

**CITIZEN PETITION BEFORE THE UNITED STATES
DEPARTMENT OF DEFENSE AND THE UNITED STATES
ARMY CORPS OF ENGINEERS**

CENTER FOR FOOD SAFETY)
660 Pennsylvania Ave., S.E.)
Suite 302)
Washington, DC 20003, et. al.)

Petitioners)

v.)

DONALD H. RUMSFELD,)
in his official capacity as,)
Secretary)
U.S. Department of Defense)
1000 Defense Pentagon)
Washington, DC 20301-1000)

and)

LIEUTENANT GENERAL)
ROBERT B. FLOWERS,)
in his official capacity as,)
Chief of Engineers and Commander)
U.S. Army Corps of Engineers)
2600 Army Pentagon)
Washington, DC 20310-2600)

Docket No. _____

**PETITION SEEKING A MORATORIUM ON THE ISSUANCE OF PERMITS
FOR THE RAISING OF TRANSGENIC FISH
IN THE AQUATIC ENVIRONMENT**

INTRODUCTION

Pursuant to the Right to Petition Government Clause contained in the First Amendment of the United States Constitution,¹ the Administrative Procedure Act,² and the Department of Defense's implementing regulations,³ petitioners file this petition with the Department of Defense ("DOD")/United States Army Corps of Engineers ("USACE") and respectfully request that the DOD/USACE immediately impose a moratorium on the raising of transgenic fish⁴ in ocean pens or anywhere in the aquatic environment until the following actions are undertaken:

- (1) Conduct an Environmental Assessment ("EA"), Environmental Impact Statement ("EIS"), and Programmatic Environmental Impact Statement ("PEIS") as required by the National Environmental Policy Act ("NEPA");
- (2) Consult with the Department of Interior ("DOI") and Department of Commerce ("DOC") as required by the Endangered Species Act ("ESA"); and
- (3) Initiate a public interest review, provide public notice with a request for comments, and conduct a hearing in accordance with the Rivers and Harbor Act and USACE's implementing regulations.

After completing these statutory requirements, it will be apparent that growing transgenic fish⁵ in ocean pens will significantly disrupt the environment and is contrary to the public interest. Therefore, the

¹ "Congress shall make no law ... abridging ... the right of the people ... to petition Government for a redress of grievances." U.S. Const., amend. I. The right to petition for redress of grievances is among the most precious of the liberties safeguarded by the Bill of Rights. United Mine Workers of America, Dist. 12 v. Illinois State Bar Ass'n, 389 U.S. 217, 222 (1967). It shares the "preferred place" accorded in our system of government to the First Amendment freedoms, and has a sanctity and a sanction not permitting dubious intrusions. Thomas v. Collins, 323 U.S. 516, 530 (1945). "Any attempt to restrict those First Amendment liberties must be justified by clear public interest, threatened not doubtful or remotely, but by clear and present danger." Id. The Supreme Court has recognized that the right to petition is logically implicit in, and fundamental to, the very idea of a republican form of government. United States v. Cruikshank, 92 U.S. (2 Otto) 542, 552 (1875).

² 5 U.S.C. § 553(e).

³ 32 C.F.R. § 336.6.

⁴ Transgenic fish means a genetically engineered fish that (A) has been altered at the molecular or cellular level by means that are not possible under natural conditions or processes (including, but not limited to, recombinant DNA and RNA techniques, cell fusion, microencapsulation, macroencapsulation, gene deletion and doubling, introducing a foreign gene, and changing the positions of genes), other than a means consisting exclusively of breeding, conjugation, fermentation, hybridization, in vitro fertilization, or tissue culture, *and* (B) a fish made through sexual or asexual reproduction (or both) involving a fish described in (A), if possessing any of the altered molecular or cellular characteristics of the fish so described.

⁵ Hereinafter, the term "transgenic fish" includes all transgenic fish and transgenic fish eggs.

USACE should propose a rulemaking banning the raising of transgenic fish in ocean pens or in any other device within the aquatic environment. To ensure that this ban is followed, USACE should use its enforcement authority and impose criminal or civil penalties to violators.

PETITIONERS

Petitioner, *Center for Food Safety* (CFS), is a non-profit, membership organization located at 660 Pennsylvania Ave., SE, Suite 302, Washington, DC 20003. Petitioner was established in 1997 to address the increasing concerns about the impacts of our food production system on human health, animal welfare, and the environment.

Petitioner *American Oceans Campaign* (AOC) is located at 600 Pennsylvania Avenue, Suite 210, Washington DC 20003. AOC is a national organization that works to revitalize the nation's oceans and coastal waters. AOC has two primary goals: restore and protect ocean habitats and ensure clean, safe beach water.

Petitioner *American Lands Alliance* is located at 726 7th Street, SE Washington, D.C. 20003. Petitioner works with grassroots activists around the country to protect forests and other ecosystems and the fauna and flora that depend on them.

Petitioner *Atlantic Salmon Federation* (ASF) is located at P.O. Box 5200, St. Andrews, NB E5B 3S8. Petitioner is an international, non-profit organization that promotes the conservation and wise management of the wild Atlantic Salmon and its environment. ASF has a network of seven regional councils (New Brunswick, Nova Scotia, Newfoundland, Prince Edward Island, Quebec, Maine, and New England) which have a membership of more than 150 river associations and 40,000 volunteers. The regional councils cover the freshwater range of the Atlantic Salmon in Canada and the United States.

Petitioner *The Campaign to Label Genetically Engineered Foods* is located at P.O. Box 55699, Seattle, WA 98155. Petitioner seeks to create national grassroots consumer campaign for the purpose of lobbying Congress and the President and to pass legislation that will require the labeling of genetically engineered foods in the United States.

Petitioner *Center for Ethics and Toxics* (CETOS) is located at P.O. Box 673, Gualala, CA 95445. Petitioner is a non-profit organization located on the coast of Northern California which focuses on reducing the amount of chemicals used in the environment and protecting susceptible individuals from exposure to toxic chemicals.

Petitioner *Center for Marine Conservation* (CMC), located at 1725 DeSales Street, N.W. Suite 600 Washington, D.C. 20036, is committed to protecting ocean environments and conserving the global abundance and diversity of marine life. Through science-based advocacy, research and public education, CMC promotes informed citizen participation to reverse the degradation of our oceans.

Petitioner *Council for Responsible Genetics* (CRG) is located at 5 Upland Rd., Suite 3, Cambridge, MA 02140. Founded in 1983, CRG is a national non-profit organization of scientists, environmentalists,

public health advocates, physicians, lawyers, and other concerned citizens. CRG encourages informed public debate about the social, ethical, and environmental implications of new genetic technologies.

Petitioner *Cabinet Mountain Market* is located at 14 Old Bull River Rd. Noxon, MT 59853. Petitioner is a grower/consumer co-op dedicated to providing fresh, local, organic foods to the community; and to the members of the community about the impacts of industrial agriculture and its products on human health, animal welfare, rural communities, and the environment.

Petitioner *Earth Island Institute*, located at 300 Broadway, Suite 28, San Francisco, CA 94133, believes that life on earth is imperiled by human degradation of the biosphere. Petitioner develops and supports projects that counteract threats to the biological and cultural diversity that sustains the environment. Through education and activism, these projects promote the conservation, preservation, and restoration of the earth.

Petitioner *Earth Island Journal* (EIJ) is located at 300 Broadway, Suite 28, San Francisco, CA 94133. EIJ was first published in 1982 as a class project at Stanford University. A quarterly magazine since 1987 and currently affiliated with the Earth Island Institute, EIJ has won significant acclaim for its groundbreaking coverage of environmental and social issues.

Petitioner *The Edmonds Institute* is located at 20139 92nd Avenue West, Edmonds, WA 98020. Petitioner is a non-profit, public interest organization committed to the health and sustainability of ecosystems and their inhabitants. It seeks to engage in projects that foster respect for and protection of the rights and health of all communities. The Institute focuses its efforts on understanding and sharing information about environmental, human rights and human health, and economic impacts of new technologies and intellectual property policies. The current emphasis of its programs is on: (a) biosafety and the legally-binding international regulation of modern biotechnologies, (b) intellectual property rights and just policies for the maintenance and protection of biodiversity, including policies that foster recognition and sustenance of agricultural biodiversity, and (c) exploration of the ethical implications of new technologies.

Petitioner *Farm Verified Organic, Inc.* (FVO) is located at 5449 45th Street SE, Medina, ND 58467. Petitioner is an international organic certification organization established in the early 1980's. Petitioners certify as "organic" over 115 family farms, cooperatives, processors, handlers, and manufacturers around the world.

Petitioner *Friends of the Earth* is located at 1025 Vermont Ave., NW, Suite 300, Washington, DC 20005. Petitioner is a national environmental organization dedicated to preserving the health and diversity of the planet for future generations. As the largest international environmental network in the world with affiliates in 63 countries, Friends of the Earth empowers citizens to have an influential voice in decisions affecting their environment.

Petitioner *Friends of the Presumpscot River* (FOPR) is a non-profit organization located at P.O. Box 223, South Windham, ME 04082. Their mission is to protect and enhance the Presumpscot River and its shore lands through stewardship and advocacy, working on issues such as upgrading the river's classification, discharge permitting processes and development issues along its banks.

Petitioner *Genetically Engineered Food Coalition*, located at 1200 18th Street NW, 5th Floor, Washington, DC 20036, is a coalition of seven organizations united in their commitment to testing and labeling genetically engineered food.

Petitioner *Georgia Strait Alliance* is a non-profit organization formed in 1990 to protect and restore the marine environment and promote the sustainability of Georgia Strait, and its adjoining waters and communities. Georgia Strait is the 135-mile long inland sea between Vancouver Island and the British Columbia mainland. Georgia Strait adjoins Puget Sound, together making up the area known as Georgia Basin.

Petitioner *Go Wild Consumer Awareness Campaign* is located at 1081 Sudden Valley, Bellingham, WA 98226. The “Go Wild” Campaign educates consumers on sustainable seafood choices, and the health and environmental impacts of gene-altered and feedlot produced salmon and shrimp.

Petitioner *Green Decade Coalition/Newton* (GDC/N) is a non-profit, membership organization located at 474 Center Street, Newton MA 02458. GDC/N was founded in 1990 to create sustainable solutions to environmental problems facing our city and our world.

Petitioner *Greenpeace, Inc.* is located at 1436 U Street NW, Washington, DC, 20009. Petitioner is the U.S. headquarters of one of the world’s major environmental organizations with offices in 33 countries and over 3 million donating supporters worldwide. Petitioner is a non-profit organization devoted to the protection of the environment with an emphasis on global environmental problems such as climate change and the protection of the stratospheric ozone layer, prevention of nuclear, chemical and biological pollution, and defense of biodiversity.

Petitioner *Tim Grussendorf* is a commercial fisherman, fishing vessel *Christi Sea*, and seafood processor located at 9386 River court Way, Juneau, AK 99801.

Petitioner *Half Moon Bay Fisherman’s Marketing Association*, located at P.O. Box 340, El Granada, CA 94018, is a non-profit organization formed in 1960 to advance the interests of commercial fishermen in Pillar Point Harbor, California, with special interests in promoting sustainable fisheries and responsible resource management.

Petitioner *Edward Hansen*, fishing vessel *Ocean Gold*, is a commercial fisherman located at 9369 North Douglas Hwy, Juneau AK 99801.

Petitioner *Humane Society of the United States* (HSUS) is located at 2100 L Street, NW, Washington, DC 20037. Petitioner is the nation’s largest animal-protection organization, with more than 7 million constituents. The HSUS was founded in 1954 to promote the humane treatment of animals and to foster respect, understanding, and compassion for all creatures.

Petitioner *Institute for Agricultural and Trade Policy* (IATP) is located at 2105 1st Avenue South, Minneapolis, MN 55404-2505. Petitioner is a research and education organization that acts locally, nationally and internationally to develop and support policies and strategies that expand choices and opportunities to farmers, farm workers and local communities around the world, regenerate the natural resource base, take a precautionary approach to the use of chemicals and genetic manipulation and avoids dependence

on purchased inputs and external energy sources, and tackle the causes rather than the consequences of unsustainability, looking for positive, progressive, and proactive ways of solving problems. IATP works with farmers, consumers, unions, environmental organizations, citizens groups and others both in the U.S. and around the world.

Petitioner *Institute for Fisheries Resources*, located at PO Box 11170, Eugene, OR 97440-3370, is a non-profit organization dedicated to the study, protection, and enhancement of both marine and anadromous biological resources on the Pacific Coast of the United States and Canada.

Petitioner *Keta Fisheries* is a commercial fishing company located at 10620 Starlite CT, Juneau, AK 99801 which specializes in wild salmon.

Petitioner *Maine Green Independent Party* is a legitimate political party organized to address problems of democracy, human rights and the environment through political action.

Petitioner *Maine Organic Farmers and Gardeners Association* is located at P.O. Box 2176, Augusta, ME 04338-2176. Petitioner is the oldest and largest organic organization in the USA and seeks to help farmers and gardeners grow organic food, to protect the environment, to promote stewardship of natural resources, to increase local food production, to support sustainable rural communities, and to illuminate for consumers the connections among healthful food, environmentally sound farming practices, and vital local communities.

Petitioner *Maine Toxics Action Coalition* (MTAC) was formed in 1995 to eliminate dioxin from the paper making process in Maine. Petitioner, a coalition of about 20 environmental and health-related organizations statewide, has since expanded their reference to include issues such as education and outreach around toxics and fish consumption, pesticide issues and other public health issues.

Petitioner *The Mangrove Action Project* is a global network dedicated to conserving mangrove forest ecosystems as well as promoting the rights of local coastal communities to sustainably manage their coastal resources, including mangrove forests. MAP was founded in 1992 and now has over 450 NGOs and 250 academics as well as other individual members in 60 nations.

Petitioner *Maryland Conservation Council, Inc.* is a non-profit, volunteer organization incorporated in 1969. It is a statewide coalition of environmental organizations and concerned individuals whose purpose is to provide an effective and continuing coordinating structure to work for the preservation and appreciation of Maryland's rich natural heritage, to sustain the vitality of its biological diversity and of its varied ecological systems, and to ensure the wise use of its resources.

Petitioner *Massachusetts Public Interest Research Group* (MASSPIRG) is located at 29 Temple Place, Boston, MA 02111. Petitioner is a non-profit, nonpartisan organization dedicated to serving as a watchdog for the state's citizens and environment. With tens of thousands of members and a staff of policy specialists, petitioner combines the expertise of professionals with the power of citizens in defense of clean air and water, strong safeguards for consumers, a free and vigorous democracy, and a way of living today that ensures a better quality of life tomorrow.

Petitioner *Alexandra Morton*, is a scientist located at General Delivery, Simoom Sound, British Columbia, Canada. She has been studying killer whales, including their role as top predator in an ecosystem of which salmon are a large part, in a remote archipelago on the coast of British Columbia year-round for 17 years.

Petitioner *Mothers for Natural Law* is a non-profit educational organization founded in 1996 to provide practical information and support to mothers in their attempt to insure and protect the health, well-being and innocence of their children. Though petitioner's goal is to address all challenges facing families today, from child abuse to the abuse of the environment, the primary focus during the first five years has been to raise national public awareness on the dangers of genetically engineered foods and secure mandatory labeling, safety testing, accountability and a moratorium on these foods.

Petitioner *National Environmental Law Center* is located at 29 Temple Place, Boston, MA 02111. Petitioner is a non-profit, non-partisan research and litigation organization working to stop polluters through legal action and pollution prevention techniques.

Petitioner *National Environmental Trust* is located at 1200 18th Street, NW, 5th Floor, Washington, DC 20036. Petitioner is a non-profit, non-partisan membership group established in 1994 to inform citizens about environmental problems and how they affect our health and quality of life. Through public education, NET helps people understand an issue and express their concerns to public officials.

Petitioner *Native Fish Society* is located at P.O. Box 19570, Portland, OR 97280. Petitioner strives to protect and restore native fish and their habitats, recently securing an administrative rule in Oregon to prevent the release of transgenic fish into state waterways.

Petitioner *Native Forest Network's Eastern North American Resource Center*, located at P.O. Box 57, Burlington, VT 05402, focuses primarily on genetically engineered trees and their threat to global forest ecosystems. Petitioner works to protect native forest, forest communities, and indigenous peoples.

Petitioner *Northwest Ecosystem Alliance* (NWEA) is located at 1421 Cornwall, Suite 201, Bellingham, WA, 98225. NWEA was founded in 1988 to protect and restore wildlands in the Pacific Northwest and support such efforts in British Columbia. NWEA, bridges science and advocacy, working with activists, policy makers and the general public to conserve our national heritage.

Petitioner *Northern Keta Caviar*, located at 2601 Channel Dr. Juneau, AK 99801, is a commercial fishing and caviar production company that processes and sells wild salmon.

Petitioner *Organic Consumers Association* (OCA) is located at 6114 Highway 61, Little Marias, MN 55614. Petitioner is a nationwide grassroots public interest organization dealing with issue of food safety, industrial agriculture, and genetic engineering while promoting organic and sustainable agriculture.

Petitioner *Organic Trade Association* (OTA) is a non-profit business association located at 74 Fairview Street, Greefield, MA 01301. Though OTA does not endorse the organic certification of wild aquatic animals, OTA's mission is to encourage global sustainability through promoting and protecting the growth of diverse organic trade.

Petitioner *Pacific Coast Federation of Fishermen's Association* (PCFFA), located at PO Box 29370, San Francisco, CA 94129-0370, is a federation of 25 different port and fishermen's marketing associations spanning the U.S. west coast from San Diego to Alaska. Since its inception 20 years ago, PCFFA has been leading the industry in assuring the rights of individual fishermen and fighting for the long-term survival of commercial fishing as a productive livelihood and way of life.

Petitioner *Penobscot Bay Watch* is a non-profit, membership organization located at 418 Main Street, Rockland, ME 04841. Petitioner was established in 1995 to respond to concerns about the impact of coastal development and industrial agriculture on the abundance and distribution of natural species in Penobscot Bay and the tidal Penobscot Bay River.

Petitioner *Pesticide Action Network-North America* (PANNA) is located at 49 Powell St., Suite 500 San Francisco, CA 94102. Petitioner has campaigned to replace pesticides with ecologically sound alternatives since 1982. PANNA links over 100 affiliated health, consumer, labor, environment, progressive agriculture and public interest groups in Canada, Mexico, and the United States with thousands of supporters worldwide to promote healthier, more effective pest management through research, policy development, education, media, demonstrations of alternatives and international advocacy campaigns.

Petitioner *Pine Creek Organic* is located at 200 Pine Swamp Road, Danville, PA 17821. Petitioner is a small, certified organic operation growing medicinal and culinary herbs, leafy greens, tomatoes, peppers, and raspberries.

Petitioner *Dean Risley* is a commercial fisherman and processor in Southeast Alaska located at PO Box 1012, Haines, AK, 99827.

Petitioner *Save Our Shores* is located at 2222 East Cliff Drive, #5A, Santa Cruz, CA 95063. Petitioner was formed to protect and promote the ecological integrity of the Monterey Bay National Marine Sanctuary through education, policy research, and citizen action.

Petitioner *Cory Schreiber*, 1221 Northwest 21st Avenue, Portland, OR 97209, is a critically acclaimed chef specializing in "cooking from the source," emphasizing organic produce from the Pacific Northwest. Awarded the James Beard Award in 1998 for the "Best Chef Pacific Northwest," Mr. Schreiber opened a restaurant, *Wildwood*, in 1994 in his native Portland.

Petitioner *The Sierra Club* is located at 85 Second Street, Second Floor, San Francisco, CA 94105-3441. Petitioner is one of the world's leading conservation organizations, as well as one of the oldest, with over 600 thousand members. It's the largest grassroots conservation organization in the United States. The purposes of the Sierra Club include protecting the quality of the natural and human environment and using all lawful means to carry out its objectives.

Petitioner *Southeast Alaska Fishermen's Alliance, Inc.* is located at 9369 North Douglas Hwy, Juneau, AK 99801. Petitioner is a non-profit, membership organization established in May 2000 to preserve, promote, protect and perpetuate the fishing industry for salmon, crab, shrimp, and longline fisheries in SE Alaska and to further promote legislation, conservation management, safety at sea, and the general welfare of its members.

Petitioner *Sweet Lisa Seafood*, fishing vessel *Salty*, located at PO Box 6464, Ketchikan, AK 99901, produce numerous Alaskan wild salmon products.

Petitioner *The Temple of Ascension* is a learning center dedicated to raising individual consciousness, as well as a healing center dedicated to joining the physical with the spiritual. It is the petitioner's belief that one's birthright (if and when one chooses it) is to ascend from this physical dimension to the next level in spiritual development. One practices ways and means to refine and attune one's body (one's temple) to reach a level of harmony that will activate one's light within, thereby leading to soul development and ascension.

Petitioner *Norman and Karen Thompson*, fishing vessel *Dog Catcher*, is a commercial fisherman in Alaska and Washington, located at 2520 Oakes Ave, Anacortes, WA 98221.

Petitioner *Arthur Thurn*, fishing vessel *Skibo*, operates a 36-foot salmon gill-netter and halibut long-liner that works in Southeast Alaska and is located at 2323 G. Street, Bellingham WA, 98225-3640.

Petitioner *20/20 Vision Education Fund* is a non-profit membership organization located at 1828 Jefferson PL, NW, Washington, DC 20036. Petitioner was established in 1985 to facilitate citizen participation in pending peace and environment issues. This is accomplished by notifying members through a monthly action card that sets out how each member can write a letter or take some action in no more than 20 minutes each month. Priority campaigns include stopping national missile defense, promoting clean vehicle technology and ensuring safe foods.

Petitioner *United States Public Interest Research Group* (U.S. PIRG) is located at 218 D Street, S.E., Washington, DC, 20003. Petitioner is the national office for the State PIRGS, a network of groups with offices around the country working on consumer rights, good government, and environmental issues. For over 25 years the PIRGs have been one of the nation's leading nonprofit, nonpartisan groups acting on behalf of the public.

Petitioner *Washington Public Interest Research Group* (WashPIRG), located at 3240 Eastlake Ave. E., Suite 100, Seattle, WA 98102, is a non-profit, non-partisan environmental and consumer's protection group.

Petitioner *Washington Toxics Coalition* (WTC) is located at 4649 Sunnyside Ave. N., Suite 540, Seattle WA 98103. WTC is a non-profit organization dedicated to protecting public health and preventing pollution in industry, agriculture, and the home. Founded in 1981, WTC has been on the cutting-edge of policy reform efforts ranging from pesticide use reduction in schools to the elimination of persistent bioaccumulative toxics (PBTs) in Washington State. WTC also advocates the adoption of non-toxic alternatives to toxic products and develop high-quality educational materials on alternatives.

Petitioner *Washington Trollers Association* (WTA), located at P.O. Box 7431, Bellevue, WA 98008, strives to preserve and protect the Northwest's salmon stocks as well as represent the people whose livelihoods depend on the salmon. Composed of fishermen who operate out of smaller fishing boats, the WTA promotes sustainable fishing in harmony with nature and selective fishing techniques to ensure that only salmon are harvested.

Petitioner *Washington Trout*, located at PO Box 402, 15629 Main Street NE, Duvall, WA 98019, is a nonprofit science-based organization formed in 1989 to preserve, protect and restore Washington's wild fish and their habitats.

Petitioner *Wild Alaska Smoked Salmon* is a commercial fishing company, fishing vessel *Single O*, located at P.O. Box 2140, Kodiak, AK 99615, which specializes in salmon, halibut, king crab, shrimp, and caviar.

Petitioner *Joe and Erin Willis* are commercial fishermen, fishing vessel *Mariner II*, located at PO Box 43, Petersburg, AK 99833.

STATEMENT OF FACT

Genetic engineering is a novel technology that is fundamentally altering our food supply. Biotechnologists now are able to take genetic material from one organism and insert it into the permanent genetic code of another. Among these novel food creations are fish genetically engineered for human consumption. Already, over thirty-five species of transgenic fish are being developed around the world.⁶ Despite this rapid development, little, if any, action has been taken by the United States to establish a regulatory framework for addressing the novel human health and environmental impacts posed by the commercialization of transgenic fish.

Currently, the Food and Drug Administration ("FDA") has initiated steps to determine whether or not approval of the first transgenic fish for human consumption is warranted. As far as petitioners are aware, only one company, A/F Protein, is presently requesting FDA approval to market transgenic salmon to the public. A/F Protein's transgenic fish contains a growth hormone gene from a chinook salmon and an antifreeze protein gene promoter from an ocean pout that keeps the growth hormone active.⁷ This transgene is injected into fertilized eggs. Due to the continuous production of the growth hormone gene, these transgenic fish grow as much as ten to thirty times faster than normal salmon.⁸

Although this petition reviews the human health and environmental concerns connected with salmon injected with a growth hormone, it also identifies studies and reports from other types of transgenic fish that are currently being researched. The purpose of the petition is to identify the human health and environmental concerns along with the regulatory requirements that must be addressed by USACE when reviewing any and all requests for a permit to grow transgenic fish in the marine environment.

⁶ Tony Reichhardt, Will souped up salmon sink or swim?, 406 Nature 10 (July 6, 2000)[hereinafter "Souped up Salmon"].

⁷ Choy L Hew and Garth Fletcher, Transgenic fish for aquaculture, Chemistry & Indus. (Apr. 21, 1997) available at <http://ci.mond.org/9708/970812.htm>. [hereinafter "Transgenic fish for aquaculture"].

⁸ Id.

While no federal laws specifically govern the regulation of genetically engineered animals grown for human consumption, the FDA has made the informal decision to regulate transgenic fish under its authority to review animal drugs. In taking this action, transgenic fish producers must complete a New Animal Drug Application (NADA) and demonstrate the safety and effectiveness of these fish. Any such demonstration of safety must be shown through substantial evidence. Given the potential toxicity, allergenicity, and aquaculture diseases posed by the commercialization of transgenic fish, in adopting any pre-market regulatory review, the FDA must adopt a pre-market regulatory review that does not ignore these potential human health safety concerns

In addition to these novel issues of food safety, the commercial introduction of transgenic fish poses significant and unprecedented potential risks to the environment. Although FDA has experience and authority to regulate food and drugs, the agency does not have expertise in areas such as marine ecology. The manner in which transgenic fish will impact the environment must be fully reviewed by the environmental agencies charged by Congress with this responsibility. Taking such action is imperative. Already, scientists are warning about the environmental dangers caused by the accidental release of transgenic fish into the environment.⁹ If transgenic fish are permitted to be grown in ocean pens, it is inevitable that these fish will escape. Examples from fish farmers throughout the world demonstrate that farmed fish are repeatedly escaping from ocean pens. Even the Council on Environmental Quality (“CEQ”) recently stated that it “must be assumed that escapes will occur” from ocean pens.¹⁰

Unintended releases of transgenic fish into the world’s waters may cause significant impacts to the environment and endangered species. New studies have shown that transgenic fish are more aggressive, eat more food, and will attract more mates than wild fish.¹¹ In addition, these studies show that although transgenic fish will attract more mates, their offspring will be less fit and less likely to survive. As a result, scientists predict that transgenic fish will cause some species to become extinct within only a few generations.¹² Once one species becomes extinct, other species will likely be affected. There are already 114 species of fish, including Atlantic salmon, that are listed under the Endangered Species Act (“ESA”).¹³ Allowing transgenic fish in ocean pens may significantly increase this number.

⁹ See *infra* pp. 16-24

¹⁰ Case Study No. I, Growth-Enhanced Salmon, in *CEQ and OSTP Assessment: Case Studies of Environmental Regulations for Biotechnology*, 23, available at <http://www.ostp.gov/html/012201.html> (last visited Apr. 19, 2001) [hereinafter “CEQ Transgenic Salmon Study”]. The leading drafting agency on the growth-enhanced salmon case study was FDA. NMFS and DOI were also part of the drafting team.

¹¹ *Id.*

¹² William M. Muir and Richard D. Howard, *Possible ecological risks of transgenic organism release when transgenes affect mating success: Sexual selection and the Trojan gene hypothesis*, 96 PNAS 13853-13856 (Nov. 23, 1999) [hereinafter “Trojan gene hypothesis”].

¹³ U.S. Fish and Wildlife Service, *U.S. Listed Vertebrate Animal Species Report by Taxonomic Group as of 11/1/2000*, available at <http://endangered.fws.gov/wildlife.html> (last visited Nov. 1, 2000) [hereinafter “Listed Vertebrate Species”].

While FDA is currently reviewing, and has not yet approved, A/F Protein's transgenic salmon, this company already has orders for 15 million transgenic salmon eggs and is talking to fish farmers all around the world.¹⁴ Given the immediacy of this situation, it is clear that regulatory action must be taken swiftly. Although fish farmers want to grow transgenic fish in ocean pens, within the DOD; the USACE and the Secretary of Army, are responsible for determining whether this action should be permitted. Under the Rivers and Harbors Act, all structures in navigable water are strictly prohibited unless recommended by the USACE and authorized by the Secretary of Army.¹⁵ In reaching this decision, the USACE must consider the public interest by balancing several factors some of which include, conservation, economics, aesthetics, water quality, and fish and wildlife values.¹⁶ If the USACE receives a request for a permit to place a structure in navigable water, such as ocean pens, and the proposal is found by the USACE to be contrary to the public interest, then the USACE must deny the permit request. In addition, USACE is required to consult with the DOI and DOC as required by the ESA and conduct an environmental review as mandated by NEPA before granting any permits to grow transgenic fish in ocean pens.

To ensure that any federal action regulating transgenic fish completely and thoroughly provides protection to public health and the environment, for the reasons outlined herein, petitioners request that the USACE impose a moratorium on the raising of transgenic fish in oceans pens or anywhere in the aquatic environment until the agency complies with its statutory responsibilities.

STATEMENT OF LAW

Administrative Procedure Act, 5 § U.S.C. 551, *et seq.*

National Environmental Policy Act, 42 U.S.C. § 4321, *et seq.*

Endangered Species Act, 16 U.S.C. § 1531, *et seq.*

Rivers and Harbor Act, 33 U.S.C. § 401, *et seq.*

All other applicable statutes and regulations.

¹⁴ Julie Vorman, GMOs may pose new risk to endangered plants, animals, Yahoo News, May 4, 2000 available at http://dailynews.yahoo.com/h/nm/20000504/sc/biotech_endangered_1.html [hereinafter "GMOs Pose New Risk"].

¹⁵ 33 U.S.C. § 403; 33 C.F.R. § 320.2(b)(explaining that the "authority of the Secretary of the Army to prevent obstructions to navigation in navigable waters of the United States was extended to artificial islands, installations, and other devices located on the seabed, to the seaward limit of the outer continental shelf, by section 4(f) of the Outer Continental Shelf Lands Act . . .").

¹⁶ 33 C.F.R. § 320.4(a)(1).

ARGUMENT

At the same time petitioners filed this petition, petitioners also filed a petition with FDA requesting that FDA not approve the commercialization of transgenic fish due to the potentially egregious human health and environmental impacts. If FDA ignores the numerous human health and environmental concerns and approves the commercialization of transgenic fish, USACE will be responsible for determining whether or not to allow the use of ocean pens for growing transgenic fish. In making this determination, the USACE must comply with its statutory responsibilities by completing an EA, EIS, and PEIS as mandated by NEPA and initiating a consultation with DOI/DOC as required by the ESA.¹⁷ In addition to these statutory requirements, USACE is responsible for implementing its own regulations in accordance with the Rivers and Harbors Act.¹⁸ Before issuing a permit for ocean pens, USACE's regulations require the agency to issue a public notice with a request for comments, a public hearing, and a public interest review.¹⁹ All of these regulatory and statutory responsibilities must be thoroughly completed before USACE decides whether to allow transgenic fish in ocean pens.

A. The United States Corps Of Engineers Is Required Under The National Environmental Policy Act To Review The Impacts To The Environment.

The National Environmental Policy Act ("NEPA") is the "basic national charter for protection for the environment."²⁰ NEPA is intended to "promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man."²¹ The duties under this section are not "inherently flexible."²² In fact, "[c]onsideration of administrative difficulty, delay or economic cost will not suffice to strip the section of its fundamental importance."²³ The purpose behind NEPA is to "insure that environmental information is available to public officials and citizens before decisions are made and before actions are taken."²⁴

¹⁷ See 42 U.S.C. § 4321, *et seq.*; 16 U.S.C. § 1531, *et seq.*

¹⁸ See 33 U.S.C. § 401, *et seq.*

¹⁹ See 33 C.F.R. §§ 325.3, 320.4.

²⁰ 40 C.F.R. § 1500.1.

²¹ 42 U.S.C. § 4321.

²² Calvert Cliffs Coordinating Comm. Inc. v. U.S. Atomic Energy Comm'n, 449 F.2d 1109 (D.C. Cir. 1971).

²³ Id.

²⁴ 40 C.F.R. § 1500.1(b),(c).

Recognizing the effects of new technologies on the environment, Congress explicitly states in NEPA that “new and expanding technological advances” are activities that could threaten the environment.²⁵ In the legislative history, Congress expressed its concern with “[a] growing technological power * * * far outstripping man’s capacity to understand and ability to control its impact on the environment.”²⁶ Thus, in order to understand and control the effects of this new technology, Congress requires federal agencies to consider the environmental effects of new technology by complying with the requirements of NEPA. In addition to environmental concerns, the proposed action’s possible direct, indirect, and cumulative impacts on public health must be reviewed.²⁷

As mandated by Congress, the USACE must comply with NEPA before permitting transgenic fish to be grown in ocean pens or anywhere in the aquatic environment. USACE’s decision on whether or not to approve the growing of transgenic fish in ocean pens is a major federal action that may significantly affect the environment.²⁸ Therefore, before this decision is reached, USACE is required to fully and completely consider the environmental impacts as part of the NEPA process.

(1) USACE’s responsibilities under the National Environmental Policy Act.

To accomplish NEPA’s purposes, all federal agencies are required to prepare a “detailed statement” regarding all “major federal actions significantly affecting the quality of the human environment . . .”²⁹ This statement - - known as an Environmental Impact Statement (“EIS”) - - must describe: (1) the “environmental impact of the proposed action,” (2) any “adverse environmental effects which cannot be avoided should the proposal be implemented,” (3) “alternatives to the proposed action,” (4) “the relationship between local short-term uses of man’s environment and the maintenance and enhancement of long-term productivity,” and (5) any “irreversible or irretrievable commitment of resources which would be involved in the proposed action should it be implemented.”³⁰

To determine whether an EIS is required, federal agencies must prepare an Environmental Assessment (“EA”) that provides sufficient evidence and analysis to support the agency’s determination on whether a proposed action will significantly affect the environment. The Council on Environmental

²⁵ 42 U.S.C. § 4331(a).

²⁶ Found. on Economic Trends v. Heckler, 756 F.2d 143, 147 (D.C. Cir. 1985) quoting S. Rep. No. 91-296 (1969).

²⁷ 40 C.F.R. § 1508.8(b)(1999); Baltimore Gas & Elec. Co. v. NRDC, 462 U.S. 87, 106 (1983)(explaining that “NEPA requires an EIS to disclose the significant health, socioeconomic, and cumulative consequences of the environmental impact of a proposed action”).

²⁸ 42 U.S.C. § 4332(C).

²⁹ Id.

³⁰ Id.

Quality (“CEQ”) factors for determining the “significance” of an action include: (1) “the degree to which the proposed action affects public health or safety,” (2) “the degree to which the effects on the quality of the human environment are likely to be highly controversial,” (3) “the degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks,” (4) “[t]he degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration,” or (5) “the degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.”³¹ The “presence of one or more of these factors should result in an agency decision to prepare an EIS.”³²

As a limited exception to NEPA’s requirements, agencies may categorically exclude a class of actions. However, if the proposed action may “significantly affect the quality of the human environment,” then the agency must prepare an EA/EIS.³³

(2) USACE must conduct an Environmental Assessment/Environmental Impact Statement and review the impacts to the environment.

Although A/F Protein stated that they have not conducted *any* environmental tests,³⁴ USACE is responsible under NEPA for reviewing the environmental risks of growing transgenic fish in the aquatic environment.³⁵ USACE’s own regulations require at least an EA before issuing a permit.³⁶ Any decision to categorically exclude permits, for growing transgenic fish in the aquatic environment, from NEPA should be rejected because the CEQ factors for identifying the “significance” of this action on the environment, requiring an EA/EIS, are repeatedly demonstrated. Additionally, the Department of Army’s NEPA regulations require an EIS when the proposed action will significantly affect endangered

³¹ 40 C.F.R. § 1508.27(b)(2)(4)(5)(6)(9). The CEQ issued regulations implementing NEPA in response to President Carter’s Executive Order 11991 (1977). See Andrus v. Sierra Club, 442 U.S. 347, 357 (1979). The Executive Order directed federal agencies to “comply with the regulations issued by the Council.” See id., quoting Executive Order 11991. The Supreme Court has held that these regulations are entitled to substantial deference by the courts. Id. at 358; Marsh v. Oregon Natural Resources Council, 490 U.S. 360, 372 (1989).

³² Public Service Co. of Colo. v. Andrus, 825 F. Supp. 1483, 1495 (D. Idaho 1993); See Friends of the Earth, Inc. v. U.S. Army Corp of Eng’rs, 2000 U.S. Dist. LEXIS 11755 (D.D.C. 2000).

³³ 40 C.F.R. § 1508.4.

³⁴ Carol Kaesuk Yook, Altered Salmon Leading Way to Dinner Plates, but Rules Lag, N.Y. Times, May 1, 2000, at A1, A20. [hereinafter “Altered Salmon”].

³⁵ See 42 U.S.C. § 4332(C); 40 C.F.R. § 1506.5.

³⁶ 33 C.F.R. § 230.7(a).

species, environment quality, or public health.³⁷ Because the scientific evidence and agency admissions discussed below indicate that transgenic fish will likely escape ocean pens and harm endangered species, the environment, and public health, USACE must not only conduct an EA, but also an EIS before approving any permits to grow transgenic fish in the aquatic environment.

(a) Risk of transgenic fish escaping ocean pens.

Most salmon aquaculture is conducted in ocean pens. Although ocean pens may be cost effective, this method of aquaculture is highly susceptible to breakage and thus, there is a substantial likelihood that transgenic fish will escape from ocean pens and mix with wild fish. Even A/F Protein admits that “unless the aquaculture operation is entirely land-based with rigid containment methods in place, there is always the possibility of sterile transgenic fish escaping into the wild.”³⁸

As demonstrated by the current use of ocean pens for aquaculture, the accidental release of fish is considerable. Indeed, on average, 15% of farmed fish escape.³⁹ There are also several incidences of mass fish escapes. In 1990, approximately four million fish escaped from a fish farm in Norway.⁴⁰ Recently, over 170,000 farm raised salmon escaped from a net pen after a storm in Maine.⁴¹ The Fish and Wildlife Service reports that “25-40% of the fish in the North Atlantic Ocean is of aquaculture origin.”⁴² Weather, human error, and marine mammal and bird attacks⁴³ all contribute to the release of

³⁷ 32 C.F.R. § 651.29.

³⁸ Arnold Sutterlin, *et al.*, Environmental Risks In Using GH Transgenic Atlantic Salmon And Rainbow Trout For Commercial Marine Production In Canada, available at <http://www.nbiap.vt.edu/brarg/brasym96/sutterlin96.htm> (last visited Sept. 9, 1999); A/F Protein Inc., The Blue Revolution, available at <http://acbi.ca/afprotein/blue.htm> (last visited May 24, 2000) (admitting that “an ocean pen facility may well represent the most cost effective method of production, it is also the riskiest with storms, disease, predation, and changes in water temperature having severe impacts on harvest.”).

³⁹ Eric M. Hallerman & Anne R. Kapuscinski, Ecological implications of using transgenic fishes in aquaculture, 194 ICES Mar. Sci. Symp. 56, 59 (1992) [hereinafter “Ecological implications”].

⁴⁰ Walter Gibbs, Fish-Farm Escapees Threaten Wild Salmon, N.Y. Times, Oct. 1, 1996 at C4.

⁴¹ Catastrophic Salmon Escape Prompts Calls for Moratorium on the Aquaculture Industry, available at <http://www.clf.org/hot/20010223.htm> (last visited Apr. 2, 2001).

⁴² Fish and Wildlife Service, Biological Report on the Status of Atlantic Salmon: Threats to Wild Salmon, available at <http://news.fws.gov/salmon/asalmon75.html>. (last visited Apr. 10, 2000).

⁴³ 62 species of birds and 13 species of mammals are potential predators of transgenic fish in ocean pens. Rebecca Goldberg and Tracy Triplett, Murky Waters: Environmental Effects of Aquaculture in the U.S., Environmental Defense Fund at 57 (1997) [hereinafter “Murky Waters”].

fish from ocean pens.⁴⁴ Recognizing that fish repeatedly escape from net pens, CEQ recently stated that it “must be assumed that escapes will occur” from net pens.⁴⁵

If the USACE approves permit requests to grow transgenic fish in ocean pens, then this will be the first time that a transgenic animal will be raised in the ocean for human consumption.⁴⁶ A/F Protein, who intends to license these fish eggs to fish farmers, reports that they have had discussions about transgenic salmon with almost every salmon company in the world.⁴⁷ Once transgenic fish are commercialized, there will likely be a great number of transgenic fish in the water. Recognizing the harm that transgenic fish may cause, a DOI official cautioned that rare wildlife may be impacted by transgenic fish.⁴⁸ An EA/EIS must be prepared for unprecedented actions with significant effects.⁴⁹ Given the high likelihood that transgenic fish, like other farmed raised fish, will escape from ocean pens in large numbers, the environment, including endangered species will likely be affected by the unprecedented growing of these animals in the wild. Therefore, the USACE must comply with NEPA.⁵⁰

(b) Risks of transgenic fish harming endangered species

An EA/EIS must also be prepared for any action that may affect an endangered or threatened species or its habitat.⁵¹ Once transgenic fish escape from ocean pens, endangered species and species approaching “endangered species” status will be severely impacted. The rapidly decreasing fish population levels are evident in a recent study showing that there are already 82 species of fresh water fish in North American waters that are near extinction.⁵² Moreover, the number on the endangered

⁴⁴ Environmental Assessment Office, British Columbia, The Salmon Aquaculture Review: Escaped Farm Salmon, available at <http://www.eao.gov.bc.ca/PROJECT/AQUACULT/SALMON/report/v1chp5.htm> (last modified July 14, 1998).

⁴⁵ CEQ Transgenic Salmon Study, supra note 10, at 23.

⁴⁶ FDA, Center for Veterinary Medicine, Questions and Answers about Transgenic Fish, available at <http://www.fda.gov/cvm/fda/infores/consumer/transgen.htm> (last visited Feb. 22, 2000) [hereinafter “Questions and Answers”] (stating that “No transgenic fish have been approved for producing food in the U.S.).

⁴⁷ Altered Salmon, supra note 34.

⁴⁸ GMOs Pose New Risk, supra note 14.

⁴⁹ 40 C.F.R. § 1508.27(b)(6).

⁵⁰ See Edmonds Inst. v. Babbitt, 42 F. Supp. 2d 1, 18-19 (D.D.C. 1999).

⁵¹ 40 C.F.R. § 1508.27(b)(9); 32 C.F.R. §§ 651.22, 651.29.

⁵² J.A. Musick, et al, Marine, Estuarine, and Diadromous Fish Stocks at Risk of Extinction in North America, 25 Fisheries 6, 19 (Nov. 2000)[hereinafter “Musick”].

species list, has reached 114 and includes populations of the chinook, chum, coho, and sockeye salmon.⁵³ Even the number of Atlantic salmon have dramatically decreased leading the DOI and DOC to recently list this species as endangered under the ESA.⁵⁴ These agencies stated that one of the reasons for the decline of this species is due to aquaculture because farmed fish spread diseases to wild Atlantic salmon and when farmed fish escape they affect the genetic integrity and compete with Atlantic salmon for habitat and food.⁵⁵

Allowing transgenic fish in ocean pens will likely result in further devastating the Atlantic salmon and other fish populations. Already, introduced non-native fish from aquaculture facilities are believed to have contributed to the decline of eight fish species listed under the ESA.⁵⁶ Concerned about the depleting numbers of Atlantic salmon, the Department of Interior warned that this species could be “quickly wiped out if transgenic fish grown in nearby aquaculture farms escape their pens.”⁵⁷ The Department of Interior recognizes the harm that transgenic fish may cause endangered species and the scientific studies support this assertion.

Recent studies suggest that reproductive problems in transgenic fish could also severely harm existing fish populations. Studies conducted by two scientists at Purdue University show that transgenic fish will have a greater mating advantage due to their larger size.⁵⁸ However, their offspring will have a reduced ability to survive because transgenic fish are “macromutants that lack any history of selection that could reduce negative fitness effects.”⁵⁹ As a result of transgenic fish producing the least fit offspring yet obtaining a disproportionate share of the mates, the Purdue scientists predict that if 60 transgenic fish were introduced into a population of 60,000 wild fish, the species would become extinct within only 40 generations.⁶⁰ They refer to these disturbing results as the “Trojan gene effect.”⁶¹

⁵³ Listed Vertebrate Species, supra note 13.

⁵⁴ 65 Fed. Reg. 69459 (2000).

⁵⁵ DOI and DOC, Guide to the Listing of a Distinct Population Segment of Atlantic Salmon as Endangered (Nov 2000).

⁵⁶ See Murky Waters, supra note 43 at 51 - 52; DOI and DOC, Guide to the Listing of a Distinct Population Segment of Atlantic Salmon as Endangered (Nov 2000).

⁵⁷ GMOs Pose New Risk, supra note 14.

⁵⁸ Trojan Gene Hypothesis, supra note 12, at 13853 - 13856.

⁵⁹ Id.

⁶⁰ Id.

⁶¹ Id.; See Phillip W. Hedrick, Invasion of transgenes from salmon or other genetically modified organisms into natural populations, 58 Can. J. Fish Aquatic Science, 841-844 (stating that “there are very broad conditions in which a transgene with a large mating advantage and a pleiotropic viability disadvantage may

A/F Protein does not believe that transgenic fish could cause a Trojan gene effect but acknowledges that the company has not done any experiments to determine whether transgenic fish are larger at sexual maturity or have a mating advantage.⁶² However, one scientist who has conducted experiments with transgenic fish discovered that growth-enhanced transgenic coho salmon are 50% larger at sexual maturity than wild fish.⁶³ Additionally, William Muir, the same Purdue researcher who discovered the “Trojan gene effect,” recently expanded his prior research. This time, instead of assuming that transgenic fish would be bigger, he tested this hypothesis. He found that a salmon growth hormone caused adult medaka to grow 50% larger than normal but their viability to sexual maturity is as low as 78%.⁶⁴ These results suggest that transgenic fish may be bigger and could cause the Trojan gene effect at a very quick rate.

Other studies also indicate that transgenic fish may be less fit than wild fish. Research conducted by Robert Devlin and others shows that transgenic fish are less careful about avoiding predators and may not be able to endure the arduous migratory process.⁶⁵ The best current scientific evidence available shows that species extinction may occur as a result of transgenic fish that slip out of ocean pens into the wild. Therefore, an EA/EIS must be prepared.

The USACE is also required to conduct an EA/EIS when the effects of an action are likely to be highly controversial.⁶⁶ The effects that transgenic fish will have on endangered species are highly

invade natural populations, reduce their fitness, and potentially cause their extinction.”). Researcher Hedrick further explained that his findings “should serve to alert researchers of the inherent risks of accidental releases of GM organisms into natural populations.” *Id.* at 843.

⁶² Altered Salmon, *supra* note 34, at A20.

⁶³ Souped up Salmon, *supra* note 6, at 11.

⁶⁴ *Id.* Although the chinook salmon, the largest species of salmon, can grow up to 100 pounds in the wild, a New Zealand Company reported that its transgenic salmon could grow up to 550 pounds. Les Blumenthal, Genetically Altered Salmon Cause Debate Among U.S. Officials, News Tribune (Aug 21, 2000) (hereinafter “Salmon Cause Debate”).

⁶⁵ Gene RH Devlin, et al, Increased ability to compete for food by growth hormone-transgenic coho salmon *Oncorhynchus kisutch*, 30 *Aquaculture Research* 479-482 (1999) [hereinafter “Increased ability to compete”] (explaining that transgenic salmon have a reduced ability to avoid predators and complete migration for spawning due to their inferior swimming ability); Mark Abrahams & Arnold Sutterlin, The foraging and antipredator behavior of growth-enhanced transgenic Atlantic salmon, 58 *Animal Behaviour* 933-942 (June 22, 1999) [hereinafter “Foraging behavior”]; R.A. Dunham & R.H. Devlin, Comparison of Traditional Breeding and Transgenesis in Farmed Fish with Implications for Growth and Enhancement and Fitness, 6 *Transgenic Animals in Agriculture* 209, 210, 222 (1999). As for the studies that show no problems with predator avoidance or swimming ability, USACE must comply with NEPA because these conflicting studies demonstrate a controversy about the effect of introducing transgenic fish. *See e.g.* Rex A. Dunham, Predator Avoidance of Transgenic Cannel Catfish Containing Salmonid Growth Hormone s, 1 *Marine Biotech.* 545 (1999).

⁶⁶ 40 C.F.R. § 1508.27(b)(4). *See Found. for North American Wild Sheep v. U.S. Dep’t of Agric.*, 681 F.2d 1172, 1182 (9th Cir. 1982)(explaining that the term “controversial” refers to the existence of a “substantial dispute . . . as to the size, nature, or effect” of the proposed action.); *See Coalition on Sensible Transp. Inc. v.*

controversial within the scientific community. The USACE cannot simply rely upon A/F Protein's scientifically unsupported statements that transgenic fish are safe when several studies reveal that transgenic fish are less fit and will likely cause species extinction. In light of this dispute concerning the effect of transgenic fish on endangered species, USACE must comply with its statutory responsibilities by conducting its own EA/EIS.

In response to the concerns that transgenic fish may lead to species extinction, A/F Protein states that they will only sell transgenic fish that are sterile to be grown in net pens.⁶⁷ To sterilize fish, fertilized eggs receive heat or pressure shock which results in adding an extra set of chromosomes. Instead of the fish having the normal two sets of chromosomes, the fish has three sets. As a result, this "triploid" fish does not develop normal sexual characteristics.⁶⁸

Even if transgenic fish are required to be sterile, the reliability of the sterilization is not guaranteed for every fish. Sterilization is variable because it is affected by different fish strains and the ability of the personnel.⁶⁹ Anne Kapuscinski, a specialist in biotechnology and aquaculture at the University of Minnesota in St. Paul, is concerned about the unpredictability of sterilization and stated that "[e]ven when you're pretty good at it, you get a lot of batch to batch variation."⁷⁰ Recently, CEQ released a study on transgenic fish.⁷¹ This study revealed that 100% sterilization cannot be guaranteed.⁷² USACE must conduct an EA/EIS when the effect of an action is highly uncertain and involves unique risks. Due to the uncertainty in producing sterile fish 100% of the time and the risks of extinction if sterilization is not always 100% effective, USACE must conduct an EA/EIS.

(c) Risks of transgenic fish harming the environment.

Dole, 642 F. Supp. 573, 587 (D.C. Cir. 1986).

⁶⁷ Altered Salmon, supra note 34, at A20.

⁶⁸ Souped up salmon, supra note 6, at 11

⁶⁹ CEQ Transgenic Salmon Study, supra note 10.

⁷⁰ Id.; See generally, Anne Kapuscinski and Eric Hallerman, Transgenic Fish and Public Policy: Anticipating Environmental Impacts of Transgenic Fish, 15 Fisheries 2-11 (Jan - Feb 1990)(discussing issues associated with sterilization).

⁷¹ CEQ Transgenic Salmon Study, supra note 10, at 8. The leading drafting agency on the growth-enhanced salmon case study was FDA. NMFS and DOI were also part of the drafting team.

⁷² Id. at 1, 31 (admitting that none of the sterilization techniques are 100% effective); Royal Society of Canada, Elements of Precaution: Recommendations for the Regulation of Food Biotechnology in Canada, 166 (Jan. 2001) (explaining that the working group of the International Council for the Exploration of the Sea, including scientists from the U.S., found that 100% sterilization of transgenic fish cannot be ensured).

Even if A/F Protein could guarantee that sterilization of transgenic fish will be 100% effective, transgenic fish that escape ocean pens will likely disrupt and harm the environment requiring USACE to conduct an EA/EIS.⁷³ Repeatedly, non-native organisms have caused harmful ecological disruptions. Recognizing the serious environmental damage caused by non-native organisms, President Clinton issued an Executive Order in 1999 aimed at preventing the introduction of invasive species.⁷⁴ Transgenic fish are non-native organisms that may cause serious environmental damage. Therefore, USACE must review the ecological impacts that may be caused by transgenic fish.

Transgenic fish are different from wild salmon and will likely seriously disrupt the ecosystem. Studies show that growth-enhanced transgenic salmon are more aggressive and eat as much as five times as much food as wild species.⁷⁵ Even A/F Protein admits that its transgenic salmon consume more food than wild salmon.⁷⁶ One researcher observed that transgenic fish have “a revved-up metabolism. They’re hungry all the time.”⁷⁷ As a result, these transgenic fish could be foraging ravenously when food availability in an area is low out competing native fish.⁷⁸

Moreover, the fish being consumed by these aggressive hungry transgenic salmon predators will likely be impacted.⁷⁹ One scientist warned that “They’re creating very, very large fish that will become predators of other fish.”⁸⁰ These transgenic predators could further disrupt the ecosystem by expanding their geographic habitat by entering colder waters. Considering that some transgenic fish may contain a gene for tolerance to temperature, these fish may enter colder waters resulting in competition with

⁷³ 32 C.F.R. §§ 651.22, 651.29.

⁷⁴ Exec. Order No. 13,112, 64 Fed. Reg. 6,183 (Feb. 8, 1999).

⁷⁵ Foraging behavior, supra note 65; Increased ability to compete, supra note 65, at 479 - 482 (explaining that transgenic coho salmon consumed almost three times the food of wild fish).

⁷⁶ A/F Protein, Inc., News From the Farm, available at <http://www.afprotein.com/news2.htm> (last visited 3/1/00) [hereinafter “News From the Farm”] (stating that transgenic fish “require more food on a daily basis.”).

⁷⁷ Sarah Schmidt, Frankenfish or Salmon Savior, National Post (Sept. 4, 1999)(observing the abnormal behavior in transgenic fish, Dr. Devlin discovered that transgenic fish are much more aggressive. “It’s one of the things that made me wake up.”).

⁷⁸ Souped up salmon, supra note 6, at 11.

⁷⁹ Genetic engineering creates supersalmon- and controversy, Seattle Times, Nov. 30, 1999.

⁸⁰ Id.

different species.⁸¹ By out competing salmon and other endangered species for resources and habitat, transgenic fish will likely seriously disrupt the ecosystem.⁸²

As for the fish that do not escape ocean pens, the practice of raising transgenic fish in ocean pens will likely also disrupt the ecosystem. Raising transgenic fish in ocean pens may contribute to water pollution and harm wetlands.⁸³ Aquaculture waste accumulates below and around net pens and can deplete the oxygen in the water and harm marine life.⁸⁴ Moreover, aquaculture waste can harm sensitive wetland areas that provide food and habitat and are vital to the survival of many species of birds and fish.⁸⁵

Aquaculture also introduces diseases and parasites that can affect wild populations.⁸⁶ Indeed, the primary cause of salmon mortality in Norwegian rivers is the monogenean fluke introduced by aquaculture.⁸⁷ In addition, because many transgenic fish are “macromutants” with a reduced ability to survive, transgenic fish may be susceptible to more diseases and introduce more diseases than fish currently grown in aquaculture facilities. As a result, the amount of antibiotics used to treat transgenic fish will most likely be higher than the amount of antibiotics currently used for farmed fish. The most common method of distributing antibiotics to farmed fish is through fish feed. However, not all of the antibiotics are absorbed by the fish and consequently, antibiotics enter the environment through uneaten feed and feces.⁸⁸ Pesticides are also used to control parasites.⁸⁹ The effect of antibiotics and other drugs,

⁸¹ Rebecca Goldberg, Something Fishy, <http://www.environmentaldefense.org/pubs/reports/aquaculture/transgenic.html> (last modified May 2000).

⁸² Ecological implications, supra note 39, at 60 - 61.

⁸³ Rosamond L. Naylor, et al Nature's Subsidies to Shrimp and Salmon Farming, 282 Science 883 (Oct. 20, 1998) [“hereinafter “Nature’s Subsidies”] (explaining that the “Nordic salmon farming industry discharges quantities of nitrogen and phosphorous equivalent to the amounts in untreated sewage from a population of 3.9 and 1.7 million people, respectively.”).

⁸⁴ Murky Waters, supra note 43, at 35-48. A/F Protein admits that transgenic fish consume 70 to 80% more oxygen than wild fish. News From the Farm, supra note 76. **Don Stevens, et al**, Respiratory metabolism and swimming performance in growth hormone transgenic Atlantic salmon, 55 Can. J. Fish. Aquatic Science 2028-2035 (1998).

⁸⁵ Murky Waters, supra note 43, at 79; EPA, Consequences of Losing or Degrading Wetlands, available at <http://www.epa.gov/owow/wetlands/facts/fact3.html> (last visited Nov. 30, 2000).

⁸⁶ 64 Fed. Reg. at 62635 (Nov, 17, 1999).

⁸⁷ Ecological implications, supra note 39, at 60.

⁸⁸ Environmental Assessment Office, British Columbia, The Salmon Aquaculture Review Final Report available at <http://www.eao.gov.bc.ca/project/AQUACULT/SALMON/report/V1chp7.htm>, supra note –, (explaining that more studies need to review the impacts of antibiotics on the marine environment); Memorandum from Frederick Angulo, D.V.M., Ph.D. to the record (Oct. 18, 1999)(explaining that “bacteria resistant to antimicrobial agents used on specific fish farms have been isolated from sediment beneath the fish

such as pesticides, on the environment is highly uncertain and needs to be thoroughly reviewed, particularly the impact to nontarget organisms.⁹⁰ Due to the introduced diseases, parasites, antibiotics, and pesticides, the entire ecosystem will likely be affected and is at risk of harm.

Finally, feeding transgenic fish will require the taking of wild fish. Researchers revealed that in 1997, approximately “1.8 million tons of wild fish for feed were required to produce 644,000 metric tons of Atlantic salmon - a 2.8:1 ratio.”⁹¹ Taking this many fish will likely effect the balance of the ecosystem.

Some of the environmental risks involved with transgenic fish are described above but the full extent of the harm that may be caused by these fish are unknown. Ecologists currently analyzing the risks associated with transgenic fish repeatedly warn that the current scientific knowledge is inadequate to provide an adequate assessment of the risks, “There’s just so much speculation compared to the amount of data.”⁹² Similarly, a Department of Interior official stated, “I don’t think the potential impacts on nature have been thought through as well as they should be.”⁹³ Thus, in light of the current evidence showing that transgenic fish that escape ocean pens and transgenic fish contained in ocean pens may disrupt the ecosystem and due to the lack of complete scientific information analyzing all of the environmental risks, allowing transgenic fish into the environment is a significant environmental action requiring USACE to complete an EA/EIS.⁹⁴

(d) Impacts to human health

The USACE is also required to comply with NEPA when a proposed action may significantly affect public health.⁹⁵ As explained above, transgenic fish are “macromutants” that may be more

“net pens” on those fish farms.”) [hereinafter “Antimicrobial resistance”].

⁸⁹ Murky Waters, *supra* note 43, at 46-7(explaining that the environmental effects from pesticides are not completely understood).

⁹⁰ 40 C.F.R. § 1508.27(b)(5).

⁹¹ Nature’s Subsidies, *supra* note 83, at 884; See Farmed Fish Fed On Wild Caught Fish Products, Environment News Service, June 29, 200, <http://ens.lycos.com/ens/jun200/2000L-06-29-09.html> (explaining that “producing one pound of carnivorous farmed salmon or shrimp requires about three pounds of wild fish in the form of fish meal.”).

⁹² Souped up Salmon, *supra* note 6, at 10 (Dr. Devlin warns about the lack of data analyzing the risks of transgenic fish)

⁹³ Altered Salmon, *supra* note 34, at A20; See Ecological Implications, *supra*, note 39, at 56-64.

⁹⁴ 40 C.F.R. § 1508.27 (b)(5)(9); 32 C.F.R. §§ 651.22, 651.29.

⁹⁵ 32 C.F.R. § 651.29(a); 40 C.F.R. § 1508.27(b)(2).

susceptible to disease and thus may require the use of more antibiotics than fish currently grown in aquaculture facilities.⁹⁶ It is predicted that 75% of most antibiotics are lost in the environment.⁹⁷ Consequently, these antibiotics accumulate in wild fish and shellfish that feed on the food and feces of farmed fish.⁹⁸ By eating farmed fish treated with antibiotics or even wild fish exposed to the antibiotics, humans will be ingesting antibiotics that may be harmful.⁹⁹ Indeed, some antibiotics are toxic and can even cause fatal allergic reactions.¹⁰⁰

The use of antibiotics in aquaculture also exacerbate the significant problem of antibiotic resistant bacteria. Bacteria that are resistant to antibiotics can harm human health by preventing the effective treatment of illness. The American Society of Microbiology warns that the use of antibiotics in aquaculture is potentially one of the most important factors creating the evolution of antibiotic-resistant bacteria.¹⁰¹

The Centers for Disease Control (“CDC”) found that bacteria from aquaculture ecosystems can be transferred directly to humans by handling the fish.¹⁰² Even if someone is not exposed to the aquaculture operation, FDA explained that “[b]acteria on fish may also be transmitted to humans when the aquaculture fish are eaten, or when other foods, which have been cross-contaminated by bacteria from fish, are eaten.”¹⁰³ Due to the potential human health concerns connected with the use of antibiotics in aquaculture, the USACE is required to fully assess the potential impacts to human health in an accordance with NEPA.

Furthermore, the effects of commercializing transgenic fish is highly controversial among consumers and thus requires NEPA review.¹⁰⁴ For example, there is substantial dispute among

⁹⁶ See Trojan Gene Hypothesis, *supra* note 12.

⁹⁷ *Id.* at 44.

⁹⁸ *Id.*

⁹⁹ *Id.*

¹⁰⁰ *Id.* (explaining that newborns can be harmed by chloramphenicol and betalactam compounds can cause fatal allergic reactions).

¹⁰¹ *Id.* at 45.

¹⁰² Antimicrobial resistance, *supra* note 88.

¹⁰³ *Id.*

¹⁰⁴ See 40 C.F.R. 1508.27(b)(4). In a USDA poll, 85% of consumers responded that it is “very important” that genetically engineered products be labeled. Consumer’s Union, Summary of Public Opinion Surveys Related to Labeling of Genetically Engineered Foods, available at <http://www.consumersunion.org?food?summpollny699.htm?Hoban+Kendall> (last visited Nov. 6, 2000)(citing T.J. Hoban and P.A. Kendall, Report to Extension Service, USDA, Consumer Attitudes About the Uses of

consumers regarding adequate safety testing and labeling of genetically engineered foods.¹⁰⁵ Due to this controversy among consumers over the effect of genetically engineered food on public health, USACE is required to comply with the NEPA process.

Conclusion

USACE must conduct an EA/EIS if the proposed action may significantly affect the environment. Here, the factors identifying the “significance” of the action are repeatedly demonstrated. Due to the unprecedented action of allowing a transgenic animal in the environment, the potential harm to endangered species, the controversial effects of transgenic fish harming endangered species and the environment, the large amount of unknown information concerning the unique environmental risks, and the potential human health risks and controversial effects of consuming transgenic fish, USACE must comply with the CEQ regulations by conducting an EA/EIS.¹⁰⁶ Furthermore, due to the large amount of evidence demonstrating the potential harm of transgenic fish to endangered species, the environment, and human health, USACE is also required under its own governing regulations to conduct an EIS.¹⁰⁷

(3) Scope and Content of USACE’s Environmental Assessment and Environmental Impact Statement

When conducting an EA/EIS, USACE must take a “hard look” at the human health and environmental consequences.¹⁰⁸ “An environmental assessment must offer something more than a “checklist” of assurances and alternatives. It must indicate, in some fashion, that the agency has taken a searching, realistic look at the potential hazards and, with reasoned thought and analysis, candidly and methodically addressed those concerns.”¹⁰⁹ Among the issues that USACE needs to address in an EA/EIS are the following:

- A. Impacts to Human Health
 - (1) assess toxicity and unintended effects
 - (2) assess allergenicity

Biotechnology in Agriculture and Food Production (1992)).

¹⁰⁵ See Jill Nicholls, Demand growing for labels on genetically modified foods, Milwaukee J. Sentinel, July 27, 1998; Rebecca Christie, FDA under pressure on gene-modified food, Financial Times, June 18, 1999; Marian Burros, U.S. Plans Long-Term Studies on Safety of Genetically Altered Foods, N.Y. Times, July 14, 1999; Rick Weiss, Biotech Food Raises a Crop of Questions, Wash. Post, Aug. 15, 1999; Rick Lewis and Barry A. Palevitz, GM Crops Face Heat of Debate, The Scientist, Oct. 11, 1999.

¹⁰⁶ See 40 C.F.R. § 1508.27(b).

¹⁰⁷ 32 C.F.R. § 651.29; 40 C.F.R. § 1508.27(b).

¹⁰⁸ Kleppe v. Sierra Club, 427 U.S. 390, 410 n.21 (1976).

¹⁰⁹ Found. on Economic Trends v. Weinberger, 610 F. Supp. 829, 841 (D.D.C. 1985).

- (3) review dangers of consuming diseased farmed fish
 - (4) review dangers of consuming fish containing antibiotics
- B. Biocontainment strategies -types of holding facilities, including ocean pens, ponds, or indoor enclosed tanks
- (1) assessment must be specific for each species of fish and where the fish will be located in the aquatic system
 - (2) likelihood of fish escapes (review the number of escapes from ocean pens with current farmed fish)
 - (3) assess the impacts on the facility from storms, seal and bird attacks, and human error
- C. Impacts to the environment/endangered species if transgenic fish escape
- (1) assessment must be specific for each species of fish and where the fish will be located in the aquatic system.
 - (2) competition for food (aggressiveness to wild fish)
 - (3) competition for mates (impact on wild population numbers)
 - (4) introduced genes into wild population (fitness of species)
 - (5) reliability of sterilization test
 - (6) prey or niche requirements (ecological disruptions)
 - (7) affects on endangered and threatened fish species (including the listing of Atlantic salmon) and marine mammals
 - (8) oxygen depletion levels
 - (9) introduced diseases and parasites
 - (10) introduced antibiotics and other drugs
 - (11) algae blooms and pollution resulting from aquaculture facilities
- D. Impact on wild fish numbers and ecosystem due to the number of fish taken to produce transgenic fish.
- (1) number of wild fish needed to develop the anti-freeze protein
 - (2) number of fish needed to feed transgenic fish.
- E. Impact on transgenic fish due to rapid growth
- (1) abnormalities in development
- F. Socio-economic impacts
- (1) impacts to fishermen dependent upon selling wild-caught fish

The omission of any of these considerations will preclude a meaningful type of informed decision-making mandated by NEPA.¹¹⁰ In addition to the above issues, USACE must consider the

¹¹⁰ See Found for North American Wild Sheep, 681 F.2d at 1178.

availability of alternatives.¹¹¹ The agency is responsible for rigorously exploring and objectively evaluating all reasonable alternatives.¹¹² The environmental and human health impacts of the proposed action and alternatives should be listed in comparative form in order for the agency and the public to review the information.¹¹³

Consistent with CEQ's regulations, the alternative of "no action" must be included within the review.¹¹⁴ Denying permit requests to grow transgenic fish in ocean pens or in any other device is a viable alternative due to the egregious impacts to endangered species and the environment and due to the potentially harmful human health impacts.¹¹⁵ Within the draft EIS, USACE must thoroughly review the "no action" alternative and consider public comment.

Instead of using net pens, these fish could be grown in enclosed land based recirculating systems. These systems are highly controllable and because these systems are enclosed and on land, the concerns that transgenic fish will escape or cause environmental damage is virtually eliminated.¹¹⁶ Rather than discharging the water after one use, recirculating systems continuously treats and returns the water. Along with conserving water, these systems reduce parasites and diseases.¹¹⁷ Already, several aquaculture companies are successfully using this type of system for a variety of fish.¹¹⁸ This is a reasonable alternative that should be reviewed.

After reviewing the alternatives, USACE should present the alternatives in a draft EIS for the public to review.¹¹⁹ *In light of the dangers to endangered species, the environment, and human health, petitioners*

¹¹¹ 42 U.S.C. § 4332(C)(iii) (1994), 40 C.F.R. § 1508.9(b).

¹¹² 40 C.F.R. § 1502.14(a).

¹¹³ Id.

¹¹⁴ Id. §1502.14(d). Bob Marshall Alliance v. Hodel, 852 F.2d 1223 (9th Cir. 1988)(explaining that "[i]nformed and meaningful consideration of alternatives – including the no action alternative – is thus an integral part of the [NEPA] statutory scheme").

¹¹⁵ Similar to ocean pens, ponds will also allow transgenic fish to escape and adversely impact endangered species and the environment. See Murky Waters, supra note 43, at 76-77.

¹¹⁶ Murky Waters, supra note 43, at 80-83.

¹¹⁷ As for the discharge of waste containing high concentrations of nutrients, this waste must be disposed of properly. Companies using these systems are treating the effluent and using the sludge to fertilize farms. Id.

¹¹⁸ Id. at 83. Although these systems are more expensive, the more environmental restrictions placed upon aquaculture will encourage the use and development of cost-effective enclosed recirculation systems.

¹¹⁹ 40 C.F.R. § 1503.1.

recommend that USACE's final decision, based upon the EIS, prohibit the use of ocean pens or any other device for raising transgenic fish in the aquatic environment.

(4) The U.S. Army Corps of Engineers must conduct a Programmatic Environmental Impact Statement and review the impacts to the environment and human health.

In addition to completing an individual EIS for each permit request to grow transgenic fish in ocean pens, the USACE must also conduct a comprehensive environmental impact statement called a programmatic environmental impact statement (“PEIS”). Within a PEIS, an agency is responsible for reviewing the combined effects of a proposed action.¹²⁰ The Supreme Court has explained that a programmatic EIS is necessary “when several proposals for . . . actions that will have cumulative or synergistic environmental impact upon a region are pending concurrently before an agency, their environmental consequences must be considered together.”¹²¹

Here, USACE must review the cumulative impacts to the environment and human health before approving multiple permits for growing transgenic fish in ocean pens. A/F Protein has already indicated that they have orders for 15 million transgenic salmon eggs.¹²² Moreover, there are over thirty-five species of transgenic fish currently being developed around the world that may be marketed to consumers in the near future.¹²³ How a large number and variety of transgenic fish grown in ocean pens will impact the environment and human health must be thoroughly assessed by the USACE in a PEIS.¹²⁴ *Therefore, petitioners recommend that the USACE address the cumulative impacts of transgenic fish on the environment and human health in a PEIS prior to approving any permits for growing transgenic fish in the aquatic environment.*

B. The United States Army Corps Of Engineers Is Required Under The Endangered Species Act To Consult With The Department of Interior And The Department Of Commerce Before Approving An Activity That May Affect An Endangered Or Threatened Species.

¹²⁰ See 40 C.F.R. §§ 1502.4(b)(c), 1508.18(b)(4); See Nat'l Wildlife Fed'n v. Appalachian Reg'l Comm'n, 677 F.2d 883, 888 (D.C. Cir. 1980)(explaining that the “environmental consequences of proposed actions must all be considered together in a single, programmatic EIS when their impacts will have a compounded effect on a region.”).

¹²¹ Kleppe v. Sierra Club, 427 U.S. 390, 410 (1976).

¹²² GMOs Pose New Risk, supra note 14.

¹²³ Souped up Salmon, supra note 6, at 10.

¹²⁴ 40 C.F.R. § 1502.4(b)(c)(3).

As recognized by the Supreme Court, the Endangered Species Act (“ESA”) is “the most comprehensive legislation for the preservation of endangered species ever enacted by any nation.”¹²⁵ Observing that “man and his technology has [sic] continued at an ever-increasing rate to disrupt the natural ecosystem,”¹²⁶ Congress intended for the ESA to “halt and reverse the trend toward species extinction, whatever the cost.”¹²⁷

Once species are listed as endangered or threatened under the ESA, they receive a number of statutory protections. For example, Section 9 prohibits any person to “take” a listed species.¹²⁸ The term “take” is broadly defined to include “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.”¹²⁹ The DOI and DOC are responsible for taking affirmative steps to protect and recover listed species.¹³⁰

Section 7 of the ESA requires every federal agency to conserve species listed as endangered or threatened.¹³¹ It also mandates that “in consultation with and with the Assistance of the Secretary¹³²,” each federal agency shall “insure that any action authorized, funded or carried out by such agency . . . is not likely to jeopardize the continued existence of any endangered species or threatened species. . . .”¹³³

Before going forward with an action that may affect listed species, the federal agency must first prepare a biological assessment. The biological assessment must evaluate the effects of the action on listed species “including consideration of cumulative effects,” and consideration of “alternate actions

¹²⁵ Babbitt v. Sweet Home Chapter of Comm. for a Great Or., 515 U.S. 687, 698 (1995).

¹²⁶ TVA v. Hill, 437 U.S. 153, 176 (1978) (quoting hearings on Endangered Species before the Subcommittee of the House Committee on Merchant Marine and Fisheries, 93d Cong., 1st Sess., 202 (1973)(statement of Assistant Secretary of the Interior).

¹²⁷ Id. at 184.

¹²⁸ 16 U.S.C. § 1538(a)(1).

¹²⁹ Id. § 1532(19).

¹³⁰ Id. § 1533(f).

¹³¹ Id. § 1536(a)(1); TVA v. Hill, 437 U.S. 153, 173 (1978).

¹³² 16 U.S.C. § 1532(15)(explaining that Secretary means Secretary of Interior or Secretary of Commerce). See 50 C.F.R. §§ 222-224 (explaining jurisdiction for Secretary of Commerce); See Id. § 17.11 (explaining jurisdiction for Secretary of Interior); See Id. § 400 *et seq* (discussing joint jurisdiction).

¹³³ Id. § 1536(a)(2). If the Director of the FWS or NMFS determines that any action by the federal agency may affect a listed species, the Director may request a consultation if the federal agency fails to do so. 50 C.F.R. § 402.14(a).

considered by the Federal agency for the proposed action.”¹³⁴ Only if the biological assessment concludes that the agency action will not adversely affect any listed species, and the Secretaries concur in writing, may the agency avoid the formal consultation requirement.¹³⁵

If an agency action may affect a listed species, then the federal agency must engage in a formal consultation and obtain a biological opinion from the Secretaries of DOI and DOC.¹³⁶ To adequately review the effects of the action, the federal agency must provide the Secretaries with “the best scientific and commercial data available.”¹³⁷ Then, the Secretaries must review this information, evaluate the status of impacted species, determine the cumulative effects of the action, and issue a biological opinion as to “whether the action, taken together with cumulative effects, is likely to jeopardize the continued existence of listed species . . .”¹³⁸ If the federal agency action is likely to jeopardize a listed species, then the Secretaries must identify alternatives.¹³⁹

The ESA prohibits an agency from proceeding with an action that may impact a listed species before the analysis required by Section 7 is complete.¹⁴⁰ Here, USACE must complete the ESA Section 7 requirement before USACE decides whether to permit transgenic fish to be grown in ocean pens or anywhere in the aquatic environment. As explained above, the scientific evidence shows that transgenic fish are more aggressive, eat more, and attract more mates yet produce less viable offspring resulting in transgenic fish causing the extinction of wild species within only a few generations.¹⁴¹ A/F Protein also recognizes the dangers to endangered species and states “Lord knows we can’t promise total safety for anything.”¹⁴²

¹³⁴ 50 C.F.R. § 402.12(f).

¹³⁵ Id. § 402.13.

¹³⁶ 16 U.S.C. § 1536(b).

¹³⁷ 50 C.F.R. § 402.14(d).

¹³⁸ Id. § 402.14(g)(1)-(4).

¹³⁹ 16 U.S.C. § 1536(b)(3)(A).

¹⁴⁰ Id. § 1536(a)(2)(stating that an agency must “insure” that its actions will not jeopardize a listed species).

¹⁴¹ See supra 16-24. See also S.C.R. 71, 2000 Leg., 1999-2000 Sess. (CA 2000) (discussing environmental concerns with transgenic fish, especially impact on endangered or threatened species of salmon).

¹⁴² Altered Salmon, supra note 34, at A20.

There are 114 listed endangered and threatened fish species and 82 species nearing extinction that could be impacted by transgenic fish.¹⁴³ Additionally, impacts on predator species who consume transgenic fish must be considered.¹⁴⁴ There are 93 bird species and 13 marine mammal species that could also be adversely affected by transgenic fish.¹⁴⁵ Due to the listed species that could be harmed by transgenic fish, the USACE must complete a biological assessment and engage in formal consultations.

It would be arbitrary and capricious and an abuse of discretion if the USACE fails to engage in formal consultations.¹⁴⁶ The DOI and DOC have already indicated their concerns over transgenic fish. The National Marine Fisheries Service (“NMFS”), part of the DOC, warned that “[w]e have to have absolute certainty that transgenic fish do not interact with wild stocks.”¹⁴⁷ Finally, the DOI fears that Atlantic salmon, recently listed under the ESA, could be “quickly wiped out” by transgenic salmon¹⁴⁸ and wants “to ban all genetically modified salmon for now.”¹⁴⁹

In light of the scientific evidence and agency concerns that endangered species will be harmed if transgenic fish are permitted to be grown in ocean pens, USACE must fully identify the effects of this action on listed species and identify alternative actions. *Therefore, petitioners request that USACE prepare a biological assessment and initiate formal consultations with DOI and DOC before taking any action in approving permits for growing transgenic fish in ocean pens or anywhere in the aquatic environment.*¹⁵⁰

C. The United States Army Corps Of Engineers Must Comply With The Rivers And Harbors Act And Its Own Implementing Regulations.

In addition to complying with NEPA and the ESA, the USACE must also comply with its own statutory and regulatory requirements under the Rivers and Harbors Act. Section 10 of the Rivers and

¹⁴³ Listed Vertebrate Species supra note 13; Musick, supra note 52.

¹⁴⁴ See CEQ Transgenic Salmon Study, supra note 10, at 23 (stating that how the growth hormone affects predators of transgenic fish should be considered).

¹⁴⁵ Listed Vertebrate Species supra note 13.

¹⁴⁶ See Sierra Club v. Marsh, 816 F.2d 1376, 1386 (9th Cir. 1987).

¹⁴⁷ Altered Salmon, supra note 34, at A20.

¹⁴⁸ GMOs Pose New Risk, supra note 14.

¹⁴⁹ Marc Kaufman, Atlantic Salmon Placed on Endangered Species List, Wash. Post, Nov. 14, 2000.

¹⁵⁰ If DOI/DOC issue a biological opinion finding that endangered species will be in jeopardy by transgenic fish in net pens, then USACE must deny permit requests. As explained by the Supreme Court in Bennett v. Spear, this opinion has “powerful coercive effect.” 520 U.S. 154, 169 (1997).

Harbors Act prohibits the obstruction of navigable waters of the United States.¹⁵¹ The Supreme Court has interpreted this provision broadly by finding that this section “flatly prohibits the ‘creation of any obstruction’ to navigable capacity that Congress itself has not authorized, and it bans construction of any structure in any water of the United States ‘except on plans recommended by the Chief of Engineers and authorized by the Secretary of Army.’”¹⁵² Explaining that Section 10 must be construed broadly, Justice Holmes stated that “[a] river is more than an amenity, it is a treasure.”¹⁵³ The only instance when a structure is permitted in navigable waters is when the USACE issues a permit in accordance with its regulations.¹⁵⁴

Reflecting the broad authority under Section 10, the USACE’s regulations provide that a permit will not be issued if it is contrary to the public interest.¹⁵⁵ Instead of basing the decision solely on the issue of navigation, the USACE is required to balance the expected benefits against the foreseeable detriments in a public interest review.¹⁵⁶ The variety of factors the USACE must consider include:

conservation, economics, aesthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, flood hazards, floodplain values, land use, navigation, shore erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, considerations of property ownership and, in general, the needs and welfare of the people.¹⁵⁷

In evaluating these factors, the USACE considers the following:

- (i) The relative extent of the public and private need for the proposed structure or work;

¹⁵¹ 33 U.S.C. § 403.

¹⁵² United States of America v. State of Alaska on Bill of Complaint, 503 U.S. 569, 576 (1992)(quoting 33 U.S.C. § 403).

¹⁵³ Id. at 578 (quoting New Jersey v. New York, 283 U.S. 336, 342 (1931)).

¹⁵⁴ 33 U.S.C. § 403; 33 C.F.R. § 325.8.

¹⁵⁵ 33 C.F.R. § 320.4(a).

¹⁵⁶ See State of Alaska on Bill of Complaint, 503 U.S. at 579-582 (quoting H.R. Rep. No. 91-917, at 6 (1970)) (quoting the Congressional Committee stating that the Corps “should instruct its district engineers . . . to increase their emphasis on how the work will affect all aspects of the public interest, including not only navigation but also conservation of natural resources, fish and wildlife, air and water quality, esthetics, scenic view, historic sites, ecology, and other public interest aspects of the waterway.”).

¹⁵⁷ 33 C.F.R. § 320.4(a)(1).

- (ii) Where there are unresolved conflicts as to resource use, the practicability of using reasonable alternative locations and methods to accomplish the objective of the proposed structure or work; and
- (iii) The extent and permanence of the beneficial and/or detrimental effects which the proposed structure or work is likely to have on the public and private uses to which the area is suited.¹⁵⁸

In addition to conducting a public interest review, the USACE is required to advise all interested parties of the request for a permit by providing the public with notice along with an opportunity to comment and a public hearing.¹⁵⁹ If the USACE decides that the permit request is contrary to the public interest, then it must deny the permit.¹⁶⁰ A structure that is placed in navigable waters without a USACE permit is subject to criminal or civil penalties.¹⁶¹

The USACE will be faced with conducting a public interest review if FDA approves the commercialization of transgenic fish. Because ocean pens are the most cost effective form of aquaculture, transgenic fish farmers will most likely be requesting USACE for a permit to grow transgenic fish in ocean pens.¹⁶² Already, A/F Protein has orders for 15 million transgenic salmon eggs.¹⁶³ To fully review the impacts caused by transgenic fish, the USACE should immediately conduct a public interest review and provide the public with notice, an opportunity to comment, and a public hearing.

- (1) Growing transgenic fish in the aquatic environment will be highly detrimental to the public's interest.

As explained *supra*, the detrimental effects of growing transgenic fish in ocean pens are significant. Transgenic fish will most likely easily escape ocean pens and consequently disrupt the balance of the environment threatening the survival of numerous species. Once these resources are lost, the public's recreational, educational, and aesthetic interest in the marine

¹⁵⁸ *Id.* § 320.4(a)(2)(i)-(iii).

¹⁵⁹ *Id.* §§ 325.3, 327.4, 327.11.

¹⁶⁰ *Id.* § 320.4(a)(1).

¹⁶¹ *Id.* § 326.5.

¹⁶² A/F Protein Inc., *The Blue Revolution*, available at <http://acbi.ca/afprotein/blue.htm> (last visited May 24, 2000)(admitting that “an ocean pen facility may well represent the most cost effective method of production, it is also the riskiest with storms, disease, predation, and changes in water temperature having severe impacts on harvest.”).

¹⁶³ GMOs Pose New Risk, *supra* note 14.

environment will be permanently impeded.¹⁶⁴ Moreover, the loss of aquatic species will significantly impact the economic interest of fishermen who rely upon selling wild caught fish.¹⁶⁵ Consumers concerned about the human food safety of transgenic fish may prefer wild caught fish but due to the likely depletion of wild aquatic species, consumer's choices may be limited to only transgenic fish.¹⁶⁶

In addition to the extinction of species, the combination of aquaculture waste and antibiotics will significantly pollute the environment. As explained *supra*, the pollution discharged from ocean pens will likely threaten wetlands, water quality, and human health.¹⁶⁷

There are foreseeable *permanent detriments* to the public's interest in, *inter alia*, conservation, aesthetics, recreation, education, fish and wildlife, wetlands, water quality, food production, and human food safety if the USACE approves permits to grow transgenic fish in ocean pens.¹⁶⁸ Therefore, the USACE should find that protecting the aquatic environment from transgenic fish far outweighs any economic benefit from growing transgenic fish in ocean pens.¹⁶⁹

(2) It is not necessary to grow transgenic fish in ocean pens because there are reasonable available alternatives.

As discussed *supra*, enclosed recycled land based systems are a viable alternative for growing transgenic fish. Although this alternative may be slightly more expensive than ocean pens, the financial difference between ocean pens and enclosed recycled land based systems should not be given much weight.¹⁷⁰ The detriments to the public interest of allowing transgenic fish in the aquatic environment far outweighs the financial benefits of permitting ocean pens. Therefore, any requests for a permit to grow transgenic fish in ocean pens should be denied.

¹⁶⁴ See 33 C.F.R. § 320.4(a).

¹⁶⁵ *Id.*

¹⁶⁶ *Id.*

¹⁶⁷ *Id.*

¹⁶⁸ See 33 C.F.R. § 320.4(a)(2)(iii).

¹⁶⁹ See *Id.* § 320.4(a)(1),(2). The argument that farmed fish will limit the taking of wild fish and increase the amount of fish protein available is controversial. See Farmed Fish Fed On Wild Caught Fish Products, Environment News Service, June 29, 2000, <http://ens.lycos.com/ens/jun200/2000L-06-29-09.html> (explaining that “producing one pound of carnivorous farmed salmon or shrimp requires about three pounds of wild fish in the form of fish meal.”).

¹⁷⁰ See *Id.* § 320.4(2)(i)(ii), (3).

In accordance with the Rivers and Harbors Act and the USACE's own implementing regulations, petitioners request that USACE initiate a public interest review, issue a public notice along with a request for comments, and hold a public hearing before approving any applications for permits to grow transgenic fish in ocean pens. Due to the permanent harm caused by permitting transgenic fish in the aquatic environment, USACE should find that issuing permits for growing transgenic fish is in conflict with the public interest and therefore, deny any requests for permits. Petitioners also request that USACE initiate a rulemaking banning the growing of transgenic fish in the aquatic environment that is enforceable by civil or criminal penalties.

CONCLUSION

For the reasons contained herein, the petitioners respectfully request that the DOD/USACE immediately impose a moratorium on the raising of transgenic fish in ocean pens or anywhere in the aquatic environment until the following actions are undertaken:

- (1) Conduct an Environmental Assessment , Environmental Impact Statement, and Programmatic Environmental Impact Statement as required by the National Environmental Policy Act;
- (2) Consult with the Department of Interior and Department of Commerce as required by the Endangered Species Act; and
- (3) Initiate a public interest review, provide public notice with a request for comments, and conduct a hearing in accordance with the Rivers and Harbor Act and USACE's implementing regulations.

After completing these statutory requirements, it will be apparent that growing transgenic fish in ocean pens will significantly disrupt the environment and is contrary to the public interest. Therefore, the USACE should propose a rulemaking banning the raising of transgenic fish in ocean pens or in any other device within the aquatic environment. To ensure that this ban is followed, USACE should use its enforcement authority and impose criminal or civil penalties upon violators.

Petitioners request that the agency provide an answer to this citizen petition with 180 days. In the absence of an affirmative response, petitioners will be compelled to consider litigation in order to achieve the agency action requested.

Respectfully submitted,

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