

AQUACULTURE VALUES REPORT

A VISIONING PROJECT OF THE
NORTH AMERICAN MARINE ALLIANCE

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Aquaculture Values



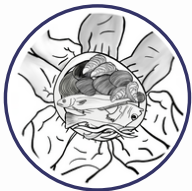
FOOD

Aquaculture is essential to the overall seafood supply and is vital for healthy and culturally appropriate food systems.



STEWARDSHIP

Aquaculture production should protect and honor every watershed and ecosystem's intrinsic ecological value and environmental rhythms on land and at sea.



COMMUNITY-BASED

Community-based aquaculture enhances the social, ecological, economic, and cultural fabric of our communities and integrates with existing fisheries.



ACCESS

Aquaculture should provide equitable opportunities for new and diverse participants of all ages, genders, races, cultures, and incomes.



EQUITABLE SUPPLY CHAINS

All workers along the seafood supply chain deserve fair living wages, safe working conditions, and work with dignity.



PLACE-BASED KNOWLEDGE

Local and place-based knowledge is necessary to steward aquaculture operations in harmony with the surrounding ecosystems on both land and sea.



PUBLIC RESOURCE

We affirm the public trust doctrine and the unique rights of tribal nations in their traditional homelands.



ACCOUNTABILITY

Fair, transparent, clear, and adequate regulatory planning and enforcement are critical to values-based aquaculture.

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EXECUTIVE SUMMARY

Aquaculture refers to the practice of growing aquatic plants, algae, and animals in the water, on land and at sea. Aquaculture, like agriculture, comes in many forms. At its best, akin to family farming, aquaculture can be a sustaining bedrock for our local communities, economies, and food systems. At its worst, akin to factory farming, aquaculture damages ecosystems, displaces communities, and undermines local economies. In North America, the aquaculture sector is growing rapidly, and includes a broad range of actors, from small-scale, independent oyster growers to massive farmed finfish operations. While varied across contexts, in general aquaculture policy has not been responsive to diverse needs, is convoluted and inaccessible to small farmers, and is plagued by regulatory conflicts of interest.

As government initiatives build momentum for growth in the industry, bottom-up dialogue and action against the corporatization of our oceans is more important than ever. Current and emerging aquaculture political initiatives and operations need a set of values that prioritize stewardship, local control, and equitable distribution of development risks and benefits. Otherwise, we risk repeating the pattern (across the food system) of prioritizing large-scale corporate interests over people and the planet. What might those shared values look like across our network?

The following report addresses this question and opens up pathways for coalition building across seafood sectors. The goals of this document are threefold: 1) to create a framework for farmed seafood that enhances collective missions supporting sustainable, equitable, and accessible seafood systems, fisheries, and ecosystems; 2) to uplift aquaculture practitioners implementing values in their operations and entrepreneurial endeavors; and 3) to build trust and cohesion between wild-caught and farmed seafood communities.

To accomplish these goals, this report lays out a set of values that harvesters, fishermen, farmers, advocates, and policymakers can use to guide, uplift, and build trust across current and emerging aquaculture contexts. The project team synthesized existing values from partner networks, gathered input from a survey and four focus groups, and received iterative feedback on method design, survey questions, values, and the draft report from informal project advisors and aquaculture industry members throughout the project.

The aquaculture values, listed below, align with and draw directly from food sovereignty principles as well as FLC, Local Catch, and Slow Fish values. They aim to foster trust and guide aquaculture practices and policy within and outside of NAMA's networks, and gain strength when they are considered collectively, rather than as individual values. They are aspirational, not ranked by importance, and should be applied holistically rather than individually. The aquaculture values are:

Food: Aquaculture is essential to the overall seafood supply and is vital for healthy and culturally appropriate food systems.

Stewardship: Aquaculture production should protect and honor every watershed and ecosystem's intrinsic ecological value and environmental rhythms on land and at sea.

Community-based: Community-based aquaculture enhances the social, ecological, economic, and cultural fabric of our communities and integrates with existing fisheries.

Access: Aquaculture should provide equitable opportunities for new and diverse participants of all ages, genders, races, cultures, and incomes.

Equitable Supply Chains: All workers along the seafood supply chain deserve fair living wages, safe working conditions, and work with dignity.

Place-based Knowledge: Local and place-based knowledge is necessary to steward aquaculture operations in harmony with the surrounding ecosystems on both land and sea.

Public Resource: We affirm the public trust doctrine and the unique rights of tribal nations in their traditional homelands.

Accountability: Fair, transparent, clear, and adequate regulatory planning and enforcement are critical to values-based aquaculture.

Implementing a common framework for values-based aquaculture is notwithstanding challenges. For example, there is widespread recognition that the scale of aquaculture operations is critically important, yet defining what scale is appropriate is context-dependent.

Furthermore, co-optation of the framework can occur by organizations claiming allegiance to sustainable aquaculture but whose actions—when examined more closely—counter the values. While co-optation is impossible to prevent altogether, this report supplements the general values framework with specific case studies and policy recommendations to provide concrete examples of what values-aligned aquaculture can actually look like in context.

Definitions

*Note that the first time each of these words is used in the report, it is noted with an asterisk**

Access: Access refers to two distinct concepts in this report. The first is access to aquaculture growing and harvesting rights. The second is access to healthy, affordable, and culturally appropriate food.

Agroecology: Agroecology prioritizes ecological health, bottom-up power, and social welfare to achieve sustainability. Agroecological practices are rooted in local knowledge, traditions, and strategies that work with ecosystems to support human and non-human health and resilience.

Aquaculture: Farming aquatic plants, algae, and animals in the water, on land and at sea.

Community-based farmers: Community-based farmers are members of the communities where they harvest. They are typically independent owner-operators, and the bulk of their businesses' earned income circulates within close range of the community, in contrast to aquaculture corporations and investors that extract money and resources from communities and distribute them elsewhere. Community-based farmers steward small- and medium-scale operations adapted to their local ecosystems. They are ecological experts attuned to the nuances of environmental rhythms and fish and marine species' well-being. The term community-based reminds us that what is possible in one region may not necessarily be possible in another due to differences in ecosystems, infrastructure, community interest, etc.

Food sovereignty: The right of all people to decide on and participate in how their food is grown, distributed, and consumed. In other words, people's right to drive the development of their own food systems.

Fishermen: This is an inclusive and gender-neutral term for us and the one used most commonly among non-male identifying folks who fish in our network. It refers to those who might also use the terms fish harvesters, fisherwomen, fisher-misses, fisherfolk, and fishers.



Genetic modification: Altering an organism’s genetic makeup using genetic engineering or transgenic technology to create species or attributes that would otherwise not occur in nature (i.e., cannot be made using traditional cross-breeding methods). Genetically modified organisms are often referred to as GMOs.

Mariculture: A subset of aquaculture that refers to the cultivation of marine organisms in coastal or marine waters.

Participatory governance: Community members and affected constituencies are empowered to actively participate in decision-making processes.

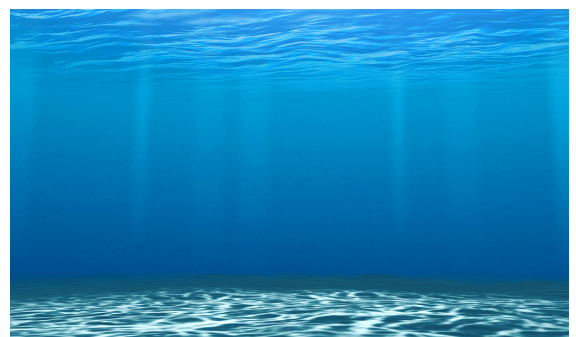
Public trust doctrine: A legal principle that preserves natural and cultural resources for public use and benefit. The natural resources held in public trust include navigable waters, wildlife, and land.

Precautionary principle: A principle that supports adopting precautionary measures when scientific evidence about the risk of an action, often to the environment or human health, are uncertain. In simple terms, if there is uncertainty, apply caution.

Privatization: In aquaculture connected to marine resources and estuaries, privatization refers to transforming aquaculture access rights into monetary, private-property assets. Privatization often allows for the purchase of permits and leasing rights to consolidate upward toward the most affluent and often far-removed corporations, often at the expense of community-based farmers.

Seafood: Saltwater and freshwater fish, shellfish, and algae.

Values: A set of core ideals used to create a higher level of internal and external accountability; advance community-based fisheries; and strengthen collaborations that rebuild vibrant and resilient fishing fleets and port communities, honor nature, and provide healthy fish, shellfish, and other foods from the sea to the public.





INTRODUCTION

Aquaculture* is the fastest-growing food production sector and currently supplies almost 50% of seafood* for human consumption worldwide.¹ Aquaculture makes up approximately 7% of U.S. seafood production and 24% of the overall value of U.S. seafood.² The sector is growing rapidly, and encompasses a broad range of approaches from small, independent farms to multinational companies, and includes growth of a wide variety of fish, shellfish, and algae. Former President Donald Trump’s Executive Order (EO) entitled “Promoting American Seafood Competitiveness and Economic Growth”³ and the “Advancing the Quality and Understanding of American Aquaculture Act (AQUAA Act)”⁴ presented aquaculture as an “immense opportunity” for economic growth and food production.

However, both are arguably based on misinformation, favor industrialized aquaculture, and disadvantage community-based aquaculture systems.⁵ The AQUAA Act also claims that developing the aquaculture sector can decrease the deficit between U.S. seafood exports and imports, despite evidence showing the trade deficit is largely caused by distribution rather than production.⁶ Efforts to streamline aquaculture permitting and advance aquaculture development have also enabled ocean grabbing,⁷ industry concentration, and monopolization. For example, international operations have the resources and political clout needed to expedite permits against public outcry.⁸ Deregulation policies can also favor industrial aquaculture offshore⁹ at the expense of small community-based farmers*, marine ecosystems,¹⁰ and federal goals related to equitable access*.¹¹

¹ Gamble, M. M., Sarker, P. K., Kapuscinski, A. R., Kelson, S., Fitzgerald, D. S., Schelling, B., & Takayuki, T. (2021). Toward environmentally sustainable aquafeeds. *Elementa*, 9(1).

² National Marine Fisheries Service (2022). Fisheries of the United States, 2020. U.S. Department of Commerce, NOAA Current Fishery Statistics No. 2020. Available at: <https://www.fisheries.noaa.gov/national/sustainable-fisheries/fisheries-united-states>

³ Administration of Donald J. Trump. (2020). Executive Order 13921—Promoting American Seafood Competitiveness and Economic Growth. Available at: <https://www.govinfo.gov/content/pkg/DCPD-202000342/pdf/DCPD-202000342.pdf>;

⁴ Advancing the Quality and Understanding of American Aquaculture Act. Titles - S.3100 - 117th Congress (2021-2022): AQUAA Act. Congress.gov, Library of Congress, 28 October 2021, <https://www.congress.gov/bill/117th-congress/senate-bill/3100/titles>.

⁵ North American Marine Alliance. (2023). AQUAA Act 101. Accessed May 2, 2023. <https://www.namanet.org/why-we-care/aquaa-act-101/>.

⁶ Gephart, Jessica A., Halley E. Froehlich, and Trevor A. Branch. (2019). To Create Sustainable Seafood Industries, the United States Needs a Better Accounting of Imports and Exports. *Proceedings of the National Academy of Sciences* 116, no. 19: 9142–46. <https://doi.org/10.1073/pnas.1905650116>.

⁷ Ocean grabbing refers to acts of dispossession or appropriation of marine resources or spaces. See Bennett, N. J., Govan, H., & Satterfield, T. (2015). Ocean grabbing. *Marine Policy*, 57: 61-68.

A nuanced dialogue is needed for local communities to be empowered to inform the policies that affect them and the ecosystems that sustain them. Federal, state, and venture capital initiatives are increasingly supporting aquaculture research. Significant public and private dollars in the United States are backing research and development in aquaculture, with the federal government investing \$919 million (USD) between 1995 and 2015.¹² For example, \$49 million was awarded to the Alaska Mariculture Cluster by the U.S. Department of Commerce to support growth in kelp aquaculture in 2022.¹³ Media coverage of aquaculture also often lacks nuance. For example, it places uncritical faith in the innovation of kelp and shellfish farming as solutions to climate change, plastic production, and food insecurity, regardless of social or ecological context,¹⁴ but fails to address the concerns of ocean grabbing or monopolization. Or, media highlights controversies between wealthy coastal landowners and aquaculture advocates, with little attention to the many collaborative relationships between local communities and community-based aquaculture operations.

Creating bottom-up dialogue and action against the corporatization of our oceans is more important than ever as governance and media build momentum for growth in the North

American aquaculture industry. But what might assembling resilient coastal economies from the bottom up rather than the top down look like? What would happen if our regulatory environment and federal dollars supported values based aquaculture farms? How might we foster nuanced dialogue in collaboration between fishing and farming communities?

The following report addresses these questions by laying out a set of values*, case studies, and policy recommendations that harvesters, fishermen*, farmers, advocates, and policymakers can use to build coalition across seafood sectors. These aquaculture values (referred to as “values” for the remainder of the document) are intended to emphasize food sovereignty*,¹⁵ illuminate examples of values-based aquaculture, and ultimately build trust across seafood sectors (i.e., wild harvest fisheries, mariculture*, and land-based aquaculture). Notably, important distinctions and nuances exist between different aquaculture forms, but these values apply to all aquaculture (shellfish, finfish, hatcheries, land-based, marine, seaweed, etc.). The values are Food, Stewardship, Community Based, Access, Equitable Supply Chains, Place-based Knowledge, Public Resources, and Accountability. To create these values, the project team synthesized a literature review of existing values from partner organizations, developed and distributed a survey, and conducted four focus groups.

⁸ Dressel, Holly. (September 28, 2022). In Seaweed, Climate Capitalists See Green. The Breach. <https://breachmedia.ca/in-seaweed-climate-capitalists-see-green/>.

⁹ Offshore often refers to outside statutory jurisdiction (past 3 miles from the shoreline) and within the exclusive economic zone (EEZ) –an area of the ocean, generally extending 200 nautical miles (230 miles).

¹⁰ Fry, Jillian, David Love, and Gabriel Innes. (2018). Ecosystem and Public Health Risks From Nearshore and Offshore Finfish Aquaculture. *Johns Hopkins, Science Brief*.

¹¹ National Marine Fisheries Service (2023). NOAA Fisheries Equity and Environmental Justice Strategy. National Oceanic and Atmospheric Administration.

¹² Love, David, Irena Gorski, and Jillian Fry. (2017). An Analysis of Nearly One Billion Dollars of Aquaculture Grants Made by the US Federal Government from 1990 to 2015. *Journal of the World Aquaculture Society*, 48(5): 689-710.

¹³ Creative, Efelie. (2023). Alaska Mariculture Initiative. Alaska Fisheries Development Foundation. Accessed February 15, 2023. <https://afdf.org/research-and-development/alaska-mariculture-initiative>.

¹⁴ National Marine Fisheries Service. Seaweed Aquaculture. NOAA. Accessed February 15, 2023. <https://www.fisheries.noaa.gov/national/aquaculture/seaweed-aquaculture>.

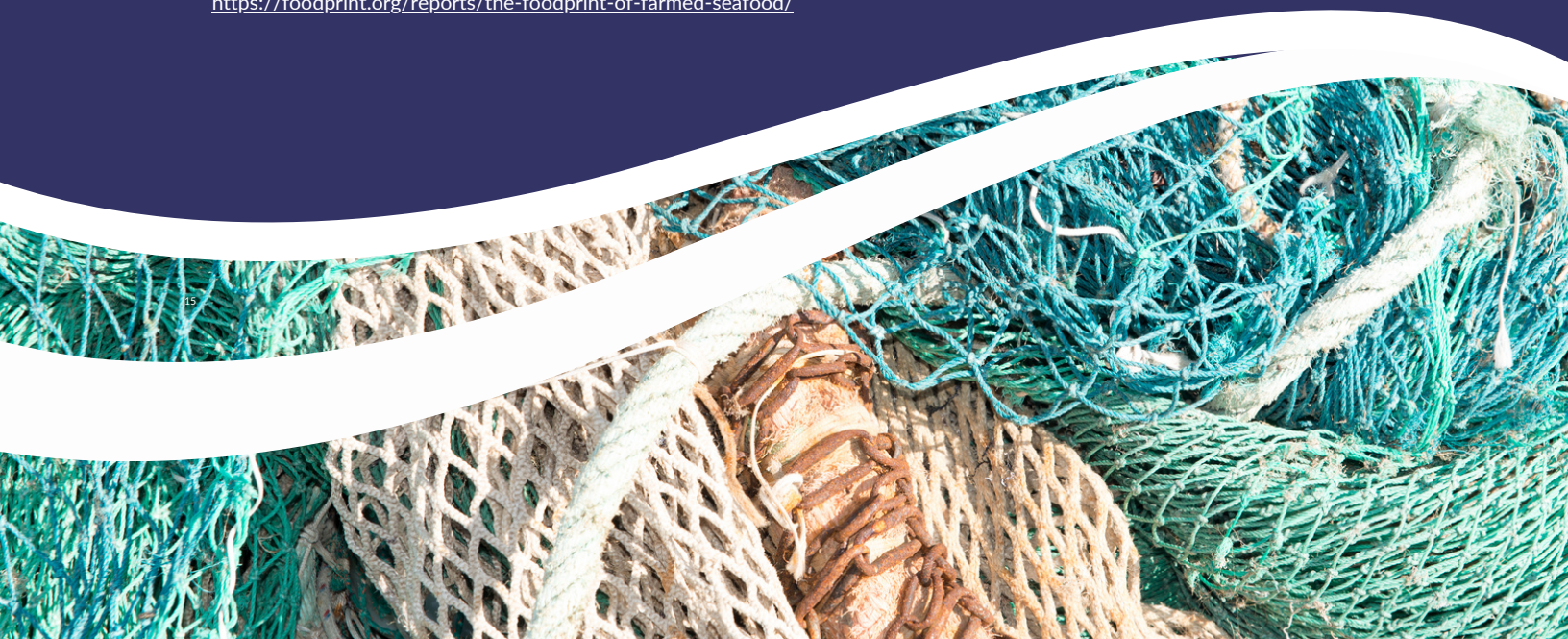
¹⁵ La Via Campesina. (June 15, 2003). *Food Sovereignty: Via Campesina*. <https://viacampesina.org/en/food-sovereignty/>.

BACKGROUND

The North American Marine Alliance (NAMA) was created in 1995 by a group of fishermen and fishing community advocates to explore alternatives to top-down marine management structures. Its mission is to build a movement toward a healthy ocean and just seafood system. To achieve this, NAMA has built a network of fishing communities across the U.S. and North America. Over the past decade, NAMA's work has increasingly focused on defending the ocean as a public commons and advocating against fisheries access rights consolidating into the hands of larger-scale private equity firms and multinational corporations. Network members voiced concern about larger-scale aquaculture companies' momentum and top-down governmental efforts promoting industrial fish farms in the ocean. As such, NAMA partnered with FoodPrint to write a report entitled the FoodPrint of Farmed Seafood, which primarily focused on the harms of industrial-scale aquaculture. To complement this effort, network members expressed a need for proactive values and member vision-driven reports describing the types of aquaculture NAMA's network participants supported.

¹⁶ NAMA. Who We Are. <https://www.namanet.org/about-us>

¹⁷ Foodprint. The FoodPrint of Farmed Seafood & Aquaculture. <https://foodprint.org/reports/the-foodprint-of-farmed-seafood/>



Data Collection

To create the final aquaculture values, the project team reviewed values statements from partner networks committed to ecological and economic viability of entire seafood systems—the Flish Locally Collaborative (FLC),¹⁸ Local Catch,¹⁹ and Slow Fish,²⁰ and conducted a survey and four focus groups. In addition to input from the survey and focus groups, the project team received iterative feedback on method design, survey questions, values, and the draft report from informal project advisors and aquaculture industry members throughout the project.

The survey solicited respondents' experience and values regarding aquaculture, and their concerns, ideas, and level of engagement with aquaculture policies.²¹ We also asked for general demographic information on the survey to understand the network population better. We observed several best practices for developing surveys, such as using questions to gather quantitative data, keeping the questions and survey concise, and providing optional opportunities for longer qualitative answers. The project team included feedback on survey questions from an advisory group of advocates, practitioners, and experts in aquaculture.

The project team created the survey using FLC and Local Catch values and distributed the survey through the FLC, Local Catch, and Slow Fish listservs. The survey was shared using a Google Form, which was accessible and user-friendly, allowed questions to be formatted into Likert scales, stored responses as individual data points, and provided data summaries. To distribute the survey, the project team relied on the breadth of reach and depth of community established by NAMA and their shared networks and allies, including the FLC, Local Catch, and Slow Fish. We sent emails inviting engagement to each network's existing listservs. We offered a window of three weeks to respond and sent two reminder emails as the date approached. We also sent the survey to important contacts, advisors, and allied network gatekeepers to improve the response rate.

¹⁸ For more information on the FLC values, please visit NAMA's website at https://www.namanet.org/sites/default/files/field_file/FLC%20Core%20Values.pdf.

¹⁹ Local Catch Network. Core Values. <https://localcatch.org/core-values/>

²⁰ Slow Fish. <https://slowfoodusa.org/slow-fish/>

²¹ The survey was intentionally biased; we wanted to hear from network members who were generally on board with NAMA's and FLC's values and vision and who could help reframe those values to the current political and economic aquaculture climate.

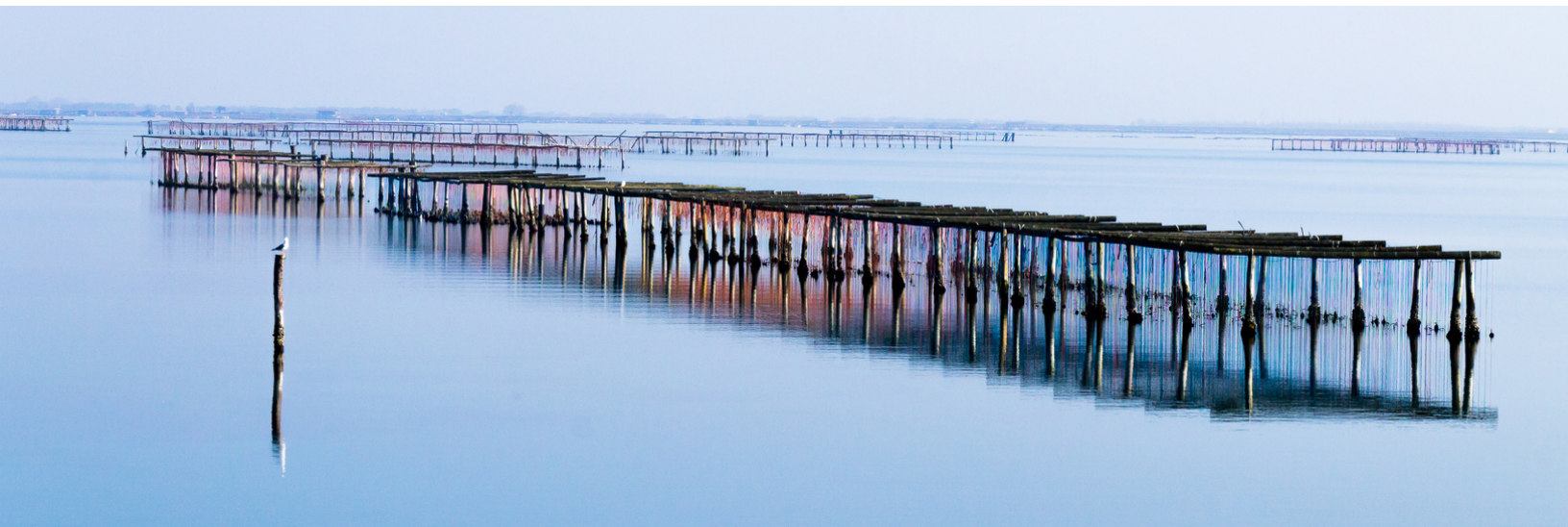


The project team then designed and facilitated four focus groups over three months to deepen our understanding of network members' vision for values-based aquaculture. Focus groups observe and stimulate participants' interactions, gather feedback, identify experiences, and categorize perceptions with and among participants.²² Using a focus group format also enabled us to take the pulse of the social environment (e.g., collaboration versus competition) among participants, network members, and sector affiliates within this emerging market segment.

The first two focus groups aimed to gather broader feedback and interpretations of the network survey and preliminary data synthesis and understand the perceptions of “values-based aquaculture” among members and collaborators. In contrast, the final two focus groups gathered feedback on drafted value statements. Each focus group began with project background information, outlined key questions to cover during the session, and reviewed guidelines for productive and respectful conversations. One facilitator and at least one notetaker were present at each focus group. Focus group slides and raw, anonymous data are available upon request.



²² Cameron, J. (2005). Focusing on the focus group. *Qualitative research methods in human geography*. 2(8), 116-132.



Results

The following section summarizes the results from the survey (n=58) and focus group (n=47), which collectively, through participatory research, created a framework for aquaculture that enhances sustainability and equity in seafood systems, fisheries, and ecosystems.

SURVEY RESULTS

Survey Respondents Demographic Summary.

The survey asked respondents about their age, gender, race, business or organizational affiliation, and place of residence. Of the respondents, 62% were affiliated with wild fisheries or aquaculture operations, and 51% were based in Maine, Alaska, or California. Table 1 shows the summary of the survey respondents' demographics.

Table 1 – Demographic description of survey respondents.

Gender Distribution		
	Male	53.4%
	Female	43.1%
	Non-binary	1.7%
	Prefer not say	1.7%
Age Distribution		
	25 - 34	17.2%
	35 - 45	25.9%
	45 - 55	24.1%
	56+	32.8%
Distribution of Racial Identity	White	87.9%
	American Indian or Alaskan Native	3.4%
	Hispanic or Latinx	3.4%
	Other ²³	11.9%
Organizational/Business Affiliations Distribution	Wild fish harvester	24.1%
	Aquaculture	20.7%
	Both (wild harvest & aquaculture)	17.2%
	Other (e.g., advocacy, conservation, industry, intermediary, etc.)	38%
Geographical Distribution	Maine	25.5%
	Alaska	15.3%
	California	10.2%
	British Columbia	6.8%
	New York	5.1%
	Oregon	5.1%
	Rhode Island	5.1%
	Other (<2 respondents per region)	26.9%

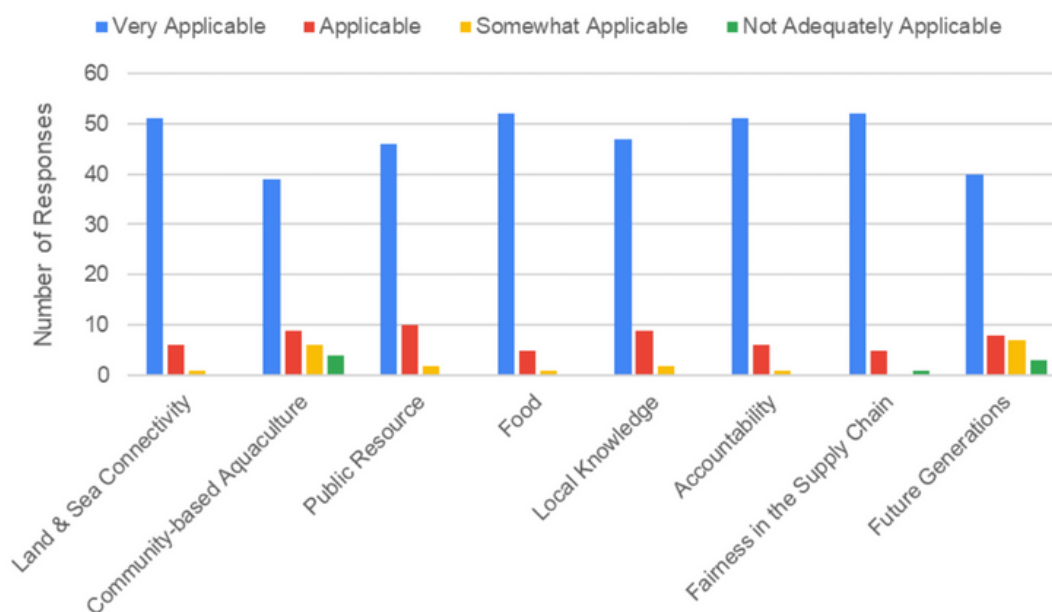
²³ "Other" includes the following identities: Asian or Asian American; Black or African American; Native Hawaiian or Other Pacific Islander; Black, European, Caribbean Lucayan; Sicilian; Yup'ik; and mixed.

NOTE: The majority of respondents identified as white, which we recognize as a limit on the perspectives represented in our results. Future surveys should prioritize a diverse respondent pool.

Evaluation of existing values' applicability to aquaculture

As part of the survey, respondents were asked to rank existing values (e.g., land-sea connectivity, community-based, public resource, food, local knowledge, accountability, fairness in the supply chain, and future generations), as “very applicable,” “applicable,” “somewhat applicable,” and “not adequately applicable” to aquaculture. As described above, these values were pulled from existing seafood value statements (FLC, Local Catch). Figure 1 shows the results of respondents' applicability ranking of values themes.

Figure 1 – Respondents' applicability ranking of values themes.



Evaluation of the government's ability to integrate values into policy initiatives.

The survey asked respondents to identify the level of government entities with which they engaged in the context of aquaculture. Most respondents engaged with federal or state entities managing or governing aquaculture. Table 2 describes the total number of respondents who had experience engaging with various scales of entities governing aquaculture.

Table 2 – Number of respondents who had experience engaging with entities governing aquaculture.

Federal	40
State or provincial	48
Municipal	25
First Nations or Tribal	14
Other (e.g., no engagement, Congressional, European Union, committees, hatcheries, etc.)	7

[^]respondents (n=58) could have engaged with more than one jurisdiction, which leads to a total number higher than “n.”

The survey then asked respondents to evaluate how well-existing aquaculture policies at various scales (local,²⁴ state/provincial, First Nation or tribal, and federal) integrated the values into their policies, such as leasing and environmental assessments, using a Likert scale: “1” being “very poorly” and “5” being “very well.” Most respondents indicated that local entities governing aquaculture integrated values into policy initiatives poorly and adequately. Most respondents indicated that state/provincial entities governing aquaculture incorporated values into policy initiatives poorly. Most respondents indicated that Federal entities governing aquaculture integrated values into policy initiatives poorly and very poorly. Figures 2 – 4 report the total number of respondents’ responses measuring various scales of the government’s ability to incorporate values into policy initiatives.

Figure 2 – Respondents’ evaluation of how well **local** entities governing aquaculture integrated these values into policy initiatives (where 1 = very poorly, 2 = poorly, 3 = adequately, 4 = well, and 5 = very well).

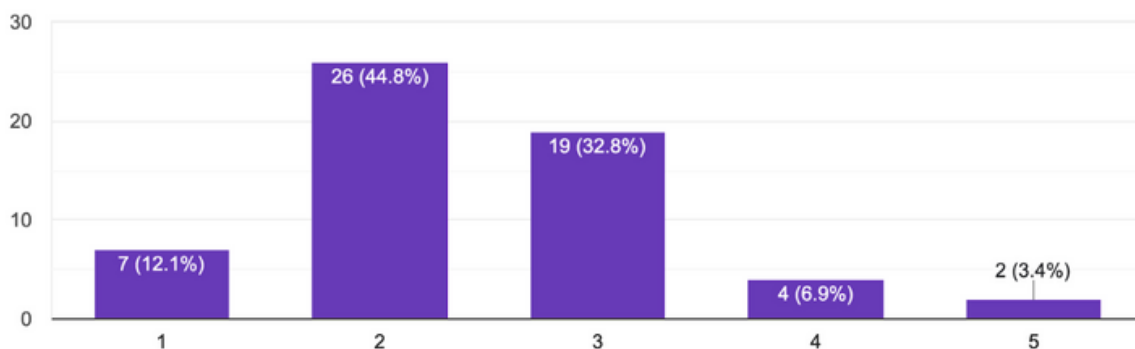


Figure 3 – Respondents’ evaluation of how well **state or provincial** entities governing aquaculture integrated these values into policy initiatives (where 1 = very poorly, 2 = poorly, 3 = adequately, 4 = well, and 5 = very well)

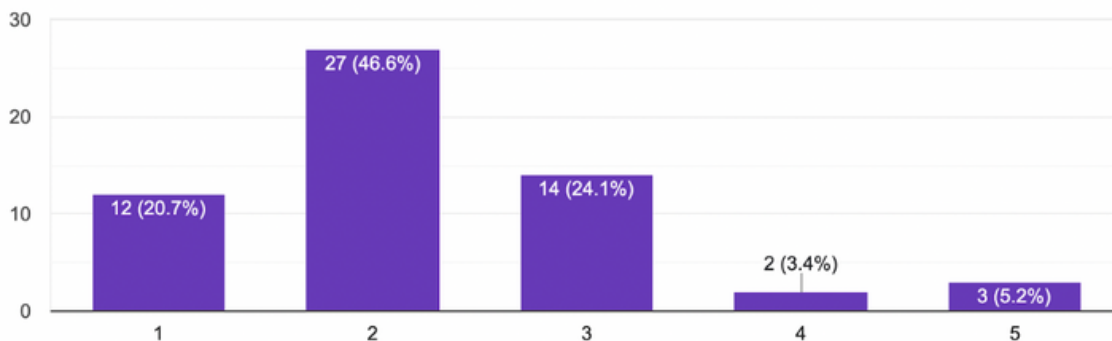
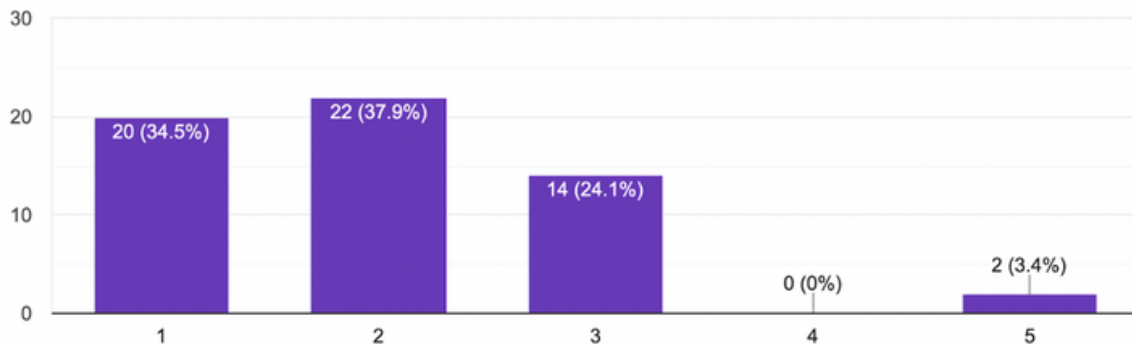


Figure 4 – Respondents’ evaluation of how well **federal** entities governing aquaculture integrated these values into policy initiatives (where 1 = very poorly, 2 = poorly, 3 = adequately, 4 = well, and 5 = very well)

²⁴ Local was left open-ended in the survey, but could mean town, city, or county-level policies.

Figure 4 – Respondents’ evaluation of how well **federal** entities governing aquaculture integrated these values into policy initiatives (where 1 = very poorly, 2 = poorly, 3 = adequately, 4 = well, and 5 = very well)



Qualitative Comments Summary

Survey respondents provided qualitative comments by answering the following question: When it comes to the various sectors of aquaculture (e.g., marine finfish, marine algae, and shellfish, land-based or recirculating), what do you see is missing or needs to be revised from the core values? Qualitative data collected (n=49) were thematically categorized (e.g., food, healthy ecosystems, access and public trust doctrine*, community-based and scale, etc.) and used to create the value descriptions and the definitions at the beginning of the report. Many comments referenced concerns about stewardship or the environment (n=26). Concerns about the importance of and abilities to distinguish and uplift community-based aquaculture were the second most noted (n=9). Ensuring and prioritizing access for new and diverse participants (n=9), resisting ocean grabbing (i.e., public resources) (n=6), and strengthening accountability (n=6) were also frequently mentioned in the qualitative comments. Appendix B outlines the comments received and Figure 5 summarizes the responses per value category.

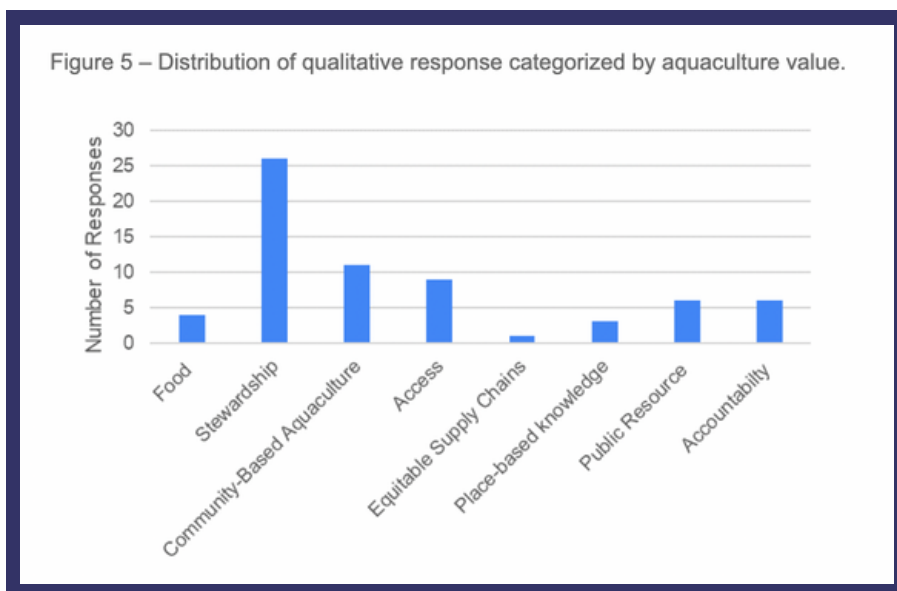
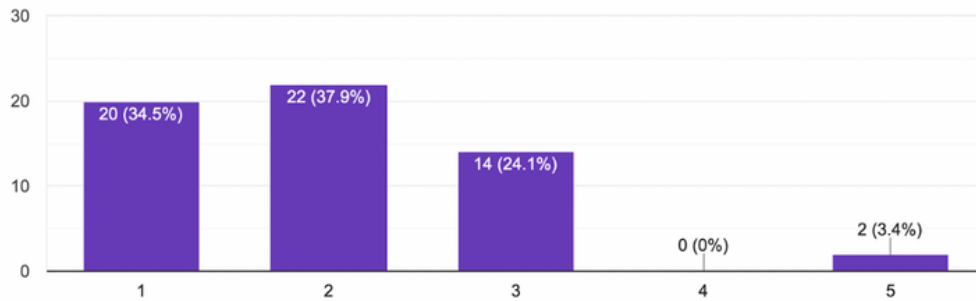


Figure 4 – Respondents' evaluation of how well **federal** entities governing aquaculture integrated these values into policy initiatives (where 1 = very poorly, 2 = poorly, 3 = adequately, 4 = well, and 5 = very well)



FOCUS GROUP RESULTS

The following section summarizes the main takeaways from four focus groups conducted over three months. The first focus group occurred in person at Local Catch's Seafood Summit in Girdwood, Alaska, whereas all proceeding focus groups were held virtually via Zoom. Focus group participants were recruited using the contact information and expressed interest in the survey. The survey asked: Are you interested in being contacted for future research on this topic? It prompted respondents to choose one of the following responses: (1) Focus group; (2) Peer reviewing (portions of) the final report; or (3) No, thank you. Survey respondents who selected the Focus group were contacted to participate in one or more focus groups. Table 3 summarizes attendance at the focus groups.

Table 3– Focus group attendee summary.

Format	Aims	# of Participants (n = 47)	Facilitators	Note Takers
In Person	Survey synthesis General discussion of aquaculture values	17	1	2
Virtual	Survey synthesis General discussion of aquaculture values	4	1	1
Virtual	Draft values feedback	6	1	1
Virtual	Draft values feedback	20	1	3

In Girdwood, Alaska, focus group participants suggested that the project team examine and incorporate existing values statements from like-minded seafood and fisheries-based organizations (i.e., FLC, Local Catch, Slow Fish) and agriculture values previously developed (e.g., agroecology*, food sovereignty, etc.). Participants discussed the difference between self-imposed values and measurable standards and highlighted the following needs in the forthcoming aquaculture values:

- considerations for inputs (e.g., feed and water);
- a statement on genetically engineered fish, shellfish, and kelp;
- environmental externalities and net impacts;
- statement on hatcheries; and
- animal welfare.

Participants also expressed more significant concern for understanding the tradeoffs embedded in the conversation of scale. For example, large-scale operations can prevent new entrants, perpetuate consolidation, and introduce many environmental concerns. However, if an aquaculture operation is too small in scale, it might struggle to become economically viable. One participant shared that in Maine, there is a proposal to limit farms to five acres; for an independent person to earn a modest living from kelp farming alone, it requires a much larger acreage (e.g., 55 acres), pointing to the importance of sector- and place-specific nuances around the scale. Participants acknowledged that the independent nature of the owner/person in control is a factor when considering scale.

Participants in the second focus group expressed concerns about accountability in the aquaculture political economy, including regulating scale and ensuring community benefits, highlighted the importance of watershed (stream) health on the nearshore ocean environment (i.e., ecological connectivity), and discussed the financial hurdles when entering the aquaculture industry (i.e., access). Interestingly, participants could not agree when discussing the “need” for aquaculture. The discussion focused on scale concerns and reinforced that aquaculture should be politically and economically positioned to support place-based community use/benefits, regardless of scale. Participants expressed concern about ocean grabbing in the name of aquaculture, which would exclude other marine uses (e.g., recreation, commercial fishing, etc.) when space is “locked up” in unused aquaculture leases. For example, one participant explained that some people get a 60-acre lease but only plan on using five acres and propose using the remaining 55 in the application “sometime in the future.”

Participants in the third focus group discussed the tradeoffs between specificity in values

language versus broader language that was more “accessible and effective for a communications standpoint.” Participants also advocated for using supportive or optimistic language in the values rather than language depicting what types of aquaculture the network opposes. Lastly, focus group participants highlighted areas where values were too redundant or overlapping or needed further clarification. For example, participants suggested adding more details to the values to better distinguish between genetic modification* and selective breeding techniques normative to regenerative or net zero environmental impact aquaculture. They also suggested that the use and definition of regenerative aquaculture be clearer and that all supply chain actors (i.e., producers, buyers, wholesalers, etc.) should be explicitly included in the values.

The fourth and final focus group participants discussed their preferences (and dislikes) for various terms used in the values, such as aquaculturists, growers, or farmers. They also suggested additional detail to better distinguish between the challenges facing fish workers and note the influencing roles of fish buyers, such as sharing risk with producers and creating nimble yet lucrative sales contracts.

Participants also expressed concerns about whether the values would exclude corporate-controlled aquaculture while supporting place- and community-based aquaculture. For example, one participant stated that supporting technical assistance for place- and community-based aquaculture is important because “big corporations always have technical assistance in-house, so they have the resources and acumen to complete complex paperwork without any issues.” In contrast, smaller organizations or aquaculture start-ups struggle to maintain or complete necessary political and economic requirements (e.g., leases, environmental reviews, technical training, etc.).

Aquaculture Values

The final aquaculture values align with and draw directly from food sovereignty principles and Local Catch, FLC, and Slow Fish values, and the feedback gathered throughout this project. The values foster trust and guide aquaculture practices and policy within and outside of NAMA's networks. These values are intended to be taken holistically rather than individually, aspirational, and not ranked by importance. They provide a framework upon which to build and are flexible enough to respond to unique ecological, social, cultural, and economic characteristics.



FOOD: Aquaculture is essential to the overall seafood supply and is vital for healthy and culturally appropriate food systems.

We believe that food is a fundamental human right and that farmed seafood should be accessible regardless of a person's income level. The ocean ecosystem is a valuable and irreplaceable food production system. We guard against uses of the ocean and land that may harm nature's long-term ability to provide food. People should have healthy and culturally appropriate seafood produced through ecologically sound and sustainable methods. We support policies, initiatives, practices, and educational approaches that embed seafood into governance, curriculum, and markets. We embrace and engage seafood literacy and consumer education to enable conscientious purchasing, handling, and consumption that aligns with natural ecosystems and fosters climate change mitigation.

Supporting local food systems: Urban Fish Farm

Aquaculture can be an important art contributor to healthy and culturally appropriate food systems. Urban Fish Farm, LLC is a seafood enterprise and for-profit spin-off of the [Rid-All Green Partnership](#), a non-profit that runs an urban farm in Cleveland's Kinsman Neighborhood. Rid-All transformed a historical illegal dumping ground –the “Forgotten Triangle”-- into a vibrant community hub, providing learning opportunities about food, agriculture, and small business management. Since 2011, Rid-All has been raising tilapia using hydroponics and aquaponics and training adults in aquaponics practices. The tilapia are raised from fingerlings in tanks, and the nitrogen produced by the fish waste



feeds spider plants located above the tanks, which filter the water. No chemical filters or antibiotics are used on the farm. Once market size, Urban Fish Farm sells the tilapia to local restaurants. Over the past several years, the business has grown slowly, taking the time to learn, make changes, and raise tilapia to the highest quality. As of February 2023, about 45,000 tilapia at different stages are growing on the farm, and the farm is selling its tilapia through a wholesale fish house and to a local Cleveland restaurant.



STEWARDSHIP: Aquaculture production should protect and honor every watershed and ecosystem's intrinsic ecological value and environmental rhythms on land and at sea.

Humans are part of the ecosystem, and everything we do on land and at sea has an impact. We support aquaculture practices that employ agroecological practices that protect and replenish ecosystems, enhance the coupled well-being of society and nature, and operate while respecting nature's complex and dynamic character. We celebrate regional biodiversity by supporting those who grow and harvest aquaculture species in concert with their natural spatial and community ecology. We advocate for policies that support the work of aquatic and marine farmers to practice aquaculture premised on the regeneration of ecosystems and have a net positive or neutral ecological impact, including climate mitigation. We oppose aquaculture practices that are controlled by multinational corporations, and that embody industrial concentrated animal feeding operations, dismiss animal welfare and husbandry, and use genetic modification. Aquaculture operations that rely on feed from wild fish populations or use feed dependent on plant-based ingredients have also been scrutinized for their environmental impacts, such as large-scale deforestation for soy farming.²⁵ We resist modern intensive aquaculture that leads to major environmental concerns, such as introducing antibiotics and non-native species into the environment, polluting the ocean and upstream watersheds, and spreading disease.

²⁵ Kamalam, B. S., & Pandey, P. K. (2023). Nutrition and Environment Interactions in Aquaculture. In Outlook of Climate Change and Fish Nutrition (pp. 407-422). Singapore: Springer Nature Singapore.

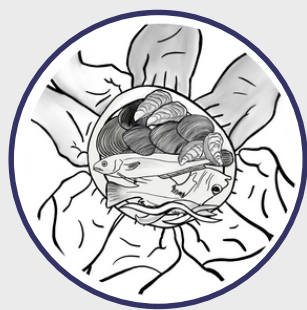
²⁶ More information is available at the McFarland Springs Rainbow Trout Farm website at <https://mcfarlandsprings.com/>

Regenerative Aquaculture: McFarland Springs Rainbow Trout

Aquaculture production should be rooted in agroecological principles and protect watersheds and the ecosystem's intrinsic ecological value. In California, McFarland Springs Rainbow Trout are commercially raised on a 100% vegetarian non-GMO diet. The feed used has no artificial dyes, antibiotics, or hormones and has zero synthetic chemicals. McFarland Springs uses a plant-based feed diet containing proteins from peas, pistachio, and barley, and rich in omega-3 DHA from that provide the same vitamins and nutrients as conventional feed ingredients but without the heavy metals and pollutants. The McFarland Springs farm is a zero-waste, carbon-neutral farm that runs on hydroelectricity generated from the farm's operations. After nourishing the trout, the water from their zero-waste, carbon-neutral farm continues into the meadow, where it grows sagebrush and grasses. This closed environment also means the trout can never escape into the environment.²⁶



Image: farm at the pristine headwaters of California's Susan River, a natural spring free of the pesticides and contaminants found in most other water sources. Source: McFarland Springs Trout Website.



COMMUNITY-BASED: Community-based aquaculture enhances the social, ecological, economic, and cultural fabric of our communities and integrates with existing fisheries.

We value, respect, and seek continual support for aquaculture and fishery-based livelihoods grounded in community. We advance the value of self-determination by empowering farmers to shape their destinies through participation in decision-making processes. We emphasize the importance of appropriate scale and local ownership. We support policies that prevent consolidation. Aquaculture should benefit local economies, commit to the long-term health of the environment, and put people before profit. This reciprocal relationship is best achieved through independent ownership models.

Strengthening Working Waterfronts: Lobster pounds for aquaculture

Community-based aquaculture operations can strengthen working waterfronts and integrate seamlessly with existing fisheries. Semi-enclosed tidal impoundments, formed by fencing or walling off sections of coastal waters, have long been used in aquaculture. In Maine, tidal impoundments were traditionally used to store lobsters before market (called “lobster pounds”). Lobster pounds are located on the waterfront and have relatively warm surface temperatures, making them suitable for shellfish cultivation. Today, most lobster pound sites are privately owned by fishing communities or cooperatives but are rarely used. Instead, lobster pounds store



Image: Lobster pound farm in Steuben, Maine. Source: Amanda Moeser

infrastructure to support wild fisheries, including supplying bait, selling products (e.g., lobster and clams), and providing space to store and access fishing vessels or cultivate oyster aquaculture. Lobster pound sites have organically created a bridge between wild and aquaculture sectors. This innovative use of these formerly unused sites is helping lobster pound owners generate income from aquaculture to help pay their rising waterfront taxes in areas facing continued coast gentrification. In a small way, this creates coastal jobs while paying for the existing working waterfront infrastructure at these sites supporting important commercial fisheries.

²⁷ Leeman, C, Martin, E, Coleman, S, Gray, MW, Kiffney, T, Brady, DC. (2022). The potential socio-environmental advantages of repurposing lobster impoundments for eastern oyster (*Crassostrea Virginia*) aquaculture. *Aquaculture*, 554

²⁸ Downeast Institute. 2021. Can vacant lobster pounds in Washington and Hancock Counties be used for oyster aquaculture? <https://downeastinstitute.org/wp-content/uploads/2021/05/lobster-pound-aquaculture-3-2-21-1.pdf>



ACCESS: Aquaculture should provide equitable opportunities for new and diverse participants of all ages, genders, races, cultures, and incomes.

We advocate for policies and workforce development/training that retains and restores access to marine and aquatic-dependent livelihoods for future generations of community-based farmers and fishermen. Unfortunately, barriers to equitable participation exist. It is important to create affordable opportunities that elevate diversity, economic resilience, and food access for farmers and fishers, particularly Black and Indigenous women, youth, and people of color. We value efforts to build a future where aquaculture and wild fisheries co-exist and support one another. We view access to aquaculture as an important diversification strategy for communities and individuals, as well as supplemental income for fishermen and other community members.

Equitable Access: The Native Conservancy

Aquaculture can provide livelihood opportunities for diverse participants. In Alaska, the Native Conservancy is breaking down barriers for next-generation Indigenous Ocean Farmers. They are a locally-led mariculture organization that provides economic, cultural, and ecological revitalization opportunities through their Ocean Farmer Immersion Training program and kelp farming programming. As shared by president and founder Dune Lankard, kelp farming offers an avenue for Native youth and women to build a resilient and regenerative ocean livelihood. Kelp farming also supports local food security, restores vital herring and wild salmon habitat,

and can mitigate harmful effects of climate change on coastal communities. The Native Conservancy's Indigenous Ocean Farmer Immersion Training program allows participants to build upon their cultural and traditional experiences. Native participants gain hands-on training in local kelp seed sourcing (diving and harvesting their wild seed), cultivating (growing their seed), out-planting, monitoring, harvesting, and processing kelp in this quickly emerging regenerative ocean farming industry. For those ready to start a farm, the Native Conservancy offers technical assistance and financial support for the permitting process, farm design, and business planning. Additionally, the Native Conservancy is bridging gaps in the supply chain that disadvantage small growers by conducting market access research and collaborating with the Alutiiq Pride Marine Institute in Qutalleq (Seward), Alaska, to build portable kelp seed nurseries for remote Alaska communities.



Image: native conservancy staff collecting tissue samples at kelp research test site in Prince William Sound Source: © Ash Adams



EQUITABLE SUPPLY CHAINS: All workers along the seafood supply chain deserve fair living wages, safe working conditions, and work with dignity.

We promote seafood supply chains that embody transparency, fairness, and respect. Supply chains must ensure safe working conditions, fair prices and wages, long-term financial security, and accessibility of entry to farmers and local seafood workers. We acknowledge that various types of oppression in our society, including financial exploitation, racism, sexism, and classism, manifest in and against our aquaculture communities and all workers in the seafood supply chain. We support policies that ban discrimination and increase opportunities for all workers to create a dignified and sustainable livelihood, including the right to organize and collectively bargain. We also support policies that enable farmers to sell seafood products locally and directly to consumers.



PLACE-BASED KNOWLEDGE: Local and place-based knowledge is necessary to steward aquaculture operations in harmony with the surrounding ecosystems on both land and sea.

Indigenous and community-based fishermen, farmers, and seafood workers have unique knowledge about complex ocean ecosystems and should be prioritized as collaborators in policy and decision-making. Those working in the seafood system are often the first to observe and suffer from environmental changes. Combining scientific knowledge with place-based, historical, fine-scaled, and traditional knowledge can create a better, less costly, and more adaptive assessment and management of aquatic and marine ecosystems. We must retain and restore access to these forms of knowledge. We value multi-disciplinary science and the inclusion of voices typically marginalized from research and management.



PUBLIC RESOURCE: We affirm the public trust doctrine and the unique rights of tribal nations in their traditional homelands.

The ocean and its resources should be held in public trust, not privatized. Community-based aquaculture cannot survive without equitable access to the ocean commons and must be aligned with all existing tribal treaties regarding land/water use rights. We guard against policies and governance that convert access to marine resources into monetary, tradeable, private property rights. We advocate for a commons approach to leasing, which includes size considerations, transparency, rigorous socio-ecological benefit analysis, and equitable acquisition of new and existing rights.

Successful models on land: Agrarian Trust

The Public Resource value prioritizes equitable community-based leasing. On land, Agrarian Trust is working to ensure that next-generation farmers can access land through the Agrarian Commons model for land tenure. The national organization fundraises to purchase land for locally-run Agrarian Commons that hold title to farmland and have permanently removed it from the competitive market. Agrarian Commons leases land to next-generation



Image: Farm crew on West Virginia Agrarian Commons land. Source: Agrarian Trust

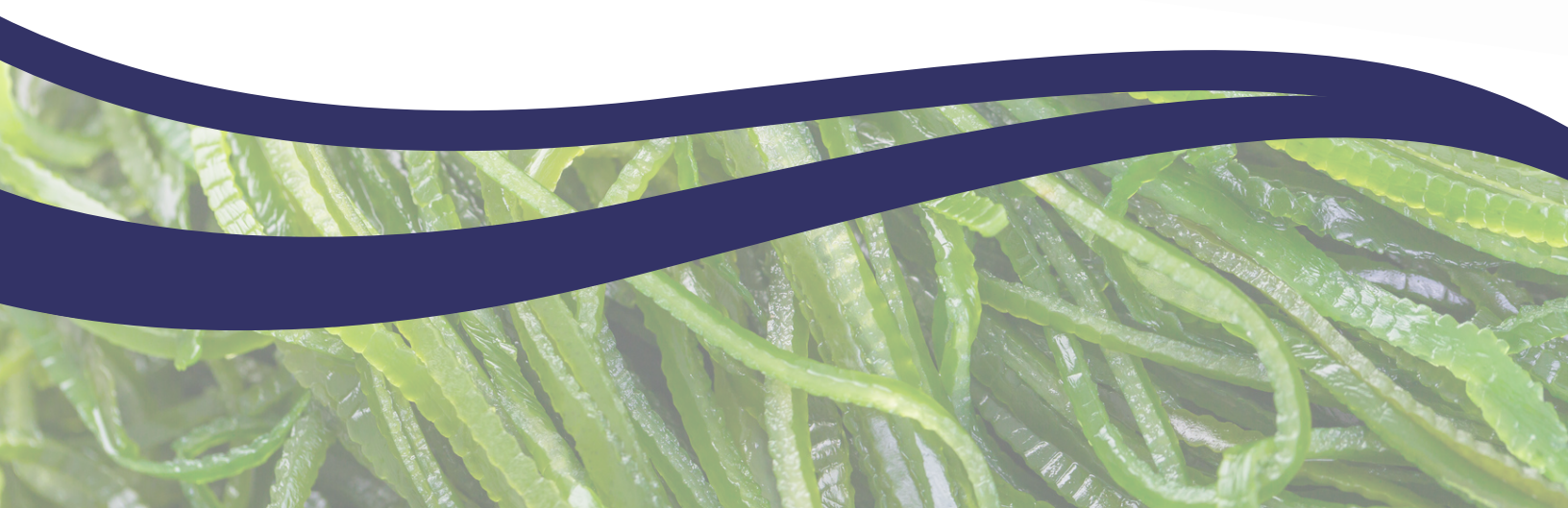
farmers via a 99-year lease that farmers can pass on to their children. With the security of a lease that costs them next to nothing, farmers and their communities are given the missing piece to build community wealth and resilience, grow abundant healthful food, and cultivate the land using regenerative practices. While farmers have full autonomy in their farm business, the limited scope and place-based Agrarian Commons Boards ensure that the land cannot be bought or sold to a developer and remains in ecological stewardship.



ACCOUNTABILITY: Fair, transparent, clear, and adequate regulatory planning and enforcement are critical to values-based aquaculture.

Community-based aquaculture requires accountability and transparency at all levels. We support accountability and transparency in decision-making processes that affect aquaculture, fisheries, and marine spaces. Transparency includes publicly collected and accessible fisheries, sea farming data, and participatory decision-making processes*. We acknowledge that partial and illegitimate representation, funding opacity, and conflicts of interest are present at all levels of the aquaculture sector and have a destructive effect on the necessary reforms promoting fairness, marine conservation, and collaboration.

The values described above are neither prescriptive nor measurable standards (e.g., certifications) but rather describe a shared understanding of what it means to implement and prioritize values-based aquaculture. We provided several examples of aquaculture operations that embody the aquaculture values in practice. However, significant work must be done to translate these values into action at local, state/provincial, and federal levels. The following section describes what it might look like for aquaculture policy and governance to incorporate these values. It serves as a guide toward more participatory, collaborative, and equitable policy development.





POLICY IMPLICATIONS

The following section synthesizes suggested policy approaches to incorporate aquaculture values into policy initiatives. Data for this section was compiled from the survey and focus groups. These recommendations are cross-cutting and focus on policies governing aquaculture production. Notably, the policy recommendations are highly context-dependent—there are important differences in jurisdiction, process, and policy context across aquaculture sectors—and represent perspectives from participants in this project, but do not necessarily reflect consensus within NAMA’s network.

In the survey, respondents were asked to consider how federal, state/provincial, or local policy could better support aquaculture that aligns with their values. Several responses to that question were individualized by place, region, or sector. However, many responses expressed a need for holistic, bottom-up policy approaches that were more collaborative, inclusive, and equitable than the status quo. Repeated themes included policy suggestions to enhance participatory governance, apply the precautionary principle* to protect ecosystems and biodiversity, ensure co-existence between wild fisheries and aquaculture, reduce barriers to entry, support the viability of small-scale participants while preventing consolidation, and uphold tribal sovereignty and unique rights.

FOOD

- Enact policies that reflect the principles of food sovereignty: self-determination, local economies, strong democratic processes, people before profit, and food as fundamental human rights. See, for example, the Food Sovereignty Bill enacted in Maine in 2022,²⁹ and the widespread local food ordinances that have been enacted across the country.
- Clear, transparent, accessible policies governing post-harvesting operations, including seafood distribution, food safety, and direct marketing.
- Many seafood certification schemes have issues of legitimacy and transparency, making it hard for consumers to make informed decisions. Regulatory agencies should be responsible for developing and enforcing transparent and consistent labeling (e.g., country of origin labeling) that demonstrates socially, environmentally, and economically sustainable aquaculture. This should include clear information about whether fish or their feed are genetically modified.³⁰

²⁹ Maine Food Sovereignty Act. <https://legislature.maine.gov/statutes/7/title7ch8-F.pdf>

³⁰ Foodprint. The FoodPrint of Farmed Seafood & Aquaculture <https://foodprint.org/reports/the-foodprint-of-farmed-seafood/>

STEWARDSHIP

- Apply a precautionary approach to aquaculture regulations and legislation to safeguard ecosystems and biodiversity.
- Protect water quality by accounting for the impacts of fish and shellfish metabolic waste, discharge from land-based operations, use of antibiotics, disease, and other pollution into wild ecosystems within water quality statutes/regulations.
- Consider the cumulative effects of aquaculture on wild populations of fish, shellfish, marine mammals and seabirds, and algae within leasing statutes/regulations, including the potential displacement of native populations by cultured species.
- Develop stricter regulations for the environmental impacts of finfish aquaculture, including types of feed that can be used (e.g., avoiding feeds that deplete or harm wild fish populations, or come from industrial agriculture), pen density, and pollution limits.
- Recognize the connectivity between land and sea: restore stream connectivity and raise stream flow standards.
- Consider how aquaculture operations may impact and/or respond to a changing climate, including more frequent and extreme weather conditions.
- Include the impacts of aquaculture on coastal zones in state coastal zone management plans.
- Develop stricter policies for biosecurity and genetic pollution, including prohibiting the culture of genetically modified organisms.

Washington bans net pen fish farming in state waters

Following the mass escapement of Atlantic salmon in the Puget Sound in 2017, the Washington Department of Natural Resources prohibited aquaculture operations with non-native fish in state waters. A 2018 study revealed that a virus reported in farmed Atlantic salmon was found in most of the sampled fish that escaped and could compromise the native, wild stocks of Pacific salmon species.³¹ Moreover, farmed salmon pens are often infected with sea lice, which affect salmon growth and cause death, in severe cases. Young sockeye salmon have been found to be infected with higher levels of lice after swimming past sea farms.³² In response to the critical ecological effects of net pen fish farming of Atlantic salmon in the Puget Sound, the state Legislature passed a law in 2018 to phase out Atlantic salmon net pens in Washington state waters by 2022, and prohibit new aquaculture operations with non-native fish in state waters.³³ Additionally, the Washington Department of Ecology issued updated National Pollutant Discharge Elimination System permits for proposed net pen operations of native species (e.g., steelhead, black cod). These permits required increased protective measures to prevent net pen failures and escapes in Puget Sound. In 2022, due to continued impacts from net pen aquaculture with native species, the Department of Natural Resources made the decision to prohibit all net pen fish farming in state waters,³⁴ joining similar bans in California, Oregon, and Alaska. Washington state is one example of how policy measures could support stewardship values; the policy language and precautionary approach could be applied to other aquaculture species across North America and beyond.

³¹ Kibenge, Molly JT, et al. (2019). Piscine orthoreovirus sequences in escaped farmed Atlantic salmon in Washington and British Columbia. *Virology journal* 16: 1-13. Retrieved at <https://virology.biomedcentral.com/articles/10.1186/s12985-019-1148-2>

³² Marty, Gary D., Sonja M. Saksida, and Terrance J. Quinn. (2010). Relationship of farm salmon, sea lice, and wild salmon populations. *Proceedings of the National Academy of Sciences* 107.52: 22599-22604.

³³ National Marine Fisheries Service. Steelhead Net Pen Aquaculture in Puget Sound: Frequently Asked Questions. <https://www.fisheries.noaa.gov/west-coast/aquaculture/steelhead-net-pen-aquaculture-puget-sound-frequently-asked-questions>. Accessed May 22, 2023.

³⁴ State of Washington Department of Natural Resources. (November 17, 2022). Commissioner's Order on Commercial Finfish Net Pen Aquaculture. Accessed at https://www.dnr.wa.gov/sites/default/files/publications/em_commissioners_order_net_pens.pdf

COMMUNITY-BASED

- Strengthen the role of local policy within nesting levels of aquaculture oversight.
- Prevent consolidation and corporate control of aquaculture to avoid the same problems that have come from the privatization of fishing rights, including funneling benefits to large corporations at the expense of small-scale fishermen. This may be addressed within state and federal leasing regulations, for example by developing owner-operator provisions that keep aquaculture operations at an appropriate scale and benefit the local community. Policies to prevent consolidation and corporate control must also address the increasing role of private equity funds focused on aquaculture, from feed production to fish farming to processing.³⁵
- Move beyond the growth mindset and narrow focus on economic opportunity to develop aquaculture policies at all levels that support communities and protect ecosystems and the public trust.
- Within state and federal leasing regulations, apply precaution to transferability and sublease structures that facilitate consolidation.
- Support existing community-based aquaculture operations and limit access for large, out-of-state corporate entities.
- Meaningfully integrate public input when determining lease requirements and renewal.
- Support the co-existence of and collaboration between aquaculture and wild fisheries.

ACCESS

- Reduce barriers to entry for diverse, small-scale participants, including creating funding incentives for small businesses and a clear regulatory framework that supports small-scale producers when navigating permitting processes.
- Develop programs and policies that specifically support access for women, youth, and Black, Indigenous, and people of color to participate in aquaculture (recognizing that aquaculture can provide opportunities for coastal livelihoods that may not be present in wild fisheries due to limited entry and other regulatory barriers).
- Enhance working waterfront infrastructure and public access to the coast to support the viability of small-scale aquaculture businesses.

EQUITABLE SUPPLY CHAINS

- Develop policies that make it easier for farmers to sell seafood products locally and directly to consumers.
- Enforce strong labor standards within all aquaculture operations.

³⁵ Grain (December 14, 2022). Private equity sharks take a bit out of the 'blue economy'. <https://grain.org/en/article/6932-private-equity-sharks-take-a-bite-out-of-the-blue-economy>

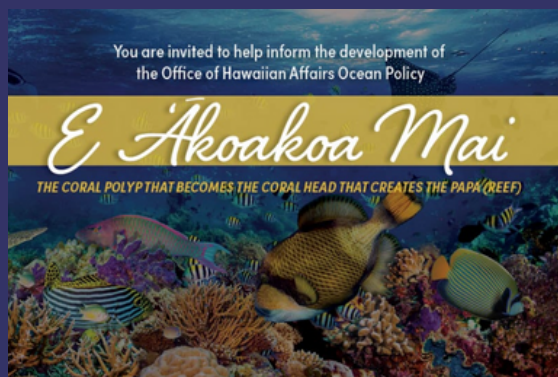
PLACE-BASED KNOWLEDGE

- Participatory governance: Policies at all levels must be developed with true input from local communities, aquaculture practitioners, tribal nations, fishermen, and those with lived experience. The voices most often represented in policy processes are those that hold power and influence and do not necessarily represent the diverse perspectives and needs of growers and communities, particularly those operating at a small scale.
- Expanded consultation with diverse stakeholders before designating federal aquaculture opportunity areas or developing new permitting schemes.
- Create opportunities for diverse, community-minded growers to participate in policy processes without fear of reprisal from any industry association or regulatory body.
- Create open, transparent regional councils to manage aquaculture with representation from practitioners and those with lived experience.
- Develop regional aquaculture policies that account for the diversity of local contexts and ecosystems.

Developing ocean policies that reflect the values, culture, and traditions of Native Hawaiian people

The Office of Hawaiian Affairs (OHA) is a state agency founded to advocate for the overall well-being of Native Hawaiians, and address historical injustices and challenges facing the Native Hawaiian Community. OHA has begun to play an increasing role in ocean policy, including as one of the co-managers of the Papahānaumokuākea National

Marine Sanctuary. In late 2022, OHA hosted nine in-person Ocean Policy Development meetings and one online Zoom Meeting, engaging several hundred people in a process aimed at the following mission: “To create innovative, effective ocean policies that reflect Hawaiian and Oceanic cultural values and traditions that meet or exceed global standards of practice.” Meetings were held at local libraries, cafes, parks, and community centers, and provided dinner for all attendees.



This policy process was explicitly built on a recognition of the place-based knowledge of the Hawaiian people. The meetings were intended to help design a “community informed ocean policy that re-affirms the inherent relationship between kānaka (Hawaiians) and ‘āina/kai (land/ocean)” by listening to the knowledge of those already stewarding marine ecosystems, and supporting “Native Hawaiian people and communities to voice their lived experiences, concerns and desires regarding our ocean-based rights and resources”.³⁶ The input gathered from these ‘discovery meetings’ will inform OHA in advocating for the Native Hawaiian community.

³⁶ Office of Hawaiian Affairs. Ocean Policy. <https://www.oha.org/oceanpolicy/>. Accessed on May 22, 2023

PUBLIC RESOURCE

- Ensure that aquaculture policy is aligned with all existing tribal treaties regarding land and water use rights and upholds the unique rights of tribal nations. This includes providing the first right of refusal to tribal nations for lease areas in their traditional homelands and waters and preemptive consultation in aquaculture permitting processes.
- Protect wild fisheries and ecosystems from potential negative impacts of aquaculture.
- Grapple with the public trust doctrine to ensure that all future access to ocean resources are based on public trust rather than private property ownership.
- Prevent speculation in aquaculture leasing regulations, where businesses lease more area than they plan to use so they have the option to expand into the future, which limits public use of the area.

ACCOUNTABILITY

- Address the conflict of interest within government bodies acting as both a promoter and a regulator of aquaculture. The significant federal funding geared toward the growth of the aquaculture sector raises questions about equity when considering existing ocean users. It is poised to make the same mistakes as were made with the industrialization of agriculture (with the land grant system working to the advantage and profit of large corporations to the detriment of rural communities).³⁷
- Undertake a spatial planning process for aquaculture that evaluates the interactions and cumulative effects on ecosystems, communities, economies, existing fisheries, and management structures.
- Ensure that policy and regulation at all levels are guided by independent science.
- Increase transparency within aquaculture companies, including information about genetic modification and feed type and sourcing.
- Greater regulatory oversight and more robust enforcement of aquaculture operations. For example, develop and enforce specific thresholds for when a finfish operation should be shut down for violating labor or environmental standards.

The policy recommendations above come from the shared and individual perspectives of survey respondents and focus group participants. They do not reflect a consensus across participants and are context-dependent. However, the policy recommendations guide aquaculture governance and development toward values-based operations.

³⁷ Hightower, Jim. (1972), *Hard Tomatoes, Hard Times: The Failure of the Land Grant College Complex*. Agribusiness Accountability Project. Schenkman Publishing



CONCLUSION

Aquaculture is important in our local communities, economies, and food systems. In this report, aquaculture is an expansive term that refers to vastly different practices, species, ecosystems, and scales (e.g., finfish vs. shellfish and seaweed, fed vs. unfed, land-based vs. marine, inshore vs. offshore). As aquaculture grows on land and at sea, this growth must support ecological stewardship and sustainable and equitable seafood supply chains. Aquaculture grounded in the community provides access for diverse participants, incorporates place-based knowledge, protects public resources, and promotes accountability, can cement working waterfronts, build cohesion between wild-caught and farmed fisheries, and contribute to healthy and culturally appropriate food systems.

Although this report lays out a common framework for values-based aquaculture, implementing this framework is notwithstanding challenges. First, while there is widespread recognition that the scale of aquaculture operations is critically important, defining the appropriate scale is context-dependent. Instead, the values in this report focus on uplifting ownership models where the benefits from aquaculture remain within the local community and governance structures where local people have the power to determine appropriate scale and act as guardians of socially, economically, and ecologically just aquaculture. Secondly, survey respondents and focus group participants voiced concerns that these values may be co-opted by organizations that claim to be aligned with a sustainable vision of aquaculture but whose actions run counter to these values when examined more closely. While co-opting is difficult to avoid altogether, the following values gain strength when considered and defended collectively rather than as individual values.

”

As aquaculture grows on land and at sea, this growth must support ecological stewardship and sustainable and equitable seafood supply chains.

AQUACULTURE VALUES

1. **Food:** Aquaculture is essential to the overall seafood supply and is vital for healthy and culturally appropriate food systems.
2. **Stewardship:** Aquaculture production should protect and honor every watershed and ecosystem's intrinsic ecological value and environmental rhythms on land and at sea.
3. **Community-based:** Community-based aquaculture enhances the social, ecological, economic, and cultural fabric of our communities and integrates with existing fisheries.
4. **Access:** Aquaculture should provide equitable opportunities for new and diverse participants of all ages, genders, races, cultures, and incomes.
5. **Equitable Supply Chains:** All workers along the seafood supply chain deserve fair living wages, safe working conditions, and work with dignity.
6. **Place-based Knowledge:** Local and place-based knowledge is necessary to steward aquaculture operations in harmony with the surrounding ecosystems on both land and sea.
7. **Public Resource:** We affirm the public trust doctrine and the unique rights of tribal nations in their traditional homelands.
8. **Accountability:** Fair, transparent, clear, and adequate regulatory planning and enforcement are critical to values-based aquaculture.

The shared values outlined above can help guide aquaculture toward practices and regulatory structures that protect ecosystems, provide new opportunities, and integrate into our shared lands and waters. These values will inevitably exclude certain aquaculture practices, but do not single out any particular technique or sector. While there is a need to develop regulatory frameworks and governance structures specific to each type of aquaculture, the values can be applied across aquaculture sectors (i.e., species and spatial location). Current and emerging aquaculture political initiatives and operations need values that prioritize stewardship, local control, and equitable distribution of risks and benefits of aquaculture development to avoid a pattern of prioritizing economies over people and the planet.



APPENDICES

Appendix A - Survey tool

https://docs.google.com/forms/d/e/1FAIpQLSfcmKnA2wNNsyYKpQB3M6ca6RK8wHKtrwaquDotHJ5qMZ2TLQ/viewform?usp=sf_link

Appendix B – Qualitative comments received and the number of responses per value.

Comments	Food	Stewardship	Community-based	Access (new and diverse participants)	Equitable Supply Chains	Place based knowledge	Public Resource	Accountability
How aquaculture should benefit local communities.			X					
The role of diversity/biodiversity in sustainable systems.		X						
All sectors of aquaculture, when sustainably practiced, contribute to the global demand for seafood protein	X							
Not much! Possibly more explicit acknowledgement of land/river connectivity in #1		X						
Scale - e.g. industrial vs small farms. Genetic stock manipulation in the wild.		X	X	X				
To do all that is possible to lessen our impact on the wild ecosystem.		X						
Access-- Since aquaculture is still developing, one of the primary things of importance to me is that more people have access to starting aquaculture businesses (to the waterfront, to work on the water, to seafood, and to marine based livelihoods), specifically women, youth, and minorities. Aquaculture can create opportunities for community-based livelihoods			X	X			X	
Inputs into the systems are important as well as the actual aquaculture itself. Feed, energy use, type of fish, water amendments (just like in on-land farming, water may need to be conditioned for fish health), type of system, who is running it and how all matters.		X						
Aquaponics. Also in terms of local seafood, where is feed procured, is it sustainable and does the end product still qualify as local if the feed is from imported ingredients?	X							

Clarification of "community-based" and "scale"? I.e. what values and/or principles can guide increases in scale or transitions of production system types that may require an expansion of the "community-based" definition or require another category of production?			X					
Accountability is too wishy washy - we need adequate regulatory enforcement, protecting the environment from non-native invasive species and GMO's		X						X
There needs to be more on the ecological impacts of aquaculture and how it can be done in a natural way with little input and impact. Something along the lines of "Ecological Respect: Enhancing, reflecting, and supporting the ocean's natural ecosystems in ways that help mitigate climate change."		X						
There are a growing amount of "fake farmers" in the kelp aquaculture realm. We would be well served to come up with a definition of what an authentic kelp farmer actually is and tie it to income the way land farmers are,			X					
There's little/no mention to the health and fishing opportunities of lakes or the rivers and streams that ultimately lead to the ocean, nor of the land bordering our waters which affects their health and prosperity. There's also mention of 'seafood' throughout the principles - does this cover fish and other creatures we eat from other sources of water (land-based and recirculating)?		X						
Not genetically altering what nature has worked on for longer than humans have been around.		X						

Seems pretty thorough-I think stewardship is often looked at with a narrow view--I think it is important for it to look at all aspects of running a business, not just the cultivation part.		X			X			
Perhaps an extra emphasis on prioritizing the health of native marine species.		X						
Aquaculture is the second largest vector for the spread of non-native species. I think biosecurity and other environmental impacts should be considered in addition to the potential environmental benefits (if done in the right places with the right practices, aquaculture can provide regenerative/restorative benefits). This also relates to the Land & Sea Connectivity value.		X						
A DIVERSE background of knowledge is necessary for success and sustainability.				X		X		
More clarity on the benefits of remaining local. For example, if a company is 'local,' but funded through foreign investment and the foreign investors are the ones reaping the main financial benefit, that is not in line with the core values of SF.			X					
Understanding the difference between finfish and shellfish aquaculture.		X						
Food Sovereignty	X							
Retaining opportunities for future gen.		X		X			X	
Impact on wild harvests		X						
Something getting at the idea that aquaculture should never be pushed from the outside or the top down as a way to get fishermen to stop fishing.			X					X

Restricting multinational corporations control of the ocean.							X	X
Impact on wild marine species; impact on climate change		X						
External costs need to be stated for marine, intensive open water pen aquaculture. Fish waste needs to be quantified and stated as part of any NPDES permit application, whether EPA requires it or not.		X						X
Aquaculture risks a healthy ecosystem. Failure to properly restore ecosystems, remove dams and then prematurely assume aquaculture is a solution, when it will likely further degrade natural ecosystems and wild catch.		X						
Public trust doctrine should include restoring fresh water stream flow. A Vital element in cultivating seaweed, and for coral survival.		X					X	
A greater focus about: impacts on wild species, the sustainability of feed and energy usage, and the potential introduction of non-native species and what impacts that would have.		X						
A very distinct separation is needed between small mom & pop kelp farms compared to Mowi, Cargill nasty ass industrial fish farming.. T			X	X			X	
It would be good to critically consider the ecological impacts of aquaculture projects in an already-stressed marine environment, and develop a core value of supporting only those projects where harmful impacts to the marine environment and marine wildlife can be avoided or significantly minimized.		X						
How aquaculture affects wild fisheries		X						

Owner-operator vs corporate structure			X	X				
There should be more emphasis and definition of what accountability means. This is particularly true with rampant disease, escapes and downstream ecological impacts of everything from GMO products to RAS systems.		X						X
Traditional and science based knowledge						X		
Manage over harvesting of resources up front		X						X
Aquaculture is a form of farming, and farming requires a fundamentally different posture than harvesting: specifically, one of long-term stewardship. Farmers are responsible for both the health of the ecosystem. We should also be clear-eyed that certain forms of aquaculture are remarkably similar to industrial confined animal feeding operations (CAFOs), which are widely acknowledged to be one of the most destructive forms of food production on the planet.	X	X						
While it is somewhat built in implicitly to the current values as described, I think some value around democratizing aquaculture or lifting up more participatory planning/ownership/governance models is an important value. It's not a binary but, for example, I would certainly give more points to a community-led aquaculture co-op than a corporate-owned, black box entity in charge of an aquaculture op.				X	X			

We need to better consider the allowable scale and subsequent impact particularly of fin fishing operations/proposals on local environments and communities, as well as who has access to propose and operate aquaculture businesses of all kinds in our waters.		X	X	X				
I am in agreement with the Public Trust Doctrine; important to note the Tribal trust doctrine and the difference in which public trust conflicts with federal trust to Indian trust lands and resources.				X		X	X	
Total Comments	4	26	11	9	1	3	6	6

**Some comments have been shortened for the Report. All anonymous data are available upon request.*

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