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# Kin, community, and diverse rural economies: Rethinking resource governance for Alaska rural fisheries

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ABSTRACT

The challenge of designing institutions and resource policy for ecosystem and social resilience in rural and small-scale fisheries is receiving renewed attention in Alaska and elsewhere. Many rural and Indigenous fishing communities have been negatively impacted by modern resource allocation and management regimes that restrict and privatize fishery access through the creation of individual property rights. This article draws on ethnographic and interview data from a multi-sited study to improve policy considerations for rural and small-scale fisheries access. The Bristol Bay region of southwest Alaska is a site of concerning social trends including the 'graying of the fleet' and a rise in nonlocal ownership of fishing rights. Since the state began limiting entry into salmon fisheries in 1975, local permit holdings in Bristol Bay communities have declined by roughly 50%. This paper examines the ways in which assumptions and norms operating within state, regional, and local institutions support and/or constrain local fishing practices and participation in the region. A central objective is to challenge dominant and universalist assumptions of fishermen as dis-embedded, profit-maximizing, self-interested actors that do not fit well with small-scale, rural, and Indigenous fisheries. This paper identifies social relationships and interdependencies as central to rural fishing communities and livelihoods and absent from the rational choice/individual economic actor assumptions of modern resource allocation and management regimes. Findings presented here offer new framings for environmental analyses and help to inform solutions to ecological and social sustainability concerns marking global fisheries today.

## 1. Rethinking resource governance in light of diverse community economies

The challenge of designing institutions and resource policy for ecosystem and social resilience in rural and small-scale fisheries is receiving renewed attention in Alaska and elsewhere [1–5]; [6–10]. Many rural and Indigenous fishing communities have been negatively impacted by modern resource allocation and management regimes that restrict and privatize fishery access through the creation of individual property rights [11–14]. The loss of locally held fishing rights (e.g., fishing permits and quotas) in rural communities in the North Pacific has been well-documented in both federal and state managed fisheries that have transformed the right to fish into a tradable commodity [15–21].

In southwest Alaska, Bristol Bay, known as home and headwaters to the largest runs of wild salmon on the planet, represents a site of concerning social trends in Alaska fisheries, including the 'graying of the fleet' [22–24], and a rise in nonlocal ownership of fishing rights [25–27].[1] Local permit holdings in the region have declined by roughly 50% since the state began limiting entry into salmon fisheries in 1975 [28]. Permit ownership among residents of Bristol Bay under the age of

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[1] Nonlocal refers to residents of other regions of Alaska and nonresidents of the State of Alaska (see Ref. [28] for detailed description of residency categories used to track permit holdings in state fisheries).

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40 has also dropped by 50% [29].

This article draws on ethnographic and interview data from a multi-sited study to improve policy considerations for rural and small-scale fisheries access. Specifically, this paper addresses two objectives: 1) to examine the ways in which state, regional, and local institutions support and/or constrain local fishery participation and practices in the Bristol Bay region, and 2) to problematize dominant and universalist assumptions of fishermen as dis-embedded, profit-maximizing, self-interested actors.

Institutions examined include: 1) state governance, in the form of a limited entry system that treats fishery access rights as individual property rights, 2) regional organizations, and 3) local informal institutions organized around kinship and community ties. In the context of the latter, these include locally defined norms, rules, and social responsibilities of groups and individuals that "shape the way people interact with each other and with their environment, including who makes decisions and how they are made" [30]:2). Special attention is paid to the ways in which social interdependencies shape fishing practices, motivations, and decision-making.

### 1.1. Theoretical insights: diverse economies and new tragedies

This study draws on work advanced by Gibson-Graham [31,32] and others on 'diverse community economies' as alternative forms of economic organization often dismissed as unmodern or incompatible with modern capitalist systems, including fishery systems [6]; see also [33–36]. Gibson-Graham and Miller [37]:7) note that "we have inherited a vision of the economy as a distinct sphere of human activity, marked off from the social, the political, and the ecological as a domain of individualized, monetized, rational-maximizing calculation." In fisheries, this vision is visible in management and policy measures designed to overcome the 'tragedy of the commons' [38] through the commodification and privatization of fishing rights [39–41].

Fisheries privatization is a management tool rooted in neoliberal ideologies that promote private property rights, economic efficiency values, and devolution of risks to the private sector [12]. While often framed as a conservation tool in popular discourse, fishery privatization is an economic tool meant to maximize efficiency and is based on the assumption that fishermen are profit-maximizing rational actors motivated by self-interest [42–44]. Such thinking is pervasive in designing top-down management systems, but increasingly identified as a 'panacea analytical and policy trap' [45,46]. This is especially the case for small-scale fisheries because of the tendency for proponents of privatization to: 1) reduce complex socioecological interrelationships to simple constructions of overexploitation rooted solely in self-interest, and 2) ignore the conditions for and multiple examples of sustainable common property resource management [47–50].

In Alaska fisheries, resource privatization has become a common institutional solution that includes various forms of catch share programs (including Individual Transferable Quota (ITQ) programs) in federal fisheries and a limited entry system in state managed fisheries. Despite the incorporation of various community protection measures, individualized and commodified fishery access rights in Alaska and elsewhere remake fishery systems in ways that create new tragedies, described as 'tragedies of commodification' [15,51–53]. Prominent examples include negative impacts to new entrants, young fishermen, crew, and skippers, as well as rising inequities and social dislocations linked to the dispossession of fishing rights among rural, small-scale, and Indigenous fishing communities [7,13,21,54–60].

The work of Gibson-Graham [32]:625) and the larger Community Economies Collective shines light into conceptual corridors closed off by conventional framings of the modern capitalist economy as driven by the "mechanistic logics of capital accumulation and the behavioral logics of rational individualism" (see also [6,37,61]).[2] Their work offers new insights into contemporary marine policy discussions in particular by holding up marginalized, alternative, or 'hidden' economic activities as credible objects of policy.

Defining economy as a "proliferative space of difference," Gibson-Graham [32]:617) introduce the concept of 'community economies' not as a reference to small, specific, or place-based locales, but rather as "economic spaces or networks in which relations of interdependence are democratically negotiated by participating individuals and organizations" [32]:627; see also [6]. Examples range from cooperatives to mixed subsistence and cash economies to informal exchange to unpaid care, among others [6,32]; see also [62]. Burke and Shear [33]:132) further elaborate, "rather than understanding the economy as an unyielding capitalist system or structure, we can choose to represent and engage the economy as a diverse array of economic relations and practices 'scattered across a landscape'— different arrangements of production, exchange, surplus appropriation, ownership, and so-on."

This paper adopts 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 (see Ref. [61]. Community economies examined below are rooted in cultural values and place attachments. They are drawn on here to shed light on the plurality of ways that fishermen organize labor, capital, and profit to contribute to economic gain as well as intergenerational opportunity, community well-being, and 'in-place sustainability' [63]. Community economies - as forms of economic organization and interdependence – challenge some of the basic assumptions guiding modern fisheries management. They are presented here to provide potential paths forward in developing policy provisions to recreate opportunity that has been lost in many rural and Alaska Native fishing communities.

## 2. Article organization and methods

Following review of study communities and research methodologies, this paper discusses the implementation of the State of Alaska's Limited Entry Program in 1974. Special attention is given to the institutional fit and unintended consequences of the program. Focus is then directed to the success of region-level institutional interventions advanced by Bristol Bay's Community Development Quota (CDQ) entity, the Bristol Bay Economic Development Corporation (BBEDC). In the final section, this paper discusses the role of informal, local social institutions, including family fishing cooperatives, mentorship, and other alternative economic arrangements comprised of kin and community-based fishing networks.

### 2.1. Study communities

Bristol Bay's commercial fishing economy is predominantly single-resource dependent, with cash income and employment largely reliant on an intense seasonal economy kick-started each summer with the world's largest sockeye salmon fishery. Although regional employment opportunities are dominated by local government, and educational and health services industries, the sockeye salmon harvest generates 60% of self-employment income in the region [64].

Roughly 70% of the region's population (est. 7400) identifies as Alaska Native with Unangax̂ (Aleut), Dena'ina, and Yup'ik comprising the primary Alaska Native groups [65]. Subsistence salmon harvests in

[2] http://www.communityeconomies.org/community-economies-collective-cec.

Bristol Bay are some of the highest in the state with smaller villages harvesting an estimated 426 pounds per person from the 1980s–2000s [66]:2).[3] The median household income for the region is $48,600 with high variability between communities [65].[4] One-third of the region's population lives below the poverty line (ibid.)

Four Bristol Bay communities are included in this study: Togiak, Dillingham, Kokhanok, and the Bristol Bay Borough, which includes the communities of Naknek, South Naknek, and King Salmon (see Fig. 1). The selection of these communities was based on long-term research relationships and other criteria and community characteristics (e.g., community size (hub vs. village), CDQ/non-CDQ, and other differences described below).

There are notable differences between these culturally and demographically diverse communities, but each can be characterized as a mixed-economy dependent on both commercial and subsistence fishing opportunities. Dillingham (pop. 2300) is the largest community in the region and serves as a hub community on the west side of the bay (59% of Dillingham's population identifies as Alaska Native). The Bristol Bay Borough's population is just under 1000 and spread across Naknek (pop. 500), King Salmon (pop. 315) and South Naknek (pop. 64) [65]. Roughly 30% of the Borough's population identifies as Alaska Native (although more than 80% of South Naknek's population identifies as Alaska Native). Naknek serves as a center for commercial seafood processing activity on the east side of the bay with more than a dozen onshore seafood processors in operation during the salmon season. King Salmon is located 15 miles upriver from Naknek and connected via road. South Naknek is the only community located on the south side of the Naknek River.

Eighty percent of Kokhanok (pop. 150) identifies as Alaska Native, primarily Dena'ina Athabascan and Yup'ik. Located on the south shore of Lake Iliamna, Kokhanok is the only study community that is not a designated CDQ community, and thus not formally eligible for CDQ programs and services.[5] Togiak (pop. 900) is a Yup'ik community west of Dillingham. The Togiak fishing district enjoys a special designation that prevents permit holders fishing in the other four Bristol Bay salmon fishing districts from fishing in the Togiak district before July 27. The Togiak run is smaller and runs later than other districts in Bristol Bay.[6] This date of transfer limitation protects the traditional fishery there against the influx of nonlocal fishing vessels and allows the community fleet to catch the bulk of the harvest in their home district without competition from vessels that might move into Togiak opportunistically [3]. This may be one reason that Togiak has not suffered local permit loss similar to other communities in Bristol Bay.

Between 1976 and 2016, all study communities except for Togiak experienced a loss in local permit holdings (see Table 1). South Naknek experienced a 56% decline (48–21).[7] Salmon permit holdings declined by 26% in Dillingham (260–192), 33% in Kokhanok (15–10), and 17% in Naknek/King Salmon (160–139) (ibid). These declines are not as severe as the loss of local permit holdings in Bristol Bay's smaller villages. For example, local salmon permit holdings in Pilot Point, Levelock, Egegik, Ekwok, Pedro Bay, and Nondalton have all declined by more than 75% [67].

[3] Salmon comprise 58% of the total non-commercial harvest of wild resources in the region, the highest percentage in the state [66]:2; see also [89].

[4] Median household income for the four study communities range from highs of $84,000 and $79,000 in King Salmon and Naknek, to a low of $31,500 in Kokhanok followed by $45,500 in Togiak [65].

[5] Kokhanok is not within 50 miles of the Bering Sea coast, the geographic criterion required to participate in the CDQ program.

[6] The 1999–2018 average sockeye harvest for the Togiak District is around 600,000 sockeye compared to the Nushagak District average of 7.5 million [90].

[7] These numbers refer to the combined loss of setnet (S04T) and drift (S03T) salmon permits.

### 2.2. Methods

This manuscript comes from a larger multi-sited ethnographic research project on the graying of the fleet in Alaska fisheries [3,22,23,26]; see also [20] for collaborative research in the Kodiak region). The larger research project employed a mixed-methods approach that includes semi-structured interviews, a survey instrument targeting middle and high school students, participant observation, and an extensive literature review. Data drawn on here comes primarily from 61 semi-structured interviews conducted with project participants between 2014 and 2017. Interview participants included fishermen (active, inactive, and retired crew and permit holders), elders, young residents (generally under 40 years of age), and other community members and leaders. Some interview participants were identified as local leaders or for their experience with the research topics. Others were identified and selected through purposeful nonprobability chain-referral, or snowball sampling, where participants were asked to suggest other fishermen and community members to include in the study [68].

Interviews lasted between 1 and 2 h; interview locations were typically identified by study participants and included people's homes, and office space provided by village councils and the University of Alaska Fairbanks Bristol Bay campus. Interviews covered a range of topics including questions focusing on family and fishing background, reliance on commercial fishing, entry opportunities and challenges, family and community support and encouragement, plans for the future, and attitudes toward fishing as a lifestyle, occupation, and opportunity (see Refs. [69] for interview protocol). With the consent of research participants, all interviews were digitally recorded, transcribed, and iteratively coded using grounded theory [70], and the qualitative data analysis software, Atlas.ti.

## 3. Institutional misfits: Alaska's limited entry system

### 3.1. The need to limit entry in Alaska fisheries

The Alaska Legislature enacted the Limited Entry Act in 1974 to address growing concern over poor salmon returns, declining ex-vessel values, and a rising number of nonresidents of the state participating in Alaska fisheries. Prior attempts to limit entry into state fisheries failed due to constitutional challenges, including a *No Exclusive Right of Fishery* provision that states "no exclusive right or special privilege of fishery shall be created or authorized in the natural waters of the State" (Alaska Constitution VIII:15).[8] In 1972, an amendment to the constitution qualified this provision to allow for exclusive access to fisheries for the purposes of conservation, economic viability, and the development of aquaculture.

Keeping fishing rights in the hands of Alaskans dependent on fisheries, especially rural residents with limited alternative economic opportunities, was a key objective of the limited entry program [56]. Limiting entry was meant to "prevent economic distress among fishermen and those dependent upon [fishing] for a livelihood" (Alaska Constitution VIII:15). To meet this objective, the application for a limited entry permit was based on a points system with scoring criteria based in part on economic dependence on the fishery, reliance and availability of alternative occupations, and past participation in the fishery defined between 1969 and 1972 (Alaska Statutes, Sec. 16.43.250).

At the time, the only other limited entry system in place for the State of Alaska to consider in program design was in British Columbia salmon fisheries. British Columbia's limited entry program resulted in

[8] For example, efforts to close fishing districts to nonresidents of the state in the 1960s were deemed unconstitutional [75].


**Fig. 1.** Map of study communities (red dots). Indigenous place names are in bold. (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)

**Table 1**
Change in salmon permit holdings by community. Source: Local salmon permit holdings data by community from CFEC special data request. Data and communities included in total Bristol Bay population counts include CFEC communities considered local to the fishery administrative area; see pg. 2 of CFEC Permit Holdings and Estimates of Gross Earnings in the Bristol Bay Commercial Salmon Fisheries, 1975–2017.

| Community | Population (2016) | Salmon Permit Holdings (2016) | Change in Permit Holdings (1976–2016) | Change in Permit Holdings as % (1976–2016) |
|---|---|---|---|---|
| Dillingham | 2314 | 192 | −68 | −26% |
| King Salmon | 315 | 35 | 0 | 0% |
| Kokhanok | 152 | 10 | −5 | −33% |
| Naknek | 497 | 104 | −21 | −17% |
| South Naknek | 64 | 21 | −27 | −56% |
| Togiak | 893 | 116 | +14 | 14% |
| Bristol Bay | 7475 | 681 | −691 | −50% |

increasing license values and declining participation among First Nations fishermen.[9] These consequences were thought to be avoidable in Alaska in part because trends showed a tendency toward increasing fishery participation among Alaska residents, including Alaska Natives [71]. The State also anticipated the development of tools such as a revolving loan fund to counter rising permit costs associated with creation of a freely transferrable permit (i.e., permits are salable and inheritable). Despite concerns, creating a system based on free transferability was stated to be preferable to alternatives because transferability avoided creating a closed class of fishermen, allowed permit holders to pass permits down to family members, and minimized government interference (ibid).

Similar to British Columbia, Alaska's limited entry system systematically disadvantaged and displaced many rural and Alaska Native fishing families [72–75]. The creation of a fully alienable, individualized commodity was ill-suited to meet the management objective of supporting rural fishery participation. The system continues to serve as a barrier to entry for young fishermen and future generations unable to overcome high entry costs [24].

[9] Vessels fished by First Nations declined from 15% to 8% in the first few years of the program [71]:5).

### 3.2. Limiting rural access in state fisheries

The assumptions underpinning Alaska's Limited Entry Program, including how and why people fish, marginalized and excluded some rural and Alaska Native fishermen. These exclusions occurred from the outset with the initial allocation of permits and are perpetuated today through the market-based allocation of fishing permits.

Fishermen were assumed to be highly efficient, full-time fishermen, profit-driven with a competitive ethos, and fully entrenched in the market economy [15,72,73]. Koslow [72]:60) describes the permit application process as modeled after a non-rural fisherman, "one who fishes every season, good or bad, and fishes the entire season, [who] maintains written records of income, and has sufficient education to comprehend a complex application process …" Petterson's [75] detailed analysis examines describes a complex application process marked by confusing and limited information, inadequate outreach in rural communities, and a systematic failure to consider the cultural characteristics of rural Alaska Native fishermen, including the strong, non-competitive, and egalitarian ethic of Alaska Native peoples in Bristol Bay. Carothers [15]:102) further emphasizes contrasting models of fishing operations employed by many rural fishermen that did not match the individualization model of the limited entry permit system.

The economic pluralism of rural fishermen and the mixing of commercial and subsistence engagements were detrimental to permit qualification based in part on the duration of commercial engagement within a single season … The assumption that fishing operations were individually run was also an inappropriate classification for rural fishing operations. Many local rural residents ran their fishing operations in partnerships or kin groups, rather than nonlocals who tended to run their operation in hierarchical captain-crew relationships.

Overall, the permit application and program development process failed to consider the social, cultural, and economic realities of many rural and Alaska Native fishing communities. Language and cultural barriers were exacerbated by poor outreach and misinformation resulting in 30% of Bristol Bay residents eligible to apply for a limited entry permit not doing so [75]:318). Participants interviewed for this study described limited entry as a management system that "stole the culture and the livelihood from the locals."

> "[A local fisherman] had been fishing in Togiak all his life as a drifter [drift gillnet] and a setnetter … But then the next year [Limited Entry] came around and he couldn't fish because he didn't – he never got any of the paperwork, you know, a lot of people didn't speak

English; English was a second language … yeah, nowhere near accessible. If you didn't know how to exist in a western paperwork world, you missed out."

Such serious shortcomings resulted in lawsuits, including a settlement resulting in the issuance of an additional 275 permits to rural Alaskans (see *Wassillie v. CFEC* in Ref. [76]. Despite the controversial nature of limited entry, the program has survived numerous legal challenges. More than 80 Alaska Supreme Court decisions have resulted in only minor modifications to the program [77].

### 3.3. Loss of local permit holdings in Bristol Bay

Many of Alaska's rural fishing communities have experienced decline in local permit ownership since the State of Alaska began limiting entry into commercial fisheries. In Bristol Bay, the loss of local fisheries access has been especially pronounced. Nonlocal and nonresident permit holders currently account for 89% of total gross earnings in the drift fishery [78].[10] Local permit holdings in the Bristol Bay drift gillnet fishery declined from 38% of the total number of permits in 1975 to 18% in 2017 (from 712 to 341 permits) [28].[11] Local permit holdings in the salmon setnet fishery declined from 63% to 35% between 1975 and 2017 (660–340 permits).[12] The loss of locally held setnet permits is noteworthy as setnetting was restricted exclusively to residents of the region prior to statehood.[13] Today, residents of the region hold roughly one-third of Bristol Bay setnet permits [28]. In total, residents of the Bristol Bay region hold less than one-quarter of all salmon drift and setnet permits.

Fig. 2 shows how drift and setnet permits have left the region since 1975. Both the setnet and drift fishery are losing locally held permits through the migration of permit holders (net loss of 217 permits), but overall permit transfers account for the greatest loss of locally held permits over time (net loss of 439 permits).

The impacts of creating fully transferable and commodified fishing rights on many rural fishing livelihoods and communities are well-documented and linked to inequities in access to financing for permit purchase, among other factors [3,25,73]. These range from lack of credit and credit history and higher borrowing costs to lower personal wealth, and access to and knowledge of capital markets and financing options [56]. For example, Apgar-Kurtz [25]:72) notes that a state loan program created at the time of Limited Entry was "designed to assist all state residents in purchasing permits, but by 1980, 86% of loan participants were urban Alaskan residents. Participants were required to provide collateral and meet the debt service from their fishing income alone. During this period, no Bristol Bay residents participated in this program." Subsequent efforts to address these inequities through financing mechanisms have had limited success [3].

Meredith's [76]:33) recent study shows how transferable access rights can undermine the sustainability of rural fishing operations noting that "rural harvesters are constrained in their ability to access capital, to borrow and to smooth income … The high degree of volatility, uncertainty, and externalities inherent in the context of a salmon fishery make [permit] sales more likely to occur *under duress* than through forward-looking optimization" (emphasis added). Meredith's [76] study is particularly insightful because it builds on early work to show not only how rural fishermen face greater obstacles to buy into fisheries managed under transferable access rights, but also face greater pressure to sell. Many of these pressures were described by project participants.

"If you're a resident out here, and you're Native, there's only two things that you've got that are worth anything. And that is a permit or a Native allotment. The rest of your assets are meaningless. And when you have a bad fishing season, and you have six kids at home, and you haven't made any money, what's the alternative? Sell part of the native allotment or sell the permit."

Financial, cultural, and geographic barriers paired with lack of experience with debt, credit, and financial management are key historical and contemporary considerations in understanding the ways in which Limited Entry disproportionately negatively impacts rural and Alaska Native fishing communities. In the last decade, BBEDC has created a suite of programs and services to address these inequities and bolster local salmon permit ownership and fishing operations.

## 4. Regional institutional interventions

"If these small businesses were manifested by storefronts, the ongoing closure and shuddering of storefronts year after year in our small, local communities would be visually dramatic and have our citizens demanding change. We don't see this visually because our boat harbors aren't emptying out. They're still full. But the ownership [is] changing, and with that the [local] economies … It's imperative that we address this issue."

(*Norm Van Vactor, BBEDC – Testimony to State of Alaska House Fisheries Committee, April 2015*).

### 4.1. Increasing local permit ownership in Bristol Bay

BBEDC is one of six Community Development Quota (CDQ) groups in Western Alaska. The CDQ program was created in 1992. At the time, the program allocated 7.5% of the pollock resource to remote Western Alaska communities that had been left out of the industrial development of rich Bering Sea fisheries. Today, the program allocates a portion ranging between 7.5 and 10% of all Bering Sea and Aleutian Islands quotas for groundfish, halibut, and crab to CDQ entities.[14] CDQ groups use earnings and royalties from these fisheries to advance regional economic development through investments in local fisheries and industry, ownership of offshore vessels, infrastructure, and education [8,79,80]. The CDQ program is regarded as a global model for fisheries management because it ensures a portion of the benefits of fishery resources remain in adjacent coastal communities.

BBEDC offers a range of internship and employment opportunities,

[10] For example, average gross earnings of local vessels is much lower than average gross earnings of nonlocal and nonresident vessels. In 2017, average gross earnings in the drift fishery ranged from $82,325 for local vessels to $134,697 for nonlocal vessels, and $139,782 for nonresident vessels [78]:22). In the setnet fishery, the range in average gross earnings is $47,624 (local), $56, 394 (nonlocal), and $61,240 (nonresident) (ibid).

[11] Alaska Natives were largely excluded from the drift fishery that was historically controlled by nonresident fishermen and canneries prior to statehood [84].

[12] Shore fishery leases are another factor that can affect local setnet operations in Bristol Bay. The Shore Lease Fishery Program was initiated by the State in the 1960s to resolve user conflicts. The program is not mandatory, but provides advantages. For example, a shore lease provides individual fishermen with protection in the form of a limited exclusive interest or first priority right to use a leased fishing site. There is an application fee, surveying costs and an annual lease fee associated with a shore lease. In 2017, 57.5% of Bristol Bay salmon setnet permit holders held a shore lease, but local permit holders have much lower lease rates than nonlocals (42% of local permit holders have a shore lease compared to 66% of nonlocals) (see Ref. [91]. Generally, locals have historic or family ties to fishing sites. These ties may not be known or acknowledged by nonlocals that can displace long-time fishing families from traditional sites through the formal leasing program ran by the State (ibid.).

[13] See "Laws for Protection of the Commercial Fisheries of Alaska and Related Information" USFWS Regulatory Announcement 60, Issued March 1959. Page 2 lists Bristol Bay Residence Requirements citing Amendment to Public Law 282, 75th Congress (April 1938, 52 Stat. 208; 48 USC, Sup IV, 222a).

[14] For current CDQ allocations see p. 15 at https://alaskafisheries.noaa.gov/sites/default/files/cdq-program-summary-1018.pdf.

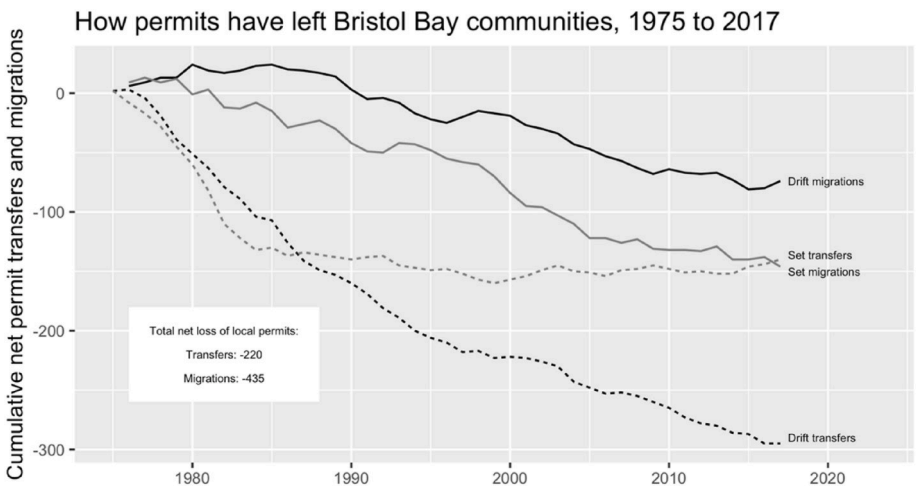


**Fig. 2.** Net change in local Bristol Bay salmon permit ownership. The number of permits considered local can change by transfer or migration. Transfers describe the sale, gift, or trade of a permit from one person to another, while migrations describe the movement of a permit holder to a new resident category (i.e., local or nonlocal). If the number of transfers/migrations out of the local category is greater than the number of transfers/migrations into the local category, the net transfers/migrations in that year will be negative. See Gho and Farrington [28] for details about permit transactions.

including employment aboard their Bering Sea offshore vessels. Although the CDQ program was not explicitly designed to provide small-scale fishing opportunity (see for example [80], in Bristol Bay, this opportunity is provided for CDQ residents who actively fish the CDQ halibut allocation. Since 2008, BBEDC has invested earnings from Bering Sea fisheries to create a suite of programs designed to reverse the outflow of salmon fishing rights from the region.[15] This paper focuses primarily on BBEDC's Permit Loan Program but study participants highlighted other programs and services as vital to local participation in fisheries.

> "The only reason I've been able to stay in it with a 38-year-old boat is that BBEDC has put so much money into the community on vessel upgrades. Two years ago, I lost my engine. I was able to replace the engine. I've been able to do quality improvements … it's the only thing that's kept me in fishing."

> "[These] types of programs, I think, is what is going to turn the tide. Basically, you have to subsidize the cost for the watershed residents, just for it to make sense. A limited entry permit—what—last winter was $170,000 …"

BBEDC's Permit Loan Program provides residents with down payment assistance, loan guarantee, interest rate assistance, and sweat equity assistance. Applicants are required to fulfill mandatory financial and business counseling. Program participants are not required to repay funds unless they fail to meet certain conditions during the life of the loan, such as a residency requirement, mandatory financial counseling and training, and active participation in the fishery (i.e., permits must be fished).

When the Permit Loan Program launched in 2008, BBEDC set a first-year goal of supporting seven to 15 residents in acquiring a salmon limited entry permit.[16] Several years later, in 2014, BBEDC reached the low end of their target with seven residents having acquired a permit through the program. Several factors, primarily financial constraints discussed above, contribute to the limited success of the program in the early years [81]. BBEDC has revised the program over the years to increase participation. By the end of 2019, 60 Bristol Bay residents had acquired permits through BBEDC's Permit Loan Program. Changes include softening program requirements to increase eligibility, and extending some services to include residents of communities beyond the 50-mile CDQ boundary.[17] Table 2 shows the number of residents by community participating in BBEDC's Permit Loan Program. It is notable that 65% of program participants are Dillingham residents. This suggests that having locally based resources and staff plays an important role in one's ability to navigate and take advantage of available benefits. Also noteworthy is that of the ten communities listed in Table 2, three (Newhalen, New Stuyahok, and Koliganek) are non-CDQ communities accounting for five program participants.

The inclusion of non-CDQ communities for certain services has helped to reduce, but not eliminate, tensions and inequities felt in the region between CDQ and non-CDQ communities captured in the excerpt below.

> "Well, like me, the skiff itself is going to cost probably $20–25,000 bucks and [my cousin] he lives in a [CDQ community] and with the BBEDC grants and stuff that he gets, if he wants that skiff, he's only going to have to pay like $5000 bucks for the skiff. It's going to cost me so much more for living further from the bay."

BBEDC programs featured prominently in interviews. Project participants frequently identified BBEDC programs as the new pathway to entry for local residents.

**Table 2**
Bristol Bay Economic Development Corporation Permit Loan Program participation by community and commercial fishing permit type, 2008–2019.

| Participants 2008–2019 | | Permit Type | |
|---|---|---|---|
| Dillingham | 33[a] | Drift | 41 |
| Egegik | 1 | Set | 19 |
| King Salmon | 2 | Total | 60 |
| Koliganek | 3 | | |
| Levelock | 1 | | |
| Manokotak | 4 | | |
| Naknek | 4 | | |
| New Stuyahok | 1 | | |
| Newhalen | 1 | | |
| Togiak | 4 | | |
| Total | 54 | | |

[a] An additional 6 participants, all from Dillingham, have exited the program.

[15] See bbedc.com for full list of programs.

[16] BBEDC chose the initial goal of seven to 15 permits per year due to research that suggested seven permits would slow the exodus of permits from the region while 15 would reverse flow [93].

[17] Some project participants living beyond the CDQ boundary mentioned moving from their home community to a CDQ community to qualify for BBEDC programs. This potential avenue for entry raises community sustainability concerns for Bristol Bay's non-CDQ villages.

"Well, just the BBEDC thing—that's awesome—that's how everyone is getting their permits. Other than that, they really don't know how to get them, besides getting passed down in their families."

"I think BBEDC is doing a great job, because they're trying to focus on local. I think that it should have happened years ago when Limited Entry first [came] in, because some local people, they sold out. Because they didn't know the value. And there was nobody helping them. They didn't know what they had was worth what it really was."

"[BBEDC] will help you find [a permit]. I guess there's a lot of people in the region that go through BBEDC to help them find somebody to either buy their permit or [medical] lease it if they're not going to use it."

Despite praise, BBEDC's efforts to increase local permit ownership face great challenges.[18] A BBEDC representative recently described their efforts as getting them "halfway to zero" because the region is losing on average 17 permits per year while BBEDC is repatriating on average five to seven permits per year [81].[19] Access to capital and high cost of entry (and other costs) remain formidable barriers to entry despite generous financial terms provided by BBEDC. The program also remains hamstrung by a low number of applicants who qualify financially. Roughly half of all applicants to the program are diverted to BBEDC's partner organization for assistance with financial planning, credit recovery, or legal issues [81]. In this way, slow uptake of the program represents the struggle to overcome the state governance framework imposed on rural fishermen under Limited Entry. One's right to access the local fishery resource ultimately remains rooted in one's ability to secure and pay back a loan.

"I won't go into detail, because it's our family's business, but we rearranged all of our family finances in order to do this [again]. We decided that the only way we could do it would be [to] prepare to make a big investment. [For us], for BBEDC and the lender, it's a big investment for everybody … I don't know any more than I did when I turned my [last] application in. I'm not more or less capable. I just have more money now. That's it."

BBEDC programs represent complex, generous, and sometimes painstaking strides to increase local access to fisheries in the region. BBEDC has created a new pathway to entry by providing grant assistance to local residents in an effort to achieve greater parity with nonlocal fishermen in access to financing. But success is hindered by the basic premise that the right to fish is still determined by one's financial situation. In this way, residents who may have the highest need of assistance to (re)enter fisheries, especially those that live beyond the CDQ boundary and outside of hub communities, remain marginalized.

"There's only a handful of people that have benefited from that program … BBEDC is the economic engine in Bristol Bay for the fisheries. They invest a lot of money, they have invested a lot of time in trying to analyze how to fix this problem. But they haven't figured out how to do it. The economic engine that runs this whole program is based, not on need, it's based on availability to pay back. So when you're dealing with the downturn in the economy, the cost of living, people [who] don't have their ducks in a row financially, they're not gonna benefit from this program."

[18] Although many participants spoke positively of BBEDC programs, they also recognized that these programs weren't available to all watershed residents, and that non-CDQ community residents were often unable to access these programs.

[19] One reason for this is the frequent occurrence of BBEDC assisting local fishermen looking to exit the industry with finding a local buyer. Brokering these local buyer-seller pairings avoids further permit loss but doesn't result in a net gain.

The final section of this paper focuses on informal social institutions in Bristol Bay to draw attention to how locally defined norms and social responsibilities shape fishing practices and decisions. These examples represent diverse economic practices and forms of organization that challenge the universality of constructions of fishermen as profit-maximizing, self-interested actors.

## 5. Local fishing forms and practice: social institutions and motivations

In their critique of the dominant rational choice interpretation of human behavior, Jentoft et al. [82]:426) note that "choices are not always made with individual gain in mind, and even when they are the gain is socially defined and shaped." In examples below, project participants describe economic practices and choices around fishing, livelihood, and gain that are rooted in social relationships and informed by place attachments and values of cooperation and community (Jentoft and Wadel 1984 cited in Ref. [83]. These values are difficult to account for in modern day resource governance decisions that tend to take for granted values of individualism, efficiency, and profit-seeking. This is not to say that there are not competitive and profit-driven fishing operations in Bristol Bay. Rather, the point is that there are other community and cultural values at play which are eclipsed by the former but, as discussed below, fundamental to community well-being and long-term community participation in fisheries.

For example, sharing, fairness, and helping featured prominently as basic fishing values in interviews with many rural fishermen. In multiple interviews, accounts of one's fishing practices and decisions exposed norms and values embedded in diverse forms of interdependence and "complex relations of community-making" [37]:6).

"So I've got a daughter who I fished with … now that she's experienced I'm moving on –I just purchased another boat. It cost me an arm and a leg, but I'm going to be training another granddaughter. So it'll be that."

"When I was younger, I'd get crew from up north. I grew up in one village and they don't have nothing—no economic base. So I usually get a partner from up that way. Help them out a little bit."

In other examples, project participants described decisions around crew hire and relations. Below, a vessel owner describes ending his season early to enable young crew to secure onshore employment.

"It's really tough for a vessel owner—and I'm a vessel owner … I affect three, sometimes four, families during the salmon season … I can't ask [crew] to stay the whole season. If there's [work on shore], he better go after it rather than fish with me. I'll just haul in my boat—that's the way I look at it. I'd love to stay out there, and I'd love to have a full crew. But how could you do it with—if you've got a conscience."

In another case, a vessel owner described recruiting local youth lacking in fishing experience as crew. Others familiar with the situation noted the difficulties and costs of working aboard a fishing vessel with inexperienced crew but described the captain's motivations as wanting to help youth with less opportunity. For this captain, the cost of hiring inexperienced crew is weighed against broader community gains associated with providing next generation opportunity.

"There are a lot of kids in this area that don't get exposure to the fishery that should. I actually took one out this summer … He's 17 years old and he's never been involved in the fishery. Really, if you're involved with the family fishery, you start at a very young age and you get a lot of skills and you're well versed in everything by the time you're 17. I think opportunities for that are probably limited to some of the people around here."

In both of the above interview excerpts, the circumstance and needs of crew members are central to decisions affecting fishing operations and profit (e.g., fishing at a slower pace, ending the season early, etc.). In another example, a young project participant described an informal wealth sharing network premised on the distribution of fishing income to family members who had previously held the permit and passed it down, or provided support in other ways.

> "The permit was transferred down from [a family member] to my mom permanently, but he was expecting 10% every year from her [fishing] income. Then she decided she was getting older, and she couldn't [fish] so she decided to transfer it to me. Same thing—I gave her 10%, and my [relative] 10%, because it was my [relative] that first [gave it] to my mom … I usually give my mom and my dad about 10% each, even if I don't have to … They've been helping me, so I help them back."

In contrast to individual economic gain, this example demonstrates the importance of reciprocity and relationships, including historic relationships, and recognition of how the passing down of a fishing permit through family members continues to be acknowledged through the sharing of fishing profit.

Fishing cooperative-like structures were also discussed by interview participants. There are a variety of cooperative-like structures in place in Bristol Bay salmon fisheries.[20] Most are comprised of extended family and community-based networks. These arrangements allow fishermen to pool resources, including gear, permits, labor, expertise, and skill.[21] In some cases, cooperatives allow groups of fishermen to diversify between the setnet and driftnet fishery, or to move between setnet sites. These are especially critical functions during gear-specific fishery closures or when salmon runs are affected by river channel changes or shifts in weather patterns. Generally, the system provides increased opportunity, flexibility, and mobility throughout the fishing season. Excerpts below illustrate how fishing cooperatives also provide for shared decision-making, and enable high producers to support others through poor seasons.

> "We have our own little co-op. At the end of the season, everybody's fish goes into one big pot and gets divided, which I want to say saves [the] people that don't do so well. We all help each other out. Last year [my partner] was the only one putting in poundage [fishing]. We weren't allowed to [fish]. But whenever he calls for ice or something, we'd run it out to him and so, at the end of the season, it was him that saved everybody else from being flat broke."

> "It's [a] big family operation. We've all invested in it … My [family] kind of suffers the most as far as costs and stuff goes. We've got a big pot that we work into, and everybody gets a percentage of that … So we all help each other any way that we can."

In this community economy example, the more experienced members tend to bear a greater financial burden to support the success of other members. A central feature of this cooperative structure is the democratic and equitable nature of decision-making: "We all know how things work and we've all just kinda settled into our roles … And when something goes wrong, we all come together and have a meeting and ask if it's the right thing, and we all say 'yeah, sure'."

Finally, in one of the more powerful examples, a project participant describes local fishermen electing to pull their nets to ensure that those fishing further up-river are able to harvest a share of the run.

> "Some people, it is all business, — there's no history or family politics or community associated with that. For people that were raised [here], and born and live here, it's very different. Like … fishing [here], [people] look out for each other. And a lot of those sites do really well. If they do well one day, the sites behind them weren't doing that well, so they'll pull their nets so the people behind them can do well."

This excerpt exemplifies the basic value of sharing and caring for community, and captures a key difference between fishing to maximize profit and fishing for livelihood. Historical and contemporary accounts describe Alaska Native fishing practices as a livelihood practice where the goal is not to harvest as much as possible, but rather to harvest what you need, for example, catching as much as you need to make it through to the next season [15,72,75,84].

The motivations, values, and relationships underlying fishing practices and forms of organization discussed here remain largely hidden in modern day fishery policy and conservation solutions that prioritize individualism and efficiency over critical contexts of place, culture, and community. Findings presented here highlight some of the ways in which dominant conceptualizations of fishermen as dis-embedded and driven by self-interest clashes with local cultural logics, including values of multi-generational connections to place, culture, and community; equity; sharing and taking care of each other; spending time together and working as a family; conflict avoidance; and learning and teaching (see also [20,85]. How can Bristol Bay's diverse community economies help to inform better policy options? What solutions are found in these hidden practices?

## 6. Summary: sustaining local fishing livelihoods as community economies

Alaska's limited entry system transformed the right to fish into a tradable commodity. From the outset, the market-based allocation of fishing rights was meant to ensure that fishermen could operate in a 'business-like manner' [71]:4). Early concerns that "inefficient operators would be under pressure to sell their permits to more successful fishermen" (ibid) under such a system failed to result in protection or recognition of the rationale and role of rural and small-scale fishing operations.

Drawing on ethnographic research in Bristol Bay, this paper considers how formal and informal institutions positively and negatively influence local fisheries access and participation in Bristol Bay salmon fisheries. As part of this effort, this paper advances community economies as a theoretical and practical tool to potentially improve the design of entrenched and emerging institutions charged with resource management decisions impacting rural fishing communities. In addition to generating wealth and employment, the fishing practices and forms of organization presented here make important contributions to community and facilitate the intergenerational transfer of values, skills, and opportunities in rural fishing communities. These practices are produced and reproduced through social relationships and foundational to community sustainability.

More than forty years after Limited Entry was implemented the difficulty in addressing enduring inequities in the system remains palpable. In some cases, recent regulation changes in Bristol Bay salmon fisheries have exacerbated these issues. In 2004, the Board of Fisheries allowed dual permit operations in the Bristol Bay salmon drift fishery, which allows for two permit holders to fish from a single vessel [27]. Since 2004, nonresidents of the state account for 58% of new entrants into the drift fishery [27]. Similar impacts to new entrants and local permit holders occurred in the setnet fishery between 2010 and 2012 when the Board of Fisheries allowed permit stacking, which allows individuals the ability to concurrently hold two salmon setnet limited entry permits [86]. The program sunset in 2012 but available data shows that stacked permit operations reallocate harvests across residency classes in Bristol

[20] There are a variety of cooperative forms emerging in Bristol Bay salmon fisheries. Not all share the same values or structure. For example, some were described as less fair or more hierarchical in structure.

[21] Permits are still held and fished by the individual permit holder.

Bay, with nonlocals and nonresidents primarily benefiting from the regulation [86]:13). Permit stacking in the setnet fishery also reduced opportunity for new entrants into the fishery. In 2011, the rate of new entrants into the setnet fishery dropped to a historic low of 6% (ibid.).[22] These examples are illustrative of the varied consequences of fisheries regulation changes and the challenge of creating provisions that can protect local access.

Other fishing nations and regions have designed and implemented provisions to address intergenerational inequities and the loss of rural, small-scale, and Indigenous access. Prominent examples include community use rights, youth permits and quota, fishery trusts and permit banks, set-asides for rural regions, and special provisions for small-scale and Indigenous fishermen [3,14]. In Alaska fisheries, solutions remain stifled by legal and regulatory structures that prohibit many place-based provisions such as a rural residency requirement (see also [7,87]. Chief among these challenges are the ideal and legal standards of equality and equal access as written into the state constitution (e.g., see 'equal access' clauses in Sections 3, 8 and 15 of state constitution, [88]; see also [85].

Solutions to local fisheries access decline in Bristol Bay, and Alaska fisheries more generally, will be controversial. The recent introduction of a bill to create a new institution in some Alaska fisheries - Regional Fishery Trusts (i.e., permit banks) - was received with some skepticism and concerns over the constitutionality of the bill. Other provisions that might be well-suited for the rural fishing practices described here include the creation of a use right or non-transferable right available to individuals that meet certain criteria (e.g., age, income level, past fishery participation, etc.) and perhaps specifically designated for small-scale access (for example, a limit on the amount that can be harvested under the permit). Creating an affordable and non-market based access right that cannot be sold or migrate away from rural fishing communities is vital to address the shortcomings of the current system. Even BBEDC is unable to prevent the potential out-migration of permits they have returned to the region through the Permit Loan Program. Once a permit is fully paid for and a person has exited the loan program, there is nothing to prevent that person from selling the permit or moving away from the region. What is needed is a collaborative, state-led effort that can review the effectiveness of previous efforts and legislation designed to ensure rural fisheries participation, and make public policy recommendations, including updating statutes.

It is remarkable that the opportunity to fish in the rural and mixed subsistence/cash economies of Bristol Bay is ultimately determined by ties to urban-based financial institutions and a fishing finance and business acumen divorced from local fishing history/experience, knowledge, and skill. It is even more remarkable that the state created a system in which young people from places like South Naknek, Manakotak, and Togiak must compete with people from Seattle and San Francisco for the right to fish in Bristol Bay. The solutions needed to address access challenges in Alaska fisheries will require legal, political, economic, and social strategies. Solutions will also require new framings of the problem, explicit consideration of rural and small-scale fishing values and livelihoods, and policy that is not premised on a singular version of fishing motivations and values.

## Authors statement

RD and CC secured grant funding to carry out this research. These authors also designed and coordinated this study as Project Leads. RD and JC carried out all interviews and ethnographic fieldwork in the Bristol Bay region. JC and DR transcribed and coded all interview transcripts. JC created all figures included in this manuscript. RD drafted the manuscript while remaining authors reviewed and provided feedback. All authors have read and approved the final manuscript.

[22] Prior to permit stacking, on average just over 10% of setnet permit holders were new entrants [86].

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