



SIERRA CLUB
FOUNDED 1892

Industrial Aquaculture Concerns: Shellfish

"Disruption of sediment and prey inputs, changes in hydrology and other processes results in a chain reaction, ultimately leading to lost or dysfunctional habitat for salmon." *King County Juvenile Salmonid Report, Aug. 2004*



During geoduck planting 40,000+ PVC pipes, nets, and rebar are installed *per acre* on tidelands. High pressure water jets liquefy sand up to 3' deep while harvesting.



Large canopy nets alter natural feeding dynamics for native species.



About 1,700 plastic geoduck nursery seed pools and plywood smother tidelands in an "innovative" and "emerging" technology used by industry growers.



Oyster bags extend for miles, covering tidelands and impacting natural habitat.



Wildlife such as juvenile bald eagles are caught in large nets, likely drowning with incoming tides. Nets also trap sea life, restricting food sources and making them vulnerable to the hot sun.



Here an otter is being strangled by a band used to secure netting to individual tubes.

"A recent review of the ecosystem-level effects of shellfish aquaculture determined that while more study is needed, the available literature indicates that intensive shellfish aquaculture may divert materials to benthic food webs, alter coastal nutrient dynamics, and have cascading effects on estuarine and coastal food webs." *The Puget Sound Partnership Discussion Paper, p. 14, July 11, 2008*



The Public Trust Doctrine* obligates us to protect our natural resources for future generations. Therefore, the Sierra Club has created the following policy:

Sierra Club Aquaculture Policy

General Aquaculture Policy: We oppose the rearing of carnivorous finfish in open cages and expansion of other industrial aquaculture activities that:

- threaten native species and regional biodiversity,
- cause habitat loss through shoreline modification and pollution, or
- utilize PVC tubes, rebar, oyster bags or predator prevention materials (such as netting) that harm or deter native species from using areas necessary for their survival.

Aquaculture on Public Lands: We request a moratorium on Public Aquatic Lands leases for aquaculture until a comprehensive Department of Natural Resources policy for aquaculture leasing is established based on sound science. We also request a comprehensive policy for aquaculture leases to include:

- a baseline that is established before leasing of each potential lease site,
- resources assessment at each site, and
- harvest rates for native animals and planting densities for aquaculture be based on minimal ecological impacts.

Species of concern listed on the U.S. Ecological Society invasive species database should be included on individual state Watch Lists. Cumulative impact analysis and public hearings should be required prior to future issuance of permits. Independent, peer-reviewed research must be required by county, state, federal, and elected officials to help ensure quality and integrity in environmental policy and regulations. The wild geoduck subtidal harvest policy should be sustainable; the geoduck intertidal leasing program should be canceled; and efforts should work toward terminating finfish leases on state lands.

* *Public Trust Doctrine:* www.ecy.wa.gov/programs/sea/sma/laws_rules/public_trust.html

Industrial Aquaculture Concerns: Finfish

Marine fish farming has many problems and yet is being promoted for our state and offshore waters. Pollution and chemicals flush from open cages. Parasites and pathogens are amplified in the crowded conditions, threatening nearby or migrating marine life.

An invasive species in the Pacific region, Atlantic salmon are raised in aquaculture operations in Chile, British Columbia and Washington. In four years, more than 613,000 non-native Atlantic salmon escaped from privately owned net pens into Puget Sound.



Epidemics of sea lice flushing from fish farms kill juvenile wild salmon as they attempt their annual migration to sea.

Photo from Alexandra Morton

Washington is targeted for more salmon and steelhead production, new species such as black cod, and "Open ocean aquaculture in the Strait of Juan de Fuca" (NOAA Aquaculture Program, Sept. 2007). The "National Offshore Aquaculture Act" has been introduced into Congress and would open our Exclusive Economic Zone, three to 200 miles offshore, to thousands of privately owned fish farms.

Caged fish are fed pellets of mackerel, sardines and anchovies, taking essential food from human populations around the world while depleting the marine food chain. One third of ocean caught fish are made into feed for fish and animals reared in marine or land feedlots. Between 3-5 pounds of small fish are required to grow 1 pound of caged salmon. Other species in experimental production require up to 20 pounds of small fish for each pound of growth.

In violation of agreements to remove oil rigs from public waters when no longer in use, the energy industry is seeking to increase profits by converting decommissioned structures to aquaculture operations.

Photo from NOAA



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