantic population. Two major areas of concentration are apparent in the vast range of the Interior population: (1) the prairie lakes of Alberta, Manitoba, and Saskatchewan (which account for 69 percent of the Interior population); and (2) the U.S. and Canadian Great Lakes (accounting for another 12 percent).

Seven political units account for 70 percent of the North American breeding birds, with Manitoba alone accounting for 36 percent. Thirty (52 percent) of the 58 political units listed by Hatch (1995) each harbor fewer than 100 breeding pairs. In the catfish-producing States identified by Price and Nickum (1995), only Florida and California have sizeable breeding populations.

In the south-central United States (Arkansas, Louisiana, Mississippi, and west Tennessee), the double-crested cormorant has been known since pre-colonial times and has been recorded as an occasional breeder throughout the swampy forests of the region since at least the early 1800s (Jackson and Jackson 1995). Jackson and Jackson predicted that (in the absence of major limiting factors) the cormorant will once again become a regular member of the mid-South breeding avifauna, with birds dispersed more widely because of reservoir construction and with concentrations expected in the vicinity of aquaculture facilities.

The double-crested cormorant has always been widely distributed as a breeding species. The only suspected instance of range expansion in the 20th century is in the United States and Canadian Great Lakes, which apparently were colonized by birds expanding eastward from the Canadian prairies beginning with Lake Superior about 1913 and ending with lakes Erie and Ontario in the late 1930s (Weseloh et al. 1995). It is possible, however, that these events represented recolonization of former (but previously undocumented) breeding localities from which the species was extirpated before 1912. For example, although Barrows (1912: 67) knew of no breeding records for Michigan, he noted that it was "generally distributed over the State during the migrations" (with specimens from almost every county) and speculated that "probably there are few sheets of water any size within our limits which are not visited by this bird at least occasionally."

The core of the wintering range (i.e., the regions of greatest density) did not change appreciably between 1959–1972 and 1959–1988 (Root 1988: 11, Sauer et

al. 1996b). Cormorant wintering populations are concentrated in coastal States and Provinces, from North Carolina to Texas in the east and from California to British Columbia in the west. In the mid-South, there also are appreciable concentrations inland from the coast (e.g., east Texas, eastern Oklahoma, southeastern Arkansas, west-central Mississippi, and northeastern Alabama). Of the 9 catfish-producing States for which Christmas Bird Count data are available, 6 have indices of relative abundance that exceed the national mean; the median abundance in these 6 States (including the major catfish-producers of Alabama, Louisiana, and Mississippi) was 2.0 times the national mean (range: 1.4–9.6).

The scattered occurrence of early winter stragglers throughout much of the interior of the continent as far north as Minnesota and southern Saskatchewan (Sauer et al. 1996b) is probably a natural phenomenon of longstanding (i.e., it probably does not represent a northward expansion of the wintering range). As evidence of this, we find that 11 percent of 227 winter recoveries (December–February 1923–1988) of birds banded in Saskatchewan, Lake Huron, and eastern Lake Ontario were from latitudes north of the major catfish-producing States of Alabama, Arkansas, Louisiana, and Mississippi (Dolbeer 1991). Forty percent of these 227 winter recoveries are from 1° blocks of latitude and longitude that intersect the Gulf Coast and another 22 percent are from degree blocks that intersect the main stem of the Mississippi River. Analysis of 5,589 band recovery records for the period 1923–1988 (Dolbeer 1991) revealed that southward movement from areas north of latitude 42°N occurs primarily in October and November. Cormorants of all ages are at their greatest median distance from northern nesting areas—about 1,900 kilometers (1,200 miles)—from December through March.

Cormorants nesting in Canada and the northern United States from Alberta to the Gulf of St. Lawrence migrate in winter primarily to the southern United States between Texas and Florida. There is considerable mixing and overlap in winter of nesting populations from widely divergent areas. From 38 to 70 percent of the birds from Saskatchewan through the Great Lakes region winter in the lower Mississippi Valley (States of Arkansas, Louisiana, and Mississippi) as do 10 percent of the birds from such disparate areas as Alberta and the New England coast (Dolbeer 1991). In other words, the major catfish-producing States of the lower Mississippi may be envisioned as lying at the apex of an

inverted triangle, with cormorants from a 3,000 kilometer (1,860 mile) expanse of breeding range being funneled into the region in the winter by topographic features and the flow of the major rivers. In commenting on this funneling effect, Jackson and Jackson (1995) noted that "It is a most unfortunate coincidence that the very heart of the catfish-farming industry is located in the Mississippi Delta at the confluence of the Arkansas and Mississippi rivers."

Our knowledge of double-crested cormorant population trends before 1959 is based on fragmented and largely anecdotal accounts from scattered portions of the range. Syntheses of much of this information (Hatch 1995, Weseloh et al. 1995, and Jackson and Jackson 1995) reveal the following general patterns: (1) by 1900, cormorant numbers had been reduced, and their range possibly restricted, by human persecution and the extensive drainage and degradation of natural wetlands; (2) the widespread construction of reservoirs and impoundments (beginning in the 1920s), in concert with sport fish stocking programs and the creation of refuges and other conservation lands (beginning in the 1930s), had beneficial effects on cormorant numbers; (3) the widespread use of DDT and other pesticides (beginning in the 1940s) had devastating effects on cormorant reproductive success, with the result that populations reached their lowest point in the mid-1970s; (4) the ban on DDT in 1972 and the general decrease in levels of environmental contamination, in concert with development of the catfish industry in the mid-1970s, created a favorable environment for the growth of cormorant populations.

Quantitative information on double-crested cormorant population trends is available from three sources: (1) Breeding Bird Survey data (1966–1994), (2) Christmas Bird Count data (1959–1988), and (3) published accounts of censuses of breeding colonies. Trend information from these sources is discussed in the following paragraphs:

(1) Between 1966 and 1994, the continental breeding population increased at an estimated rate of 6.1 percent/year (Sauer et al. 1996a). The very high rate of growth in the early years (13.0 percent/year), and to a lesser extent for the entire period, is partly an artifact of the extremely small population in the early years of the survey period (late 1960s and early 1970s). Compared to the earlier (1966–1979) time period, the growth of the continental and Canadian populations appears to have slowed appreciably in the later (1980–1994) period; however,

the U.S. population has continued to show a significant rate of increase in the 1980s and 1990s, apparently due primarily to the continued rapid growth of populations in the mountains and plains States. The only significant declines noted were in the West Coast region (1966–1994) and in North Dakota (1980–1994), although the West Coast trend appears to be contradicted by rather dramatic site-specific increases in British Columbia, Washington, and California (Carter et al. 1995). Most of the recent increase in numbers has occurred within the known historical breeding range (Hatch 1995).

(2) Between 1959 and 1988, the continental wintering population increased at an average rate of 7.3 percent/year (Sauer et al. 1996b); significant increases were registered for 17 of the 20 States or Provinces for which data were available. Trends are available for 9 of the primary catfish-producing States; 6 of these States (Alabama, Louisiana, Mississippi, Oklahoma, Texas, and Virginia) have trends (median 16 percent, range 12–19 percent) that are well above the continental average. Most of the localities in the mid-South for which information is available show dramatic population increases between the mid-1970s and the early 1990s, with the trends paralleling a similar magnitude of growth in the area of catfish ponds in the region during the same period (Jackson and Jackson 1995).

(3) Rather dramatic increases in breeding pairs are documented at colonies in the Great Lakes (Weseloh et al. 1995), the St. Lawrence River and associated waters (Chapdelaine and Bédard 1995), New England (Krohn et al. 1995), the West Coast (Carter et al. 1995), and elsewhere (Weseloh et al. 1995). The trends documented by these studies generally parallel those from the Breeding Bird Survey and the Christmas Bird Count.

#### **Foraging Behavior of the Double-crested Cormorant at Aquaculture Facilities**

*Daily Movements and Activity Budgets.* In the Mississippi Delta, cormorants fly an average of 16 kilometers (25 miles) from their night roosts to feeding sites. Each bird spends about 18 percent of daylight hours feeding; 88 percent of their foraging is done at catfish ponds and 12 percent near roost sites. The average cormorant forages for 60 minutes each day, but spends just 20 minutes underwater in actual pursuit of fish (King et al. 1995).

*Feeding Rates.* Feeding rates may be dependent on the size and abundance of the available fish and the metabolic

demands of the birds, and can be quite variable. Actively feeding cormorants in commercial catfish ponds capture an average of about 5 fish/cormorant/hour (Stickley 1991, Stickley et al. 1992), but can vary from 0–28 (Schramm et al. 1984). Partly because of this variability, the rate of 5 fish/cormorant/hour reported by Stickley et al. (1992) is highly skewed; the median was only 2 fish/cormorant/hour, and the mean was equaled or exceeded at only 3 (21 percent) of the 14 ponds studied. Stickley et al. (1992) did not find a significant relationship between the mean number of cormorants present and the number of catfish consumed, but ponds with 40 or more cormorants generally had a feeding rate of 1 or fewer fish/cormorant/hour. Similarly, cormorant feeding rates were not related to the density of fingerling catfish, density of all catfish (all size classes combined), or mean length of fish.

*Diet Composition.* Cormorants eat a wide variety of prey items, and there is thus a great deal of variation in prey composition, both geographically and seasonally. Nearly all of the published information on diet composition at aquaculture facilities has been gathered in the vicinity of catfish farms in the southeastern United States (Bivings 1989, Conniff 1991, Glahn and Stickley 1992, Glahn et al. 1995, and Glahn and Brugger 1995). These studies show that, among birds actively feeding on catfish ponds, the average proportion of catfish in the winter diet (by number) is most commonly in the range of 50–55 percent. The proportion varies seasonally from less than 30 percent in October and November to more than 80 percent in February, March, and April.

*Prey Size.* Although cormorants are capable of taking catfish up to 42 centimeters (16 inches) in length (Campo et al. 1993), studies repeatedly have shown that the vast majority of catfish caught by cormorants at commercial facilities are in the range of 7–20 centimeters (3–8 inches), with most averaging about 10–15 centimeters (4–6 inches) (Schramm et al. 1984, Stickley 1991, Stickley et al. 1992). This range of prey sizes is remarkably close to that of prey taken by cormorants in natural freshwater habitats. In five such studies (Durham 1955, Hirsch 1986, Haws 1987, Hobson et al. 1989, Campo et al. 1993), prey size ranged from 6–21 centimeters (2–8 inches), with a median value of about 12 centimeters (5 inches).

*Prey Preferences.* Lacking a precise knowledge of the species composition and size distribution of the prey population, it is impossible to make definitive statements about prey preferences. However a few tendencies

are apparent. For example, the 10–15 centimeter (4–6 inch) fingerling catfish preferred by cormorants in one study represented about 64 percent of the catfish (by number) in the ponds (from Stickley et al. 1992), suggesting that the birds were merely preying on the most readily available fish. In this same study, 1 of the 14 ponds contained gizzard shad in addition to catfish. Nineteen shad were consumed for every catfish eaten, even though the pond contained about 5,100 fingerling catfish/hectare (2,100/acre). The apparent preference for gizzard shad in this instance may be related to their being more easily caught, handled, and swallowed by cormorants (the mean handling time for catfish was 6–7 times greater than that of gizzard shad).

**Daily Food Consumption Rates.** Estimates of daily food consumption rates of cormorants at or in the vicinity of aquaculture facilities in the southeastern United States vary widely, from 208–504 grams (7–17 ounces, or 0.4–1.1 pounds) (Schramm et al. 1984, Schramm et al. 1987, Bivings et al. 1989, Conniff 1991, Brugger 1993, Glahn and Brugger 1995). The most widely accepted figure is about 320 grams (11 ounces, or 0.7 pounds) of fish/day, of which about one-half (or 160 grams [5.5 ounces, or 0.35 pounds]) would be catfish (Brugger 1993).

### Impacts of Double-crested Cormorants on Aquaculture

With the exception of catfish, quantitative accounts of the impacts of cormorants on freshwater aquaculture stocks generally are lacking. The fairly large body of literature that has developed in the past 12 years represents an attempt to assess the impacts of cormorants on the commercial catfish industry. Synopses of the pertinent literature are given in the following paragraphs.

In the past, cormorants have been reported only infrequently at fish hatcheries. For example, questionnaire surveys conducted in 1977 (Scanlon et al. 1979) and 1984 (Parkhurst et al. 1987) indicate that cormorants were considered to be problems at only 4–5 percent of these facilities nationwide. Of the more than 90 other (including non-avian) species mentioned as predators, 45–50 percent were listed more frequently than cormorants. Purported instances of cormorant damage to hatchery fish in Texas (Dukes 1987) include the loss of 90 percent of the smallmouth bass (*Micropterus dolomieu*) 2-year-old brood stock at the Jasper facility.

The frequency of occurrence of cormorants at a given catfish pond is a

function of many interacting factors, including: (1) size of the regional cormorant population; (2) the number, size, and distribution of catfish ponds; (3) the size distribution, density, health, and species composition of fish populations in the catfish ponds; (4) the number, size, and distribution of “natural” wetlands in the immediate environs; and (5) the size distribution, density, health, and species composition of “natural” fish populations in the surrounding landscape. Cormorants are adept at seeking out the most favorable foraging sites. As a result, cormorants rarely are distributed evenly over a given region, but rather tend to be highly clumped or localized. For example, in 27 weekly surveys at 50 catfish ponds in Humphreys County, Mississippi, 1987–1988, cormorants were observed at only 9 of the 50 ponds and only on 14 occasions (Hodges 1989). Thus, it is not uncommon for many fish farmers in a region to suffer little or no economic damage from cormorants, while a few farmers experience exceptionally high losses.

Cormorants clearly respond in a positive way to the presence of shallow-water ponds stocked with high densities of easy-to-capture prey fish. For example, within two weeks of stocking 2 ponds in Hendry County, Florida, with 5–20 centimeter (2–8 inch) fingerling catfish, 12 cormorants were feeding in the ponds and roosting on nearby poles. A nearby 2.5 hectare (6 acre), 2.5-meter (8-foot) deep pond, stocked with 75,000 3–8 centimeter (1–3 inch) fish in August 1980, had attracted 13 cormorants by September. These birds continued to feed at the pond throughout the fall and winter, and in spring 1981 they nested in a nearby cypress dome. By November 1981, about 50 cormorants were feeding in the pond (Schramm et al. 1984). The positive response of cormorants to the presence of shallow-water ponds stocked with high densities of easy-to-capture prey fish (as illustrated above) is clearly a major factor responsible for their impacts in a variety of aquaculture situations (e.g., baitfish ponds in Minnesota, koi ponds in Missouri and elsewhere, ornamental fish ponds in Florida, and catfish ponds in the southeastern United States and elsewhere).

Assuming averages of 5 fingerling catfish consumed/cormorant/hour and 30 cormorants/pond (a constant number of feeding birds present throughout an 8 hour day), the catfish population of a typical pond in the Mississippi Delta (51,000 fish/hectare in a 8-hectare pond, which is equivalent to 20,650 fish/acre

in a 20-acre pond) would be halved in 167 days (Stickley et al. 1992). However, if actual values were nearer the median values of 2 fish/cormorant/hour and 15 birds/pond (from Stickley et al. 1992), the number of days required for the cormorants to reduce the population by half would be increased to 850 days (a 5-fold increase).

Of 281 catfish farmers queried on the Mississippi Delta in 1988 (Stickley and Andrews 1989), 87 percent felt that they had a bird problem. Moderate to heavy cormorant activity (defined as at least 25 birds/day) was reported by 57 percent of Delta farmers. Losses to birds (harassment costs plus value of fish lost) were estimated at \$5.4 million (3 percent of total sales).

Overall, there appears to be little conflict between cormorants and the food- or game-fish industry in Florida (Brugger 1992), but losses of food fish, primarily catfish, can be locally severe (Brugger 1995); for example, cormorants were responsible for the loss of up to 50 percent of the fingerling catfish in open 0.125 hectare (0.31 acre) ponds during 1991 at the University of Florida.

Although fish of commercial value made up only a small percentage of the diet of cormorants collected in the vicinity of aquaculture facilities in central and southeast Arkansas from mid-October to early December, the finding of a few fish of very high value (e.g., grass carp with wholesale value of about \$4.00 and koi worth \$5.00–10.00 each) suggests that cormorant depredations can be locally or seasonally severe.

On the Mississippi Delta, cormorants consumed an estimated 18–20 million catfish during the winters of 1989–1990 and 1990–1991, which was equivalent to 842–939 metric tons (928–1,035 short tons, or 1.86–2.07 million pounds, or 844–939 thousand kilograms). Based on the cost of replacing these fish, annual losses to the catfish industry were estimated at \$1.8–2.0 million, which corresponds to about 4 percent of the estimated catfish standing crop each year. Although losses were documented over a six-month period, the majority (about 64–67 percent) occurred in February and March (Glahn and Brugger 1995).

At catfish farms in Oklahoma (with about 324 hectares [800 acres] of surface water in production) in 1993, cormorants consumed an estimated 7,196 kilograms (15,900 pounds, or 7.9 short tons) of catfish valued at \$14,000–36,000 (depending on size of the fish consumed), or about 3–7 percent of Oklahoma catfish sales (Simmonds et al. 1995).

### Cormorant Depredation Permits

Depredation permits to take double-crested cormorants at commercial aquaculture facilities have been issued by the Fish and Wildlife Service since 1986. Composite data for a recent two-year period (1993–1994) show that about 8,200 cormorants were taken each year by 2,261 permit holders.

Cormorants represented the majority (about 57 percent) of the total number of birds killed nationwide; two-thirds of the cormorants were taken in the southeastern region of the United States, with substantial numbers also taken in the southwest and the upper Midwest.

Between 1989 and 1996, the number of permits issued to take double-crested cormorants in the southeastern United States more than quadrupled, from 50 to 215 (Coon et al. 1996). The reported take of 4,000–8,000 birds annually has had no noticeable effect on the size of the regional wintering population.

Mastrangelo et al. (1995) noted that the reported take never exceeded 68 percent of the authorized take and attributed this to the frightening effect that lethal control has on bird behavior. Hess (1994) described a recent study in which catfish farmers at three complexes in Mississippi were authorized (under Fish and Wildlife Service permits) to remove as many as 2,500 cormorants in a 19-week period. Participants were supplied with ammunition and encouraged to kill as many birds as allowed by the permit. The fact that only 290 birds had been killed by the end of the project was attributed to a learned behavior by the birds to avoid areas where they might be shot (Hess 1994).

### Environmental Consequences of Proposed Action

**Cormorant Population.** The proposed action (a depredation order) is expected to result in a moderate increase in the number of double-crested cormorants taken at aquaculture facilities. The impact is expected to be localized (e.g., possible reductions in the size of wintering populations in the immediate vicinity of catfish farms). To calculate the potential maximum harvest, we can assume that 42 cormorants (the average number reported taken by holders of depredation permits in the southeastern United States, 1989–1995; from Coon et al. 1996) will be shot at each of the about 2,200 catfish farms in the United States. The resultant annual take of 92,400 birds will represent about 5–10 percent of the continental population. This level of take will be more than offset by the recruitment of young birds into the population; a reproductive

success of 1.7–3.2 young/nest (Duffy 1995) will equate to a minimum recruitment, at current population levels, of 612,000 young into the population each year. In reality, the proposed action is expected to result in only a modest increase in the number of double-crested cormorants taken at aquaculture facilities.

**Socio-Economic.** The proposed action is expected to reduce the direct economic losses caused by cormorants at commercial aquaculture facilities. It also will enhance the effectiveness of current nonlethal control programs, thus reducing overall damage control costs to producers. The proposed depredation order will reduce paperwork and costs associated with administering the current permit system and will promote quicker and more efficient depredation control operations by shifting responsibility to the individual aquaculturists. A depredation order will demonstrate cooperation between the Federal agency responsible for protecting and enhancing wildlife (Service), the Federal agency responsible for dealing with wildlife damage issues (ADC), and the individual producers in dealing with a problem that has the potential to expand far beyond the wildlife management arena.

**Other Fish-Eating Birds.** Although the proposed action does not authorize the taking of other fish-eating birds, it is possible that a few birds could be taken accidentally on occasion. The two species that are most likely to be confused with the double-crested cormorant are the neotropical cormorant (*Phalacrocorax brasilianus*) and the anhinga (*Anhinga anhinga*). These species have foraging habits very much like those of the double-crested cormorant and may occur on or in the vicinity of catfish ponds in the Gulf Coast States. The likelihood of other fish-eating birds being mistaken for double-crested cormorants and shot accidentally is not expected to increase above that which presently occurs. However, because of a projected increase in the number of producers conducting lethal control operations for cormorants, it is possible that there will be a slight to moderate increase in the actual number of other fish-eating birds (especially neotropical cormorants and anHINGAS) taken accidentally. Any negative effects on these species would be extremely localized, and long-term impacts on populations would be unlikely.

**Endangered and Threatened Species.** Negligible impacts to endangered or threatened species are expected under the proposed action. Few endangered or

threatened species have ever been taken by aquaculturists with depredation permits. The likelihood of endangered or threatened species being taken by accident is not expected to increase under the proposed action.

### Public Comments Invited

The policy of the Department of the Interior is, whenever practical, to afford the public an opportunity to participate in the rulemaking process. Accordingly, interested persons may submit written comments, suggestions, or objections regarding this proposal to the location identified in the addresses caption. Comments must be received on or before August 22, 1997. Following review and consideration of the comments, the Service will issue a final rule on these proposed amendments.

### National Environmental Policy Act

In accordance with the National Environmental Policy Act of 1969, the Service has prepared an Environmental Assessment of the proposed action, and a Finding of No Significant Impact has been issued. Copies of these documents are available from the Chief, Office of Migratory Bird Management, U.S. Fish and Wildlife Service, 4401 North Fairfax Drive, ms 634—ARLSQ, Arlington, VA 22203.

### Endangered Species Act Consideration

Consultations will be initiated to ensure that actions resulting from this proposal will not likely jeopardize the continued existence of endangered or threatened species or result in the destruction or adverse modification of their critical habitat. Findings from these consultations will be included in a biological opinion and may cause modification of some regulatory measures proposed in this document. The final rule will reflect any such modifications.

### Regulatory Flexibility Act, Executive Order (E.O.) 12866 and Paperwork Reduction Act

Based on the economic impacts discussed above, the Service has determined under the Regulatory Flexibility Act of 1980 (5 U.S.C. 601 *et seq.*) that this rulemaking would not have a significant effect on a substantial number of small entities, which include businesses, organizations and governmental jurisdiction. This rule was not subject to review by the Office of Management and Budget under E.O. 12866.

The Service examined the proposed rule under the Paperwork Reduction Act of 1995 and found that it does not

contain information collection requirements.

#### Unfunded Mandates

The Service has determined and certifies, in compliance with the requirements of the Unfunded Mandates Act, 2 U.S.C. 1502 *et seq.*, that this rulemaking will not impose a cost of \$100 million or more in any given year on local or State government or private entities.

#### Civil Justice Reform—Executive Order 12988

The Department, in promulgating this proposed rule, has determined that these regulations meet the applicable standards found in Sections 3(a) and 3(b)(2) of Executive Order 12988.

#### References Cited

A complete list of all references cited herein is available upon request from John L. Trapp, Office of Migratory Bird Management, U.S. Fish and Wildlife Service, 4401 North Fairfax Drive, ms 634—ARLSQ, Arlington, Virginia 22203.

#### Author

The primary author of this proposed rule is John L. Trapp, Office of Migratory Bird Management.

#### List of Subjects in 50 CFR Part 21

Exports, Hunting, Imports, Reporting and recordkeeping requirements, Transportation, Wildlife.

#### Proposed Regulation Promulgation

Accordingly, the Service hereby proposes to amend part 21, subpart D, of subchapter B, chapter I, title 50 of the

Code of Federal Regulations, as set forth below:

#### PART 21—[AMENDED]

1. The authority citation for part 21 continues to read as follows:

**Authority:** Pub. L. 95–616, 92 Stat. 3112 (16 U.S.C. 712(2)).

#### Subpart D—Control of Depredating Birds

2. Part 21, subpart D, is amended by adding §21.47 to read as follows:

##### §21.47 Depredation order for double-crested cormorants at aquaculture facilities.

In all States in the contiguous 48 States except Arizona, California, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oregon, South Dakota, Utah, Washington, and Wyoming, persons actually engaged in the production of aquaculture commodity stocks may, without a Federal permit, take double-crested cormorants when found committing or about to commit depredations to aquaculture stocks on the premises owned or occupied by such persons: *Provided that:*

(a) Double-crested cormorants may be taken only by shooting, and only when necessary to protect freshwater commercial aquaculture and State-operated hatchery stocks from depredation; none of the birds so taken may be sold or removed from the area where killed; and all dead birds must be buried or incinerated within this area, except that any specimens needed for scientific purposes as determined by the Director must not be destroyed.

(b) Double-crested cormorants may be shot at freshwater commercial

aquaculture facilities or State-operated hatcheries only in conjunction with an established non-lethal harassment program approved by the Animal Damage Control program of the U.S. Department of Agriculture's Animal and Plant Health Inspection Service.

(c) Double-crested cormorants may be shot only within the boundaries of freshwater commercial aquaculture facilities or State-operated hatcheries.

(d) No person operating under the provisions of this section may use decoys, taped calls, or other devices to lure birds within gun range.

(e) Any person exercising the privileges of this section must permit, at all reasonable times, Federal or State wildlife enforcement officers access to the premises on which the operations have been or are being conducted; and must furnish to the officers whatever information they may reasonably require concerning the operations, including a log of the number of double-crested cormorants killed.

(f) Nothing in this section authorizes the killing of double-crested cormorants contrary to the laws or regulations of any State, and none of the privileges of this section may be exercised unless the person possesses the appropriate State permits, when required.

(g) Unless specifically extended, the authority granted in this section will automatically expire on April 30, 2005.

Dated: June 9, 1997.

**William Leary,**

*Acting Deputy Assistant Secretary for Fish and Wildlife and Parks.*

[FR Doc. 97–16395 Filed 6–20–97; 8:45 am]

Billing Code: 4310–55–F