



R & E Grant Application 11-13 Biennium

Project #:
11-052

Black Rockfish PIT Tagging

Project Information

R&E Project Request: \$9,880.00
Match Funding: \$172,760.00
Total Project: \$182,640.00
Start Date: 12/5/2011
End Date: 6/30/2013
Project Email: David.W.Wagman@state.or.us
Project Biennium: 11-13 Biennium
Organization: ODFW - Newport

Applicant Information

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Past Recommended or Completed Projects

This applicant has no previous projects that match criteria.

Project Summary

This project is part of ODFW's 25 Year Angling Plan.

Activity Type: Monitoring

Summary: Each year, black rockfish (BRF)(*Sebastes mystinus*), account for up to 85% of the recreational groundfish catch. The daily bag limit of groundfish has fluctuated considerable since 1970. Accurately estimating the population size will assist in maintaining the sustainability of this important resource. The black rockfish PIT tagging program was begun in 2002. The project's goal is to accurately estimate the population size of BRF within the nearshore zone off the central coast between Newport and Waldport, OR. The project accomplishes this goal by tagging and releasing at least 3000 BRF each spring. Throughout the year BRF are sampled from the Newport private and charter fleets to recover tagged fish from the daily catch. The number of returned tags is used to estimate total mortality rate using the Brownie Capture, Mark and Recapture Model. This estimate can then be applied to the annual recovery rate and combined with BRF landing data to

estimate annual population exploitation rate, survival rate and abundance. As the study has progressed the number of tagged fish has increased to nearly 35,000 and over 2600 tags have been recovered; because of this, the confidence intervals of our estimates have gotten smaller leading to a better estimate of the population size. This analysis was used in the 2007 stock assessment and when combined with other data lead to higher daily bag limits in 2010. In 2010, the project estimates between 1.5 and 2 million BRF reside in the study area.

Objectives:

The objective of the project is to accurately estimate the population size of BRF. Monitoring the status of BRF populations is essential to the continued success of Oregon's recreational bottomfish fishery, especially as more offshore area is closed to protect overfished species. The primary objective of this study is to tag and release at least 3,000 BRF each year in the vicinity of Newport, Oregon, and to recover tags from the recreational fishery landings. A multi-year capture-mark-recapture (CMR) model is used to provide annual estimates with corresponding confidence intervals of population exploitation rate, survival rate and abundance of BRF off Newport. Results are used to inform stock assessments and to monitor the status of the BRF population off the central coast of Oregon. Ancillary data generated by this project has been and will continue to be used to understand the ecology and fishery dynamics of black rockfish. A secondary objective is to opportunistically collect age and maturity samples from less common rockfish species (*Sebastes* spp), in the course of checking for tagged black rockfish. Basic life history parameters are not well known for these exploited species and are necessary to better manage Oregon's nearshore fisheries and ecosystem.

Fishery Benefits:

The ability to estimate population size of BRF accurately will help to maintain this sustainable natural resource for the recreational and commercial fisheries off the coast of Oregon. This project helps to protect and enhance Oregon's fish for use by future generations by producing more accurate data to estimate population size. The BRF fishery is unique in that it is a year round fishery. It has provided fishing opportunities during years of diminished salmon returns and has become a mainstay of Oregon recreational fisheries. The continuation of this fishery relies on precise estimates of population size. As fluctuations occur in this fishery, managers can adjust quickly because of the accuracy and timeliness of the data produced by this project.

Watershed Benefits:

There is no direct benefit to the watershed.

Current Situation:

Currently sampling of the black rockfish catch is hampered by the use of older technology tag reader scanners. These devices are the only means of detecting the tags because they are internal. Improvements in scanner technology has progressed in the ten years since this project began. Although the current scanners accurately detect tags, they are constantly breaking down because they are not waterproof, prone to battery failures

and rough treatment while in the field. We have tested and purchase a new type of scanner, Y-TeX Live reader scanner, which are waterproof, have reliable rechargeable batteries and have a high shock proof capability. These readers have increase detection distance thereby further improving the tag recovery aspects of this project. The project's current supply of PIT tags is insuffiecent to tag 3000 BRF in 2012. The current budget only contains enough money to purchase 1600 tags for 2012. Funding year 2011-2012 has seen reductions in the overall budget for this project while increasing personnel costs have been included in this budget. These reductions have caused a decrease in the number of PIT tags that can be purchased for the next tagging season; decreases in the number of days that the charter vessel will be tagging black rockfish from 20 to 15 days; and reduced the project's capacity to update old technology and improve overall tag recovery data. We ask that R&E help to restore the Project's ability to continue to monitor the BRF population size by funding the purchase of 1700 PIT tags and 5 Y-TeX live track readers. The additional tags will insure the project can tag up to 3500 BRF during 2012. The new readers will improve the project's detection of tagged fish recoveries.

Alternatives: Due to the habitat where these fish reside the use of alternative sampling methods such as trawl or longline surveys to estimate population size is not possible. The Newport BRF population resides in and around rocky reef structures at depths of 5 to 20 fathoms. This environment would render these other techniques useless. Likewise alternative methods do not exist for the detection of the internal PIT tags. These tags are passive and require an external radiowave frequency to activate the tag for communication.

Designer: The original design of this project was performed by Steve Parker, Polly Rankin, Robert Hannah, and Don Bodemiller.

Methods: Passive Integrated Transponder tags or PIT tags have been used to mark BRF from March through June each year since 2002. Twenty days at sea are needed to tag at least 3000 black rockfish. The study area off the central Oregon coast extends from Gull Rock southward to Alsea Bay. PIT tags are undetectable by recreational fishers, removing the possibility of non-reporting by the anglers.

Fish are targeted by commercial passenger fishing vessel (CPFV) skippers with local knowledge of rocky reef structures. Recreational bottom fishing gear with barbless hooks is employed to capture BRF. Fish are first scanned for the presence of an existing tag, assessed for barotrauma (pressure-related) injuries, measured to the nearest centimeter, assessed for any other fishing or handling related injuries, injected with a PIT tag, and re-scanned to record the PIT tag number. The injection site for the PIT tag is the anterior of the origin of the pelvic fin into the hypaxial musculature. This site was chosen because it is outside the area typically taken as a fillet, and a tag retention study found 100% tag retention in fish tagged at this site (Parker et. al 2003). Fish are then released at the surface into an open-bottom holding pool lashed to the lee side of the boat and allowed to re-submerge. Fish that cannot descend due to expanded gases in the body were removed from the pool and assisted with the aide of a weighted recompression cage to a desired depth of 10-15 meters. Published studies (Parker et. al 2006, Hannah et al. 2007) indicate that returning black rockfish to depth quickly may be an effective method for minimizing barotrauma related mortality. Beginning in 2006 several new sub-categories of barotrauma related injuries were recorded. The presence or absence of an everted esophagus (gut in mouth) was further refined as esophagus in buccal cavity (gut 1) or esophagus pushed beyond the buccal cavity one centimeter or greater (gut 2). Symptoms related to barotrauma in the eyes (bulging eyes and air in eyes) were classified as occurring in the right eye only (R), left eye only (L), or both eyes (B). Tag distribution is matched to approximate fishing pressure, determined by numerous interviews and conversations with CPFV operators and recreational fishers. Fish are captured by volunteers, paid fishermen,

ODFW staff, and vessel crew members. Actual tagging of fish and data recording are completed by ODFW staff.

In the recapture portion of the project, sampling staff visit locations (Newport and Depoe Bay) where fish are landed to scan for the presence of PIT tags with Allflex® or Y-Tex® portable scanners. Tag detection rate experiments conducted by project staff with known tagged black rockfish carcasses show rates of detection to be an average of 98.0%. The total number scanned are tallied and the number of fish missed (not scanned) are estimated through discussions with boat captains, crew, filleters, and ODFW port samplers. Each day CPFV skippers and crew members are asked the primary area that they fished to compare distribution of effort and recovered tags to the distribution of tagged fish by area. Recapture efforts are focused on charter fishing operations, which account for 82.5% of the annual black rockfish landings in Newport, and 86.7% in Depoe Bay (ODFW internal data). Typically, ODFW staff meet charter boats as they return to port, and scan fish for PIT tags as they are filleted. Private boats are met by ODFW Ocean Recreational Boat Survey (ORBS) samplers. Sampling activities and priorities are coordinated through daily charter office visits, bar crossing counts, ORBS samplers, and Pacific States Marine Fisheries Commission (PSMFC) samplers to maximize efficiency of coverage. Most of the marked carcasses recovered are retained to collect data on length, sex, maturity, internal and external condition, tag site migration, and extraction of the physical tag.

Wagman, D. W. and Krutzikowsky, G. K. 2010 annual progress report, black rockfish exploitation rate study. Oregon Department of Fish and Wildlife internal report. (attached)

Hannah, R. W., M. T. O. Blume and J. E. Thompson. 2009. Length and age at maturity of female yelloweye rockfish (*Sebastes ruberimus*) and cabezon (*Scorpaenichthys marmoratus*) from Oregon waters based on histological evaluation of maturity (pdf) . Oregon Dept. Fish Wildl., Information Rept. Ser., Fish. No. 2009-04. 29 p.

Brownie, C., D.R. Anderson, K.P. Burnham, and D.S. Robson. 1985a. Statistical inference from band recovery data—a handbook, 2nd edition. U.S. Fish and Wildlife Service Resource Publication 156.

Buell, T.V., R.W. Hannah, and S.J. Parker. 2007. Estimation of black rockfish (*Sebastes melanops*) population parameters from recreational fisheries mark-recovery data off Newport, Oregon. In: The Status of Black Rockfish off Oregon and California in 2007. Pacific fisheries Management Council, Appendix A. Pacific Fishery Management Council 2130 SW fifth Ave. Suite 224, Portland, OR 97210

Hannah, R.W., and K.M. Matteson. 2007. Behavior of nine species of pacific rockfish after hook-and-line capture, recompression, and release. Transactions of the American Fisheries Society 136: 24-33.

Parker, S.J., P.S. Rankin, J.M. Olson, and R.W. Hannah. 2007. Movement patterns of black rockfish (*Sebastes melanops*) in Oregon coastal waters. pp 39-57 IN: J. Heifietz, J. Dilusino, A.J. Gharett, M.S. Love, V.M. O'Connell and R.D. Stanley (eds.) Biology, Assessment, and Management of North Pacific Rockfishes, Alaska Sea Grant University of Alaska, Fairbanks.

Parker, S.J., H.I. McElderry, P.S. Rankin, and R.W. Hannah. 2006. Buoyancy regulation and barotrauma in two species of nearshore rockfish. Transactions of the American Fisheries Society 135: 1213-1223.

Parker, S.J., and P.S. Rankin. 2003. Tag location and retention in black rockfish: Feasibility of using PIT tags in a wild marine species. North American Journal of Fisheries Management 23: 993-996.

Inspector: Gway Kirchner; Troy Buell; Greg Krutzikowsky

Funding Elements: R&E funds will be used for the purchase of five Y-TEX Live Tracker Readers used for the detection of internalized PIT tags in BRF sampled in the recreational fisheries of Newport and Depoe Bay, OR. R&E funds will be used to purchase 1700 PIT tags to be used during 2012 tagging season.

Partners: Yes

1) US Fish and Wildlife Service is a major contributor to this project, contributing yearly 75% of the operating funding for this project.
 2) The State of Oregon contributes 25% of the operating fund for this project.
 3) General public volunteers are very important to the success of the project's tagging operations. During 2011, thirty seven volunteers made 116 trips and accounted for nearly 33% (1357) of the BRF caught and tagged. Each year between 20 to 50 volunteers donate a minimum of 8 hours a day and travel expenses to participate on this project. In 2011, volunteers donated 7110 miles and 1000 hours.

Existing Plan: No

Affected Contacted: Yes

Affected Supportive: Yes

Affected Comments: The Newport charter fleet is directly affected by this project. They contribute their knowledge of the area and fish locations to the project. They also bid on the annual contract for tagging operations and willfully give information on the areas fished and the size of the total catch. Many members of the Newport CPFV fleet have expressed their support for the project.

Project Schedule/Participants/Funding

Activity	Date	Participants
Start of Federal year 2012, dock-side scanning continues	10/1/2012	NRS-2
Annual 2010 SFR Progress Report completed, dock-side scanning continues, vessel contract preparation	12/14/2012	NRS-2
Vessel contract open for Bids, dock-side scanning continues, purchase PIT tags and new readers	1/5/2012	NRS-2, Charter Fleet
Vessel contract awarded, dock-side scanning continues, issue new readers to Port samplers	2/1/2012	NRS-3, NRS-2, Charter vessel captain
At-sea tagging operations begin, dock-side scanning continues	3/1/2012	NRS-2, EBAs, volunteers, vessel crew, 5 employees
At-sea tagging operation end, dock-side scanning continues	6/30/2012	NRS-2, EBAs
Dock-side scanning intensifies	7/1/2012	NRS-2, EBA

End of Federal Fiscal year, dock-side scanning continues, data preparation and analysis	9/30/2012	NRS-2
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Affected Species:

Black Rockfish, *Sebastes melanops*

Project Permits

This project has no permits.

Project Monitoring

Organization	Address	Activity	Frequency
US Fish and Wildlife Service	911 NE 11th Ave. Portland, OR 97232	Progress Report	Annual

Project Maintenance

This project has no maintenance plans.

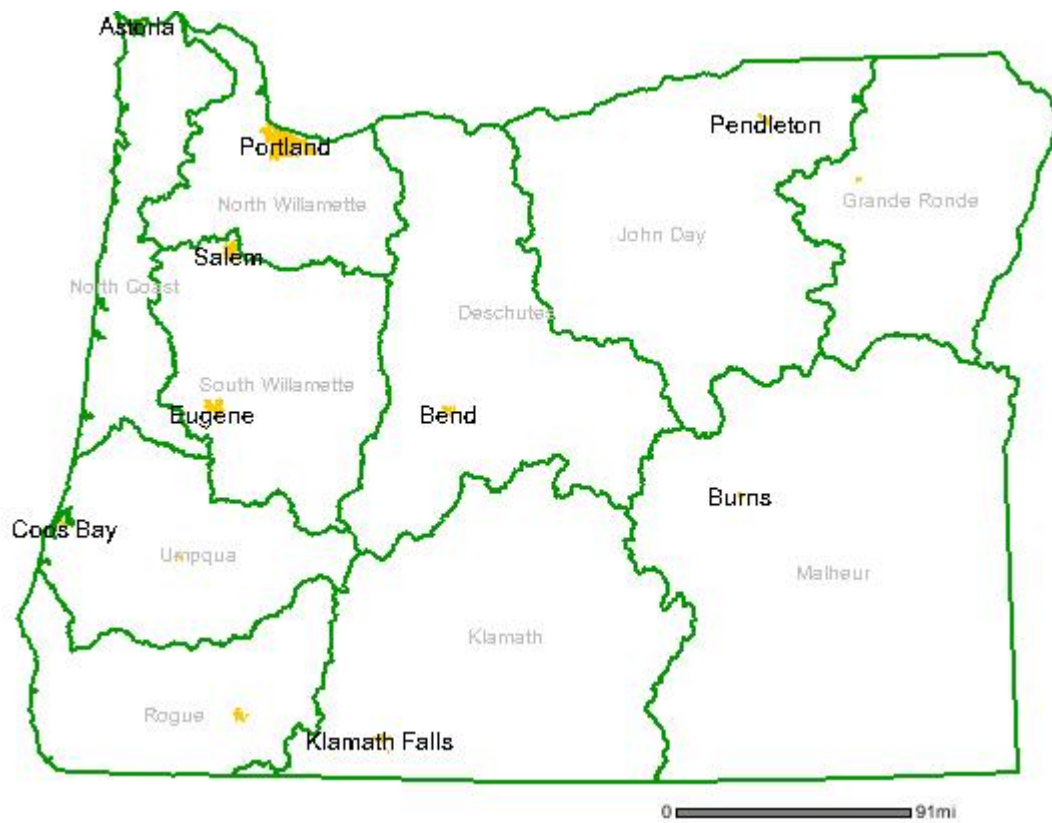
Project Match Funding

Funding Source	Cash	In-Kind	Other	Description	Total	Secured?	Conditions?	Comments
R&E Request	\$9,880.00	\$0.00	\$0.00		\$9,880.00	No	No	
U.S. Fish and Wildlife Service	\$129,570.00	\$0.00	\$0.00		\$129,570.00	Yes	No	
State of Oregon	\$43,190.00	\$0.00	\$0.00		\$43,190.00	Yes	No	
				Total Match Funding:	\$182,640.00			

Project Budget

Item	Item Type	Units	Unit Cost	R&E Funds	Match Funds	Total
indirect costs	Administration	1	\$26,685.00	\$0.00	\$26,685.00	\$26,685.00
charter vessel	Contracted Services	1	\$26,250.00	\$0.00	\$26,250.00	\$26,250.00
PIT Tags	Equipment	1700	\$2.90	\$4,930.00	\$0.00	\$4,930.00
scannners	Equipment	5	\$990.00	\$4,950.00	\$0.00	\$4,950.00
P/S Total	Personnel	1	\$110,845.00	\$0.00	\$110,845.00	\$110,845.00
S/S Total	Supplies/Materials /Services	1	\$8,980.00	\$0.00	\$8,980.00	\$8,980.00
					Total Budget:	\$182,640.00

Project Map



Additional Files

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[Pit Tagging Study Area](#)

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