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APPLICATION FOR AN EXEMPTED FISHING PERMIT (EFP)

TITLE: Collaborative fishing to test pot gear for selective harvest of lingcod off of Washington and Oregon

a. Date of Application: May 26, 2016

b. Applicant: The Nature Conservancy
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c. Statement of purpose and goals

The purpose of this application is to acquire an exemption from federal rules that prohibit use of pots for fishing within the non-trawl Rockfish Conservation Area (RCA) offshore of Washington and Oregon.

The purpose of this EFP is to test modified and control pot gear in the non-trawl RCA off Washington and Oregon. The goal of the experiment is to test of the efficacy of the pots for selective harvest of lingcod (*Ophiodon elongatus*) and avoidance of rebuilding stocks - particularly yelloweye rockfish (*Sebastes ruberrimus*) - and Pacific halibut (*Hippoglossus stenolepis*), a prohibited and limiting species. Yelloweye rockfish and Pacific halibut are commonly caught in association with lingcod targeting, whether by trawl or hook and line gear. If successful, the pots will yield conservation gains by reducing the bycatch of yelloweye rockfish and Pacific halibut while increasing the utilization of lingcod. The EFP applicants and participants will cover all quota needs, research, and observer costs and fishing participants, therefore we are not requesting any additional set-asides for this EFP.

Even as overfished stocks continue to rebuild, and even with the individual fishing quota (IFQ) program for the trawl sector, fishermen will continue to be constrained because they lack gear that is selective enough to catch certain target stocks without incurring substantial bycatch of rebuilding stocks. Of the 30 species and species complexes included in the IFQ program, in 2014 and 2015 fishermen caught only four – sablefish north of 36^0N. latitude, petrale sole, Pacific whiting (2014 only), and canary rockfish (2015 only) – at or near (>80%) the amount allocated. For all non-whiting species and species complexes, the overall attainment of trawl allocation in 2014 and 2015 was only 26%. This under-utilization of the resource results in lost opportunities for revenue that would support fishermen and coastal communities. The main reason for this lack of utilization is the fear of catching “choke” species (e.g., rebuilding and prohibited species). The fishery needs innovations in gear design, to increase the harvest of healthy species and provide for greater utilization of optimum yields, while providing for conservation of species of concern.

Lingcod is a fitting focal species for the team's efforts because of its broad coastwide abundance, high value, and catches that are far below allowable harvest levels. Lingcod – even when caught with bottom trawls – already have one of the higher price-per-pound values in the West Coast groundfish fisheries. Only 16% of its 2.5 million pound IFQ allocation north of $40^{0}10'$ N. latitude was caught in 2015. Coastwide in 2015, only 13% of the quota allocated (i.e., the Harvest Guideline) to the trawl and non-trawl sectors was landed. Even if fishermen had access to fish in the RCAs, they may avoid targeting lingcod with trawl or longline gear because of the risk of catching rebuilding stocks that co-occur with lingcod. Lingcod caught in pots also have a higher value, due to the freshness and quality of the fish. For example, in 2015, price-per-pound for the small amount of lingcod caught in pots was 40% higher than those caught in trawls; line-caught lingcod was 167% higher price-per-pound.

This EFP is a core part of a broader effort between The Nature Conservancy's Washington and Oregon chapters (Conservancy), fishermen in Washington and Oregon, and researchers from the University of Washington to address the need for stock recovery and the needs of communities that depend on fishing. The effort has 4 components:

1. Gear innovation: The cornerstone of the work is development and testing of the pot gear described in this EFP. If the gear proves effective, fishermen can safely fish the design in areas where lingcod, rebuilding groundfish stocks and Pacific halibut co-occur, allowing fishermen to utilize more of their lingcod quota, while conserving less desirable species.
2. Adoptability: The gear's potential appeal to fisherman is also critical. To assess the likelihood that fishermen will adopt the gear to target lingcod, the University of Washington team members are modeling the likelihood of adoption based on the gear's catch performance, its selectivity, and the condition of the catch.
3. Food web modeling: An increase in lingcod harvest also may have the benefit of reducing pressure on rockfish stocks, as lingcod are a voracious predator on several species of rockfish. As another element in the team's work, researchers from the University of Washington are modeling potential population level impacts to rockfish from reducing predation pressure from lingcod.
4. Market analysis and strategic planning: Complementary to gear innovation is the team's effort to understand how an increased supply of sustainably caught lingcod can be matched to consumer demand. Over the next 2 years, Conservancy staff is developing a strategic plan and solidifying necessary partnerships for advancing a distribution system and market pipelines for sustainably-caught lingcod and possibly other species.

Another element of the long-term effort has been the assembly of a steering committee. Membership includes the collaborators, fisheries scientists, fishing industry experts, and fisheries managers. The group helped to review 2014 test fishing protocol, and has largely been on hiatus in 2015. Selected committee members have provided feedback on this EFP. If this EFP is approved, the committee will work to select test fishermen, assist in site selection, review and comment on research findings, and share the results through their professional networks.

The plan is that with a modified gear type for the groundfish fishery and an improved pathway from pot to plate, fishermen will have the means to fish profitably with less impact on non-target stocks.

Disposition of all species: Retention and discard will be allowed under existing IFQ Program rules. Catch will be documented by the observer program and counted against available quota in the vessel account. Additionally, EFP participants and Conservancy staff will take biological samples (e.g., collection of stomach contents, fin clips, otoliths) from a portion of lingcod that are caught, for analysis by partners at the University of Washington.

d. Justification

Recovery of overfished stocks has and will continue to drive management decisions in the groundfish fishery for the next several decades. Of the ten West Coast groundfish species that have been declared overfished since the late-1990s, five – bocaccio, cowcod, Pacific Ocean perch, darkblotched and yelloweye rockfish – are still rebuilding. Rebuilding analyses indicate that bocaccio and darkblotched rockfish populations are likely to rebuild in 2017, and cowcod in the next decade. Those same analyses show that yelloweye rockfish and Pacific Ocean perch will take much longer to recover. Managers will have to make any regulatory adjustments with substantial scrutiny to ensure successful rebuilding of yelloweye rockfish and Pacific Ocean perch stocks.

The RCAs exist primarily to curtail incidental catch of overfished and rebuilding groundfish stocks caught with stocks that are more abundant. Economic recovery and long-term sustainability of the fisheries depend on commercially viable, low-bycatch gear alternatives. In open areas, bottom trawling will continue to be a part of the groundfish fishery, but fishermen are looking for an addition to their gear sheds. Now is an ideal time to develop a modified gear type to selectively harvest fish.

Beginning in 2014, the EFP applicants conducted gear testing of modified types of pot gear designed for selective harvest of lingcod, with little to no bycatch of other species. The team fished the pots in depths ranging from 100-206 fathoms in Washington waters seaward of the non-trawl RCA (Figure 1). We tested three types of gear – 1) collapsible-wing, 2) hard-trigger, and 3) soft tunnel entries (Figures 2-5) – equipped with escapement and excluder equipment (e.g., aluminum rings, sock tunnels). We encountered very few lingcod in our sampling, unfortunately. However, catch rates of sablefish with the collapsible-wing gear were more than double, and up to eight-fold higher, than that of catch rates for other pots. In the 16 days of test fishing conducted, catch included 1,876 sablefish, 6 lingcod, 0 yelloweye rockfish, 2 canary rockfish and 7 Pacific halibut, which was well below the amount of quota we had allocated for test fishing. Low catch of lingcod in this testing could be due to several factors, including low sample size, gear design, or location. Prior to test fishing proposed in this EFP application we will conduct outreach with fishermen and gear manufacturers to collect additional ideas and insights about how to best design and test the gear. We will conduct additional gear testing in 2016, yet need access to areas within the non-trawl RCA to test how critical location is to gear efficacy.

The EFP is necessary because while we can continue to test gear efficacy outside of the non-trawl RCA, adult lingcod are most abundant at depths less than 100 fathoms [1] (i.e., within the non-trawl RCA; Figure 6). In visual surveys in the recently completed RCA Study[2], that included the Central California

[1] Smith and Forrester 1973, and Jagielo 1988 *in* Hamel, O.S., Sethi, S.A., and Wadsworth, T.F. 2009. Status and future prospects for lingcod in waters off Washington, Oregon, and California as assessed in 2009. Northwest Fisheries Science Center.

[2] led by the Conservancy, Moss Landing Marine Laboratories /California Sea Grant, and the National Marine Fisheries Service Southwest Fisheries Science Center in partnership with the California Groundfish Collective (formerly known as the CA Risk Pool) and Environmental Defense Fund.

Seafood Marketing Association (CCSMA) EFP (#13-14-TNC-01)[3], researchers found that lingcod densities were approximately 4 times higher in depths less than 100 fathoms, than in depths greater than 100 fathoms. Lingcod densities in hard-substrate habitat were also more than twice of those in soft-substrates. While the study area was in the RCAs (trawl and non-trawl: 30-150 fathoms) off of central California, NOAA's Biogeographic team from the National Center for Coastal and Ocean Science (NCCOS) and a team at NOAA's Northwest Fisheries Science Center[4] generated coastwide predictive groundfish models and maps for the RCA study. In those, modeled lingcod abundance was highest in the deeper portions of the non-trawl RCA (Figure 7). Our focus is to test gear in the deeper portions of the non-trawl RCA (i.e., 50-100 fathoms in Oregon, 75-100 fathoms in Washington), as smaller lingcod are found in shallower depths, and larger lingcod in depths closer to 100 fathoms[5]. If the gear is to be commercially viable, we need to test its efficacy there.

The groundfish fishery is constrained by the RCAs that prevent fishing where rebuilding stocks are most likely to be encountered. The management strategy is rational from an ecological perspective, but may unnecessarily limit the economic performance of the fishery. This is largely due to the absence of gear types that can be used to selectively harvest target species without incurring bycatch of rebuilding stocks. If the testing proposed in this EFP can show that the pots work to selectively catch lingcod, the partnership can provide information for consideration by the Pacific Fishery Management Council and National Marine Fisheries Service (NMFS). While the focus is the lingcod pot, the concept of using gear innovations to re-open fishing opportunities in the RCAs is of region-wide interest.

e. Broader significance

Project success in the long-term will have positive impacts for the groundfish fishery, fishing communities along the coast and consumers in the Pacific Northwest. Through 2016, the Conservancy is developing metrics so that we can elucidate the conservation benefits for people and nature from this project and other engagements on the West Coast.

It is our purpose to make successful gear widely available. The designs are non-proprietary and freely shared with fishermen and fishing gear manufacturers. Because of the more northerly distribution of lingcod, we expect fishermen in Washington, Oregon, and northern California to be the earliest adopters of the gear. If the gear proves successful ecologically and economically at a commercial scale, and if fishermen are allowed to use the gear in closed areas, the team anticipates that catches of lingcod will increase. As quota utilization is so low – 16% of lingcod north of $40^{0}10'$ N. quota caught in 2015 – an increase in catch is well within the ecologically and legally determined guidelines for the fishery.

The nature of the gear – selective harvest – means that "successful" gear could be fished at a commercial scale within the limits of the quota. This means that bycatch of yelloweye rockfish, in particular, must be very low so that quota allowances are not exceeded. If research with University of Washington partners provides insight about the degree to which harvest of lingcod reduces predation pressure on rockfish, we can make a stronger case for ecological benefits of use of the gear. If the gear is successful, it may also lead other groups to modify design of pots for selective harvest of other species or species complexes (e.g., petrale sole).

[3] Final report to PFMC: http://www.pcouncil.org/wp-content/uploads/2015/09/B1b_SUP_OPC2_TNC_EFP_SEPT2015BB.pdf
[4] Results found at: http://www.pcouncil.org/wp-content/uploads/Groundfish_EFH_Synthesis_Report_to_PFMC_FINAL.pdf
[5] Jagielo 1994 *in* Hamel, O.S., Sethi, S.A., and Wadsworth, T.F. 2009. Status and future prospects for lingcod in waters off Washington, Oregon, and California as assessed in 2009. Northwest Fisheries Science Center.

Further, advances made in distribution and marketing that the team has underway as part of the larger project can catalyze market and distribution innovations for lingcod, as well as other fish, caught off the West Coast. Fishermen coastwide can benefit from these markets for sustainably caught seafood. New market pipelines could also bring healthy, sustainably-caught seafood to a wider range of consumers in the Pacific Northwest. Ultimately, the partnership hopes to help boost supply of fish to meet the high demand that already exists.

Finally, all elements of this project, from research fishing to market innovation, are opportunities for fishermen who participate in this EFP to further refine and reinforce their roles as leading advocates for ocean conservation in their communities, in the political arena, and with regulatory agencies. This, in turn, leads to positive environmental outcomes in fisheries, including establishing better fishing practices.

f. Duration of EFP

We propose to conduct 2 years of test fishing - 2017 and 2018. We are requesting that the EFP be granted for January 2017-December 2018 to allow for flexibility in timing of test fishing.

g. Number of vessels covered under the EFP

We anticipate working with 4 fishing vessels from ports in Washington and Oregon. Please see section k for further information on the selection process for EFP participants and vessels.

h. Species to be harvested and harvest estimates

The EFP applicants and participants will provide all quota needed for test fishing. Below is a list of anticipated species, and upper limits that the team may encounter for target and rebuilding/recently rebuilt species for the 2-year duration of the EFP. We developed the estimates of harvest based on assumptions of gear selectivity, average weight of individual species, and upper estimates of the anticipated effort.

	Species to be Harvested	**Harvest Estimates (pounds)**
Target species	Lingcod	Up to 15 metric tons
Rebuilding or recently rebuilt species	Yelloweye rockfish	Up to 100 lbs
	Canary rockfish	Up to 500 lbs
	Dark-blotched rockfish	Up to 500 lbs
	Pacific Ocean perch	Up to 500 lbs
	Petrale sole	Harvest will be limited by the amount of quota available in vessel accounts
Other Species	Sablefish	Up to 5 metric tons
	Minor shelf rockfish, Minor slope rockfish, Splitnose rockfish, Yellowtail rockfish, Other flatfish, Arrowtooth flounder, Pacific whiting, Dover sole, English sole, Pacific halibut	Harvest will be limited by the amount of quota available in vessel accounts

Since we propose to fish within the IFQ Program, we do have the option to purchase or acquire quota if needed. Accordingly, the numbers above are estimates of what we expect we may catch rather than actual caps or limits for the EFP. However, given that our measure of success depends on effective avoidance of yelloweye rockfish, we consider the estimate of yelloweye rockfish harvest to be an internal soft cap for gear testing. While we have the capacity to purchase additional yelloweye rockfish quota, our intent is not to purchase excessive amounts as yelloweye rockfish quota constrains the entire fishery. Rather, we have developed 'move-off' rules, described below, designed to mitigate impacts to yelloweye rockfish.

Move-off rules and thresholds for yelloweye rockfish: While we will supply all needed quota for test fishing, we anticipate having a limited amount of quota for yelloweye rockfish, so we have created move off rules to ensure that we do not fish beyond our means. A move-off rule will be adopted to reduce the risk of catching yelloweye rockfish beyond the amount of quota pounds that the team allocates to test fishing. To begin, we set a yelloweye catch threshold based on dividing the total amount of yelloweye quota available for gear testing across the 4 vessels. The move-off rule is applied when both pot types - the collapsible-wing and standard pot - have been tested in a location. For example, if a collapsible-wing pot was used during the threshold event, it will not be used again in that location. However, if the standard pot has not been tested in that location, it can be tested before applying the move-off rule. If the threshold for a vessel is exceeded, the fishermen will not set the pot there and will move 0.1 miles from that location. If the threshold is exceeded again in the same day, fishermen will move 1 mile from the location.
Threshold amounts are set on a sliding scale so that thresholds are very low (i.e., low amounts of catch trigger the move-off rule) early in the test fishing and become higher near the completion of test fishing. An example of the sliding scale: fishermen have 25 pounds of yelloweye quota in their vessel accounts to cover the 10 days of test fishing. A daily allowable catch (pounds/day) is calculated at 2.5 pounds/day (25 pounds of quota available/days of test fishing remaining). Thus, the threshold on Day 1 is 2.5 pounds of yelloweye, which is equivalent to one fish or less. If, however, yelloweye are not caught on Day 1, the threshold increases. On Day 2, daily allowable catch is 25 pounds of yelloweye / 9 days of test fishing remaining, which is slightly more – 2.8 pounds of yelloweye. While this change from Day 1 to 2 is nominal, it illustrates the sliding scale. A simple sliding scale threshold calculator has been developed in Excel to calculate the threshold on any given day.

i. Monitoring

All vessels will have 100% observer coverage as required within the IFQ Program, funded by industry.

j. Data collection and analysis methodology

Data collection: Conservancy staff and EFP participants will collect the following data: position (GPS coordinates) of each pot, depth, set and haul time and date, bait type, and length and weight of all catch by species per pot. Research fishing will have 100% observer coverage. Conservancy staff and EFP participants will collect stomach contents from a random subsample of at least 10% of all lingcod landed. University of Washington team members will process stomach contents samples and use the resulting data to parameterize models of lingcod consumption of rockfish and other prey.

Analyses: Conservancy staff will calculate catch-per-unit-effort (CPUE) for all species based on catch per pot per hour of soak time. We will also calculate rebuilding to target ratio (rebuilding species

biomass/target species biomass). We will examine patterns in CPUE and rebuilding to target ratio across pot type, locations, depth ranges, and time of day.

In the next year, we are creating metrics of success for gear testing. The two critical determinants of success are: 1) if we catch enough volume of lingcod to make the use of the gear economically viable for fishermen, and 2) if we do not catch substantial amounts of yelloweye rockfish and Pacific halibut. We will base our metric of economic success on observed range of earnings per trip in other pot fisheries (e.g., sablefish). We will establish this range from available catch and revenue data and through outreach to fishermen. For the second element – successful avoidance of non-target species – we will measure one aspect of our success based on if our catch of yelloweye rockfish and Pacific halibut was lower than the amount of quota we estimated to use for the duration of test fishing. We will also look for spatial differences in bycatch rates. One possible outcome of the test fishing is that bycatch rates are low but only outside of high-density yelloweye rockfish areas. If both criteria for success are met, we will consider the gear to be fishing effectively.

k. How vessels will be chosen

The EFP applicants and broader project steering committee will form a selection committee that will select EFP fishing participants to conduct the gear testing outlined in this EFP. As previously mentioned, the steering committee consists of Conservancy staff from several chapters, fisheries scientists, members of the fishing industry, and state and federal fisheries managers. As was done in the CCSMA EFP that was part of the RCA Study, the selection committee will develop an application form to guide participant selection. The committee will use the application to gather information on the applicant's experience fishing with pot gear, in the groundfish fishery, fishing for lingcod, conducting research and/or collaborative fishing, access to permits and quota, and vessel information. The committee will distribute the form to harbor masters, city representatives, commercial fishermen organizations, fish processors, and fishermen in Washington and Oregon so that they can distribute the form throughout their networks. The committee will score and rank applications. The ideal candidates will have the experience and resources listed above. For top candidates, the committee will arrange to have a background check conducted by NMFS Office of Law Enforcement to ensure the selected fishermen do not have any violations. Members of the committee will then meet with top candidates and, if both parties agree to test fishing, sign agreements outlining expectations and data collection protocols for gear testing.

l. Time/place/gear used in fishing

Time: The test fishing will be conducted in 2017 and 2018. We are requesting that the EFP be granted for January 2017-December 2018 to allow for flexibility in timing of test fishing.

Place: The team will test gear within the non-trawl RCA offshore of Washington and Oregon. In Oregon, we will test at depths between approximately 50 and 100 fathoms; in Washington we will test between 75 and 100 fathoms to minimize gear conflict with recreational fishers. Prior to start of test fishing, the EFP applicant and fishing participants will select candidate sites using coarse-scale information from predictive mapping done as part of the RCA Study, fine-scale knowledge from fishermen, and information on distribution of fishing effort by fleet from the Washington's Marine Spatial Planning viewer. We will then review and update candidate sites with recreational and commercial fishermen, and regulators from Washington and Oregon, so that we further minimize gear

conflict based on where the fleets are fishing during the dates and times we plan to conduct test fishing. Test fishing will also avoid yelloweye rockfish hot spots provided by WDFW.

In 2017, we will focus gear testing in areas where lingcod distributions are predicted to be highest and yelloweye rockfish lowest relative to lingcod. We are adopting a precautionary approach in 2017 due to observations from the RCA Study of higher than predicted densities of yelloweye rockfish in high-relief habitats. While these observations were made in central California, we will approach initial sampling with caution to conduct as much gear testing as possible before using the yelloweye quota we can provide. In 2017, if gear testing is successful (i.e., moderate-high lingcod catches; yelloweye catch below allotted quota), we will conduct gear testing in 2018 in areas with predictions of high densities of both species.

Gear type: All pots that we fish will be compliant with existing requirements for pots used to target groundfish. All pots will be equipped with escapement and halibut excluding devices. The control gear is a standard sablefish pot. We will test at least one type of modified pot gear, described below. We have received numerous comments from fishermen and gear manufacturers about ideas for alternative designs. As mentioned previously in this EFP application, we will follow up them and others to identify further pot modifications that may be appropriate to test. The one type of modified pot that we already are interested in testing is a collapsible-wing pot (Figures 2, 5). We chose this modification for further testing based on its higher catch efficiency during 2014 gear testing. General pot dimensions of the collapsible-wing pot with wings folded in are height 35", bottom width 60", and top width 41". The team developed the collapsible-wing design so that as a fish swims around the perimeter of the pot, it inadvertently swims into one of the wings and into the pot. The design capitalizes on behavioral differences between lingcod and rockfish, retaining bottom-dwelling lingcod at the bottom of the pots while allowing rockfish to escape through 10 inch fixed aluminum rings in the top of the pots. Accordingly, the collapsible-wing pots are taller than standard sablefish pots. The wings are collapsible so that fishermen can secure them to the side of the pot so that pots can be stacked on deck, as is the practice when commercially fishing with pots.

Gear amount: The fishermen will fish pots individually to minimize habitat damage caused by pots dragging along the ocean floor. In 2017, we will fish 48 pots. The maximum total pot sets will be 1,344, which will be done by 4 vessels, each fishing 14 days, each fishing 6 pots per group and 4 groups per 24-hour period. Each fishermen will fish two groups of 6 pots, where each group will be set (as individual pots) at a the same approximate depth. Each group will consist of 2 collapsible-wing, 2 control pots, and 2 of an additional modified design to be finalized through outreach with fishermen and net manufacturers. The fishermen will set 4 groups of 6 pots each 24 hour period – 2 groups during the day and 2 at night. We will sample the same locations during the day and at night. We will sample in one location for up to two days (two day and two night sets) before moving to another location. If, after one complete day (one day and one night set), we do not catch fish, the fishermen will move to a new location. Additional move-off protocol, described in section h ("Species to be harvested and harvest amounts"), apply when fishermen catch yelloweye rockfish or Pacific halibut beyond threshold amounts. If the gear fishes successfully in 2017, we will double the amount of effort, so a total of 96 pots fished in a maximum of 2,688 sets.

m. Signature of the applicant

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Figure 1. Study Area for 2014 gear testing

Figure 2. Collapsible-wing pot for EFP testing. Arrows indicate entry points for fish. Escapement ring not shown.

Figure 3. Trigger pot gear with top-mounted camera on deck of F/V Morning Star. Preliminary gear testing, June 2014.

Figure 4. Aluminum escapement ring mounted in top webbing of trigger pot. Preliminary gear testing, June 2014.

Figure 5. Sablefish catch in collapsible-wing pot. Preliminary gear testing, November 2014, off Ilwaco, WA.

Figure 6. Lingcod catch in the observed fishery: 2002-8. From: Hamel, O.S., Sethi, S.A., and Wadsworth, T.F. 2009. Status and future prospects for lingcod in waters off Washington, Oregon, and California as assessed in 2009. Northwest Fisheries Science Center.

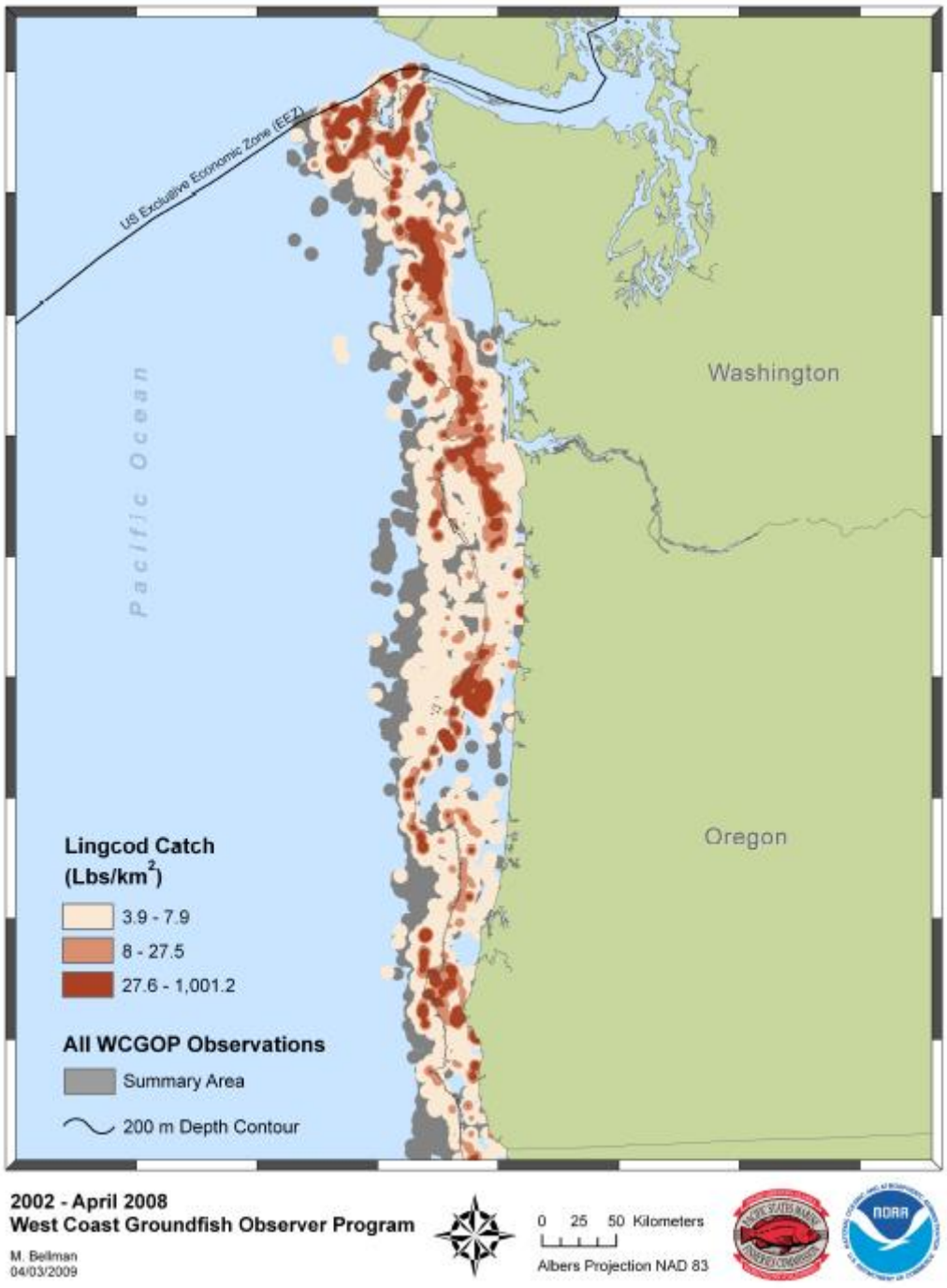

Figure 7. Estimate of relative abundance of lingcod, derived from 2003-10 West Coast Groundfish Bottom Trawl Survey dataset. Data from: http://efh-catalog.coas.oregonstate.edu/synthesis/; Methods described in National Marine Fisheries Service (NMFS). 2013. Appendix to the Groundfish Essential Fish Habitat Synthesis: A Report to the Pacific Fisheries Management Council. NOAA NMFS Northwest Fisheries Science Center. Seattle, WA. 378 p.