*University of Hawaii at Hilo*
*Pacific Aquaculture and Coastal Resources Center*

# Aquaculture Policy Issues in Hawai'i

## *A Preliminary Review & Synthesis*

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***Prepared By***

***Bridging Gaps to Insure Long-term Viability of Small Tropical Mariculture Ventures in Hawai'i and the U.S. Affiliated Islands***

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# Acronyms

| | |
|---|---|
| ADP | Aquaculture Development Program, Department of Agriculture |
| CDUP | Conservation District Use Permit |
| CSREES | Cooperative State Research, Education & Extension Service, USDA |
| CTSA | Center for Tropical and Subtropical Aquaculture |
| DAR | Division of Aquatic Resources, DLNR |
| DLNR | Hawaii Department of Land and Natural Resources |
| DOH | Hawai'i State Department of Health |
| EIS | Environmental Impact Statement |
| EPA | Environmental Protection Agency |
| GIS | Geographic Information System |
| FAA | Federal Aviation Administration |
| HAA | Hawai'i Aquaculture Association |
| HACCP | Hazard analysis and critical control path |
| IFAFS | Initiative for Future Advanced Food Systems |
| OI | Oceanic Institute |
| NELHA | Natural Energy Laboratory of Hawaii Authority |
| NGO | Non-governmental organization |
| NPDES | National Pollution Discharge Elimination System |
| PACRC | Pacific Aquaculture Coastal Resources Center, University of Hawai'i at Hilo |
| UHH | University of Hawaii at Hilo |
| USDA | United States Department of Agriculture |

## I. Introduction

This paper is a synthesis of aquaculture policy issues in the State of Hawai'i. It represents stakeholder perceptions of issues and priorities, and identifies actions to address them. It is based on the results of several meetings in 2002-04 convened by the USDA/IFAFS project on "Bridging Gaps to Insure Long-term Sustainability of Small Scale Mariculture in Hawai'i and the U.S. Affiliated Islands." The first meeting took place at the Department of Urban and Regional Planning, University of Hawai'i at Manoa, on June 25, 2002. The results of this meeting were summarized in a paper that was reviewed at the second meeting, convened June 30-July 3 at the offices of the Pacific Aquaculture Coastal Resources Center (PACRC) at Hilo and the Natural Energy Laboratory of Hawai'i (NELHA) at Keahole Point, Kona. At the end of the second meeting, policy issues were ranked by participants in order of priority.

A first draft of this paper was circulated for selected expert review and we would like to thank all those who have improved this paper with their constructive comments. This second draft is being circulated more widely to share findings and to invite further feedback. Our goal is to help clarify issues and provide a basis for defining long term strategies for promoting aquaculture growth in Hawai'i.

## II. Legal and Administrative Issues Impeding Aquaculture Development

***NPDES water discharge regulations***. The regulations of the National Pollution Discharge Elimination System (NPDES) administered by the Environmental Protection Agency under the federal Clean Water Act are perceived to be inappropriate for Hawai'i. NPDES establishes federal standards and regulations that are implemented by States. In Hawai'i, oversight of NPDES compliance is delegated to the Clean Water Branch of the Department of Health. NPDES regulates all discharges into public waters and confined animal facilities with an annual production greater than 100,000 pounds. Fish pens are considered confined animal facilities and NPDES regulations apply to fish pens in the Pacific Ocean just as they do for cattle feed lots discharging into streams. The dilution factor is not considered. It is felt that water quality standards should be interpreted specifically for aquaculture given that Hawai'i is an ocean state with no continental shelf and deep water close to shore.

***Importation permits for cultivation of non-native and unlisted species***. The permitted importation list of non-domestic animals into Hawai'i encompasses many, but not all possible aquaculture species that could be cultured. Importation of non-native species that are not on the list requires a cumbersome State Department of Agriculture (Plant Quarantine Branch) approval process that is perceived to be detrimental by some in the industry. The process of review of non-native species has been streamlined compared to the past but is still lengthy (1-3 years). The delay can mean a loss of competitiveness with other States and countries. The marine culture industry feels that the regulatory process is overly stringent in Hawai'i. In contrast, the government feels that it is doing a good job with risk assessment and the importation system is viewed as a model for other States. Non-native species not on the import list can be permitted for "research" by industry as well as universities (Restricted, B) and may later become listed for commercial importation. For example, sturgeon is listed for importation for research purposes, but is expected to be added to the commercial list.

***Offshore cultivation (moi, pearl and other species)***. The process for permitting offshore lease sites is still evolving and being improved. There are many process, agency and people issues, but from a government perspective it is viewed as going pretty well. Cultural issues associated with

culture of moi and arrangements for on-shore sale of moi during a publicly funded demonstration phase were resolved by collaborative agreement. This is still a period of experimentation and negotiation to determine the appropriate level of regulatory strictness. From the perspective of the industry, the approval process is extremely cumbersome. The first ocean lease for moi cage culture went through a 14-month approval process to obtain the 7 permits needed. The private sector feels that it is necessary to streamline the approval process if this activity is to expand and offer economic growth opportunity for the State of Hawai'i.

Water quality regulations are an issue in offshore culture. Experimental monitoring of water quality at an offshore site is being conducted by Cates International, Inc, the University of Hawai'i Sea Grant College Program, and the Hawai'i Environmental Quality Commission. This monitoring effort will document discharge from an open ocean cage culture farm with multiple cages and define the short term and long term environmental effects of moi cage farms in tropical waters. This can be used to model future monitoring programs and inform appropriate national water discharge standards and State application of those standards.

The key permits that apply to offshore cage culture include: 1) NPDES, 2) Section 10 of the Corps of Engineers related to structures in navigable waters, and 3) the Conservation District Use Permit (CDUP). In addition, the State Division of Aquatic Resources (DAR) requires permits for aquaculture facilities (demonstration of expertise, sufficient facilities, and chain of custody for marketing-farm to consumer).

It is the experience of the industry that the foremost impediment in the permitting process is the zoning requirement for Conservation District Use Lands. Because submerged lands have been designated as "Conservation District" (D-1, Submerged Lands, Sub zone R), the applicant must go through a rigorous process of "making an allowance" to use the land for a purpose other than conservation. The Board of the Department of Land and Natural Resources makes CDUP decisions based on staff input. Legislation passed in 1999 makes allowances for "mariculture" as a permissible activity, but does little to reduce the tedious process required for attaining a CDUP. The process involves multi-department collaboration and decision making, several layers of public notices, public comment period, and public hearings. This opens many avenues for legal contest that can bring the process to a standstill by environmental and other interest groups. The State's contested case process is under a constant burden of claims, many of which are perceived to be frivolous, which causes the applicant to suffer legal costs and expenses associated with the delay. The recent experience of Ahi Nui's proposed tuna culture operation north of Kawaihae is illustrative. Even though the company went to extraordinary lengths to gain the support of much of the local community, opposition from a small vocal minority has necessitated an EIS process that was considered unnecessary by the scientific community.

Another critical issue in development of offshore aquaculture is access to harbor facilities for loading and unloading and land based support sites (docks, port facilities, processing and packaging and hatchery facilities). Agricultural lands are rarely available in proximity to the offshore operation. The commercial operator must either lease very expensive land zoned for "industrial" or "waterfront industrial" use, or operate from remote areas and incur transportation costs and risks. This limits the potential for offshore aquaculture growth because an offshore site cannot operate without land based support. If the industry is to grow, there also needs to be investment in hatchery facilities. Available juvenile fish for cage culture can not currently meet even the demand of one company with two cages in operation. Onshore government guidance for cage culture is being developed and discussions on zoning for support facilities for offshore operations are in progress.

***Regulatory environment for aquaculture***. Hawai'i public agencies are conservative with aquaculture and are viewed as implicitly incorporating a "precautionary approach". Even where regulations appear to be fine on paper, the process is long. Many agencies are involved and some are reluctant to act until another agency takes a stand. The public is concerned with the introduction of non-native and invasive species into wild populations (genetic drift and competition with native populations) and disease. The public sector prefers to be cautious where there is uncertainty with new areas of the aquaculture industry. It may therefore take a while to allay fears of risks when introducing new aquaculture operations. Producers feel that a stringent regulatory environment reduces Hawaiian industry competitiveness relative to other Pacific Islands and other parts of the globe. At the same time, the high cost of land, labor, and other production inputs in Hawai'i already make it difficult for the aquaculture industry to compete.

It is the role of the Aquaculture Development Program (ADP) to facilitate aquaculture permits. Permit facilitation and private-public sector communication is particularly important in a conservative and highly regulatory environment. The ADP has developed a coordinated process for aquaculture permitting that to a certain degree addresses issues of institutional coordination. There are many government actors involved and they are all accessible to industry for assistance. Also, the lines of communication between the Hawai'i Aquaculture Association (HAA) and counties are open. Every county has someone who acts as an aquaculture coordinator. For example, the President of the HAA and the Mayor of the city of Honolulu have been working together on permit issues. The government has also surveyed suitable locations for terrestrial aquifer aquaculture and ocean cage culture and GIS maps are available with siting information.

Aquaculture facility and dealer licenses are required for the sale of all regulated species. Non-regulated species do not require a license at this time. Regulated species are wild species that are restricted by some regulation, such as minimum size, season, bag limit, etc. The licenses were initiated as a mechanism to allow culture and sale of otherwise illegal species at the request of ADP. In an attempt to encourage license compliance and remove a potential deterrent to selling cultured products, the Division of Aquatic Resources, Department of Lands and Natural Resources, initiated a waiver of the aquaculture license fee from $50 to $0 for two years.

***Export regulations, transportation, and carrier requirements***. Airmail and airline transportation of marine animals are not consistent. For example, movement by airmail such as Fed Ex can bypass introduction permits. Movement by commercial airline is confusing. The FAA has a difficult time interpreting the rules. Inter-island cargo transportation of marine animals by airline is difficult. Hawaiian Airlines will allow hand carried fish in the cabin on inter-island flights if it is packaged properly. Another problem is the cost of transportation from Hawai'i for small shipments. With greater volume, airline companies can offer better rates. But high transportation costs hold back more rapid industry growth and shipping volume. A possible solution would be to consolidate shipments with a transshipment facility at the airport for tropical fish, but the cost of developing such a facility is prohibitive.

Another major impediment to efficient shipping is the lack of provisions to certify aquaculture operations as pest and pathogen free. Because of this lack of certification, each shipment of aquatic products must be individually inspected by the DOA before shipping. As the inspection services are not readily available on a 24/7 basis throughout the State, shipments must often be packed much earlier than would be necessary if farm certification was available (as exists for plant nurseries).

The Division of Aquatic Resources is considering licensing exporters under a new license authority. The purpose of the new license is to get a better idea of the amount of local marine

resources that are being exported out of the State. It may also help in verifying reported catches from the fishers.

***Biosecurity***. Hawai'i has quarantine rules on certain aquaculture organisms, but does not have a general biosecurity program for aquaculture. If the State does not impose biosecurity regulations, USDA and the Federal Food and Drug Administration will. With monoculture of aquaculture species, and without a sound biosecurity program, the likelihood of diseases is high. Other issues are smuggling of species and introduction of organisms from the release of ballast water.

***Permits for culture of ornamental invertebrates (coral and live rock)***. According to some experts, ornamental invertebrates and shellfish for local sale offer the most significant potential to augment aquaculture gross sales in Hawai'i. Markets for live rock and live coral could include marine aquarium, curio, and reef restoration. Regulated ornamental invertebrates, such as live rocks, may be cultured and sold by licensed aquaculture dealers.

While the license could apply to live corals, the Division of Aquatic Resources, Department of Land and Natural Resources has not issued any licenses to allow this. A policy choice has been made that does not allow in situ or cage culture of live coral. The main concern seems to be potential abuse of the license. The introduction of legal coral culture might encourage illegal destruction and removal of live corals from the reef under the disguise of legal coral culture operations. It is difficult to distinguish between cultured and wild live coral.

It is reported that in Florida live rock and live coral are being cultured profitably and with ecological success. The pressure on wild harvest is reportedly reduced because culture is more profitable than harvesting from the wild. The International Marinelife Alliance is preparing a bioeconomic analysis on this topic.

***Permits for sale of cultured bivalves for consumption***. Lack of facilities for the growth and sale of clams and oysters is considered by some to be a major lost aquaculture opportunity. It is believed that there is great potential for sales of cultured oysters and clams. There are three seed companies for clams and oysters (e.g. Kona Bay), but the State has not certified grow-out operations for local consumption. The Interstate Shellfish Commission provides Federal standards for shellfish culture. In addition, each State may set its own health standards and regulations. The application of water quality requirements in Hawai'i for the sale of shellfish for consumption is stricter than other States. The Food and Drug Branch of the State Department of Health oversees approval of shellfish sanitation permits. The Department requires a certified lab for testing compliance with health requirements, but the State does not have certified labs. If the industry were to provide lab facilities it is estimated that it would cost in the range of $50,000 per operation. The State does not want to certify shared waters, so individual operations would need to be certified. The requirements for shellfish sanitation permits have led the industry to drop the battle for bivalve culture altogether and go on in other directions. The strict interpretation of shellfish regulations is thought to be a reaction to a problem with a commercial producer in the past that failed to meet State standards.

***Permits to renovate and operate traditional fishponds***. Permitting, restoration and operation of ancient Hawaiian fishponds involves a complex regulatory process. Permits are required from the Army Corps of Engineers, Department of Health, State Environmental Quality Commission, and Department of Land and Natural Resources (CDUP permit). So far, ADP has permitted two ponds. They were permitted four years ago. Four ponds have been permitted and restored on Molokai with an average size of 20 acres; one is operating. The approval process for this pond took 6 years.

***Supply and sale of publicly funded research by-products.*** The issue of sale of food and non-food research by-products by publicly funded research projects was perceived to be important. Some meeting participants felt that the laws are not clear on the commercial sale of aquaculture products by public and semi-public agencies. Supply of publicly funded research by-products is part of the larger issue of the appropriate role and forms of public support for industry development, including disease diagnostic services, overall extension service, and promoting capacity development in private sector hatcheries, grow out, processing and marketing.

There is an industry perception that supply and sale of seed stock by publicly funded hatcheries are a competitive barrier to private hatcheries because seed stock is provided for free or sold at less than the full cost of production. This issue of supply and sale of publicly funded research by-products is relevant to many past and current situations in Hawai'i, including State prawn post-larvae sales, sale of products by the University of Hawai'i (such as Chinese catfish and ornamental fish), sale of moi fingerlings by Oceanic Institute, and sale of aquaculture products by local high school projects. Some workshop participants noted that the supply and sale of pearl and kahala seed stock by publicly funded research entities could become an issue in the future in both Hawai'i and the U.S. affiliated Pacific islands.

The most recent example of conflict over the sale of publicly funded research by-products involves the sale of moi fingerlings. Oceanic Institute is the leading aquaculture and fisheries research agency in Hawai'i. It is supported largely with federal funding. Under the terms of a U.S. Department of Agriculture grant awarded by the Center for Tropical and Subtropical Aquaculture (CTSA), Oceanic Institute raised and sold moi fingerling to private farmers at an incremental price schedule: $0.07 per fingerling in the first year, $0.14 in year 2, and $0.21 in year 3. Year 3 ended in February 2002. The intent of the project was to familiarize farmers with methods for raising a new species of fish and to transition from a government subsidized price toward reliance on commercial hatcheries. After completion of the CTSA project, OI agreed to sell fingerlings at full cost of production to Cates International to stock its offshore cages.

In May of 2001 a private hatchery filed a complaint asserting unfair competition from OI in the moi fingerling business. The complaint was filed by Pacific Harvest, Inc. and was brought before the United Sates District Court, District of Hawai'i. The District Court did not have the opportunity to rule on the allegations. The complaint and counterclaim filed by the Oceanic Institute were dismissed with prejudice in February of 2002. The plaintiff reports that legal fees associated with obtaining information through the public right to information became too great a burden to continue litigation.

The litigation caused USDA to perform its own evaluation of the CTSA grant. In June 2001, USDA's Office of Extramural Programs found that CTSA and OI implemented the project consistent with the terms and conditions of the USDA Cooperative State Research, Education, and Extension Service (CSREES) grant. It was further determined that Federal funds were not used to subsidize unfair competition with the private sector. In June 2002, Pacific Harvest wrote to USDA asserting that it continues to suffer from unfair competition. CSREES replied that recent sales of threadfin fingerlings were at full cost and consistent with Federal government (Office of Management and Budget) guidelines for the sale of research products.

The HAA formed a group called the Moi Strategic Alliance to raise producer concerns and discuss private-public collaboration. The group initially focused on the test sale of food fish in the local market by the CTSA research project. Industry deliberations on the seed issue were suspended until the lawsuit was resolved and have not been resumed as yet.

***Timely dissemination of publicly funded research findings***. The aquaculture industry perceives that access to and communication of research findings and technologies from publicly funded aquaculture research entities are neither timely nor adequate. In some cases, federal and State funding agencies for aquaculture research (such as the USDA's Center for Tropical and Subtropical Aquaculture) have addressed this issue by clearly spelling out the transfer step in the contract deliverables.

***Government resources***. Limited budgetary resources are considered to be an important problem for government agencies. The Department of Agriculture, Plant Quarantine Branch, for example, is strapped by lack of budget, staff and resources to carry out its mandate. In particular, there is a lack of micro-organism experts and veterinarians on staff to provide disease diagnosis. The Aquaculture Development Program had its operating budget and staff cut in half four years ago. Consequently it must choose a smaller number of work areas where its limited resources will have the greatest impact. The Aquaculture Development Program was threatened from elimination by legislation when it was housed within the Department of Lands and Natural Resources. The aquaculture industry lobbied successfully to have the ADP transferred to the Department of Agriculture, where it presently resides.

## III. Perceived Priority Issues

To obtain a rough sense of stakeholder priorities, these issues were ranked by a simple group voting procedure at the IFAFS/USDA meeting in Kona. The ordering of issues based on the total number of votes is shown below.

1. Conflicts associated with the supply and sale of aquaculture by-products from publicly funded research
2. NPDES water discharge regulations
3. Permits for ornamental invertebrates
4. Issues related to offshore mariculture
5. Public awareness and education
5. Biosecurity
5. Importation permits for cultivation of non-native and unlisted species
6. Timely dissemination of publicly funded research findings
6. Permits for sale of cultured bivalves for consumption
7. Permits to renovate and operate traditional fish ponds
8. Zoning and building permits for aquaculture operations
8. Government budget allocation to support aquaculture offices and regulatory bodies

## IV. Actions to Address Legal and Administrative Issues

***Sale of publicly funded research by-products.*** There is a perceived need for clearer rules and guidelines for the use of public research funds for growth and sale of seed stock for aquaculture operations. A study of Hawai'i and other State experience with the sale of publicly funded research by-products would help to clarify issues and develop guidelines on how an industry goes from seed produced with public funds to technology transfer in which seed is produced from a private hatchery sector. A review of the issues would include case law and specific federal and State statues and rules (including anti trust) in Hawai'i and elsewhere. There are other States with experience, such as California (trout seed), Alabama (catfish sales), and Florida (clam sales). An objective review with recommendations or guidelines on how an industry (suppliers and

recipients) goes about discussion and resolution of conflict could help to minimize or avoid future conflicts in the Pacific. It might also identify approaches to public-private collaboration that have been successful in enabling an effective transition from public to private seed production.

***NPDES water discharge regulations***. This is an issue in flux. The Environmental Protection Agency is currently revising requirements for aquaculture NPDES permits. The new rules will be finalized and enter into force in 2004. Not only is the NPDES permit critical for offshore and onshore aquaculture sites, it may be required for hatchery discharges as well. The new rules will also affect water quality regulations that pertain to bivalve culture. The State of Hawai'i in collaboration with the HAA and the National Aquaculture Association should take a proactive role in working with EPA to ensure that Federal regulations are appropriate for Hawai'i and do not overly encumber aquaculture operators with rigorous and costly monitoring, reporting, and discharge standards.

Specific actions that were suggested include:

- Prepare a white paper for EPA, with involvement of DOH on the Pacific situation with regards to water quality regulations and aquaculture. Information is available from CTSA projects and cage monitoring
- Prepare one-page fact sheets on aquaculture monitoring findings (CTSA, NELHA data, cage culture, Molokai fish ponds)
- Convene a meeting to discuss draft EPA regulations when they come out to obtain DOH reaction and ensure industry, community and county input

***Permits for culture of ornamental invertebrates (coral and live rock)***. Review Florida policy, rules and experience in cultivation of live coral and live rock. Other suggestions include:

- Form a coalition of national and international NGO's working with State government to promote culture of ornamental invertebrates
- Build awareness of the Marine Aquarium Council's approach to certification of best practices for culture of live rock and live coral

***Offshore cultivation***. Offshore development sites could be re-zoned as agriculture, or some other designation that removes the burden of the CDUP process. For example, pre-permitted areas for aquaculture activities could be established. In order to do this it is first necessary to develop a consensus and make a policy choice that recognizes open ocean aquaculture as an acceptable activity and an expected usage of the sea, just as agriculture is an expected usage of the land. Also, industrial areas in proximity to waterfront access could be re-zoned as an incentive for aquaculture development.

Intermediate actions to facilitate zoning changes and more streamlined regulatory procedures could include:

- Raise awareness on problems that impede industry growth such as shore-facility access and hatcheries
- Educate government regulators and the public by compiling available information from throughout the world on the sustainability of offshore cultivation
- Assist in making monitoring information on offshore cultivation available
- Develop an industry code of conduct and Best Management Practices

***Public awareness and education***. Because of the conservative balance between environmental concerns and business interests, there is a need for proactive State, HAA and higher-education sponsored public education and outreach to promote and raise awareness about aquaculture, the conservation benefits of responsible aquaculture, and the long history of aquaculture in Hawai'i. The public in general is not aware of the most basic and critical conservation issues facing our wild fisheries and global trends in seafood consumption from aquaculture. Public educational brochures for marine aquaculture are lacking. A well-informed and knowledgeable public is critical to efforts to reform laws, adopt new policies, approve new industries and investments, and enact legislation to make aquaculture sustainable in Hawai'i. Aquaculture is most likely to succeed when there is strong community-based support.

***Permits for importation of live organisms to Hawai'i for cultivation of non-native and unlisted species***. Suggestions to address this issue include:

- Produce an update of a 1993 extension Fact Sheet on this topic (Olin, P., "Importing Live Organisms to Hawai'i: Procedures and Permitting," Fact Sheet No. 1, Nov. 1993, UH Sea Grant Extension Service, 3 pp.)
- Streamline processes for importation of non-native species to reduce detrimental delay to aquaculturists and evasion of import restrictions

***Timely dissemination of publicly funded research findings***. To better define this issue, it would be useful to assess how different aquaculture research agencies disseminate technical information starting with development of the scientific result and ending with its application by the private sector. How is it done and how long does it take for different types of research or different types of research entities—those that are primarily pure research and development, and those that combine research with extension.

Another action would be to develop mechanisms to improve small and medium scale aquaculture collaboration with public research entities to help guide research priorities and improve dissemination of research findings.

***Permits for sale of cultured bivalves for consumption***. Establish a task group to prepare a white paper to review and frame the issues related to bivalve culture and impediments to live sales. Examine the positive and negative aspects of bivalve culture, barriers and potential economic feasibility of bivalve cultivation on land, and make recommendations for reform of policies.

***Permits to renovate and operate traditional fishponds***. There have been task forces and books dealing with the issue of ancient fishpond restoration. The goal of restoration has a cultural component, but to be sustainable they must also be economically viable. The traditional production value of the ponds is not high. If the ponds were leased for non-traditional culture, such as live rock growth on the bottom, the potential to contribute to aquaculture value added would be greater. New ways to link the past with the future in terms of technology need to be explored.

***Improved application of regulations for aquaculture***. Regulations should be better targeted to specific environmental concerns, uncertainties and potential problems. Regulations should be implemented as written, consistently and with the use of sound science. This would reduce unnecessary and inefficient bureaucratic delays and hurdles. It would also help to define the magnitude of the risks that the regulations are intended to address, and increase stakeholders

understanding of the balance that has been agreed upon between environmental concerns and business interests.

Other suggestions include:

- Produce an update of the 1993 ADP permit guide
- Fact sheets on permitting processes for ocean leasing and sea cage permitting, near shore permitting, HACCP regulations on aquaculture products, and regulations related to ancient fish pond culture
- Development of a web-based database sponsored by ADP with industry, government and non-government contacts of people who can provide guidance and help with compliance of regulations and permits

***Export regulations, transportation, and carrier requirements***. Prepare a fact sheet on export regulations for aquaculture and carrier requirements. The possibility of certifying fish hatcheries, etc. as pathogen and pest-free so that each shipment would not have to be inspected should be explored.

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