R & E Grant Application 23-25 Biennium

Project #: 23-014

ROV replacement for nearshore video surveys

Project Information

Requested Cycle:	23-1
R&E Project Request:	$200,000
Other Funding:	$0
Total Project:	$200,000
Spending Start Date:	7/1/2023
Spending End Date:	6/30/2025
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Project End Date:	6/30/2025
Organization:	Oregon Department of Fish and Wildlife

Applicant Information

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Past Recommended or Completed Projects

This applicant has no previous projects that match criteria.

Authorized Agent

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Location Information

Where is it?

The project will occur Statewide

Project Summary

Project Summary

Please provide a couple sentence summary of the proposal.

This project would replace the failing ROV (Remotely Operated Vehicle) used for video surveys that track populations of harvested species in nearshore rocky habitats. The ROV gathers abundance data for many fish and invertebrates, especially seafloor-associated species like quillback rockfish that may further reduce angler opportunity without continued data sources.

Overall Project Goals

Describe the primary goals or outcomes of the entire project, including elements not requesting funding from R&E.

The overall goal is to support the Marine Program's technical ability to conduct accurate video surveys for quillback rockfish and other species in shallow rocky reef habitats where fish and invertebrate abundance data are lacking. Acquiring these data reduces the risk that a poorly-informed stock assessment will impact angler opportunities.

Primary objectives of R&E funding

Please describe the measurable objectives for the R&E portion of the funding request.

Purchase a replacement ROV allowing the Marine Program to extend and increase the accuracy of video surveys of multiple fish and invertebrate species in nearshore rocky habitats, starting in 2024 and lasting for at least 20 years.

Current Situation/Justification

Please describe the current situation and explain why this funding is needed.

The ODFW Marine Program acquired its current ROV in 2000, and has invested two decades of work in developing video transect sampling strategies, survey equipment, and data analysis approaches. The methods were recently approved for inclusion in stock assessments, for the first time, by the Pacific Fishery Management Council. Now, ODFW's ability to conduct ROV video surveys is threatened by aging equipment. Replacement of the ROV's tracking system, supported in part by R&E in the previous cycle, was a step toward sustaining our capabilities. The old ROV and its control console are well past their supportable lifetime and are failing, already significantly impacting the quantity and quality of surveys we are able to conduct. Meanwhile, the 2021 quillback rockfish stock assessment found unsustainable catch rates in Oregon. Consequently, retention by sport anglers was prohibited and the commercial quota was effectively eliminated. Unfortunately, the closures also eliminate the key data source (fishery landings) that inform management. Quillback rockfish are a solitary species found in nearshore rocky habitats, and consequently there are few effective survey techniques other than video surveys, since net surveys are not viable in these rocky habitats and acoustic techniques are ineffective on the seafloor.

Recreation and Commercial Benefit

This project will provide benefits to:

Recreational fisheries
Commercial fisheries

Explain how this project will contribute to current (and/or potential) fishing opportunities, access, or fisheries management.

The immediate benefit of the project lies in sustaining and improving ODFW's ability to gather data critical to managing nearshore fish stocks in general, and quillback rockfish specifically. This is a long-term investment in eventually plugging the hole in quillback rockfish abundance data and habitat usage understanding, which are both necessary if the current harvest prohibition is to be lifted. The quillback closures represent a potential loss to approximately 100,000 recreational marine angler trips annually (5 year mean), and over $20,000 of commercial ex-vessel value (2020 - 2021 mean). Additionally, sustaining our ROV survey capacity will have benefits across the multiple fish and invertebrate species included in these surveys.

While quillback rockfish present the most immediate and obvious angler access concern, there is a concern that fishing access to other species is susceptible to "assessment risk", where data deficiency causes conservative harvest restrictions. The ROV provides data for common benthic species such as lingcod and kelp greenling, but is well suited to support assessments of rarer species including vermilion, copper, China, tiger, and rosethorn rockfish. Additionally, understanding habitat use by yelloweye rockfish on nearshore reefs is an important aspect of improving general angler opportunity as that species' stock rebuilding continues.

Percent benefit split between Commercial and Recreational anglers:

30 % Commercial
70 % Recreational

Please explain, or justify, how the percentage split was determined:

This ratio is the mean of 20 years (2000-2020) of actual quillback rockfish harvest amounts by recreational and commercial anglers, respectively. This project's extension and improvement in technical capacity of video assessments serves both communities. The commercial/rec split is likely to vary somewhat among the multiple species that will be included in these surveys, but we used quillback rockfish as the most clear-cut example of a species that presents opportunities for benefit.

This project has been identified as an ODFW priority for:

Statewide

Does this project directly support implementation of the ODFW Strategic Plan and/or current Fish Division priorities?

Yes

The replacement of the ROV survey equipment (the ROV itself and its control equipment) was identified as a provisional Fish Division spending priority for the previously anticipated funds associated with the Restore America's Wildlife Act.

Please briefly explain when this was identified as a priority and what process or workgroup was used to identified this as an ODFW priority.

Discussions among Marine Program leadership, the RAWA Vision Team, and Fish Division

leadership over the past year.

Identify any plan or other document that identifies this priority.

The 2019 ROV methodology review conducted by the PMFC's Science and Statistical Committee identified shallow nearshore regions as a priority for improving the utility of ODFW's fishery independent surveys. https://www.pcouncil.org/documents/2020/08/d-4-attachment-1-2020-methodology-review-of-rov-survey-designs-and-methodologies.pdf

The 2022 quillback rockfish assessment identified research on the range of sizes available by depth as an important priority. The ROV surveys provide unbiased fish size data by depth. https://www.pcouncil.org/documents/2021/12/status-of-quillback-rockfish-sebastes-maliger-in-us-waters-off-the-coast-of-oregon-in-2021-using-catch-and-length-data-december-2021.pdf/

Oregon's Nearshore Strategy features quillback rockfish as a Strategy Species and includes recommendations on conducting fishery independent surveys, improving stock assessments, and understanding ecosystem responses to climate change. https://oregonconservationstrategy.org/oregon-nearshore-strategy/species/ https://oregonconservationstrategy.org/oregon-nearshore-strategy/recommendations/

Is this project part of an approved Salmon-Trout Enhancement Program (STEP) activity?

No

This project is intended to benefit the following species:

Marine Fish Species
Quillback rockfish
Other Fish Species
all nearshore rockfish and other groundfish
Other Species
all rocky habitat associated invertebrates

This project will benefit anglers or fishery by providing:

Monitoring/Research

Monitoring/Research

This project will be used to evaluate:

Population composition (i.e age, species, survival, size, or genetics)
Habitat (i.e structure, passage, water quality)
Distribution (i.e. presence, abscence, abundance)

Has this project been reviewed or developed by an individual with appropriate qualifications (i.e ODFW biometrician, research professor)?

Yes

The research is conducted by qualified marine scientists within ODFW's Marine Program. The Program's ROV video survey methodology and data have been reviewed and endorsed by the Pacific Fishery Management Council's Science and Statistical Committee for inclusion as a data source in stock assessments.

Is this study critical to fishery management decisions?

Yes

Quillback rockfish (and other rockfish and groundfish) population status, size distribution, and habitat utilization.

Yes

Data from video surveys of nearshore rocky habitats will be more important in upcoming stock

assessments (likely to occur by 2025 for quillback rockfish).

Is there a plan to repeat this monitoring or research in the future?

Yes

The proposed equipment purchase is one-time, but the equipment will support a research program that is intended to develop timeseries of organismal abundance/distribution data for many years.

Will the data be reported or published?

Yes

Survey data provided to stock assessors will be publicly available. Survey summary reports will be provided on the Marine Program's webpage. Scientific publications will eventually summarize the findings of the overall nearshore research program.

Project Description

Schedule

Activity	Date	RE Funding
ROV purchase initiated. Ordering could occur as soon as funding is approved by the Commission.	June 2023	No
ROV delivery likely to take 1 year, due to current supply chain challenges in the marine technology industry.	July 2024	Yes
Incorporation of the new ROV into nearshore reef video surveys.	September 2024	No

Permits

Permit	Secured?	Date Expected
N/A	No	

Project Design and Description

Please describe in detail the methods or approach that will be used to achieve the project objectives.

The scope of this proposal is to support replacement of the ROV that ODFW will use in future surveys. Information about the sampling approaches that ODFW uses in remotely operated vehicle (ROV) video surveys efforts can be found in the recent Marine Reserve Synthesis Report (https://drive.google.com/file/d/1Hn8GJniIsJRGSwpS1vMIZ0G87b45r3f-/view) and its supporting documents (https://ecologyreports.oregonmarinereserves.com/).

Alternatives to ROV replacement have already been extensively pursued, and we have reached the end of our ability to procure replacement parts and "beg, borrow, or steal" needed components. The staff time and resources already allocated to troubleshooting and repairing the failing electronics has become unsustainable. We have expanded our video sampling capabilities through the acquisition of an inexpensive shallow-water "mini-ROV", but that small battery-powered system is not capable of fully filling the need for large-scale, systematic video transect surveys.

Alternate funding has been pursued, but the unfortunate failure of the RAWA bill last year increased the need to search out new sources of funding. While not identified explicitly as match on this R&E budget, the Marine Program does invest heavily in the ROV sampling program through support for staff and supply budgets to maintain ROV operations. Additionally, program staff regularly write external proposals that help fund ROV operations and equipment modernization (cameras, sensors, control equipment, etc.). The program will continue to seek

cost sharing partners for the ROV replacement and will likely have some capacity to fill gaps in the purchase cost in the coming biennium. Therefore even partial funding from R&E may provide the cornerstone needed to secure a path to ROV replacement.

Engineering

Does the project involve capital improvement, engineering, site grading or other construction?

No

Project Management and Maintenance

What is the life expectancy of R&E funded construction, structures, equipment, supplies, data or fishery?

The ROV and control console should last 20 years with continued maintenance. The data gathered will be valuable in perpetuity; marine timeseries for organismal abundance will be extremely valuable for future resource managers.

Who is responsible for long term management, maintenance, and oversight of the project beyond what is funded by R&E.

ODFW's Marine Habitat Project staff are devoted to maintaining ROV video survey equipment, with a permanent budget to maintain equipment and conduct field surveys. The Project actively pursues external funding to support increased levels of field sampling effort, and is effective at leveraging existing resources to maximize the value of survey equipment and field sampling opportunities.

Will the project require ongoing maintenance?

Yes

Survey equipment needs to be calibrated and maintained. This is a minimal ongoing cost that can be covered by the Marine Program.

Is there a plan to collect baseline data and to conduct monitoring efforts to measure the effectiveness of the project?

Not necessary

Project Funding

Funding

Have you applied for OWEB funding for this project?

No

Has this proposal, or similar proposal for this project location, previously been denied by OWEB or other funding source?

No

Other Funding Source	Type	Secured	Dollar Value	Comments
N/A		Pending	0	See funding discussion in project description.
		Total	0	

Budget

Item	Unit Number	Unit Cost	In-kind or non-cash contributions	Funding from other sources	R&E Funds	Total Costs
PROJECT MANAGEMENT						
			0	0	0	0
		SUBTOTAL	0	0	0	0
IN-HOUSE PERSONNEL						
			0	0	0	0
		SUBTOTAL	0	0	0	0
CONTRACTED SERVICES						
			0	0	0	0
		SUBTOTAL	0	0	0	0
TRAVEL						
			0	0	0	0
		SUBTOTAL	0	0	0	0
SUPPLIES/MATERIALS						
			0	0	0	0
		SUBTOTAL	0	0	0	0
EDUCATION/OUTREACH						
			0	0	0	0
		SUBTOTAL	0	0	0	0
EQUIPMENT						
ROV (similar to Deep Ocean Engineering Phantom HD2+2)	1	200000.00	0	0	200000	200000
		SUBTOTAL	0	0	200000	200000
FISCAL ADMINISTRATION						
			0	0	0	0
		SUBTOTAL	0	0	0	0
		BUDGET TOTAL	0	0	200000	200000

Internal Review Results

Review Score: 1.4 out of 3

(0 = Do Not Fund, 1 = Strengthen Proposal, 2 = Recommend, 3 = Strongly Recommend)

Summary of Review Team Comments

Internal Review Team was concerned about the large price tag of this application with no match money from other sources.

Specific Review Team Comments

Very expensive ask for RE for equipment.

Very supportive of this grant but stakeholder or partnership contributing funds would make this grant application much more appealing. What funding partners have, if any, been approached to partner towards this purchase, particularly Commercial stakeholders and even the crabbing industry? What funding alternatives has the MRP investigated? Any alternative energy stakeholders at the table and what resources might they be able to contribute?

While I understand RAWA funding falling through (at least for now), this is a pretty sizeable ask for full funding through R&E. They mention partial funding could be useful. How much would be necessary to reasonably leverage other potential funding sources?

Would like to see other grants begin pursued to help off set the RE request.
Suggest partial funding or reapply in a later RE funding cycle.

Provide explanation on alternative funding opportunities that have been investigated, if any. Consider showing ODFW costs for labor/maintenance or other in-kind agency costs associated with ROV maintenance and operation to help justify the R & E Grant Request. Consider adding photos for inform those less familiar with the ROV's

Supports PMFMC approved stock assessment. Potentially long life of investment at 20+ years isn't bad for a piece of technology like this.

The price tag is really large for this ROV and there is no match so the ask is for R&E to fund 100% of the large purchase. Are there any other grants or opportunities for offsetting the cost of the new ROV?

Specific Review Team Questions

No match? Application describes in-kind, but no figure given. Other sources of cash match?

After further discussion, MRP has now committed to at least $50k in cash match for the ROV acquisition. This amount could increase, potentially to $100k, when our next-biennium budget becomes clearer. In-kind match was not quantified because it was not clear how to appropriately construct an estimate. However I will attempt to do so here: we have one full-time NRS-2 whose primary responsibility is to prepare and maintain our ROV survey equipment, implement ROV surveys, and process the ROV tracking data after each survey. This person would likely spend approximately 6 months dedicated to selecting, procuring, setting up, adapting, and testing the new ROV (salary total cost $60k). Another 2 months would be necessary for the NRS-3 project leader to administer the ROV replacement process and guide the new ROV sea trials (salary total cost $23k). Vessel costs for sea trials could be $10k. Therefore a reasonable in-kind match estimate might be $93k.

Plans to broaden the funding partnership for the ROV acquisition include the following three

sources:

1. The Oregon Ocean Science Trust discussed partial funding of the ROV replacement during their recent grant funding deliberations in Jan 2023, and while funds were not allocated at that time, broad support was voiced and there was intent to revisit the need during the next funding cycle.
2. A grant application is currently under development for ODFW's Oregon Conservation and Recreation Fund (due March 23), which has a nearshore research focus and a $50k maximum cap.
3. In both of the past two biennia, the Pacific States Marine Fisheries Commission has granted equipment and survey funding to support our ROV surveys through its IJFA grant program, and we intend to request support from that source in the next cycle.

While it is impossible to pre-assign dollar amounts to these sources or assume success in all of the requests, it seems reasonable to anticipate that these three sources could provide $150k in funding. With $50k from MRP, this would leave just $150k unfunded out of the total $350k cost estimate. Therefore, a reasonable minimum level of partial funding from R&E that could still facilitate success of the acquisition project would be $150k. However, there is a risk that rapid inflation of the cost of a new ROV could put the purchase out of reach. Accordingly, a higher level of R&E funding would be more likely to allow for either a cost increase or failure of one of the other funding requests, and still enable an ROV acquisition.

What happens if this project is funded at the requested level, but the price for a new ROV increases above the funding level?

MRP could absorb some price increase or funding shortfall by increasing its cash match to $100k (with a tradeoff of underfunding some other Habitat Project priority), but beyond that we would likely have to abandon the purchase attempt and return the funds to R&E. There is some evidence of substantial recent inflation in the marine equipment sector, so this is a real risk if our total funding falls short.

What is the expected lifespan of the ROV that would be purchased?

The new ROV should be serviceable for 20 years. Technology developments may make other equipment attractive before that time, but we should be able to capitalize on our equipment for at least 20 years. We exceeded this period with the prior ROV, and we are prioritizing serviceability in the selection of the next ROV.

Additional Files

Budget Information

Maps

Photos

- Photo- ROV — *This shows the current ROV. The many peripherals include specialized lights, cameras, scaling lasers, altimeters, and other sensors.*
- Photo- ROV deck view — *This shows the ROV control trailer, ROV, and umbilical from above, on the deck of a 76' research vessel.*
- Photo- ROV topside control equipment — *This shows the topside ROV control station, with the ROV pilot viewing video from the ROV on the seafloor in real time.*

Design Information

Management Plans and Supporting Documents

Permits and Reviews

Partnerships

Public Comment

Administrative Documents

- Signature authorization

Completion Report

A completion report has not been submitted for this project.