Update Report

Period 2/1/2013 - 1/31/2014

Project R/COCC/SS-1 - Social and economic effects of ITQs on the West Coast Groundfish fishery solving the weak stock/bycatch problem

STUDENTS SUPPORTED

Kuriyama, Peter, ptrkrym@uw.edu, University of Washington, School of Aquatic and Fishery Sciences, status cont, field of study Fisheries, advisor Trevor Branch, degree type MS, degree date 2014-09-01, degree completed this period No
Student Project Title The effects of weak stock constraints on catch, discards, and fishing behavior in the United States West Coast Groundfish Fishery

Involvement with Sea Grant This Period Graduate student

Post-Graduation Plans Intends to continue with a PhD.

CONFERENCES / PRESENTATIONS

Kotaro Ono Incorporating habitat and spatial information into a delta GLMM applications to the US West coast groundfish fishery and survey data. Sea Grant IFQ PI meeting, UC Santa Barbara, public/profession presentation, 25 attendees, 2013-11-21
Peter Kuriyama Catch shares so far in the West Coast Groundfish Fishery. Sea Grant IFQ PI Meeting, UC Santa Barbara, public/profession presentation, 25 attendees, 2013-11-21
Peter Kuriyama How and why do people fish? Discover Science Weekend. Seattle Aquarium, public/profession presentation, 100 attendees, 2013-11-11
Trevor Branch Testimony before US Senate Subcommittee on reauthorization of the Magnuson-Stevens Fisheries Act, public/profession presentation, 80 attendees, 2014-01-30
Trevor Branch Seafood sustainability it's not all doom and gloom. Invited talk to FMI Global Sustainability Summit., public/profession presentation, 50 attendees, 2013-08-15
Social and economic effects of ITQs on the West Coast Groundfish fishery solving the weak stock/bycatch problem
Project update and meeting of PIs and students., SG-sponsored, 20 attendees, 2013-11-22

ADDITIONAL METRICS

K-12 Students Reached	0	Acres of degraded ecosystems restored as a result of Sea Grant activities	0
Curricula Developed	0	Resource Managers who use Ecosystem-Based Approaches to Management	0
Volunteer Hours	0	HACCP - Number of	0

		people with new certifications
Cumulative Clean Marina Program - certifications	0	

PATENTS AND ECONOMIC BENEFITS

Description		Patents	Economic Benefit ($)	Businesses Created	Businesses Retained	Jobs Created	Jobs Retained
Benefits difficult to attach precise monetary amount to.	Actual (2/1/2013 - 1/31/2014)	0	0	0	0	0	0
	Anticipated (2/1/2014 - 1/31/2015)	0	0	0	0	0	0

TOOLS, TECH, AND INFORMATION SERVICES

Description		Developed	Used	Names of Managers	Number of Managers
West Coast ground fish discard dataset	Actual (2/1/2013 - 1/31/2014)	1	1	NMFS - Marlene Bellmann (writing paper with us on results)	1
	Anticipated (2/1/2014 - 1/31/2015)	0	0		

HAZARD RESILIENCE IN COASTAL COMMUNITIES

Name of coastal community	County		Number of resiliency trainings / technical assistance services provided	Was community hazard resiliency improved (e.g., via changes in zoning ordinances) ?
None		Actual (2/1/2013 - 1/31/2014)	0	No
		Anticipated (2/1/2014 - 1/31/2015)	0	

ADDITIONAL MEASURES

Safe and sustainable seafood

Number of stakeholders modifying practices
Actual (2/1/2013 - 1/31/2014) 100
Anticipated (2/1/2014 - 1/31/2015) 0
All producers, processors, etc have greatly modified their practices as a result of catch shares. As part of our larger project we are working with MRAG/Moore economists to document these broader community changes.
Sustainable Coastal Development
Actual (2/1/2013 - 1/31/2014) 0
Anticipated (2/1/2014 - 1/31/2015) 0

Number of fishers using new techniques
Actual (2/1/2013 - 1/31/2014) 100
Anticipated (2/1/2014 - 1/31/2015) 0
Implementation of catch shares has resulted in a huge change in harvesting techniques, which we are measuring and documenting. Far cleaner fishing, and avoidance of overfished species like never before.
Coastal Ecosystems
Actual (2/1/2013 - 1/31/2014) 0
Anticipated (2/1/2014 - 1/31/2015) 0

PARTNERS

Partner Name Fisheries and Oceans Canada (DFO)

Partner Name Gordon and Betty Moore Foundation

Partner Name MRAG USA Ltd, type Other, scale Federal or National

Partner Name Northwest Fisheries Science Center (US DOC, NOAA, NMFS, NWFSC)

Partner Name Pacific Fishery Management Council (PFMC)

Partner Name University of California, Santa Barbara (UCSB)

IMPACTS AND ACCOMPLISHMENTS

Title More fish, larger catches Washington Sea Grant research measures catch share effects on West Coast groundfish fisheries

Type impact

Relevance, Response, Results Relevance The groundfish fishery is one of the largest and most complex on the West Coast involving, more than 90 fish species and thousands of fishermen and seafood workers. In 2011 the Pacific Fishery Management Council implemented individual fishing quotas (IFQs), and fishing revenues rose substantially. However, concerns remained about the effect of IFQs on fishing communities and the health and sustainability of fishery stocks. Objective, authoritative data clearly is needed on catch shares' economic, ecological, and social impacts and the return on investment in them. Response Washington Sea Grant partnered with California Sea Grant to examine IFQ impacts on the fishery. WSG-funded researchers are focusing primarily on fleet-wide catches, status of fish stocks, and discard practices in the fishery. Results are contributing to team participation in a larger national project to provide neutral, science-based information about catch share performance that compares Northeast and West Coast groundfish programs. Results Because IFQs are so new, it is difficult to attribute changes in the fishery to their implementation, but in the first year overall stock biomass improved slightly as in the preceding three years. Catches for all stocks were below allowable

levels and discards were lower than in any year in the previous decade. Interim results are published online at http //catchshareindicators.org/westcoastinterimresults/. Analysis will continue through 2016 with funds from the Moore Foundation and a NMFS-Sea Grant fellowship, and information from the project will be available to guide future catch share decisions.

Recap Recap WSG-funded researchers tracked the ecological and economic effects of a new catch-share system for West Coast groundfish fisheries.

Comments Primary Focus Area LME (SSSS) Secondary Focus Area COCC (SCD) State Goals Support conservation and sustainable use of living marine resources through effective and responsible approaches, tools, model and information for harvesting wild and cultured stocks and preserving protected species (SSSS Industry) Assist coastal communities and marine-dependent businesses in planning and making decisions that provide local and regional economic benefits, increase resilience and foster stewardship of social, economic and natural resources (SCD Efficiency)

Related Partners , , , , ,

PUBLICATIONS

Title Opportunistic exploitation an overlooked pathway to extinction

Type Reprints from Peer-Reviewed Journals, Books, Proceedings and Other Documents Publication Year 2013 Uploaded File Branch_etal_2013c_Oppo....n.pdf URL none

Abstract How can species be exploited economically to extinction? Past single-species hypotheses examining the economic plausibility of exploiting rare species have argued that the escalating value of rarity allows extinction to be profitable. We describe an alternative pathway toward extinction in multispecies exploitation systems, termed ‘opportunistic exploitation’. In this mode, highly valued species that are targeted first by fishing, hunting, and logging become rare, but their populations can decline further through opportunistic exploitation while more common but less desirable species are targeted. Effectively, expanding exploitation to more species subsidizes the eventual extinction of valuable species at low densities. Managers need to recognize conditions that permit opportunistic depletion and pass regulations to protect highly desirable species when exploitation can expand to other species.

Citation Branch TA, Lobo AS, Purcell SW (2013) Opportunistic exploitation an overlooked pathway to extinction. Trends in Ecology and Evolution 28 409-413

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Journal Title Trends in Ecology and Evolution

Title Modeling co-occurring species a simulation study on the effects of spatial scale for setting management targets

Type Reprints from Peer-Reviewed Journals, Books, Proceedings and Other Documents

Publication Year 2013 Uploaded File Dougherty_etal_2013_Mo....e.pdf URL none

Abstract Many species of marine fish are found in similar habitats and display similar vulnerability to fishing pressure, although their sustainable exploitation rates may differ considerably. Managing and setting harvest limits is challenging for such co-occurring species because the management targets for the less productive species may affect the fishing opportunities for the more productive species. We used simulation modeling to explore the effects of setting multi-species management targets and harvest regulations at local area or coast-wide levels. Setting management targets over the entire coast, and identifying optimal harvest rates within each local area, consistently led to the same or higher yields than setting management targets for each area. Essentially, the global conservation goal can be achieved by protecting areas in which the less productive species is abundant and by taking most of the harvest from other areas. The increases in yield do not increase the coast-wide probabilities of either species being overfished or severely depleted, but do increase these probabilities at the local area level for the less productive species. These results are magnified with increased spatial variation in the ratio of abundance and differences in intrinsic rates of growth among the fished species.

Citation Dougherty DT, Hilborn R, Punt AE, Stewart IJ (2013) Modeling co-occurring species a simulation study on the effects of spatial scale for setting management targets. Canadian Journal of Fisheries and Aquatic Sciences 70 49-56

Journal Title Canadian Journal of Fisheries and Aquatic Sciences

Title The legal, regulatory, and institutional evolution of fishing cooperatives in Alaska and the West Coast of the United States

Type Reprints from Peer-Reviewed Journals, Books, Proceedings and Other Documents
Publication Year 2013 Uploaded File De_Alessi_etal_2013_Le....t.pdf URL none

Abstract Between 1997 and 2011, fishing cooperatives on the West Coast of the U.S. and Alaska grew to cover almost 60% of U.S. West Coast and Alaska commercial fisheries. In those fisheries, cooperatives now manage capacity reduction and harvest limit compliance internally, transforming the way harvest limits are met—but not how they are set. Economic and regulatory incentives, both positive and negative, explain variations in cooperative structures and functions, particularly the level of participation, number of cooperatives within a fishery, and a shift in emphasis over time from internal quota setting and trading to managing non-target prohibited species avoidance. Ecological limits, which have generally been effective at sustaining fisheries on the Pacific coast, are still exogenous to cooperative management. Cooperatives commonly share information to avoid bycatch, but only coordinate harvests of target species to a very limited degree. Whether cooperatives evolve from effectively meeting external targets to either participating in the setting of limits (co-management) or moving beyond quota management into revenue sharing and coordinated fishing will depend on whether legal institutions and political objectives also evolve to allow new contractual and institutional arrangements.

Citation De Alessi M, Sullivan JM, Hilborn R (2013) The legal, regulatory, and institutional evolution of fishing cooperatives in Alaska and the West Coast of the United States. Marine Policy 43 217-225

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Journal Title Marine Policy

Title Effects of management tactics on meeting conservation objectives for western North American groundfish fisheries

Type Reprints from Peer-Reviewed Journals, Books, Proceedings and Other Documents Publication Year 2013 Uploaded File Melnychuk_etal_2013_Ef....s.pdf URL none

Abstract There is considerable variability in the status of fish populations around the world and a poor understanding of how specific management characteristics affect populations. Overfishing is a major problem in many fisheries, but in some regions the recent tendency has been to exploit stocks at levels below their maximum sustainable yield. In Western North American groundfish fisheries, the status of individual stocks and management systems among regions are highly variable. In this paper, we show the current status of groundfish stocks from Alaska, British Columbia, and the U.S. West Coast, and quantify the influence on stock status of six management tactics often hypothesized to affect groundfish. These tactics are the use of harvest control rules with estimated biological reference points; seasonal closures; marine reserves; bycatch constraints; individual quotas (i.e., 'catch shares'); and gear type. Despite the high commercial value of many groundfish and consequent incentives for maintaining stocks at their most productive levels, most stocks were managed extremely conservatively, with current exploitation rates at only 40% of management targets and biomass 33% above target biomass on average. Catches rarely exceeded TACs but on occasion were far below TACs (mean catch TAC ratio of 57%); approximately $150 million of potential landed value was foregone annually by underutilizing TACs. The use of individual quotas, marine reserves, and harvest control rules with estimated limit reference points had little overall effect on stock status. More valuable fisheries were maintained closer to management targets and were less variable over time than stocks with lower catches or ex-vessel prices. Together these results suggest there is no single effective management measure for meeting conservation objectives; if scientifically established quotas are set and enforced, a variety of means can be used to ensure that exploitation rates and biomass levels are near to or more conservative than management targets.

Citation Melnychuk MC, Banobi JA, Hilborn R (2013) Effects of management tactics on meeting conservation objectives for western North American groundfish fisheries. PLOS ONE 8(2) e56684. doi 10.1371/journal.pone.0056684

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Journal Title PLOS ONE

Title How does species association affect mixed stock fisheries management? A comparative analysis of the effect of marine protected areas, discard bans, and individual fishing quotas

Type Reprints from Peer-Reviewed Journals, Books, Proceedings and Other Documents Publication Year 2013 Uploaded File Ono_etal_2013_How_does....t.pdf URL none

Abstract We developed a spatially explicit bioeconomic model of a mixed-stock fishery with an unproductive and a productive stock to examine how the spatial overlap between species affects the outcome of a fishery under alternative management methods. We considered a competitive total allowable catch (TAC) system, with and without a ban on discards, and an individual vessel quota (IVQ) fishery managed either to maximum sustainable yield (MSY) or maximum economic yield (MEY). We also evaluated the utility of marine protected areas (MPAs) designed to protect the unproductive species for each management scenario. Banning discarding (whether under a TAC or IVQ) created the biggest increase in profit regardless of species overlap as it moves the target species biomass toward Bmey. MPAs reduced the profit in most cases and were not always successful at conserving the unproductive stock above a target size. The IVQ system managed to MEY produced the most profit among all scenarios while preserving the populations above some target values in most cases, but an IVQ system managed to MSY produced lower profits than a competitive TAC with a discard ban at some levels of species overlap.

Citation Ono K, Holland DS, Hilborn R (2013) How does species association affect mixed stock fisheries management? A comparative analysis of the effect of marine protected areas, discard bans, and individual fishing quotas. Canadian Journal of Fisheries and Aquatic Science 70 1792-1804

Journal Title Canadian Journal of Fisheries and Aquatic Science

Title Measuring the effect of catch shares

Type Internet Resources, Topical Websites Publication Year 2013 Uploaded File none URL http //catchshareindicators.org/westcoastinterimresults/

Abstract Presented here are interim results for indicators of the West Coast groundfish trawl fishery. Currently, these interim results focus on the nine fishing years (2002-2010) before the catch share program began in 2011. Throughout the Measuring the Effects of Catch Shares project, we will compare new results against that baseline period. For some indicators with available data, we also present an extended baseline covering more years. For those indicators for which the necessary data are currently available, the interim results also cover the first year or two of the catch share program. Because the program is so new, it is too soon to say whether changes observed to date result from implementation of catch shares or from other influences. From now until 2016, we will release additional interim results periodically as data analysis is completed, and a final report will be released in 2016. One of our major goals is to make data and findings publicly available in a web-based, interactive format that is accessible to all interested parties, and this release is a step toward that goal.

Citation http //catchshareindicators.org/westcoastinterimresults/

Journal Title none

OTHER DOCUMENTS

No Documents Reported This Period

LEVERAGED FUNDS

Type influenced Period 2013-02-01 2014-01-31Amount $69643

Purpose Measuring the effects of catch shares

Source Gordon and Betty Moore Foundation

UPDATE NARRATIVE

Uploaded File Costello_8295_update_n....6.pdf

Progress report narrative: "Social and economic effects of ITQs on the West Coast groundfish fishery: solving the weak stock/bycatch problem"

Activities carried out

Graduate student Kuriyama

Peter Kuriyama started on the project in Fall 2012, as the 1 February Sea Grant start date did not align with university admission timelines. He has been working on two chapters for his MS. In his first chapter he is comparing the discard rates and catch:TAC (total allowable catch) ratios for a wide range of species in the U.S. west coast groundfish trawl fishery both before and after catch shares were implemented, and before and after catch shares were implemented in British Columbia. In his second chapter he is examining spatial patterns in fishing effort before and after catch shares were implemented in the U.S. west coast fishery.

For project 1 on discards we have the data in hand from the US and BC and the analysis is complete with the project being written up now.

For project 2 on spatial fishing effort, the logbook data have been obtained and analyses are underway and expected to be completed by the end of 2014.

We have supplemented funding for Peter Kuriyama with one quarter of a TA at the University of Washington for R programming (FISH552 / FISH553), and additional funding from the MRAG/Moore project, which ends in December 2016, allowing us to extend Peter's funding into a third year on the Sea Grant calendar (a no-cost extension has been granted).

Peter has made good progress on his project and has a manuscript in prep. from the first chapter of his MS, and another one well on its way. Collaboration with the UCSB PIs has been extremely fruitful and forged connections that would not have been possible otherwise. Given the larger Moore/MRAG funding, he plans to apply for a bypass to go from MS to PhD in 2014.

All milestones have been met and the project has dovetailed perfectly with the larger Moore-funded project.

Broader collaboration

UW participants are working together with Chris Costello, Steve Gaines and Robert Deacon at UC Santa Barbara and several of their postdocs and students. We have had regular progress calls with them, and a PI meeting in November 2013 in Santa Barbara to collaborate further. A meeting with fishers is planned this year, to coincide with the Pacific Council meetings, and a second PI meeting at the end of this year.

Participants

PIs: Trevor Branch and Ray Hilborn

Graduate students: Peter Kuriyama (funded through Sea Grant), and Kotaro Ono (funded through NOAA) who is working on a related and complementary project, and has attended many of the meetings of this project.

Results

Five related peer-reviewed papers have been published from the project, with at least two more core papers planned from Kuriyama's thesis.

Challenges encountered

After some delays in obtaining data, we now have all the data in hand that are needed for the project.

Changes in project direction

None so far.

Related projects

PI Branch is funded to work with Prof. Tim Essington on a related project by the Moore Foundation (via MRAG USA) to produce ecological indicators to measure the effects of catch share programs. The two focal systems are the US west coast groundfish fishery, and sector management in the New England groundfish fishery. Some of the indicators are common to both projects (e.g. changes in discard rates over time), and we will use the Moore project money (to December 2016) to continue funding Peter Kuriyama's work after the Sea Grant funding finishes. The two projects are highly complementary.

Kotaro Ono is completing his PhD on how fishing affects weak stock management, which is also highly related to this project, but is separately funded by NOAA.