History, Current Status, and the Future of Open Ocean Aquaculture Permitting and Leasing in Hawaii

3

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It is a necessary conclusion that ultimately the scientific insights into the impacts of open ocean aquaculture must be turned into policies, laws, and regulations governing industry development. Hawaii established a state law in 1986 to allow leasing of state marine waters for aquaculture and ocean energy purposes. Due to legislature concerns, however, the final statute only had limited applicability for small research projects (Corbin and Young 1997). Hawaii amended its state law in 1999 to correct these problems and encourage large-scale commercial aquaculture use of offshore waters (Cates et al. 2001). A coalition of state, university, and private sector interests engaged the public and supported this far-reaching change in the state legislature because: hatchery technology for mass rearing of local species was available; growout technology suitable for local open ocean conditions was commercially available; a federally funded, large-scale demonstration of cage culture, gathering real data, was underway (Ostrowski et al. 2001); experienced ocean interests were ready to invest in commercial aquaculture projects; and there existed strong state and public support for aquaculture for economic development.

Ocean leasing authority is legally vested with the Hawaii Department of Land and Natural Resources (DLNR) that manages all state marine waters out to 4.83 km (3 miles). Chapter 190D, Hawaii Revised Statutes, Ocean and Submerged Lands Leasing, as amended, established as state policy that marine waters could be leased by DLNR for commercial aquaculture and it defined a process for permitting and leasing ocean space, which included the surface, water column, and substrate.

Three major permits are required by an offshore aquaculture project in Hawaii marine waters, two from the State and one from the Federal government (DOA and DLNR 2006). The Conservation District Use Permit (CDUP) from DLNR is a conditioned permit that describes the conditions of use of the ocean resource including: species, operational parameters, degree of exclusivity, location and site layout, emergency response considerations, and management plans. The application requires an Environmental Assessment be carried out. The National Pollution Discharge Elimination System/Zone of Mixing Permits (NPDES/ZOM), issued by the State Department of Health, govern discharges from cage aquaculture facilities and they create an approved area around the facility where the state receiving water standards can be legally exceeded. Extensive water quality and substrate monitoring is required as a condition of the permit. In the United States, there is also exemption from these discharge permits for facilities producing less than 45,454 kg per year.

The Federal permit is issued by the U.S. Army Corps of Engineers (USACE), a national agency in charge of very large-scale water control projects. Inclusive in USACE authority is issuing a Section 10 Permit required of structures placed in navigable waters of the United States. The process for receiving this permit includes consultations with appropriate agencies on protected species, sensitive habitat, and coastal developments.

Once all the permits are received, the DLNR can issue a long-term lease for the proposed ocean site. The complex lease document includes key provisions, such as term (15 to 20 years), rent (fixed cost per acre [0.4 ha] or 1% to 1-1/2% of gross sales), a performance bond to address project removal, and ability to assign the lease to another party. Importantly, the DLNR can direct lease to the applicant for aquaculture, without the need for a public auction.

Hawaii currently has two operating commercial open ocean projects, Cates International, growing the Pacific threadfin *(Polydactylus sexfilis)*, and Kona Blue Water Farms, growing the greater amberjack *(Seriola rivoliana)*. Three more projects are pending, focusing on the Pacific threadfin, greater amberjack, and yellow fin tuna *(Thunnus albacares)* (DOA and DLNR 2006).

The Hawaii permitting and leasing process is accepted by government and the public because it involved knowledgeable and respected entrepreneurs, it required an Environmental Assessment, full disclosure on applications, and extensive community outreach, it was a transparent process and open to the public, and it used an adaptive learning approach to difficult environmental impact issues. It was also crucial that important issues, i.e., exclusive use, multiple use conflicts, native species, performance bond for project removal, and reasonable terms and rates to encourage investment, were addressed up front in the process. In the future, the state hopes to improve the site selection process through use of a computerized, interactive Geographic Information System to map and select sites (Young et al. 2003).

Based on experience to date, Hawaii's goals for open ocean aquaculture development are 10 successful commercial farms in 10 years, generating $100 M in sales annually. The major challenges going forward are: new species availability and large-scale hatchery technology for all species, accessibility to support infrastructure in harbors, the complexity of the permitting and leasing process, the high initial project costs, and the marketing of large volumes of product per harvest (DOA and DLNR 2005).

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