

LEGALIZING LOCAL: ALASKA'S UNIQUE OPPORTUNITY TO CREATE AN EQUITABLE AND SUSTAINABLE SEAWEED FARMING INDUSTRY

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ABSTRACT

The seaweed farming industry in Alaska is in its nascent stages. There is tremendous potential for growth, but also risk of exploitation and inequitable outcomes. Alaskans have a unique and urgent opportunity to enact policies that can ensure and promote equitable, sustainable development that centers the voices and interests of marginalized groups – including Indigenous and rural populations – and provides benefits to local economies. This Note seeks to contribute to the creation of a sound policy framework for the responsible development of Alaska's seaweed farming industry by advancing both a theoretical framework and specific policy recommendations. Drawing from the experiences of other jurisdictions and Alaska's fishing industry, this Note suggests various policies that could be used to promote the development of the seaweed industry in ways that benefit local, rural, and Alaska Native populations. It then discusses potential legal barriers to the implementation of those policies and proposes strategies for navigating those barriers. This analysis involves state and federal law and could be applied to other jurisdictions seeking to promote equitable, sustainable local development. Finally, this Note advances several specific recommendations intended to help Alaskans realize an equitable, sustainable seaweed farming industry. These include: creating restrictions on seaweed farm leases, implementing policies that promote local participation and ownership, and promoting the development of cooperative businesses.

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I. INTRODUCTION

Mariculture¹ is a growing and increasingly significant economic activity and source of global food production.² While seaweed farming has been a source of sustenance in some cultures for thousands of years, it has recently generated increased interest among coastal communities throughout the world.³ Recent decades have seen exponential growth in the cultivation of seaweeds and a rise in temperate and cold-water cultivation.⁴ The advantages of seaweed cultivation can include socioeconomic improvements for rural and low-income coastal communities,⁵ as well as environmental benefits.⁶

One promising site for mariculture expansion is Alaska. With over 34,000 miles of coastline, the potential for mariculture development—and especially seaweed production—is substantial: “Alaska is prime real

1. Mariculture is the care, cultivation, and farming of aquatic animals and plants in a marine environment. Milford E. Shirley, *Mariculture: Stepchild of the Law of the Sea*, 10 LAW AMS. 950, 951 (1978).

2. FOOD AND AGRIC. ORG. OF THE U.N., STATE OF THE WORLD, THE STATE OF WORLD FISHERIES AND AQUACULTURE (2020) [hereinafter STATE OF THE WORLD]; see also Alejandro H. Buschmann et al., *Seaweed Production: Overview of the Global State of Exploitation, Farming and Emerging Research Activity*, 52 EUR. J. PSYCH. 391, 397 (2017) (describing the increasing scale of research and production in world mariculture); Carlos M. Duarte et al., *Can Seaweed Farming Play a Role in Climate Change Mitigation and Adaptation?*, FRONTIERS MARINE SCI., Apr. 12, 2017, at 1 (noting “[s]eaweed aquaculture [is] the fastest-growing component of global food production”).

3. See, e.g., Sanjeevanie Ginigaddara et al., *Seaweed Farming as a Sustainable Livelihood Option for Northern Coastal Communities in Sri Lanka*, 6 FUTURE FOOD: J. ON FOOD, AGRIC. & SOC’Y 57, 58 (2018) (“[S]eaweed farming in Sri Lanka has seen significant growth and continues to expand globally.”); Alejandro Espi Aleman et al., *Development of Seaweed Cultivation in Latin America: Current Trends and Future Prospects*, 58 PHYCOLOGIA 462, 462 (2019); David O. Mirera et al., *Societal and Environmental Impacts of Seaweed Farming in Relation to Rural Development: The Case of Kibuyuni Village, South Coast, Kenya*, OCEAN & COASTAL MGMT., Aug. 15, 2020, at 1, 2.

4. STATE OF THE WORLD, *supra* note 2, at 21–23.

5. Maria Eggertsen & Christina Halling, *Knowledge Gaps and Management Recommendations for Future Paths of Sustainable Seaweed Farming in the Western Indian Ocean*, 50 AMBIO 60, 61 (2020) (“In many low-income countries, initiation of seaweed farming has been considered as a management strategy, introducing an alternative livelihood option among resource poor coastal communities . . .”).

6. See Duarte et al., *supra* note 2, at 2–3 (discussing how seaweed cultivation can be a carbon sink, can be used for biofuel, can reduce emissions from agriculture, and can reduce the effects of ocean acidification). But see Rafael Loureiro, Claire Gachon & Céline Rebours, *Seaweed Cultivation: Potential and Challenges of Crop Domestication at an Unprecedented Pace*, 206 NEW PHYTOLOGIST 489, 491 (2015) (explaining that the ecological effects of seaweed farming need to be researched further because “intensive farming and domestication are accompanied by profound and often irreversible consequences on biodiversity”).

estate for kelp. It has nutrient-rich, clear waters with optimal temperatures, as well as rocky ocean substrate—perfect for kelp holdfasts.”⁷ A vibrant seaweed industry could provide significant benefits for the state of Alaska,⁸ including sustainable economic growth, local job creation in coastal communities, expansion of the existing seafood industry, increased food security for Alaskans, and environmental benefits.⁹ It could also provide off-season and alternative sources of income for fishermen and seafood industry workers.¹⁰

Recently, state authorities have “recognized commercial kelp aquaculture’s profit potential and begun taking steps to foster development of the industry.”¹¹ These efforts include the creation of the Alaska Mariculture Task Force (“Task Force”).¹² Several reports on the development of mariculture and seaweed farming in Alaska have been produced in recent years,¹³ including the 2018 Alaska Mariculture Development Plan (“Development Plan”), which identifies barriers to

7. Catherine Janasie & Amanda Nichols, *Navigating the Kelp Forest: Current Legal Issues Surrounding Seaweed Wild Harvest and Aquaculture*, 33 NAT. RES. & ENV’T 17, 18 (2018); see also Michael S. Stekoll et al., *Mariculture Research of *Macrocystis Pyrifera* and *Saccharina Latissima* in Southeast Alaska*, J. WORLD AQUACULTURE SOC’Y, Dec. 2020, at 1, 1 (“Kelp farming can be an economic engine for coastal communities of Alaska. Other benefits include ecosystem services, including carbon sequestration and mitigation of eutrophication.”).

8. Alaska Admin. Ord. No. 280 (Feb. 29, 2016), <https://gov.alaska.gov/admin-orders/administrative-order-no-280/> (“The farming of aquatic plants could provide diverse social, environmental, and economic benefits for Alaska residents.”).

9. *Id.*

10. Erin McKinstry, *In Alaska, Interest in Kelp Farming Is on the Rise, but Bureaucracy’s Still Catching Up*, ALASKA PUB. MEDIA (Mar. 19, 2021), <https://www.alaskapublic.org/2021/03/19/interest-in-kelp-farming-is-on-the-rise-in-alaska-but-bureaucracy-is-still-catching-up/>.

11. Janasie & Nichols, *supra* note 7, at 17.

12. The Alaska Mariculture Task Force was created in 2016 by Independent Governor Bill Walker. Alaska Admin. Ord. No. 280, *supra* note 8. Current Republican Governor Mike Dunleavy, elected in 2018, kept the task force in place, indicating bipartisan support. Julie Decker, *Mariculture a Growing Opportunity for Alaska Industry*, ANCHORAGE DAILY NEWS (Jan. 18, 2020), <https://www.adn.com/opinions/2020/01/18/mariculture-a-growing-opportunity-for-alaska-industry/>.

13. See, e.g., N. ECON., INC., ECONOMIC ANALYSIS TO INFORM THE ALASKA MARICULTURE INITIATIVE: CASE STUDIES (2015), <https://www.afdf.org/wp-content/uploads/1c-Economic-Analysis-to-Inform-AMI-Phase-I-Case-Studies.pdf>; MCDOWELL GROUP, ECONOMIC ANALYSIS TO INFORM A COMPREHENSIVE PLAN, PHASE II (2017) [hereinafter COMPREHENSIVE PLAN, PHASE II], http://www.adfg.alaska.gov/Static/fishing/pdfs/mariculture/phase_2_fullrep_ort.pdf; ALASKA MARICULTURE TASK FORCE, ALASKA MARICULTURE DEVELOPMENT PLAN 5 (2018) [hereinafter ALASKA MARICULTURE DEV. PLAN], https://www.afdf.org/wp-content/uploads/Alaska-Mariculture-Development-Plan_v2018-06-29_FINAL_digital.pdf.

development and makes detailed recommendations regarding actions needed to fulfill the industry's potential.¹⁴ The guiding principles for the plan include sustainability, Alaska Native participation, and compatibility with existing marine uses.¹⁵ However, the principles do not adequately address local or rural participation, equitable benefits, or community wellbeing.¹⁶

Experts have set a goal of growing this into a \$100 million industry for Alaska.¹⁷ Yet the structure of the industry—and who will participate and receive the benefits—is uncertain. Will the benefits go to Alaskan communities, or will profits leave the state? Alaska lacks a practical vision for the development of a sustainable, locally based seaweed economy that centers community wellbeing.¹⁸ The 2016 administrative order detailed potential benefits, including jobs and improved food security in coastal communities.¹⁹ But there has been a lack of a specific plan—on the part of the state and the relevant stakeholder groups—for how to achieve these possible benefits and how they will be shared amongst the most marginalized and vulnerable populations. This is troubling because of Alaska's history of colonization, exploitation of resources by corporate interests, outmigration of resource benefits,²⁰ and ongoing inequities that disproportionately affect Alaska Native and rural populations.²¹

This lack of a specific plan for addressing potential inequities is concerning due to the current trajectory of the nascent industry. The State of Alaska only began issuing significant numbers of kelp farming permits—leases for areas of ocean in which farmers cultivate kelp—in 2017.²² There are currently no restrictions on lease size or quantity of

14. ALASKA MARICULTURE DEV. PLAN, *supra* note 13, at 5.

15. *Id.* at 8.

16. *See id.* (failing to mention local or rural participation, equitable benefits, or community wellbeing).

17. *Id.*

18. For a definition of "wellbeing," see Rachel Donkersloot et al., *Assessing the Sustainability and Equity of Alaska Salmon Fisheries Through a Well-Being Framework*, ECOLOGY & SOC'Y no. 2, 2020, at 1, 2 ("We define well-being as a way of being with others that arises when people and ecosystems are healthy, and when individuals, families, and communities equitably practice their chosen ways of life and enjoy a self-defined quality of life now and for future generations.").

19. Alaska Admin. Ord. No. 280, *supra* note 812.

20. *See* Neil Gilbertsen, *Residency and the Alaska Fisheries*, 24 ALASKA ECON. TRENDS 4, 14 (2004) (describing how non-resident fishermen capture an outside proportion of the value of Alaska's fisheries).

21. *See* Donkersloot et al., *supra* note 18, at 2 ("Salmon fisheries and communities in Alaska show increasing trends of inequities, a lack of fairness, in outcomes such as the erosion of rural and Alaska Native resource access, livelihoods, cultural practices, and self-determination.").

22. COMPREHENSIVE PLAN, PHASE II, *supra* note 13, at 34 (noting that in 2017, only "fourteen aquatic farmers in Alaska [were] permitted to grow kelp, though

leases that a person or entity can hold.²³ Predictably, applications for large leases are increasingly coming from non-Alaskan corporations.²⁴ Without protection and assistance, small-scale and local would-be seaweed farmers are almost certain to be pushed out of an unregulated market by more powerful and sophisticated actors. And because there are currently no taxes on farmed seaweed at the time of harvest or sale,²⁵ local economic benefits from corporate seaweed farming may be realized only peripherally. This means there is a substantial risk of outmigration of the benefits of seaweed farming, leaving local communities behind.

A related set of problems concerns barriers of entry²⁶ and the resulting exclusion of farmers from marginalized groups, such as those without substantial formal education and economically vulnerable individuals. Barriers include difficulties in permitting and lack of access to capital.²⁷ Many of these concerns are widely acknowledged by Alaskans involved in the industry.²⁸ However, there seems to be a lack of consensus about how to effectively address many of these problems.²⁹ This Note outlines several ways to approach the development of an

only three [were] actively culturing plants”).

23. Telephone Interview with Flip Pryor, Aquaculture Section Chief, Alaska Dep’t of Fish & Game (Feb. 24, 2021); see generally Alicia Bishop et al., *A Guide to Aquaculture Permitting in Alaska*, ALASKA SEA GRANT (2021), <http://akaquaculturepermitting.org/>.

24. For example, the massive seafood processing corporation Trident Seafoods has applied for multiple large seaweed farm leases. Rachel Sapin, *Can Trident Jump Start Alaska’s Aquaculture Industry?*, INTRAFISH (May 14, 2019), <https://www.intrafish.com/aquaculture/can-trident-jump-start-alaskas-aquaculture-industry-/2-1-603084>.

25. Bethany Goodrich, *Farming Alaska’s Seas*, ANCHORAGE DAILY NEWS (Dec. 2, 2017), <https://www.adn.com/alaska-life/we-alaskans/2017/07/08/farming-alaskas-seas/>.

26. See Elizabeth Earl, *Emerging Mariculture Industry Seeks to Streamline Permitting*, ALASKA J. OF COM. (May 1, 2019), <https://www.alaskajournal.com/2019-05-01/emerging-mariculture-industry-seeks-streamline-permitting/> (“A major obstacle remaining . . . is the regulatory hurdle to get an aquatic farm permitted.”).

27. McKinstry, *supra* note 10.

28. In preparing this Note, the Author spoke with eleven persons involved in the seaweed industry in Alaska, including local seaweed farmers, seaweed products business owners, a nonprofit director, a regulator with the state, entrepreneurs, an attorney assisting seaweed farmers with organizing businesses and navigating permitting, marine biologists, seafood marketing specialists, Alaska Native business and tribal leaders, and an Alaska Native policy expert. These conversations helped shape the Author’s views on the seaweed industry, the challenges faced by various stakeholders, and potential solutions to these problems.

29. An exception is that numerous specific problems are addressed with specific solutions in ALASKA MARICULTURE DEV. PLAN, *supra* note 13, at 12–21. However, this Note also addresses some of the concerns that were not discussed in the ALASKA MARICULTURE DEV. PLAN.

equitable and sustainable seaweed farming industry. It begins with an intentional vision of development that goes beyond mere revenue metrics. Alaskan policymakers currently have the opportunity to create a practical plan for an equitable, sustainable seaweed farming industry. The plan should be rooted in ethical considerations of Indigenous knowledge, sustainability, equity, inclusion, and locally based and cooperative economies. This Note will provide a normative framework for the adoption of such a plan, followed by specific recommendations for implementation.

This Note proceeds in four parts. Part II discusses Alaska's natural resource history as it pertains to seafood and Alaska Natives, provides an overview of the current mariculture industry, and introduces the legal regime that guides this industry. Part III provides a theoretical framework of equity, sustainability, and inclusion that focuses on local community wellbeing and grounds the practical considerations to follow. Part IV explores existing models and potential strategies for an equitable, sustainable seaweed farming industry, including limited entry regulation, local preference policies, community-based ownership, and promotion of cooperative organizations. It is the Author's hope that this Note will contribute to the development of a sound policy framework for the equitable development of the seaweed farming industry in Alaska.

II. BACKGROUND

A. Alaska's Natural Resources and Alaska Native Marginalization

The extraction and harvest of natural resources play a major role in Alaska's economy.³⁰ This encompasses modern commercial industries, including the oil and gas, mining, timber, and commercial fishing industries, as well as traditional subsistence economies.³¹ The oppression of Indigenous peoples during Alaska's history has in part been carried

30. See, e.g., MCDOWELL GRP., THE ROLE OF THE OIL & GAS INDUSTRY IN ALASKA'S ECONOMY 32 (2020) [hereinafter MCDOWELL GRP., OIL & GAS], <https://www.mcdowellgroup.net/wp-content/uploads/2020/01/mcdowell-group-aoga-report-final-1-24-2020.pdf> (explaining that oil and gas provide up to thirty-three percent of all state revenues); MCDOWELL GRP., THE ECONOMIC VALUE OF ALASKA'S SEAFOOD INDUSTRY 4 (2017) [hereinafter MCDOWELL GRP., SEAFOOD], <https://www.mcdowellgroup.net/wp-content/uploads/2017/10/ak-seafood-impacts-sep2017-final-digital-copy.pdf> (noting that 26,500 Alaska residents are directly employed by the seafood industry, with an economic output of \$5.2 billion per year during 2015-16).

31. Elizabeth Barrett Ristroph, *Alaska Tribes' Melting Subsistence Rights*, 1 ARIZ. J. ENVTL. L. & POL'Y 47, 50 (2010) (explaining that most Alaska Native communities engage in a "mixed economy," with aspects of both subsistence and market economies).

out through the exploitation of resources that are central to the survival and spiritual wellbeing of Alaska Natives.³² Thus, a serious discussion of equitable and sustainable stewardship of Alaska's natural resources must acknowledge impacts to Alaska Native groups.

Much of the most egregious exploitation of resources – and fisheries in particular – occurred prior to statehood.³³ Yet the marginalization of Alaska Natives continued during and after the creation of the Alaska Constitution.³⁴ Alaska state law and the jurisprudence of the Alaska Supreme Court have often failed to sufficiently protect, or even recognize, Alaska Native subsistence hunting and fishing rights.³⁵ The struggles for participation and access to fisheries have persisted to the present day.³⁶ One example is the “mounting evidence of a statewide ‘permit drain’ or ‘outmigration’ of commercial fishing permits from the hands of rural and Alaska Native residents.”³⁷

B. Alaska Seaweed Industry Overview

“Aquatic plants . . . present a significant and sustainable economic opportunity for coastal Alaska communities, and now is the time for

32. See William L. Iggiagruk Hensley & John Sky Starkey, *Alaska Native Perspectives on the Alaska Constitution*, 35 ALASKA L. REV. 129, 131 (2018) (“In southeast Alaska, indigenous people had managed to figure out ways to control the streams for thousands of years. Certain peoples had rights to utilize those streams productively. But after 1867, the canned salmon industry built canneries all the way from southeast Alaska to my hometown of Kotzebue, which is above the Arctic Circle. They basically began to privatize salmon through the use of fish traps. This caused great distress among those people who depended on the salmon for their livelihood.”); Brad Plumer & Henry Fountain, *Trump Administration Finalizes Plan to Open Arctic Refuge to Drilling*, N.Y. TIMES (May 27, 2021), <https://www.nytimes.com/2020/08/17/climate/alaska-oil-drilling-anwr.html> (describing the Gwich'in people's opposition to oil drilling in the Arctic National Wildlife Refuge in Alaska due to its potential impact on caribou).

33. Karen Hébert, *Enduring Capitalism: Instability, Precariousness, and Cycles of Change in an Alaskan Salmon Fishery*, 117 AM. ANTHROPOLOGIST 32, 37 (2015); see also Matthew I. Robinson, *The Common Good: Salmon Science, the Conservation Crisis, and the Shaping of Alaskan Political Culture* 6 (Aug. 11, 2015) (M.A. thesis, University of Alaska Fairbanks) (on file with the University of Alaska Fairbanks) (“[B]efore statehood, Alaskans were placed on the periphery and . . . the powerful cannery syndicates located outside of the Territory overshadowed regional economic interests . . .”).

34. Hensley & Starkey, *supra* note 32, at 129 (“We, as the indigenous people who occupied this space now called Alaska for over ten thousand years, were essentially in the twilight zone of the minds of those who created the Alaska Constitution.”).

35. *Id.* at 135–37.

36. See Hébert, *supra* note 33, at 37–38 (describing numerous challenges Alaska Natives face gaining access and continuing to participate in the state fishing industry).

37. *Id.* at 38.

business leaders and policymakers to take the necessary steps for the industry to reach its full potential.”³⁸ The commercial mariculture industry in Alaska is relatively young, beginning with the Aquatic Farm Act in 1988.³⁹ In the ensuing decades, “development of the mariculture industry has progressed slowly, and annual production is approximately \$1 million.”⁴⁰ Throughout the past thirty years, the mariculture industry in Alaska has consisted almost entirely of shellfish farming.⁴¹ In Alaska, the first commercial seaweed harvest did not occur until 2017.⁴²

Seaweed farming has massive potential for expansion, making it the fastest-growing component of global food production.⁴³ In Alaska, farmers “produced more than 112,000 pounds of sugar, ribbon, and bull kelp in 2019. That’s a 200 percent increase over the state’s first commercial harvest in 2017.”⁴⁴ In the past two years, the quantity of permit applications for seaweed farm sites has increased dramatically.⁴⁵ In sum, the seaweed farming industry in Alaska presents an opportunity for rapid expansion. However, this expansion carries risks of exclusion.

C. Alaska Native Marginalization in the Seaweed Industry

The marginalization of Alaska Native people has already occurred within the development of the nascent seaweed industry. The Alaska Native Mariculture Development Workgroup—a workgroup of the Task Force—was only created in December 2020, nearly five years after the Task Force began.⁴⁶ As one prominent Alaska Native leader noted: “The [Mariculture Task Force] knew that Alaska Native representation was crucial. Why is it only now being addressed as the [Task Force] is sunseting?”⁴⁷ Seaweed is an important subsistence food for many Indigenous people and seaweed farming may occur in marine areas that

38. ALASKA MARICULTURE DEV. PLAN, *supra* note 13, at 4 (statement of Governor Walker).

39. *Id.* at 9.

40. *Id.*

41. *Id.*

42. McKinstry, *supra* note 10.

43. Duarte et al., *supra* note 2, at 1.

44. *Seaweed Aquaculture*, NAT’L MARINE FISHERIES SERV. (Sept. 28, 2020), <https://www.fisheries.noaa.gov/national/aquaculture/seaweed-aquaculture>.

45. Earl, *supra* note 26.

46. ALASKA MARICULTURE TASK FORCE, *Meeting Notes* (Dec. 15, 2020), https://www.adfg.alaska.gov/Static/fishing/pdfs/mariculture/12.15.20_mtf_minutes.pdf.

47. ALASKA MARICULTURE TASK FORCE, *Alaska Native Mariculture Dev. Workgroup Meeting Notes* (Feb. 15, 2021), https://www.adfg.alaska.gov/Static/fishing/pdfs/mariculture/02.15.2021_mtf_aknative_minutes.pdf.

are important to Alaska Native communities and tribes; the development of the seaweed industry, therefore, implicates significant Alaska Native interests.⁴⁸ This highlights the need for ongoing vigilance in centering Alaska Native participation and knowledge. Recent developments in Alaska's seaweed industry demonstrate increased efforts to engage in this process.⁴⁹

D. Legal Background

Alaska's seaweed farming industry is regulated within a complicated array of constitutional, statutory, and administrative frameworks that are in need of reform.⁵⁰ In its Development Plan, the Task Force summarizes the provisions of the Alaska Constitution relevant to mariculture.⁵¹ In short, the Alaska Constitution provides that state

48. ALASKA MARICULTURE TASK FORCE, *Meeting Notes* (Dec. 15, 2020), https://www.adfg.alaska.gov/Static/fishing/pdfs/mariculture/12.15.20_mtf_minutes.pdf (an ADFG employee and member of the Task Force stated that: "I have fielded many calls from Alaska Native representatives regarding the potential impact of seaweed farming on wild populations and traditional seaweed harvests."); *see also* ALASKA MARICULTURE TASK FORCE, *Alaska Native Mariculture Dev. Workgroup Meeting Notes* (Feb. 15, 2021), https://www.adfg.alaska.gov/Static/fishing/pdfs/mariculture/02.15.2021_mtf_aknative_minutes.pdf (one member of the group noted that: "big [farm] permits are going through. [We] want to make sure that the tribes and elders can eat.").

49. *See, e.g.*, Bishop et al., *supra* note 23, at 7 (addressing potential seaweed farmers: "If you are not an Alaska native and/or not a tribal member in the area in which you are planning to farm, request input from local tribal and native corporation leadership. It may be appropriate to contact the regional or village corporation, and/or tribal government depending on where your project is located. Make sure the area you plan to use does not conflict with traditional subsistence use or have other cultural value with which your farm might harm or interfere.").

50. This issue was recently addressed by the Alaska Mariculture Task Force, which recommended "continued regulatory improvements" at the state level and clearer permitting processes at the federal level. ALASKA MARICULTURE TASK FORCE, FINAL REPORT TO GOVERNOR DUNLEAVY 30-31 (2021) [hereinafter FINAL REPORT], <https://www.afdf.org/wp-content/uploads/Mariculture-Task-Force-Report-to-Gov-Final-compressed.pdf>. Relatedly, Alaska Sea Grant and National Oceanic and Atmospheric Administration (NOAA) Fisheries recently released a document detailing the permitting process for new mariculture farmers. Bishop et al., *supra* note 23.

51. ALASKA MARICULTURE DEV. PLAN, *supra* note 13, at 42 ("Alaska is a common property resource state and the Alaska Constitution includes provisions relating to common use. Most tide and submerged lands within Alaska's 40,000 miles of coastline are a common property resource managed upon multiple use principals and sustained yield requirements. The State of Alaska Constitution requires resource decisions to be vetted through a public process and noticed for public input to balance resource management decisions with the best interests of the State of Alaska Article 8, [s]ection 15, specifically prohibits exclusive right of fishery; however, this section was amended in 1972 to provide exemptions for

lands and waters are to be managed for the common use and benefit of the people. This is to be accomplished through public processes and according to principles of sustainability. Finally, there are important exceptions to the exclusive right of use provisions for limited entry fisheries and aquaculture.

In addition to the guidance from the constitution, the state legislature has enacted statutes that provide for mariculture activities. The Aquatic Farm Act of 1988⁵² authorizes the Commissioner of the Alaska Department of Fish and Game to issue permits for the construction or operation of aquatic farms.⁵³ The legislature's intent was "to create an industry that would contribute to the state's economy and strengthen the competitiveness of Alaska seafood in the world marketplace, broadening the diversity of products and providing year-round supplies of premium quality seafood."⁵⁴ The statute also authorizes the Alaska Department of Natural Resources (DNR) to lease water for aquatic farming.⁵⁵ Alaska Law requires public comment on "all lease applications and proposed decisions" before the DNR renders a final decision.⁵⁶

The statewide mariculture program is jointly administered by three state agencies: the DNR, the Alaska Department of Fish and Game (ADFG), and the Department of Environmental Conservation (DEC).⁵⁷ "Each of these state agencies has a specific role in authorizing and managing aquatic farm activities."⁵⁸ The DNR authorizes the use of tidal and submerged land and is responsible for balancing aquatic farm lease decisions with traditional and existing uses of the area.⁵⁹ The ADFG also plays an important role in the management of seaweed farming,⁶⁰ and the DEC deals with seafood safety and classifying waters for aquatic farms.⁶¹

At the federal level, the primary agency responsible for the oversight

the state to both limit entry into fisheries for conservation and economic reasons, and to provide for the efficient development of aquaculture in Alaska . . . Article 7 requires that the legislature provide for the promotion and protection of the public's health.").

52. ALASKA STAT. §§ 16.40.100-.199 (2021).

53. *Id.*; see also ALASKA MARICULTURE DEV. PLAN, *supra* note 13, at 43 (discussing the Aquatic Farm Act).

54. ALASKA MARICULTURE DEV. PLAN, *supra* note 13, at 43.

55. *Id.* (citing ALASKA STAT. § 38.05.083 (2021)).

56. *Id.* (citing ALASKA STAT. § 38.05.945 (2021)).

57. ALASKA MARICULTURE DEV. PLAN, *supra* note 13, at 43.

58. *Id.*

59. *Id.* (citing ALASKA ADMIN. CODE tit. 11, §§ 63.010-.050 (2021)).

60. *Id.* at 44 (citing ALASKA ADMIN. CODE tit. 5, §§ 41.001-400 (2021)) (listing some of the responsibilities of the ADFG, including overseeing permits and resources for aquatic farming).

61. *Applying for Operation Permit*, ALASKA DEP'T FISH & GAME, http://www.adfg.alaska.gov/index.cfm?adfg=aquaticfarming.general_opening (last visited Nov. 16, 2021).

of mariculture is the U.S. Army Corps of Engineers.⁶² However, the lack of a current, clear, and applicable statutory and regulatory structure for commercial seaweed farming “cultivates uncertainty.”⁶³ Several federal permits are required to start a seaweed farm, and other federal requirements create additional barriers.⁶⁴ For example, since the expiration of the Army Corps Aquaculture General Permit in 2014, all aquatic farmers are required to apply for individual permits.⁶⁵ Further, “projects require federal permitting that may trigger the Endangered Species Act and Essential Fish Habitat consultation requirements.”⁶⁶

The regulatory regime governing mariculture in Alaska is complex and inadequately addresses the needs of the growing industry and the farmers seeking to participate. While regulators are currently testing online resources and tools for planning and permitting of mariculture,⁶⁷ the process has proven difficult to navigate, especially for Alaskans without digital technology skills or formal education.⁶⁸ Permitting requires significant time, money, and expertise that many Alaskans lack.⁶⁹ In response to these issues, an attorney in Prince William Sound recently co-founded a cooperative to help local would-be farmers navigate the permitting process.⁷⁰

The regime is also inadequate in that it fails to address common concerns. For example, there is little guidance regarding how permitting decisions are to be made when there are conflicting uses present.⁷¹ Further, the public comment process is opaque and difficult to monitor, which poses problems for groups such as Alaska Native communities

62. *Aquaculture Permitting in Alaska*, NAT’L MARINE FISHERIES SERV., <https://www.fisheries.noaa.gov/alaska/aquaculture/aquaculture-permitting-alaska> (last visited Oct. 23, 2021).

63. Janasie & Nichols, *supra* note 7, at 17.

64. *Id.* at 17–18.

65. ALASKA MARICULTURE DEV. PLAN, *supra* note 13, at 48.

66. *Aquaculture Permitting in Alaska*, NAT’L MARINE FISHERIES SERV., <https://www.fisheries.noaa.gov/alaska/aquaculture/aquaculture-permitting-alaska> (last visited Oct. 23, 2021).

67. See *Mariculture Map*, ALASKA OCEAN OBSERVING SYS., <https://mariculture.portal.aoops.org/> (last visited Aug. 1, 2021) (this website allows users to plan and permit Alaskan marine aquaculture projects); Bishop et al., *supra* note 23.

68. Telephone Interview with Lia Heifetz, Co-Founder of Barnacle Foods (Mar. 12, 2021); Telephone Interview with Hannah Wilson, Alaska Sea Grant State Fellow (Apr. 21, 2021).

69. McKinstry, *supra* note 10.

70. *Id.*; see also Telephone Interview with Joe Arvidson, Co-Founder of Blue Wave Futures, LLC (Mar. 21, 2021).

71. See ALASKA STAT. § 16.40.105(3) (2021); ALASKA ADMIN. CODE tit. 5, § 41.240(a)(2)–(3) (2021) (the statutes do not mention conflicting uses); see also Telephone Interview with Flip Pryor, *supra* note 23.

seeking to protect their traditional harvest areas.⁷²

III. THEORETICAL FRAMEWORK FOR EQUITABLE DEVELOPMENT

The State of Alaska ought to adopt an approach to seaweed industry development that explicitly centers equity, sustainability, and community wellbeing. To fulfill these goals, a set of guiding principles must be established to inform policy decisions moving forward. Some helpful existing frameworks to achieve this goal include Indigenous knowledge and worldviews, Just Transition theory, critiques of trickle-down development, wellbeing, and benefit sharing.

At a high level, the values that inform this approach are largely influenced by Indigenous approaches to natural resources stewardship. The Development Plan states in its guiding principles its intention to include Alaska Natives in the development process.⁷³ This is a sound policy decision because, as Indigenous scholars explain, traditional knowledge represents “the clearest empirically based system for resource management and ecosystem protection in North America’ and, in fact, is more effective for environmental planning than the dominant society’s scientific method.”⁷⁴ Indigenous knowledge is resilient, valid, and offers lessons that can benefit everyone, including Western scientists.⁷⁵ Therefore, regulators and policy-makers in Alaska must “better understand and incorporate Indigenous knowledge and rights

72. Telephone Interview with Edward Douville, President & Gen. Manager of Shaan-Seet, Inc., and member of the Alaska Mariculture Task Force (Apr. 30, 2021).

73. ALASKA MARICULTURE DEV. PLAN, *supra* note 13, at 8; *see also* FINAL REPORT, *supra* note 50, at 4 (reiterating commitment to Alaska Native participation).

74. Rebecca Tsosie, *Tribal Environmental Policy in an Era of Self-Determination: The Role of Ethics, Economics, and Traditional Ecological Knowledge*, 21 VT. L. REV. 225, 288 (1996) (quoting Winona LaDuke, *Traditional Ecological Knowledge and Environmental Futures*, 5 COLO. J. INT’L ENV’T L. & POL’Y 127, 147–48 (1994)). For a well-known example of this, consider the bowhead whale census in the late 1970s, in which Alaskan Inupiat hunters used traditional knowledge to correct a miscount of whales done by Western scientists. Henry P. Huntington, *Using Traditional Ecological Knowledge in Science: Methods and Applications*, 10 ECOLOGICAL APPLICATIONS 1270, 1272 (2000).

75. Ray Barnhardt & Angavuqaq Oscar Kawagley, *Indigenous Knowledge Systems and Alaska Native Ways of Knowing*, 36 ANTHROPOLOGY & EDUC. Q. 8, 9 (2005) (“Indigenous peoples throughout the world have sustained their unique worldviews and associated knowledge systems for millennia, even while undergoing major social upheavals as a result of transformative forces beyond their control. . . . The depth of Indigenous knowledge rooted in the long inhabitation of a particular place offers lessons that can benefit everyone, from educator to scientist, as we search for a more satisfying and sustainable way to live on this planet.”).

into their management activities.”⁷⁶

The theoretical framework proposed in this Note is also informed by scholarship addressing the “Just Transition.”⁷⁷ The Just Transition framework can be useful in creating an equitable and sustainable approach to development.⁷⁸ This is particularly relevant in Alaska, where the existing government relies heavily on the oil and gas industry for revenue.⁷⁹ A shift to clean energy and sustainable resources, however, still “stands to perpetuate or exacerbate current patterns of inequity.”⁸⁰ Conceived broadly, a Just Transition requires more than a shift in economic production to greener alternatives; it also “requires the democratization of social and economic relations in order to subordinate production to human (and planetary) needs rather than to profit.”⁸¹

These concerns regarding equity and sustainability are especially relevant in the context of the development of the Blue Economy.⁸² There is a global push for economic growth through ocean development.⁸³ However, the “global rush to develop the ‘blue economy’ risks harming both the marine environment and human wellbeing.”⁸⁴ Without careful examination, the push for economic growth and production may sideline

76. *Id.* Moreover, there is an argument to be made that the state has an obligation under international law to consult with tribes on issues affecting their interests. See S. James Anaya & Sergio Puig, *Mitigating State Sovereignty: The Duty to Consult with Indigenous Peoples*, 67 U. TORONTO L.J. 435, 435 (2017).

77. *Just Transition*, CLIMATE JUST. ALL., <https://climatejusticealliance.org/just-transition/> (last visited Oct. 22, 2021) (“Just Transition is a vision-led, unifying and place-based set of principles, processes, and practices that build economic and political power to shift from an extractive economy to a regenerative economy.”).

78. See, e.g., Raphael J. Heffron, *The Just Transition to a Low-Carbon Economy*, 8 RENEWABLE ENERGY L. & POL’Y 39, 40 (2018) (citing Raphael J. Heffron & Darren McCauley, *What is the ‘Just Transition’?*, 88 GEOFORUM 74 (2018)) (“The central principle behind the just transition to a low-carbon economy is to reduce inequality in society while attaining the transition”); Charlotte E. Blattner, *Just Transition for Agriculture? A Critical Step in Tackling Climate Change*, 9 J. AGRIC., FOOD SYS., & CMTY. DEV. 53, 53–58 (2020).

79. See generally MCDOWELL GRP., OIL & GAS, *supra* note 30.

80. Ann M. Eisenberg, *Just Transitions*, 92 S. CAL. L. REV. 273, 282 (2019); see also MARK SWILLING & EVE ANNECKE, *JUST TRANSITIONS: EXPLORATIONS OF SUSTAINABILITY IN AN UNFAIR WORLD*, at xiii (2012) (“A transition to more sustainable forms of development that leaves these socio-economic inequalities intact will not, in our view, deliver an end result that can be called *sustainable*.”).

81. Dimitris Stevis & Romain Felli, *Global Labour Unions and Just Transition to a Green Economy*, 15 INT’L ENV’T AGREEMENTS: POL., L. & ECON. 29, 38 (2015).

82. Nathan J. Bennett et al., *Towards a Sustainable and Equitable Blue Economy*, 2 NATURE SUSTAINABILITY 991, 991 (2019) (explaining that the Blue Economy is “a term that originally implied socially equitable and sustainable development but has come to encapsulate international interest in the growth of ocean-based economic development”).

83. *Id.*

84. *Id.*

social equity and environmental sustainability in policy and practice.⁸⁵ The “assumptions of a ‘trickle-down’ blue economy are problematic.”⁸⁶ This is because, when it comes to mariculture, “the current discourse overlooks evidence that straightforward trickle-down effects—from aggregate economic growth at the national level to holistic benefits at the community level—rarely exist for marine aquaculture.”⁸⁷ Moreover, the current development discourse often fails to address the “specific mechanisms by which aggregate economic growth will translate into locally meaningful economic benefits.”⁸⁸ Development, without an intentional centering of equity and justice and without a specific plan of action to achieve local benefits, may do more harm than good.

For example, the Alaskan salmon industry’s evaluation of success based on a dollar metric for harvest (with a goal of \$1 billion) “fails to consider the distribution of fishery benefits, including how and where salmon management generates economic and social benefits for the people of the state.”⁸⁹ Indeed, much of the value from Alaska’s fisheries does not stay local.⁹⁰ Several of the largest seafood processing companies operating in Alaska are owned by national or international corporations or are private entities owned by non-residents.⁹¹ This concentration of wealth from Alaska’s natural resources illustrates the same pattern that the seaweed industry may follow if Alaska fails to commit to an intentional vision for equitable development of the industry.

These problematic effects could be mitigated with the appropriate policy and development focus: “[w]ith attention to just and equitable governance embedded in place and context, marine aquaculture can grow in ways that enhance wellbeing in Blue Communities while supporting

85. *Id.*

86. *Id.*

87. Lisa M. Campbell et al., *From Blue Economy to Blue Communities: Reorienting Aquaculture Expansion for Community Wellbeing*, 124 MARINE POL’Y 1, 1 (2021).

88. *Id.* at 3.

89. Donkersloot et al., *supra* note 18, at 2.

90. See Gilbertsen, *supra* note 20, at 14; Laine Welch, *Bristol Bay Salmon Fishery Is Generating Big Revenue This Year, But Most of the Money Will Leave Alaska*, ANCHORAGE DAILY NEWS (Oct. 4, 2021), <https://www.adn.com/business-economy/2021/10/04/bristol-bay-salmon-fishery-is-generating-big-revenue-this-year-but-most-of-the-money-will-leave-alaska/> (“In 2017, for example, 62% of gross earnings from the Bristol Bay driftnet fishery and 40% from the setnet fishery left Alaska as nonresident earnings.”).

91. See, e.g., Madelyn Kearns, *Trident Seafoods’ Chuck Bundrant Becomes a Billionaire*, SEAFOOD SOURCE (July 21, 2017), <https://www.seafoodsource.com/news/business-finance/trident-seafoods-chuck-bundrant-becomes-a-billionaire> (explaining that Bundrant was a majority owner based in Seattle).

broader economic development.”⁹² Thus, rather than approaching the development of the seaweed industry through a strictly quantitative, economic productivity approach, Alaska ought to reframe mariculture “development as a community development activity undertaken to enhance wellbeing,” and emphasize the centrality of equity and justice when considering wellbeing.⁹³ One key component of this process is more inclusive governance at all scales.⁹⁴

Another framework relevant to the seaweed farming industry is benefit sharing, which emphasizes that “the benefits from mariculture development are to reach stakeholders affected directly and indirectly by mariculture operations.”⁹⁵ The full potential of Alaska’s mariculture industry is unlikely to be realized through a limited focus on increasing production and overall revenue.⁹⁶ It will be critical, therefore, to engage with the conceptual frameworks discussed in this section,⁹⁷ which center Indigenous knowledge, equity, and wellbeing.

IV. PRACTICAL APPROACHES: PROMISING MODELS FOR REGULATION AND DEVELOPMENT

A. Seaweed Industry Development and Regulation in Other Jurisdictions

When looking to other U.S. jurisdictions for guidance on the role of regulation in the development of the seaweed farming industry, there are limited options to choose from; “[d]espite the United States’ abundant coastline, only Alaska, California, and Maine have codified provisions

92. Campbell et al., *supra* note 87, at 1.

93. *Id.* at 2.

94. See Bennett et al., *supra* note 82, at 992.

95. Cecile Brugere et al., *More Than Fish: Policy Coherence and Benefit Sharing as Necessary Conditions for Equitable Aquaculture Development*, 123 MARINE POL’Y 1, 1–2 (2021) (first citing Jesse C. Ribot & Nancy Lee Peluso, *A Theory of Access*, 68 RURAL SOCIO. 153 (2003); then citing LAWRENCE J.M. HAAS, INTRODUCING LOCAL BENEFIT SHARING AROUND LARGE DAMS IN WEST AFRICA (2009); and then citing Rachel Wynberg & Maria Hauck, *People, Power and the Coast: A Conceptual Framework for Understanding and Implementing Benefit Sharing*, 18 ECOLOGY & SOC’Y 27 (2014)).

96. *Id.* at 1.

97. Of course, other useful frameworks exist. See, e.g., Rachel Donkersloot et al., *Kin, Community, and Diverse Rural Economies: Rethinking Resource Governance for Alaska Rural Fisheries*, 117 MARINE POL’Y 1, 2 (2020) (adopting “a community economies framework to draw attention to the ways in which social interdependencies and cultural motivations underpin rural fishing practices and economies, as well as the limits of neoliberal framings of problems and solutions to sustainable human-environment relationships”).

related to commercial marine algae aquaculture.”⁹⁸

California offers a useful model in at least one respect: “California designed its regulations to ensure that the state profits from the burgeoning industry. The state requires each harvester to pay a royalty to the state . . . per ton of wet, aquatic plants harvested.”⁹⁹ Alaska law currently does not provide for a royalty paid to the state and could therefore benefit from considering California’s royalty scheme. However, California also has limitations as a potential model: “[t]he current pathway to allow the establishment and operation of new ocean farms in California is a multi-phased, time consuming and expensive process.”¹⁰⁰

Maine may provide a helpful reference. The Maine seaweed harvest “currently generates \$20 million annually, making it one of the state’s most valuable commodities.”¹⁰¹ Maine has an innovative “experimental” lease system, which provides for reduced fees for “micro” (less than four-acre, less than three-year) leases for individuals who are interested in seaweed farming on a small scale.¹⁰² Regulations also provide for a “Limited-Purpose Aquaculture” license, developed “to streamline the permitting process so that growers can ‘try out’ different locations prior to applying for a lease” and “can be approved without the extensive review that is required for either an experimental or standard lease.”¹⁰³ This gradational permitting system is a promising model for reducing administrative burdens and barriers to access.

Internationally, Australia is another potentially useful jurisdiction for comparison because the country is similarly situated to Alaska in some key respects: it is a geographically isolated, natural resource-rich region with abundant coastline and a substantial Indigenous population. Australia has also recently published a comprehensive plan for the development of its mariculture industry.¹⁰⁴ Notably, the plan includes

98. Janasie & Nichols, *supra* note 7, at 18. Washington State also has seaweed farming regulations. *See, e.g.*, WASH. REV. CODE §§ 79.135.410–430 (2021).

99. Janasie & Nichols, *supra* note 7, at 19 (citing CAL. FISH & GAME CODE § 6680 (West 2013)).

100. *Guide to Navigating Lease & Permit Approvals for Ocean Farming in California*, GREEN WAVE 1, <https://www.greenwave.org/california-permitting-analysis> (click the link to the entire report) (last visited Jul. 30, 2021) (outlining the steps in the permitting process, noting that over fifteen state and federal agencies could be involved, and that the approval process could take up to five years).

101. Janasie & Nichols, *supra* note 7, at 17.

102. *Aquaculture Lease Applications and Forms*, STATE OF ME. DEP’T OF MARINE RES., <https://www.maine.gov/dmr/aquaculture/forms/index.html> (last visited Jul. 30, 2021).

103. *Id.*

104. Jo Kelly, *Australian Seaweed Industry Blueprint – A Blueprint for Growth*, 2020 AUSTL. SEAWEED INST. (Aug. 2020), <https://www.agrifutures.com.au/wp-content/uploads/2020/09/20-072.pdf>.

specific recommendations for the marketing and “development of high-value functional food and bioproducts for humans, animals and plants,”¹⁰⁵ a vital aspect of the fledgling seaweed industry¹⁰⁶ that is not emphasized as a priority in the Development Plan.

India has also recently ventured into the Blue Economy space, investing tens of millions of dollars to increase seaweed production.¹⁰⁷ This initiative includes a fund for cottage and cooperatively owned seaweed businesses, with a specific focus on women and rural youth, as well as opportunities for producer organizations to increase bargaining power for seaweed farmers.¹⁰⁸ Alaska has much to learn from studying the development of seaweed farming industries in these other jurisdictions.

B. Possible Models for Regulation and Development

The Alaska Mariculture Development Plan includes numerous specific recommendations to change regulations to better accommodate the development of the seaweed industry.¹⁰⁹ Several of these recommendations, if enacted, would likely promote the development of equitable and sustainable seaweed farming. For example, the recommendations for offsetting lease costs,¹¹⁰ providing training,¹¹¹ creating a single point of contact for permitting,¹¹² and creating a web-based mapping and spatial planning tool¹¹³ could all increase accessibility and promote more equitable entry into the industry. However, while important, these proposed recommendations do not go far enough because they do not explicitly center a vision of equitable development. The development contemplated in the current discourse in Alaska remains unnecessarily yet predictably susceptible to the inequitable

105. *Id.* at viii.

106. In many of the telephone interviews that the Author engaged in while preparing this Note, stakeholders involved with Alaska’s seaweed industry voiced concerns about the lack of product development and marketing in the industry; the consensus is that this is a barrier to development.

107. Jason Flatt, *India’s Blue Revolution Targets Investments in Seaweed*, FOOD TANK (Jan. 2021), <https://foodtank.com/news/2021/01/indias-blue-revolution-targets-investments-in-seaweed/>.

108. *Id.*

109. See generally ALASKA MARICULTURE DEV. PLAN, *supra* note 13.

110. *Id.* at 45. (“Establish a mechanism or funding to offset lease costs.”).

111. *Id.* at 45. (“Adopt industry sponsored training or best practice standards to ensure new farmers understand aquatic farm site selection, husbandry practices, marketing and financial planning requirements.”).

112. *Id.* at 15.

113. *Id.* at 17. (“Develop an interactive web-based map tool, housed with the State or NOAA, to help inform business planning, site selection and regulatory review.”).

outcomes and disproportionate harms often associated with lightly regulated economic expansion of natural resource industries.

This section reviews possible models for regulation and development of an equitable and sustainable seaweed industry. It presents a variety of strategies and addresses potential barriers to their implementation. First, it discusses the benefits and shortcomings of implementing restrictions on leases. Next, it explores various local preference policies and strategies for navigating constitutional barriers to such proposals. Finally, it discusses options for promoting local participation through cooperative business development.

1. Model One: Limited Entry Systems

Limited entry is one common management technique for fisheries and other natural resource industries with limited resources and abundant commercial interest. In some respects, Alaska's seaweed farming regime is already limited: ADFG operation permits and DNR leases are issued for ten-year periods and must be renewed thereafter;¹¹⁴ permits and leases may be transferred under certain conditions but cannot be owned and exchanged on the market.¹¹⁵ Still, while not perfectly analogous,¹¹⁶ there are important lessons to be learned from limited entry fisheries. Alaska's limited entry permit system was initially intended "to ensure that significant numbers of rural local residents received permits in regions of Alaska with limited other economic opportunities."¹¹⁷ In addition to a finite number of available permits, other limitations include that fisheries permits may only be owned by individuals (and not corporations) and permits may not be leased.¹¹⁸

As demand and competition for farming areas increase, additional limitations on the Alaska seaweed industry's lease system will be necessary. Following the limited entry model, Alaska could restrict permits to individuals only or restrict the number of permits that can be held by a person or entity (perhaps with exceptions for cooperatives and Tribes). Further, when conflicts arise in the permit allocation and

114. Bishop et al., *supra* note 23, at 30-31.

115. *Id.* at 33.

116. There are other significant differences between seaweed farming and fisheries that may at times stretch the utility of analogy. See J. Ownes Smith & David L. Marshall, *Mariculture: A New Ocean Use*, 4 GA. J. INT'L & COMP. L. 307, 308 (1974) ("Mariculture represents a new ocean use differing from recognized uses. It requires exclusive use of ocean space, a financial investment, and legal protection for that investment.") (internal citations omitted).

117. Gunnar Knapp, *Local Permit Ownership in Alaska Salmon Fisheries*, 35 MARINE POL'Y 658, 659 (2011) (citing ALASKA STAT. § 16.43.250 (2011)).

118. *Id.*

application process, recognizing factors like economic dependence¹¹⁹ could help ensure that benefits go to local farmers.

One widely discussed problem with limited entry systems is the “outmigration” or “permit drain” of commercial fishing permits, which over the past few decades have been disproportionately lost by rural and Alaska Native permit-holders to purchasers from other U.S. states.¹²⁰ These changes in ownership have problematic social, cultural, and economic implications for regions where local communities depend on fisheries.¹²¹ Many of the coastal communities that stand to benefit most from seaweed farming are the same communities that have suffered from limited entry fisheries. While the seaweed farming regime does not rely on market-based solutions for regulation in the way limited entry fisheries do, similar issues may arise. For example, out-of-state corporations could aggressively acquire leases, thus excluding local farmers and creating an alternative form of outmigration. One way of protecting against these risks is to ensure inclusivity in the management and decision-making processes from the beginning, so that local, rural, and Alaska Native voices are afforded greater representation and participation, and regulations are designed with their needs in mind.

2. Model Two: Local Preference and Promotion Policies

How can Alaskans structure the seaweed industry to ensure that the benefits are retained by residents of coastal communities? This is a crucial question because out-of-state interests are already beginning to dominate the industry.¹²² Local preference policies must be central in the

119. *Id.* (noting that initial allocation of permits was based on factors including the applicant’s economic dependence on the fishery and availability of alternative occupations).

120. See, e.g., Courtney Carothers et al., *Fishing Rights and Small Communities: Alaska Halibut IFQ Transfer Patterns*, 53 OCEAN & COASTAL MGMT. 518, 518 (2010) (“Loss of fisheries participation in small indigenous communities can be an unintended consequence of quota systems.”); Donkersloot et al., *supra* note 18, at 2 (noting “the dramatic loss of Alaska Native and rural local fishing rights as commercial permit holdings have shifted toward urban and out-of-state residents”); Donkersloot et al., *supra* note 97, at 4 (“Alaska’s limited entry system systematically disadvantaged and displaced many rural and Alaska Native fishing families.”); Knapp, *supra* note 117, at 658 (noting that local permit loss, particularly for rural regions dependent on fishing, has long been a concern in Alaska).

121. See Knapp, *supra* note 117, at 658 (“Changes in ownership of limited entry permits by ‘local’ residents of the region where a fishery occurs may have significant economic and social implications for regions in which the local fishery represents an important or dominant economic activity. A decline in local permit ownership may lead to a decline in local fish landings, fish processing, spending of fishing income, hiring of fishing crew, entry of young people into the fishery – and more broadly in the economic and social viability of fishing communities.”).

122. Laine Welch, *Applications for Aquatic Farming in Alaska Drop Due to*

development of an equitable, sustainable seaweed farming industry in Alaska to avoid problems of “outmigration” of resource benefits, provide high quality local jobs, ensure rural and Indigenous food security, protect marine ecosystems, and keep economic value local.¹²³ Alaska’s history of inequitable development of fisheries suggests that these interests are unlikely to be adequately protected by conventional market-based approaches. Local preference polices offer a potential solution, but may face legal challenges at both the state and federal constitutional level.

This section begins with a brief overview of the current state and federal laws that present possible barriers to local preference laws. It discusses Alaska Supreme Court case law and dormant Commerce Clause case law, and it explores options for navigating these legal regimes. These include framing strategies for legislation, as well as specific recommendations of policies promoting local participation which would be likely to survive constitutional challenges. While a detailed analysis of additional constitutional challenges to local preference regulations and community-based regimes is beyond the scope of this Note, the possibility for other claims exists and has been discussed elsewhere.¹²⁴

a. Alaska Supreme Court Case Law

Without narrow tailoring, the Alaskan state courts are likely to strike down regulations based on local residence as unconstitutional under the “common use” rights for natural resources provided by article VIII of the Alaska Constitution.¹²⁵ In *McDowell v. Alaska*,¹²⁶ the Alaska Supreme Court struck down a rural subsistence harvest preference as invalid under the state constitution because it gave “special privileges” to some and did not manage “resources of the state for the benefit of *all* the people.”¹²⁷ Though the court did not provide a formal test to determine when a policy would be permissible, it did note that any such provision would need to

Pandemic, and Kelp Is Favored Over Shellfish, ANCHORAGE DAILY NEWS (Jun. 2, 2021), <https://www.adn.com/business-economy/2021/06/01/applications-for-aquatic-farming-in-alaska-drop-due-to-pandemic-and-kelp-is-favored-over-shellfish/> (noting that, in 2020, nearly all of the Alaska-grown seaweed that was sold was purchased by Blue Evolution, a California-based company).

123. See Welch, *supra* note 90.

124. See, e.g., Adam Soliman, *Achieving Sustainability Through Community Based Fisheries Management Schemes: Legal and Constitutional Analysis*, 26 GEO. INT’L ENV’T L. REV. 273, 285 (2014).

125. ALASKA CONST. art. VIII, § 3 (“Wherever occurring in their natural state, fish, wildlife, and waters are reserved to the people for common use.”).

126. 785 P.2d 1 (Alaska 1989).

127. *Id.* at 1, 6 (quoting *Owsichek v. Guide Licensing & Control Bd.*, 763 P.2d 488, 496 (Alaska 1988) (emphasis added)).

withstand “demanding scrutiny.”¹²⁸ Other cases suggest that “whatever system of limited entry is imposed must be one which . . . entails the least possible impingement on the common use reservation and on the no exclusive right of fishery clause.”¹²⁹ Regarding the interests served by the policies, the court has found that “prevention of economic distress to fishermen and resource conservation” are valid.¹³⁰

To narrowly tailor legislation, it will be necessary to minimize exclusionary effects. This could be accomplished, for example, through individually determined applications based on multiple factors (including local residence), or by limiting the number and size of permits reserved for locals so that access for other Alaskans is preserved.

b. Dormant Commerce Clause Doctrine and Navigating Constitutional Boundaries

The dormant Commerce Clause is a federal doctrine that prohibits undue burdens on interstate commerce, while recognizing states’ interests in protecting their resources and citizens.¹³¹ A state statute is generally valid where it serves a legitimate local public interest, it regulates even-handedly on its face, its effects on interstate commerce are only incidental, and the burden imposed is not excessive relative to the local benefits.¹³² For example, local ecological concerns are highly relevant to seaweed farming in Alaska and could offer a valid justification for laws that favor local interests.

Courts have repeatedly found that states retain significant authority to regulate natural resources and protect the health and safety of their residents.¹³³ “States have an important interest within their police power

128. *Id.* at 9. A concurring opinion suggests that an appropriate standard might be that a local preference is narrowly tailored to serve a compelling government interest. *Id.* at 13 (Moore, J., concurring).

129. *State v. Ostrosky*, 667 P.2d 1184, 1191 (Alaska 1983).

130. *Johns v. Com. Fisheries Entry Comm’n*, 758 P.2d 1256, 1266 (Alaska 1988) (citing *Ostrosky*, 667 P.2d at 1191).

131. *See, e.g., Pac. Nw. Venison Producers v. Smith*, 20 F.3d 1008, 1013 (9th Cir. 1994) (holding that the protection of wildlife and other natural resources of a state are some “of the state’s most important interests”); *Maine v. Taylor*, 477 U.S. 131, 151 (1986) (“[Each state] retains broad regulatory authority to protect the health and safety of its citizens and the integrity of its natural resources.”); *see also* Bethany Gullman, *Unburdening the Farm: A Dormant Commerce Clause Challenge to Conflicting Standards in Agricultural Production*, 43 MITCHELL HAMLINE L. REV. 451, 452 (2017).

132. Gullman, *supra* note 131, at 455 (quoting *Pike v. Bruce Church, Inc.*, 397 U.S. 137, 142 (1970)).

133. *E.g., Kleppe v. New Mexico*, 426 U.S. 529, 545 (1976) (“Unquestionably the States have broad trustee and police powers over wild animals within their jurisdictions.”); *Toomer v. Witsell*, 334 U.S. 385, 409 (1948) (Frankfurter, J., concurring) (noting that it has also long been recognized that a state has a

that justifies promoting sustainable agriculture The police power interest includes human health . . . , environmental conservation related to the preservation of farmland, [and] regional food security”¹³⁴ Each of these interests apply to seaweed farming in Alaska. Because Alaska is geographically isolated and has a large rural population with limited supply chain access, food security is an ongoing concern in many rural and Alaska Native communities.¹³⁵ Providing for health—defined broadly and including access to healthy foods, healthy ways of life, and traditional life-sustaining activities (e.g., subsistence harvest of seaweed by certain Alaska Native communities)—is also vitally important and falls within the police power. And environmental conservation continues to be a central issue in Alaska.¹³⁶ Well-framed legislation that relies on these interests to promote local, sustainable seaweed farming would likely be found valid if challenged on constitutional grounds.

Moreover, the Alaska Supreme Court has noted that “the state owns these [natural] resources and is required to manage them as trustee for the benefit of its citizens. The preference for Alaska residents with respect to natural resources is explicit in the state constitution and serves to differentiate resident from nonresident user groups.”¹³⁷ Therefore, setting aside areas for subsistence seaweed farming could potentially be deemed valid.¹³⁸ In sum, there is currently great potential for crafting responsive and valid policies “that can survive dormant Commerce Clause challenges, but only where steps are taken to position the initiatives in a nondiscriminatory manner that does not interfere with interstate commerce.”¹³⁹

c. Policy Options for Local, Equitable, Sustainable Development

Alaska’s history of inequitable development of fisheries provides substantial evidence that rural, Alaska Native, and other important interests (including health, food security, and sustainability) cannot be

legitimate interest in providing “enjoyment to its own people”).

134. Chris Erchull, *The Dormant Commerce Clause – A Constitutional Barrier to Sustainable Agriculture and the Local Food Movement*, 36 W. NEW ENG. L. REV. 371, 380–81 (2014) (footnote omitted) (citing Margaret Sova McCabe, *Foodshed Foundations: Law’s Role in Shaping Our Food System’s Future*, 22 FORDHAM ENV’T L. REV. 563, 574–81 (2011)).

135. Amanda Walch et al., *A Scoping Review of Traditional Food Security in Alaska*, 77 INT’L J. CIRCUMPOLAR HEALTH 1, 1–2, 8 (2018).

136. The Author also notes the importance of integrating traditional ecological knowledge (TEK), which is predominantly held by local Indigenous and rural populations, into ecologically sound natural resource management. This is another legitimate justification for local control and management preferences.

137. *Shepherd v. State Dep’t of Fish & Game*, 897 P.2d 33, 44 (1995).

138. See ALASKA MARICULTURE TASK FORCE, *infra* note 149.

139. Erchull, *supra* note 134, at 388.

adequately protected by non-discriminatory and market-focused solutions. Thus, an explicit and narrowly tailored local preference policy may be necessary to ensure the wellbeing of coastal communities, the equitable development of the seaweed industry, the conservation of the environment, the protection of traditional ways of life, and the health and safety of rural and Alaska Native populations.

One way that states can promote local business is through requirements that only small producers can sell direct to consumers and retailers, while large producers must sell to wholesalers.¹⁴⁰ A second option is “to provide direct subsidies to local farmers as a way to promote sustainable practices and to encourage the preservation of farmland.”¹⁴¹ In Alaska, these could take the form of small grants to new seaweed farm businesses and likely would not run afoul of the dormant Commerce Clause.¹⁴²

A third possibility is to tax goods produced on large farms or by large processors. For a tax to “pass constitutional muster, the tax must be applied even-handedly to in-state and out-of-state interests.”¹⁴³ In Alaska, this tax could be crafted to exclude goods that meet specific production or processing standards of sustainability and socially responsible development. For example, if a processing facility is owned by a cooperative or a collective of individuals, it could be tax-exempt. This would be a facially neutral strategy for incentivizing cooperatives. A production tax could also provide an exception for seaweed produced on small farms, because small farms typically employ more sustainable practices.¹⁴⁴

Another set of solutions addresses the problem of “outmigration” through policies or mechanisms that promote local ownership of seaweed farming rights. One option is “the creation of a use right . . . available to individuals that meet certain criteria (e.g., age, income level, past fishery participation, etc.) and perhaps specifically designated for small-scale.”¹⁴⁵ For seaweed farming, which does involve private ownership of permits,

140. See, e.g., *Black Star Farms LLC v. Oliver*, 600 F.3d 1225, 1234 (9th Cir. 2010) (upholding an Arizona statute allowing certain, smaller winemakers to sell directly to consumers and retailers).

141. Erchull, *supra* note 134, at 397.

142. See *New Energy Co. of Ind. v. Limbach*, 486 U.S. 269, 278 (1988) (“Direct subsidization of domestic industry does not ordinarily run afoul of [the dormant Commerce Clause].”).

143. Erchull, *supra* note 134, at 400.

144. Gerard D’Souza & John Ikerd, *Small Farms and Sustainable Development: Is Small More Sustainable?*, 28 J. AGRIC. & APPLIED ECON. 73, 82 (1996) (“[T]he characteristics of small farms seem to most closely resemble those of sustainable systems” since “[s]mall is more sustainable than large.”).

145. Donkersloot et al., *supra* note 97, at 9.

this could mean setting aside certain areas that are only available to farmers, or farms, meeting designated criteria. A related option would be the creation of an exclusive use right for a community. The community development quota (CDQ) program, a federal program designed to address coastal communities' loss of access to commercial fisheries in the Bering Sea,¹⁴⁶ provides an example of how this could work. The program allocated ten percent of the available pollock catch in the eastern Bering Sea to non-profit entities representing predominantly Alaska Native local communities.¹⁴⁷ However, the CDQ model must still compete in a market-based system and has a limited ability to retain permits for local ownership.¹⁴⁸ A similar system for seaweed farming could involve setting aside certain areas of ocean for the exclusive use of local communities or groups.¹⁴⁹ However, this begs the question of *which* areas would be allocated to communities. Until there is more comprehensive data available regarding which areas are most suitable for seaweed farming, we could begin with the presumption that those areas closest to communities or existing infrastructure would be the most valuable and desirable, for reasons related to accessibility and transportation costs.¹⁵⁰

This points to an important distinction between the allocation of fishing rights versus seaweed farming rights. Seaweed farming rights involve an exclusive claim to a limited area of ocean, while fishing rights generally do not involve an exclusive right to fish in a certain area. This distinction may be relevant in a constitutional analysis because a set-aside for a local community would effectively prohibit people from other parts of Alaska from using that resource. This may be overcome by advancing

146. Gilbertsen, *supra* note 20, at 13; *see also* Theresa Peterson & Ernie Weiss, *Establishing a Community Fishing Association in the Developing Gulf of Alaska Trawl Bycatch Management Program*, in *FISHING ACCESS FOR ALASKA—CHARTING THE FUTURE: WORKSHOP PROCEEDINGS* 133, 136 (Paula Cullenberg ed., 2016) (“The central tenet of the community fishing association concept is direct allocation of quota to an association in order to anchor quota in communities in perpetuity.”).

147. Gilbertsen, *supra* note 20, at 13.

148. Donkersloot et al., *supra* note 97, at 7.

149. As one example of how this could work for the benefit of Alaska Natives, *see* ALASKA MARICULTURE TASK FORCE, *Alaska Native Mariculture Dev. Workgroup Meeting Notes* (Feb. 15, 2021), https://www.adfg.alaska.gov/Static/fishing/pdfs/mariculture/02.15.2021_mtf_aknative_minutes.pdf (a member suggested: “[a]n initiative to block off coastal area for Alaska Native mariculture operations, [that] even if never used, would be reserved for Alaska Natives”).

150. This presumption is supported by the current locations of seaweed farms, most of which are located near communities or existing infrastructure. *See* ALASKA DEPT OF FISH & GAME, *AQUATIC FARMING OPERATIONS MAP* (Feb. 7, 2020), <http://www.adfg.alaska.gov/index.cfm?adfg=fishingaquaticfarming.aquaticfarminfo> (click “Operation Locations” under the “Maps” section at the bottom of the page).

compelling interests (described above) in support of such a restriction. Finally, other strategies for promoting local participation and ownership in the seaweed industry include creating fisheries trusts¹⁵¹ and community quota entity programs.¹⁵² While these mechanisms are less ambitious and have been shown to have limited effectiveness,¹⁵³ they could be parts of a larger suite of solutions.

Central to these proposals is the need to keep seaweed leases local and ensure access to traditional harvest. However, at least in Alaska fisheries, legal restrictions that prohibit many place-based provisions continue to stifle solutions.¹⁵⁴ Because of these barriers, “there are no easy or obvious ways to ensure that local residents benefit from a fishery which is economically attractive to non-local residents.”¹⁵⁵ That said, there may be creative ways to navigate these barriers by advancing compelling justifications for local preferences and crafting narrowly tailored legislation.

3. Model Three: Cooperatives and Collectives

Cooperative organizations are another promising option for ensuring equitable, sustainable development of the seaweed industry in Alaska. This Section explores the possibilities for cooperative development in the seaweed industry by outlining some of the basic principles of cooperatives, examining cooperative development in the seaweed industry in other jurisdictions, and considering seafood

151. Fisheries trusts typically operate as fishing permit banks which purchase, hold, and lease access rights to local fishermen, reducing the financial burden and risks of purchasing market-based access rights. PAULA CULLENBERG ET AL., TURNING THE TIDE: HOW CAN ALASKA ADDRESS THE ‘GRAYING OF THE FLEET’ AND LOSS OF RURAL FISHERIES ACCESS 4 (Univ. of Alaska Fairbanks ed., 2017). However, fisheries trusts are more of a coping mechanism rather than an alternative to market-based access. They also rely on philanthropic support in the early stages. Alexander Kotlarov, Retrospective Analysis of the Alaska Halibut and Sablefish Individual Fishing Quota Fisheries Comparing the Program with the Anticipated Outcomes and Other Limited Entry Fisheries 219 (May 2020) (Ph.D. Dissertation, University of Alaska Fairbanks) (ProQuest).

152. The CQE program was developed in response to outmigration of halibut individual fishing quotas from fishing communities in the Gulf of Alaska. Laurie Richmond, *Incorporating Indigenous Rights and Environmental Justice into Fishery Management: Comparing Policy Challenges and Potentials from Alaska and Hawaii* i, 52 ENV’T MGMT. 1071, 1074–75 (2013). The program “permits rural communities (predominantly Alaska Native villages) to purchase and lease commercial halibut fishing privileges” through a community-based entity or non-profit organization. *Id.* at 1071. However, the CQE program has largely failed to achieve its goals of increased local and Indigenous participation. *Id.* at 1075–76. This is mostly because communities must purchase shares at market rates. *Id.* at 1075.

153. *See id.*

154. Donkersloot et al., *supra* note 97, at 9.

155. Knapp, *supra* note 117, at 666.

cooperatives in Alaska.

The Alaska Mariculture Development Plan contemplates cooperatives as a useful model for Alaska's mariculture industry and provides the following overview:

Cooperative structures are designed to provide member level benefits that may be reflected on a social, cultural and/or economic level. Coops typically offer their members a wide variety of benefits such as access to markets, shared information on technological advancements and efficiencies, shared risk, innovation, common facilities, etc. This type of structure could build [sic] help build the financial resiliency of an emerging mariculture industry.¹⁵⁶

Moreover, "[t]he primary objective of every cooperative is to help improve the quality of life of its members."¹⁵⁷ Barriers that small businesses face in the mariculture industry include lack of access to capital, lack of economies of scale, and lack of a reliable large-scale market.¹⁵⁸ Cooperatives can help address these challenges, and the cooperative model has numerous potential benefits.¹⁵⁹ A kelp cooperative might also include a member-owned processing facility "making value added products," kelp hatchery, marketing team, and industry development team that influences policy.¹⁶⁰ This is important because, in Alaska, much of the value from seafood is created by processors turning raw fish into value-added product.¹⁶¹ And many of the biggest seafood processors are not Alaskan-owned.¹⁶² Thus, cooperatives can be instrumental in keeping value local.

156. ALASKA MARICULTURE DEV. PLAN, *supra* note 13, at 36.

157. U.S. AGENCY FOR INT'L DEV., BUSINESS PLAN FOR A SEAWEED MARKETING COOPERATIVE IN TINAMBAC 7 (2017) [hereinafter BUSINESS PLAN].

158. *Id.* at 16.

159. *See id.* at 23 (listing shared labor/personnel, group purchasing, shared infrastructure, community relations, banking, industry entry and growth, market stability, grants, knowledge sharing, and democratic membership).

160. Phoebe Walsh, Cultivating Cooperatives: Benefits And Challenges of Co-Ops and Recommendations for Maine's Emerging Aquaculture Industries 35 (2020) (Ph.D. dissertation, University of New England) (on file with the University of New England library).

161. Laine Welch, *Breaking Down Alaska Seafood's Economic Value*, ANCHORAGE DAILY NEWS (Jan. 28, 2020), <https://www.adn.com/business-economy/2020/01/28/breaking-down-alaska-seafoods-economic-value/> ("Nearly 5.7 billion pounds of seafood worth \$2 billion at the docks was harvested in 2017-2018 fisheries. Processors turned it into 2.8 billion pounds of product worth \$4.7 billion.").

162. J. Penelope Goforth, *Alaska's Seafood Processing Industry*, ALASKA BUS. MAG. (Nov. 17, 2015), <https://www.akbizmag.com/industry/fisheries/alaskas-seafood-processing-industry/>.

Seaweed marketing cooperatives have been examined in other jurisdictions.¹⁶³ Some have noted that a “main reason for a lack of investment in seaweed farms is that the subsector is dominated by small-scale production in mostly poor coastal communities.”¹⁶⁴ However, there are ways to address the challenges facing these communities: “if there is closer collaboration in the sector, overall production can increase, production problems can be reduced, input supply costs can be reduced, markets will increase, and banks will be more willing to supply credit and loans to farmers.”¹⁶⁵

Similar barriers exist in many coastal and rural areas of Alaska. Thus, cooperative structures may increase the accessibility and economic feasibility of small-scale seaweed farming in Alaska.¹⁶⁶

Several strategies could promote the formation and success of seaweed farming cooperatives in Alaska. First, one might consider studying cooperative approaches to seaweed farming in other jurisdictions and the lessons learned from these projects.¹⁶⁷ Second, there are additional policy recommendations which could support and create an Alaskan economy that would be more conducive to cooperatives.¹⁶⁸ These include legislation that improves sector-specific incorporation and chartering of cooperatives, publicly funded programs for technical training and assistance related to the formation and operation of cooperatives, and support through the tax code such as subsidies and exemptions for cooperative organizations.¹⁶⁹

Existing and past models of fishing and seafood cooperatives in

163. See BUSINESS PLAN, *supra* note 157, at 1–2 (discussing a proposal to establish “a fishermen’s cooperative for the joint production, processing and marketing of seaweed products,” which “seeks to improve the income of cooperative members through institutionalized market and trading activities for high/premium quality seaweeds”).

164. *Id.* at 4.

165. *Id.*

166. Alexander M. Kaminski et al., *A Review of Inclusive Business Models and Their Application in Aquaculture Development*, 12 REVS. AQUACULTURE 1881, 1889 (2020) (“In aquaculture, there are examples of cooperatives and collective action groups being used as a means to improve economic performance and participate in global value chains by countervailing market power for smallholders where high degrees of power are often concentrated upstream and downstream from production.”).

167. See Adibi M. Nor et al., *Is a Cooperative Approach to Seaweed Farming Effectual? An Analysis of the Seaweed Cluster Project (SCP), Malaysia*, 29 J. APPLIED PHYCOLOGY 2323, 2323 (2017) (making multiple recommendations to improve the cooperative development of the seaweed industry).

168. See BRETT THEODOS ET AL., POLICY STRATEGIES TO BUILD A MORE INCLUSIVE ECONOMY WITH COOPERATIVES 3 (2020) (listing six specific areas where policy can help cooperatives build an inclusive economy).

169. *Id.* at 11, 15–16.

Alaska also provide helpful examples.¹⁷⁰ For instance, the Chignik salmon cooperative formed in 2002 in response to declining salmon prices.¹⁷¹ State fishery managers “agreed to split the allocation within the fishery proportionately between cooperative members and noncooperative members.”¹⁷² As a result, the number of active fishing vessels fell and the value of the catch increased,¹⁷³ while all members of the cooperative shared the profits equally.¹⁷⁴ The cooperative was operational until 2005, when the Alaska Supreme Court found the cooperative to be in violation of Alaska’s limited entry fishery program because it allows people who are not actually fishing to benefit from the fishery resource.¹⁷⁵ This case illustrates the legal limitations of certain cooperative mechanisms, especially when receiving direct allocations from the state.

These proposed policy solutions must continue to center values of equity, sustainability, and community wellbeing. The process of creating and implementing any policy agenda that purports to advance these values must itself be subject to the same guiding principles of inclusivity and equity.

V. CONCLUSION

Alaskans have a unique opportunity to create an equitable, sustainable seaweed industry. If state and industry leadership make a credible commitment to this equitable vision and invest in projects such as the development of cooperatives, infrastructure for distribution and processing, and technical assistance for marginalized communities and cooperatives, the future benefits could be tremendous. If Alaska uses creative policies to maximize the local and ecological benefits of seaweed farming, the economic, social, cultural, and ecological gains for rural communities throughout the state may be much greater than if the state outsources the development of its industry to large, out-of-state corporations, as it has done with other industries. This moment presents a rare and urgent opportunity to commit to an equitable, sustainable, inclusive future for the seaweed industry in Alaska.

170. See Michael De Alessi et al., *The Legal, Regulatory, and Institutional Evolution of Fishing Cooperatives in Alaska and the West Coast of the United States*, 43 MARINE POL’Y 217, 218 (2014) (“Cooperatives have formed in the Pacific whiting, Alaska pollock, Alaska crab, and the mixed stock ground-fish fisheries off Alaska and the Pacific Coast.”).

171. *Id.* at 220.

172. *Id.*

173. *Id.*

174. *Id.*

175. *Grunert v. State*, 109 P.3d 924, 932 (Alaska 2005).