Attachment A: Photos and Fish Descriptions

ATTACHMENT A1
PHOTOS OF RICE CREEK & GEORGIA PACIFIC

Photo 1: Netted Bluegill on electro-fishing boat in Rice Creek

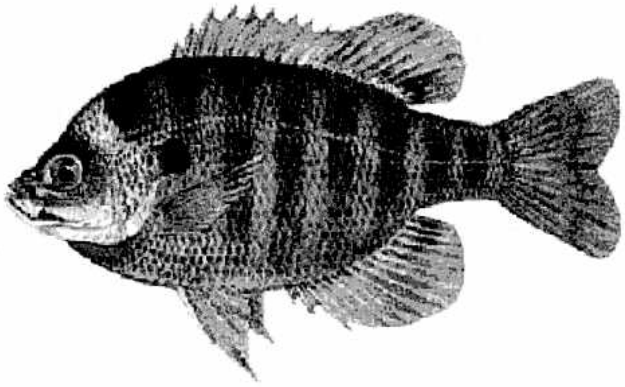
Photo 2: Rice Creek Discharge Area - Upstream Location

Photo 3: Close-up of Rice Creek Along Creek's Edge

ATTACHMENT A2
PHOTOS OF RICE CREEK & GEORGIA PACIFIC

Photo 4: Georgia Pacific Site

Photo 5: Georgia Pacific Site



BLUEGILL

(*Lepomis macrochirus*)

Common Names - bream, blue bream, sun perch, blue sunfish, copperhead, copperbelly, roach.

Description - Bluegills have small mouths and oval-shaped, almost rounded, bodies. Body coloration is highly variable with size, sex, spawning, water color, bottom type, and amount of cover. In general, they are somewhat lavender and bronze with about six dark bars on their sides. Males tend to have a copper-colored bar over the top of the head behind the eyes. The breast is silver to slightly blue most of the year, with some yellow or orange during spawning season. Females are generally lighter colored than males. Two distinctive characteristics are the prominent black spot on the rear edge of the gill-cover and a black spot at the base of the posterior portion of the dorsal fin.

Subspecies - Two are recognized: the northern bluegill (*Lepomis macrochirus macrochirus*), found in northwest Florida; and the Florida bluegill (*Lepomis macrochirus mystacalis*), found throughout Florida except the panhandle. The bluegill also hybridizes with other members of the sunfish family.

Range - Found naturally throughout Florida, and across the United States because of widespread stocking.

Habitat - Bluegills prefer the quiet, weedy waters where they can hide and feed. They inhabit lakes and ponds, slow-flowing rivers and streams with sand, mud, or gravel bottoms, near aquatic vegetation.

Spawning Habits - Bluegills are well known for "bedding" in large groups, with their circular beds touching one another. Bedding occurs in water two to six feet deep over sand, shell or gravel, and often among plant roots when the bottom is soft. Spawning occurs from April through October with the peak in May and June, when water temperature rises to about 78-80 degrees. A female may lay 2,000 to 63,000 eggs, which hatch 30 to 35 hours after fertilization.

Feeding Habits - Insects, insect larvae and crustaceans are the dominant foods of bluegills, with vegetation, fish eggs, small fish, mollusks, and snails being of secondary importance, although they may dominate their diet during certain times of the year.

Habitat - Usually found in slow-moving streams, river backwaters, reservoirs and ponds. They will tolerate a siltier bottom and higher salinity, and prefer water temperatures of 80 to 85 degrees.

Spawning Habits - As with other members of its family, they are nest builders, and the male guards the young for some time after they hatch. Both parents help excavate the large nest, usually on a sand or gravel bar. Spawning occurs in the early summer when waters reach about 70 degrees.

Feeding Habits - Although fish are their major food, whites also eat larval aquatic insects, small crustaceans, fish eggs and aquatic plants. They may feed at night, but are not as nocturnal as other catfish.

Age and Growth - Whites grow more slowly than other catfish speeies. Fish as old as 11 years have been documented. They seldom exceed a weight of three pounds.

Sporting Qualities - Among the catfishes found in Florida, the white is second only to the channel catfish in popularity. Live bait, especially minnows and worms, accounts for most caught whites, but they also will take cut and prepared baits. Since they can also be taken by commercial fishermen, no specific regulations currently apply but they are eligible for the "Big Catch" program.

Eating Quality - An excellent food fish, whites are prized for their firm, white flesh.

Records - World and State Record: 18.88 pounds, caught in the caught in the

Withlacoochee River, Marion County, Florida, in 1991.

http://www.floridaconservation.org/fishing/fishes

Age and Growth - Growth is rapid in Florida. A one-year-old fish may be four inches long. Spawning may occur the first year. Bluegills can live up to 11 years, but most are less than 7 years old. The rate of growth varies considerably in different bodies of water. However, a six-inch bluegill in Florida is typically two to four years old.

Sporting Qualities - Because of its willingness to take a variety of natural baits (e.g., crickets, grass shrimp, worms) and artificial lures (e.g., small spinners or popping bugs) during the entire year, its gameness when hooked, and its excellent food qualities, the bluegill is one of the more important sport fish in Florida and the eastern United States. As a sport fish, specific bag and size limit regulations apply, and you can register a qualifying catch as part of the Florida Fish and Wildlife Conservation Commission's "Big Catch" program.

Eating Quality - Excellent; the flesh is white, flaky, firm and sweet. They are generally rolled in cornmeal or dipped in pancake batter before frying. Many rank the bluegill as the most delicious of all freshwater fish.

World Record - 4 pounds, 12 ounces, caught in Ketona Lake, Alabama, in 1950.

State record - 2 pounds 15.25 ounces, caught in Crystal Lake, Washington County, Florida, in 1989. (Please check link for updates)

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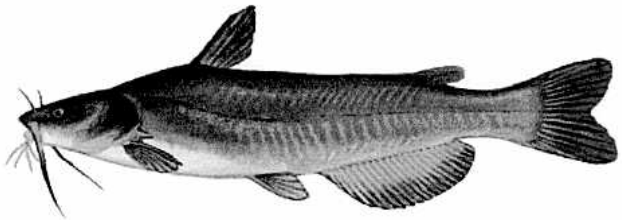
WHITE CATFISH

(*Ameiurus catus*)



Common Names - forked-tail cat, catfish

Description - The sides are blue-gray to blue-black and may be mottled. The tail is moderately forked, and the anal fin is shorter and rounder than that of channel or blue catfish. Whites have only 19-22 anal fin rays. The chin barbels are white or yellow. They have a blunt, more-rounded head, and they lack black spots on their body.

Subspecies - None

Range - In Florida, they are found statewide in rivers and steams and in slightly brackish coastal waters.

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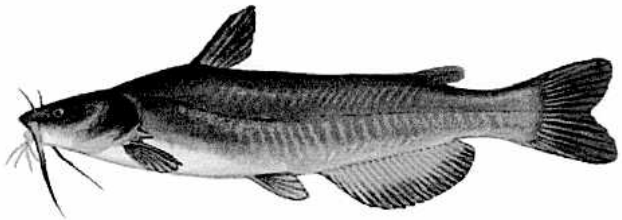

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Attachment B: Chlorinated Dibenzo-p-dioxins: General Information

Chlorinated dibenzo-p-dioxins (CDDs) are a family of 75 different compounds with varying harmful effects. CDDs are divided into eight groups of chemicals based on the number of chlorine atoms in the compound. A few examples are di-chlorinated dioxin (DCDD), tri-chlorinated dioxin (TrCDD) and tetra-chlorinated dioxin (TCDD). 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) has four chlorine atoms, one each in the 2, 3, 7, and 8 positions. 2,3,7,8-TCDD is odorless. Whether the other CDDs are also odorless is unknown. CDDs occur naturally; but human activities also produce them. They occur naturally from the incomplete combustion of organic material, such as from forest fires or volcanic activity. Industry does not purposefully manufacture CDDs, except in small amounts for research purposes. However, they are unintentionally produced by industrial, municipal, and domestic incineration and combustion processes (ATSDR 1998).

Many factors determine whether harm will occur or not to someone exposed to CDDs. These factors include the dose (how much), the duration (how long) and how the exposure occurred. Additional factors include whether or not a person was exposed to other chemicals, as well as that person's age, sex, diet, family traits, lifestyle and state of health (ATSDR 1998).

CDDs are found everywhere in the environment, albeit at generally low levels. Most people are exposed to very small background levels of CDDs when they breathe air, consume food or milk, or have skin contact with materials contaminated with CDDs (ATSDR 1998). CDDs enter the environment as mixtures containing a variety of individual components and impurities. They tend to be associated with ash, soil, or any surface with a high organic content, such as plant leaves. CDDs adhere strongly to soils and sediments. Estimates of the half-life of 2,3,7,8-TCDD on the soil surface range from 9 to 15 years, whereas the half-life in subsurface soil might range from 25 to 100 years (Paustenback et al. 1992). Sunlight and atmospheric chemicals break down only a small portion of the CDDs.

Of the 126 waste sites on the EPA National Priorities List that contain CDDs, 91 include sites where 2,3,7,8-TCDD was detected.(ATSDR 1998). People living around these sites could be exposed to above-background levels of 2,3,7,8-TCDD and other CDDs. CDDs can enter the body when one breathes contaminated air, eats contaminated food, or has skin contact with contaminated soil or other materials. The most common way CDDs can enter the body is by eating food contaminated with CDDs.

Chlorinated Dibenzofurans: General Information

Chlorinated dibenzofurans (CDFs) are a family of chemicals containing 1 to 8 chlorine atoms attached to the carbon atoms of the parent chemical, dibenzofuran. The CDF family contains 135 individual compounds (known as congeners) with varying harmful health and environmental effects. Of the 135 compounds, those that contain chlorine atoms at the 2,3,7,8 positions are

especially harmful. Other than for research and development purposes, industry does not deliberately produce these chemicals. Industry produces small amounts of CDFs as unwanted impurities of certain products, and during processes utilizing chlorinated compounds. Only a few of the 135 CDF compounds have been produced in large enough quantities that their properties, such as color, smell, taste, and toxicity could be studied. Those few CDF compounds are colorless solids. They do not dissolve in water easily. There is no known use for these chemicals. Most commonly, CDFs enter the body when one eats food contaminated with CDFs—in particular, fish and fish products, meat and meat products, and milk and milk products. Exposure to CDFs from drinking water is less than that from food (ATSDR 1994).

Like the CDDs, many factors determine whether harm will occur to a person exposed to CDFs. These factors include the dose (how much), the duration (how long) and how a person is exposed to the chemicals. Other factors include exposures to other chemicals, their age, sex, diet, family traits, lifestyle and state of health (ATSDR 1994).

Chlorinated Dibenzo-p-dioxins and Chlorinated Dibenzofurans

Chlorinated dibenzodioxins (CDDs) occur in the environment together with structurally related chlorinated dibenzofurans (CDFs). 2,3,7,8-TCDD is one of the most toxic and extensively studied of the CDDs and serves as a prototype for the toxicologically relevant or “dioxin-like” CDDs and CDFs. Based on results from animal studies, scientists have learned they can express the toxicity of dioxin-like CDDs and CDFs as a fraction of the toxicity attributed to 2,3,7,8-TCDD. For example, the toxicity of dioxin-like CDDs and CDFs can be ½ or $\frac{1}{10}$ or any fraction of 2,3,7,8-TCDD. Scientists call that fraction a Toxicity Equivalent Factor (TEF). Toxicity Equivalency Factors (TEFs) usually report CDD and CDF exposures. CDDs and CDFs are highly persistent compounds—they have been detected in air, water, soil, sediments, animals and foods. (ATSDR 1998).

The concentration of chlorinated dibenzo dioxins (CDDs) in samples of air, water, or soil is often reported as parts per trillion. One part per trillion (ppt) is one part CDD per trillion parts of air, water, or soil. For the general population, more than 90% of the daily intake of CDDs, chlorinated dibenzofurans (CDFs), and other dioxin-like compounds comes from food—primarily meat, dairy products, and fish. That said, however, the actual intake of CDDs from food for any one person would depend on the amount and type of food consumed and the level of contamination.

As stated, CDDs remain in the environment for a long time. Because CDDs do not dissolve easily in water, most will attach strongly to small particles of soil sediment or organic matter and eventually settle to the bottom. CDDs might also attach to microscopic plants and animals (plankton). In turn, larger animals eat these plants and animals, and then yet even larger animals eat them. We call this process a “food chain.” Concentrations of chemicals such as the most toxic, 2,3,7,8-chlorine-substituted CDDs, which are difficult for the animals to break down, usually increase at each step in the food chain. This process, referred to as “biomagnification,” is the reason why undetectable levels of CDDs in water can result in measurable concentrations in

aquatic animals. The food chain is the main route by which CDD concentrations build up in larger fish, although some fish can accumulate CDDs by eating particle-containing CDDs directly off the bottom (ATSDR 1998). Concentrations of dioxins in aquatic organisms can be hundreds to thousands of times higher than the concentrations found in the surrounding waters or sediments (EPA 1999). Bioaccumulation factors vary among the congeners and generally increase with chlorine content up through the tetracongeners and then generally decrease with higher chlorine content (EPA 1999).

Elevated levels of CDDs have been reported in fish, shellfish, birds, and mammals collected in areas surrounding chemical production facilities, hazardous waste sites, and pulp and paper mills using the chlorine bleaching process. Sometimes these findings have resulted in closure of these areas to both commercial and recreational fishing. People who eat food from these contaminated areas are at risk of increased exposure to CDDs (ATSDR 1998).

Individuals who could be exposed to higher than average levels of dioxins include those who ingest food containing higher concentrations of dioxins than are found in the commercial food supply. These groups specifically include recreational and subsistence fishers who routinely consume large amount of locally caught fish (EPA 1999).

Lipophilic (fat-loving) chemicals—such as dioxins—accumulate mainly in fatty tissues of fish (e.g., belly, flap, lateral line, subcutaneous and dorsal fat, dark muscle, gills, eye, brain and internal organs). Therefore, removal of fish internal organs and skin and trimming the fat before cooking will decrease exposure.

References

[ATSDR] Agency for Toxic Substances and Disease Registry. 1998. Toxicological profile for chlorinated dibenzo-p-dioxins. Atlanta: US Department of Health and Human Services.

[ATSDR] Agency for Toxic Substances and Disease Registry. 1994. Toxicological profile for chlorodibenzofurans. Atlanta: US Department of Health and Human Services.

[EPA] Environmental Protection Agency. 1999. Fact sheet on polychlorinated dibenzo-p-dioxins and related compounds update: Impact on fish advisories. Washington, DC: Office of Water.