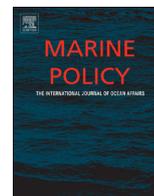




ELSEVIER

Contents lists available at ScienceDirect

Marine Policy

journal homepage: www.elsevier.com/locate/marpol

Lipstick and catch shares in the Western Pacific: Beyond evangelism in fisheries policy?



Seth Macinko*

Department of Marine Affairs, University of Rhode Island, Kingston, RI 02881, USA

ARTICLE INFO

Article history:

Received 19 November 2012

Received in revised form

29 March 2013

Accepted 2 August 2013

Available online 27 August 2013

Keywords:

Catch shares

Rights based fishing

ITQs

Fishing communities

ABSTRACT

The push for catch shares is on in the United States, nationwide generally, and in the western Pacific specifically. The prevailing understanding of catch shares emphasizes individual private property rights and changes in fisher behavior are understood to result from changes in rights in accordance with a long-established canon in fisheries economics. It is argued that this orthodoxy misses the causal factor in catch shares and thus constricts the range of policy options for catch shares. Moreover, this standard understanding of catch shares fosters opposition. Opposition to catch shares in the western Pacific can be understood as a specific variant of a generic pattern of opposition that is often centered on concerns for distributional impacts. Blind to the fact that their own misunderstanding fuels opposition, proponents of privatization resort to explaining opposition in terms of a simple, but inaccurate, for-or-against-catch-shares dichotomy. Perpetuation of this dichotomy has become a tool in the promotion of one particular ideological conception of catch shares and is a disservice to the public policy process. A possible path forward in the context of the western Pacific is presented that is based on diminishing the role of outside policy experts while encouraging local design of programs to meet local goals. Such an approach is consistent with the nature of development as local people adopt and adapt outside influences on their own terms.

© 2013 Elsevier Ltd. All rights reserved.

1. Introduction

Fishery management is an exercise in applied development theory. From this perspective, the central management question is where does a particular society want the rents from the fishery to flow? That is, a fishery represents a publicly held asset and it is a public policy question as to how a particular society elects to manage the wealth of the fishery for the benefit of the society as asset owner [1]. Catch shares, or rather particular forms of catch shares, explicitly affect the range of policy options regarding rent distribution that are available to a society. Ideally, a discussion of options and goals for rent distribution ought to precede the design of a management program that might constrain, or even dictate, the range of distribution options available. It would appear, however, that in the United States this ideal sequence has been precluded by events. That is, catch shares, or to be precise, a specific variant of catch shares, have become a goal in themselves rather than a tool in service of goals set by society.

The push for catch shares is on in the United States, nationwide generally, and in the western Pacific specifically, as evidenced by the mere convening of the workshop. The cultural context of the

western Pacific, relayed by local participants at the workshop, makes this a particularly interesting example of cross-cultural diffusion. To explore this example, this paper begins with a brief introduction to catch shares, and then looks at the history of concern for the distributional impacts associated with the shift to catch shares and other “rationalization” programs. Opposition to catch shares in the western Pacific can be understood as a specific variant of a generic pattern of opposition. In both specific and generic forms, opposition to catch shares is exacerbated by, and a response to, the prevailing manner in which catch shares are conceptualized and proffered—the reigning orthodoxy insists that catch shares work because of a stewardship interest created by owning a valuable private asset. Indeed, it is now common to see open discussion of “the privatization of the oceans” [2] where individual private property rights are seen as the only alternative to unenlightened opposition and resulting chaos and decline in the world’s oceans [3,4]. Only by ignoring the linkage between the specific form of catch shares offered and resulting opposition can a simple, but inaccurate, for-or-against-catch-shares dichotomy be perpetuated see, e.g., [3]. Perpetuation of this dichotomy has become a tool in the promotion of one particular ideological conception of catch shares—that they must be essentially perpetual private property—and is a disservice to the public policy process. An alternative approach to consideration of catch shares in the western Pacific would offer more, not less, policy options

* Tel.: +1 401 874 4820; fax: +1 401 874 2156.

E-mail address: macinko@uri.edu

and would be based on diminishing the role of outside policy experts while encouraging local design of programs to meet local goals.

2. What are catch shares?

IFQs are not property rights-based fishing, they are catch share-based fishing... Ideologically-infused beliefs have obscured this simple observation for too long... Once this conceptual breakthrough is realized, the tool (catch shares) can be liberated from the ideology (private property), and in the process open up the menu of available policy options. Full liberation of catch shares from the property rights ideology will require abandonment of the term "IFQ," which has become irretrievably contaminated by the "rights-based" dogma... Once free to contemplate catch shares unencumbered by all the conditions imposed by the rights-based campaign... it is possible to focus on designing a management system that is compatible with the existing property regime ([5], p. 29).

It is ironic that a term (catch shares) specifically offered up to escape the rights-talk afflicting the literature on individual transferable quotas/individual fishing quotas (ITQs/IFQs) [5], has now been co-opted by what one notable observer called "fisheries economists with an extreme 'property rights' interpretation of harvesting quotas" ([6], f.n. 2). The vocabulary has changed but the underlying causal analysis has not, thus perpetuating the conceptual confusion regarding cause and effect that plagues the fisheries literature in this area. Behavior changes when fishing under catch shares because the rules, not the rights, have changed. Assertions of the powers of ownership and property rights represent exhibits of faith, not analysis. When rules change, operating incentives usually change too. Pre-assigning a share of the total catch instantly removes the incentives to race that characterize a fishery where individual catch is competitively determined, not assigned.

If "the ownership fetish" [7] can be set aside, both innovation and clarity are possible in policy design. As originally proposed, catch shares are simply assigned shares of an overall catch [5]. There is room for much variation in how, and to whom, the shares are assigned but from this simple definition, certain clarifications can be brought to bear on contemporary discussions of fisheries policy. First, programs featuring assigned effort allotments (e.g., individual transferable trap certificates) are not catch shares. By definition, catch shares involve both a (total) catch and (assigned) shares of that catch. In contrast, under effort assignments, there may be no limit at all on total catch and, in any case, there is no assignment of catch to specific entities.

Second, TURFs (territorial use rights fisheries) are not catch shares (and vice versa) for similar reasons. Under TURFs, total catch and shares of that total are both not necessary conditions. Additionally, while TURFs, by definition, are rights-based, catch shares require no necessary basis in rights. The causal explanation of why catch shares work does not depend on an appeal to "rights" but simply rests on the fact that catch is pre-assigned [5,8]. Catch shares will work with or without the creation of specific property rights, thus, rights are not needed, and hence catch shares may be observed to be working (in terms of their designed objectives) just fine in the U.S. where they have been defined in statute as mere privileges. Of course, fashioning catch shares as rights may be preferred by some for ideological reasons, but that is a different argument.

Despite these fundamental differences, it has become commonplace, as at this workshop, to see TURFs talked about as a form of catch shares. This conceptual confusion has now been enshrined as national policy in the United States in the form of the definition

of catch shares presented in the NOAA catch shares policy document [9]. While this may be a case of economists appropriating a concept to add conceptual diversity (and cultural sensitivity?) to their tool kit, it is probably best to keep conversations of catch shares and TURFs separate because they *are* separate tools. Policy-making and policy evaluation are both enhanced by conceptual clarity.

3. Who's Afraid of catch shares (and why)?

Given the simple concept outlined above and the extreme flexibility in design that simplicity affords (e.g., shares could be held by individuals, groups of individuals, whole communities, or even regional or national governing bodies), it might seem surprising that the concept would be met with skepticism, fear, or even hostility in the early phases of policy development. Yet, apparently, catch shares have not been enthusiastically received by many in the audiences at outreach efforts conducted by staff from the Western Pacific Fishery Management Council (as described by staff at the workshop, see also [10]). As has been argued elsewhere [11], this kind of reaction to the conventional presentation of catch shares is not surprising.

The critical feature to understand is that the source of concern lies not with the generic concept of catch shares, but with the specific form of catch shares put forth by proponents. The standard approach to catch shares is a self-proclaimed enclosure movement:

[Catch shares] are part of one of the great institutional changes of our times: the enclosure and privatization of the common resources of the ocean. These are now mostly the exclusive property of the coastal states of the world ([12], p. 3).

Conceptualized in this way, catch shares are not, contrary to their usage in much of the fisheries literature, about filling a property rights vacuum, but rather, a self-acknowledged overthrow of an existing property rights regime. The movement to privatize what is currently a public asset—not the fish, but the right of fishing and the fishery—usually engenders concerns for the distributional effects of such a policy shift. These distributional concerns are focused on both communities and individuals with ties to the fishery. Ironically, the standard responses by catch share proponents to these distributional concerns fuel further resistance to the programs. To understand resistance to catch shares, it is thus useful to understand "their" history in terms of distributional issues.

3.1. Distributional effects: communities

An exchange over the effects of a proposed catch share program on communities in Alaska aptly illustrates the conventional treatment afforded such concerns:

Fisherman/Mayor: "I wonder what the effect the share quota systems... [would have on] Alaska's coastal communities or industries?" ([13], p. 145).

Economist: "Well, I suppose I don't know. To some extent, I'd like those questions to be on the other side of the ledger. What I'm interested in and what I think we need to focus our attention on is the aggregate effect over the entire U.S. economy, initially ignoring the question of how particular groups, and particular individuals and particular regions come out." ([13], p. 145).

Given the community related concerns expressed at the workshop, it is not hard to imagine the first part of this exchange being articulated throughout the western Pacific. As for the second part of the exchange, the dismissal of concerns over community impacts involves the classic distinction in economics between allocation and distribution. If distribution is, by definition, a

second order issue, it becomes hard for those concerned about the impact of policies on places to be heard. Telling those who harbor concerns about place that they should instead focus on a trickle down theory of benefits is not likely to bring these two viewpoints closer together.

3.2. Distributional effects: individuals

Before there were catch shares, there was license limitation. While assigning catch in advance alleviates the competitive race that is perfectly logical under licenses (i.e., when catch is not pre-assigned), much of the rationale and supporting rhetoric behind the present push for catch shares is identical to that found in the earlier push for license limitation (see [14] for abundant examples of the early theory and rhetoric). In fact, consulting the early “limited entry” literature is useful for seeing just how little has changed, on some points, in the minds of the theorists proffering economic “rationalization” policies. Consider the standard economic emphasis on factor mobility—in this case labor mobility. First, the theory concerning how all can benefit from the shedding of what is perceived to be redundant labor:

One implication of this [theoretical] insight is that reducing the number of fishermen and gear will usually increase the income of those enterprises that remain by more than it will reduce the incomes of those that are excluded. In principle, at least, a system that transferred part of the gains from the first group to the second could leave both of them better off than they had been, **while the rest of society would benefit from the labor and capital freed for other useful activity** ([15], p. 8), emphasis added.

This text-book interpretation of the Gordon–Schaefer bio-economic model [16,17] is then coupled with a concise belief in the prescription for what do with those displaced by the enclosure movement: “The problem, if there is one, is to redirect the flow of potential new entrants from the fishery to other occupations ([18], p. 751).” The leading early theorists of limited entry could be remarkably brazen when dismissing what might seem to be obvious concerns about the increasing barriers to entry posed by the quest to introduce individual property rights in the fishery:

To the extent that the very young, untrained, and handicapped find entry more difficult because of the higher capital investment required, one can only reply that it is unwise to be poor, ignorant, or unwell—the same restrictions on entry that apply everywhere ([18], p. 748).

The point here is not to ridicule the early theorists—their statements can stand or fall on their own. Rather, the point is to note that it is likely that many people, particularly those in isolated fishing communities where occupational mobility may be severely restricted, may find such statements to be at odds with their own perceptions of the purpose of state intervention in fishery management. After nearly 60 years of essentially a mono-culture in the fisheries economics literature, the dismissal of distributional concerns is well-known to anyone who conducts even the most cursory reading of the fisheries economics literature or has attended an outreach meeting aimed at explaining the logic of rationalization to concerned publics (including fishers and other residents of their communities). Resistance in the western Pacific should not be unexpected. As was heard at the workshop, people in island fishing communities do not want to leave. Here the people of the western Pacific again share similarities with other peoples connected to place. Mobility is often a means of remaining in, not exiting, a community [19] and it has long been known that the nexus between lifestyle and self-identity in resource-

dependent occupations results in a high likelihood that such occupations are not easily substitutable with alternative occupations even if alternatives are available [20,21].

One area where catch shares do depart from the earlier license limitation schemes (in terms of distributional impacts) appears to be the power relationship between vessel owners and crew and indeed other non-catch share owning vessel owners. Catch shares, as usually implemented, transform the fishery into what can be called a rentier fishery where share owners effectively capture the resource rent. As classically understood, a resource rent is a payment to access or put a natural resource into production [7]. Catch share programs featuring wide scale leasing are now revealing just how substantial the resource rent in fisheries can be:

They put all the shares in one boat and lease the rest. They charge 70 to 80% off the top for the part they lease. And owners now lease their own quota to their own boats and get the lease rate for themselves. The pay is the same but you get paid proportionally less. It depends on the boat though [22, c.f. 23].

Where should these rents flow? Who should collect them? These are big picture policy questions that deserve to be the subject of broad debate. The conventional approach to catch shares stifles such debate by suggesting that there is no alternative to conveying the future wealth of the fishery into the hands of those selected during the initial allocation. Again, perhaps such an approach can be justified by appealing to a belief that the broader society will benefit through a trickle-down process. But, surely, there is room for a robust debate here grounded in competing political and economic ideologies. No doubt openly acknowledging ideological underpinnings will cause some to balk, but long ago, Larkin [24] candidly noted that political philosophies provided the bases for preferences regarding access arrangements in fisheries.

What is beyond debate is the effect on future generations of the current pattern of conveyances:

The overall fishery may benefit economically from a [catch share program], although the cost of buying the quota of exiting fishermen may consume much, if not the majority, of the fishery’s overall gains ([25], p. 1).

Perhaps people in the western Pacific are not pleased by the prospect of saddling their youth with this kind of future. However, if the future of fishing involves paying to fish, is it unreasonable to debate who should receive those payments?

3.3. Distributional effects: communities, Part II

A critical distinction for any serious consideration of the distribution of rent concerns the difference between a group of fishers in the present generation and the larger community. Much of the current rhetoric surrounding catch shares substitutes the former for the latter. For example, the New England experiment with pooled catch shares known as sectors has been described as being focused on community management: “The goals of sector management are to ... preserve traditional fishing communities, and provide a working model of community management for others to follow” ([26], p. 12). But community here means just those fishers endowed with the gifts created by the political process: “Participating fishermen manage their catch as a community instead of under complex and often-ineffective federal restrictions” [27].

As for the rest of the community, that is, what is normally thought of as a “community” in everyday parlance, the concerns for the deleterious effects of concentrating the fishery into the hands of the gift-ees of the initial allocation are so strong that the

general taxpayer has been asked to fund the establishment of so-called permit banks to buy back what was just freely given away so that those excluded might now be included, all in the name of mitigating adverse effects on communities [28]. And Wall Street has realized the possibilities presented by all this trading in catch shares [29]. Is it possible to imagine a place where the sense of community is such that all this seems a bit far removed from how people in that community envision their future relationship with the fishery? By all accounts from the local contributions to the workshop and relevant literature [30], the western Pacific appears to be such a place.

4. Selling catch shares: reducing or expanding policy options?

The workshop occasioned many lively discussions, but from the perspective of a non-economist, the outstanding feature was the conceptual hegemony and cultural deafness of the economists present. Even at the level of the language employed to convey ideas, there was a brazenness that can only retard two-way communication. There was much talk at the workshop of how there are many ways to set up and use catch shares but little evidence of actually walking that talk. Indeed, organizations present at the workshop (e.g., Environmental Defense Fund) have argued strenuously (and successfully) in other venues *against* adapting catch shares to meet broader social goals. Instead, these voices argue that they do not want to interfere with the free market and the private business decisions of individuals vested by the creation of catch shares [31]. This is an example of a single model, in this case the rentier, or what might be called the neoliberal, model of catch shares being asserted in a way that denies the very flexibility or adaptability promised by the generic concept of catch shares.

There is an on-going evolution in the language associated with the promotion of catch shares. The characteristic feature of this evolution is the use of a strategically benign rhetoric.¹ That is, former flash-point terms like “privatization” and “property rights” have been largely replaced by an emphasis on “incentives” and “secure” shares. But the underlying causal model and belief system have not changed. This is all of a piece with the program launched over fifty years ago that diagnosed the problem as one of missing individual private property rights [32]. The benign rhetoric in this sense is something of a Trojan Horse. Flexible, adaptable, innocuous catch shares are let in the (policy discussion) gate and then locals find themselves with a single variant.

The track record of catch share experts to date suggests that their role is one of reducing options rather than expanding options. The dominant approach to catch shares is one that (i) is infused with rhetoric of privatization, enclosure, and individual ownership and (ii) promotes the transformation of the fishery into a rentier fishery controlled by men (as boat owners). Is it surprising that Pacific islanders may be less than receptive to this message? Might Pacific islanders embrace a notion of community that is larger and different than just a group of guys who own boats see, e.g., [30]? Might they not be convinced that the logic of trickle down benefits—from a newly advantaged few to the remaining many—is a sure improvement for their society as a whole?

This seems to be a case of “issue advocacy” rather than “honest brokering” of policy options [33]. There is a clear tendency to smuggle in goals and objectives, and indeed ideologies, with the

presentation of the mere tool. After a while, the whole process begins to resemble that of a missionary project with characteristic evangelistic zeal on the part of the missionaries and a level of wary suspicion on the part of the receiving audience. Indeed, as Severance [10] notes, one local participant closed by warning against proselytizing.

It has become common for proponents of catch shares to present their case in grand terms involving a stark dichotomy between enlightened thinking and ignorance:

Others feel that ocean fisheries are common property—that everyone should be free to use them, and that it is wrong to establish ownership rights in the sea. It is to be hoped that clear evidence of the effectiveness of ITQs will lead their opponents to think again ([3], p. 1045).

But this dichotomy, what may be called the privatize-or-perish dichotomy, is a false one. As noted above, the issue here is not one of filling a property rights vacuum, but a struggle between alternative rights regimes. Moreover, catch shares need not even be cast as rights in order to obtain the benefits offered by pre-assigning catch.

Perhaps it is time for the purveyors of the privatize-or-perish approach to step back and open *their* eyes and minds to new ways rather than presenting their audiences with false dichotomies. People want catch shares to be consistent with, not corrosive to, their values. It is worth noting that the one place where local people tailored a catch share program to try and address their values, the expert class derided the program for its departures from standard economic orthodoxy. Today, that program, the halibut/sablefish individual fishing quota program operating off Alaska, designed by locals for locals (largely without outside expert influence), is regarded as a model of socially responsible catch shares.²

Resistance to the rentier model is often high not because people do not like catch shares, but simply because they do not want to return to feudal-like social landscapes. The local voices at the workshop testified to deep concerns about the fate of communities and their cultural fabric while the expert discussions at the workshop suggested sheer ignorance of the value of these values. It is no wonder there is resistance. Must the promise of the tool be abandoned then? Perhaps not, perhaps what are needed are new experts. Perhaps the problem with catch shares is not with catch shares, but with how they are “sold”.

A comparison to house paint might be instructive: who could be against house paint? Rationales for paint run from the esthetic to the preservative and the generic concept is rather innocuous indeed, but one can imagine a different reaction if “house paint” invariably came to mean “you should paint your house pink”. But this slippage from the generic (catch shares as simply pre-assigned catch) to the quite specific (catch shares as individual private property, gifted to a subset of a single generation and coupled with beliefs about stewardship) is exactly what happens under most contemporary discussions of catch shares.

5. Lipstick in the Western Pacific: a way forward?

A story about a different kind of paint provides purchase on a possible path forward. At one of the extracurricular activities that invariably accompanies an event like the catch shares workshop, a

¹ In a blog-essay posted to the New York Times “Opinionator” blogs, Stanley Fish described the rhetoric used to sell the privatization of higher education as “superficially benign” (see <http://opinionator.blogs.nytimes.com/2010/12/13/the-value-of-higher-education-made-literal/> (last visited Dec. 14, 2010)).

² Linda Behnken, former three-term member of the North Pacific Fishery Management Council during the time the Council designed the halibut/sablefish program, recently reviewed this history in remarks presented at a conference devoted to the theme of “innovative strategies for success under catch shares.” Her comments are available online at: <http://www.screencast.com/t/gVvqpvNJSuJQ> (last visited 14 February 2012).

tale was told by one of the “locals” of how the people of Palau were the first of the western Pacific islanders to adopt lipstick. Significantly, they did it in their own way, using the medium differently than in mainland western civilizations, and they did not call it “lipstick”. Regardless of the historical accuracy of this tale, it serves as a perfect example of what a National Research Council committee termed “the indigenization of modernity” ([34], p. 38). That is individuals, cultures, and whole societies, adapt and appropriate the “resources” they apprehend to suit their own purposes. The NRC proclaimed that this process of indigenization was the essence of development. Discussions of catch shares in the western Pacific might be enhanced by applying this notion. To do so, requires a return to the question as to what are catch shares.

As above, catch shares are simply assigned shares of an overall catch. This, like lipstick, does not seem to be an overly difficult concept to grasp and one questions the need to employ vast amounts of outside “experts” to bring the concept to the people. If there is a role for outside experts, it would seem to be that of the honest brokers, rather than people that narrow the policy options, as discussed by Pielke [33], and that would seem to involve beginning with the questions “What are *your* circumstances, what are *your* values, what are *your* goals?” Then experts might offer some suggestions for how to design catch shares to meet those circumstances, values, and goals or to comment that catch shares might be entirely inappropriate given the particular context. But even this last part is delicate and borders on usurping a judgment best left up to the locals.

Fisheries management *is* about development. The process can proceed in the normal fashion, flying in experts with a vocabulary featuring “security” and “long-term” and “rights-based” and all the other code words employed today to steer development projects toward a model based invariably on free, effectively permanent, grants of control over the wealth of public fishery resources to selected individuals—the neo-liberal/neo-feudalism/rentier model. The way this model is presented effectively precludes a sincere conversation about where a society wants the rents to flow. If the only way catch shares work is via the magic of private ownership, then there is no point in discussing public ownership options. That is what the dominant literature would have readers believe. But the insistence on private ownership is merely ideological, not a necessary condition, and approaches a tautology. Societies effectively mix catch (extraction) shares with public ownership in other natural resource arenas. There is a choice. Instead of the evangelical approach, one can simply explain the basic idea of having boats on the water pursuing fixed shares of a larger total catch and then let the recipients of the development effort shape or even reject the project according to their own circumstances, needs, and goals. Why not let the audience indigenize the concept, in, and on, *their own terms*?

All this must take place within an overarching framework of national principles. Of course, in the U.S. there are the National Standards of the Magnuson-Stevens Act as well as a public right of fishing. Most importantly, there is an owner in place with sovereign rights over the fishery [8]. But within this framework, surely Pacific islanders can decide on their own whether and how they want to apply the tool. In other words, perhaps it is time to think of catch shares like lipstick.

References

- [1] Cunningham S. Fishermen's incomes and fisheries management. *Marine Resource Economics* 1994;9:241–52.
- [2] Hannesson R. *The privatization of the oceans*. Cambridge: MIT Press; 2006.
- [3] Heal G, Schlenker W. Sustainable fisheries. *Nature* 2008;455(7216):1044–55.
- [4] Costello C, Gaines S, Lynham J. Can catch shares prevent fisheries collapse? *Science* 2008;321(5896):1678–81.
- [5] Macinko S, Bromley D. *Who owns America's fisheries?* Washington D.C.: Island Press; 2002.
- [6] Weitzman M. Landing fees vs harvest quotas for uncertain fish stocks. *Journal of Environmental Economics and Management* 2002;43:325–38.
- [7] Bromley D. Abdicating responsibility: the deceits of fisheries policy. *Fisheries* 2009;34(6):280–90.
- [8] Macinko S, Bromley D. Property and fisheries for the twenty-first century: seeking coherence from legal and economic doctrine. *Vermont Law Review* 2004;28(3):623–61.
- [9] National Oceanic and Atmospheric Administration (NOAA). NOAA catch share policy. Available from: http://www.nmfs.noaa.gov/sfa/domes_fish/catch_share/docs/noaa_cs_policy.pdf; 2010 [last visited 02.02.12].
- [10] Severance C. [this volume].
- [11] Macinko S. In search of transition, community and a new federalism: six questions to confront on the road towards a national policy on dedicated access privileges. In: Witherell D, editor. *Managing our nation's fisheries II: focus on the future*. Anchorage: North Pacific Fishery Management Council; 2005. p. 236–44.
- [12] Neher PA, Arnason R, Mollet N. *Rights based fishing: proceedings of a workshop on the scientific foundations for rights based fishing*. Dordrecht: Kluwer Academic Publishers; 1989.
- [13] Frady T, editor. *In: Proceedings of the conference on fisheries management: issues and options*. Alaska Sea Grant Report 85-2. Fairbanks: Alaska Sea Grant College Program. University of Alaska; 1985.
- [14] Rettig RB, Ginter JC, editors. *Limited entry as a fishery management tool: In: Proceedings of a conference to consider limited entry as a tool in fishery management*, Denver, July 17–19, 1978. Seattle: University of Washington Press; 1980.
- [15] Tussing AR. Introduction: economics and policy in Alaska fisheries. In: Tussing AR, Morehouse TA, Babb Jr JD, editors. *Alaska fisheries policy*. Fairbanks: Institute of Social Economic and Government Research, University of Alaska; 1972. p. 1–12.
- [16] Gordon HS. The economic theory of a common-property resource: the fishery. *Journal of Political Economy* 1954;62:124–42.
- [17] Schaefer MB. Some considerations of population dynamics and economics in relation to the management of the commercial marine fisheries. *Journal of the Fisheries Research Board of Canada* 1957;14(5):669–81.
- [18] Crutchfield JA. Economic and social implications of the main policy alternatives for controlling fishing effort. *Journal of the Fisheries Research Board of Canada* 1979;36:742–52.
- [19] Macinko S. Fishing communities as special places: the promise and problems of place in contemporary fisheries management. *Ocean and Coastal Law Journal* 2007;13(1):71–94.
- [20] Rural Sociological Society Task Force on Persistent Rural Poverty. *Persistent poverty in rural America*. Boulder: Westview Press; 1993.
- [21] Ginkel R van. The ways of fishers: cultural dimensions of a maritime occupation. *Europaea* 1999;5(2):21–44.
- [22] Macinko S. Fisheries 'rationalization' and crew: workplace dynamics and compensation, what can we learn? NPRB Project 725 final report. Anchorage: North Pacific Research Board; 2010.
- [23] NPFMC. *Leasing practices in North Pacific fisheries Bering Sea and Aleutian Island crab fisheries* North Pacific Fishery Management Council June 2009, Agenda c-3 (b)(5). Anchorage: North Pacific Fishery Management Council; 2009.
- [24] Larkin PA. An epitaph for the concept of maximum sustained yield. *Transactions of the American Fisheries Society* 1977;106(1):1–11.
- [25] Redstone. *South Atlantic Snapper Grouper LAPP Options, Preliminary Economic and Design Options*, Redstone Strategy Group, LLC, September 18, 2007. Boulder: Redstone Strategy Group; 2007.
- [26] Leal DM, DeAlessi M, Baker P. *Beyond IFQs in marine fisheries*. Bozeman, MT: PERC (the Property and Environment Center). Available from: http://www.perc.org/files/IFQbooklet_may08.pdf; 2008 [last visited 12.12.11].
- [27] Nickerson S. Fishermen's group already uses sectors successfully. *Cape Cod Times*, (Opinion) April 21, 2009, Susan Nickerson, Executive Director, Cape Cod Commercial Hook Fishermen's Association. Available from: <http://www.capecodonline.com/apps/pbcs.dll/article?AID=/20090421/OPINION/904210306/-1/ARCHIVE> [last visited 12.12.11].
- [28] NOAA. NOAA Provides \$10 million to support New England groundfish fishery. NOAA news release 10.07, March 1, 2010. Available from: http://www.nefsc.noaa.gov/press_release/2010/News/NR1007/index.html [last visited 04.02.12].
- [29] <http://mmearth.com/markets/catch-shares/> [last visited 14.02.12].
- [30] Severance C. Customary exchange maintains cultural continuity. *Pacific Islands Fisheries*; 2010. Summer. p. 1–2.
- [31] Macinko S, Whitmore W. A New England dilemma: thinking sectors through. Report prepared for the Massachusetts Division of Marine Fisheries, Revised June 2009, 81p. Available from: <http://www.uri.edu/personal/macinko/NewEnglandDilemmaFinal.pdf> [last visited 02.12.11].
- [32] Copes P. A critical review of the individual quota as a device in fisheries management. *Land Economics* 1986;62(3):278–91.
- [33] Pielke Jr R. The honest broker: making sense of science in policy and politics. Cambridge: Cambridge University Press; 2007.
- [34] NRC (National Research Council). *The Community Development Quota Program in Alaska and lessons for the Western Pacific*. Washington DC: National Academy Press; 1999.