

Mexico Baja California red sea urchin - diver-caught Fishery Improvement Project (FIP) Workplan

Table 1: Workplan Overview

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| Workplan Version and Date | June 2024 |
| Start date: | End date: |
| January 2020 | December 2027 |
| FIP Lead | Improvements recommended by: |
| Pronatura Noroeste A.C., SEST, CONAPESCA, IMIPAS, UABC, Fishers | Pronatura Noroeste A.C., SEST, CONAPESCA, IMIPAS, UABC, Fishers |
| FIP Coordinator | Workplan developed by |
| Pronatura Noroeste A.C. / PhD. Laura Ibarra | Fishers, CONAPESCA, IMIPAS, Pronatura Noroeste A.C. |

Acronyms

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|-----------|---|
| PNO | Pronatura Noroeste A.C |
| SEST | Secretaría de Pesca y Turismos del estado de Baja California |
| IMIPAS | Instituto Mexicano de Investigación en Pesca y Acuicultura Sustentables (Ant. INAPESCA) |
| CONAPESCA | Comisión Nacional de Pesca y Acuicultura |

Unit of Assessment(s)

Fill in the following table, which will be considered the scope against which the fishery is assessed against the MSC Fisheries Standard.

Table 2. Unit(s) of Assessment (UoA)

| UoA 1 | Description |
|---|--|
| Target species (common and scientific name) | Red sea urchin (<i>Mesocentrotus franciscanus</i>) |
| Stock | Area 77 (Pacific, Eastern Central) |
| Geographical area | Baja California state west coast |
| Fishing method or gear type | Diver-caught |
| Fishing fleet or group of vessels, or individuals fishing operators pursuing stock | Artisanal Mexican fleet |

FIP Actions

Table 3. Performance Indicator Action Plan Table for Action 1.

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| Action Number and Name | Action 1. Ensure that the stock is at a level which maintains high productivity and has a low probability of recruitment overfishing. |
| Action Goal | <ul style="list-style-type: none"> - It is highly likely that the population is above the point of recruitment impairment - The population is at, or oscillates, around a level consistent with MSY. |
| Action Description | To determine that the red sea urchin population oscillates around the level of Maximum Sustainable Yield (MSY), the Working Group will evaluate population status as well as the environmental variables that determine stock conditions. Potential procedures to assist stock recovery will be identified. This is the basis for the fishery to be maintained and to seek the construction of a harvest strategy for the fishery. |
| Expected Completion Date | December 2022 |
| Priority | High |
| Estimated Cost | 2930 USD |
| Responsible Parties | IMIPAS Fishermen PNO UABC |
| MSC Performance Indicator(s) Addressed by the Action | 1.1.1 Stock status 1.1.2 Stock Rebuilding |

| Action | Tasks/ Milestones | Responsible (lead) | Responsible (supporting role) | Starting date | Expected completion date | Evidence of completion / results |
|--|--|--------------------|--|---------------|--------------------------|--|
| Ensure high probability that the red sea urchin population abundance is above the point of recruitment impairment and is fluctuating around a level consistent with maximum sustainable yield (MSY). | 1.1. Evaluate and identify factors that determine sea urchin density to build a sea urchin bank recovery strategy. | PNO | IMIPAS, Fishers, Research institutions | January 2020 | December 2020 | Technical meeting and minutes to identify and discuss the possible factors that determine the variability in sea urchin density. Discussion on procedures for sea urchin restocking is included. |
| | 1.2. Identify the characteristics of environmental variability and its influence on the density of sea urchin banks. Establish the possibility of anticipating expectations of abundance and fishery production. | PNO | IMIPAS Fishers, Research institutions | January 2021 | June 2021 | Identify and integrate information in databases on environmental factors. |
| | 1.3. Describe the ideal conditions that favor the development of healthy sea urchin banks and evaluate the possibility of replicating these conditions in other banks according to their particularities and problems. | PNO | IMIPAS Fishers, Research institutions | July 2021 | June 2022 | Analysis of the influence of environmental factors on the density of sea urchin banks. Produce technical report |

Table 4. Performance Indicator Action Plan Table for Action 2.

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| Action Number and Name | Action 2. Design and implement a rebuild strategy, for the sea urchin population within a specified timeframe. |
| Action Goal | A rebuilding timeframe is specified for the stock that is shorter by 20 years or 2 times its generation time. |

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| Action Description | A sea urchin bank recovery strategy will be built based on identified factors that determine population density. Particular attention is given to environmental variability and potential ideal conditions that favor healthy sea urchin banks. Alternative procedures that can assist in the recovery of banks will be analyzed and discussed with fishers, authorities, and researchers to consolidate a recovery plan. A modeling approach will be used to determine the expected times to recover under alternative scenarios anticipated in the plan. |
| Expected Completion Date | August 2025 |
| Priority (Based on the implementers criteria: e.g., lowest scoring issues are high priority or actions that are necessary to complete before beginning other actions are high priority) | Medium |
| Estimated Cost (An estimate of the budget needed to complete the action) | 2930 USD |
| Responsible Parties | PNO IMIPAS Fishers Research institutions SEST |
| MSC Performance Indicator(s) Addressed by the Action | 1.1.2 Stock rebuilding 1.2.1 Harvest strategy 1.2.2 Harvest control rules |

| Action | Tasks/ Milestones | Responsible (lead) | Responsible (supporting role) | Starting date | Expected completion date | Evidence of completion / results |
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| 2. Design and implement a rebuild strategy, if necessary, for the sea urchin population. | 2.1. Determine the efficiency of procedures that have the potential to assist in the recovery of banks and establish which of them have a better cost-benefit ratio (repopulation, sea urchin translocations, repopulation of sargassum forests, mariculture, etc.). | PNO | IMIPAS Research institutions | May 2021 | April 2023 | Develop a comprehensive protocol for the recovery of sea urchin banks that may include alternative mechanisms such as translocation, recovery of sargassum / algae forests. |
| | 2.2. Analyze and agree with fishermen, authorities and academics, specific actions aimed at consolidating a planned recovery plan. | PNO | IMIPAS Research institutions | January 2021 | December 2023 | Annual meetings prior to and at the end of each fishing season to analyze and agree on actions to consolidate a recovery plan and report containing the recovery plan or a discussion of why such plan is not necessary. Minutes signed with the agreements taken as a product of these meetings. |
| | 2.3. Promote the training of fishermen to carry out actions for the recovery of the sea urchin population. | PNO | Fishers Research institutions | January 2020 | August 2025 | Training for fishermen. |
| | 2.4. Perform a modeling analysis to determine the expected times for the population to recover at levels | PNO | IMIPAS Research institutions SEST Fishers | January 2022 | June 2023 | Modeling analysis report with different scenarios |

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| | consistent with the MSY. | | | | | |
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Table 5. Performance Indicator Action Plan Table for Action 3

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| Action Number and Name | Action 3. Development and implement a robust and precautionary harvest strategy |
| Action Goal | The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving stock management objectives reflected in PI 1.1.1 SG80 - The harvest strategy may not have been fully tested but evidence |
| Action Description | The working group coordinates efforts to define the management objectives, the reference points, and the integration of the components of the exploitation strategy that correspond to the current state of the fishery and that will allow maintaining the red sea urchin stock within the boundaries defined by the reference points. |
| Expected Completion Date | December 2025 |
| Priority | High |
| Estimated Cost | 2930 USD |
| Responsible Parties | IMIPAS PNO Fishers Research institutions |
| MSC Performance Indicator(s) Addressed by the Action | 1.2.1 Harvest strategy |

| Action | Tasks/ Milestones | Responsible (lead) | Responsible (supporting role) | Starting date | Expected completion date | Evidence of completion / results |
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| Action 3. Develop and implement and harvest strategy | 3.1. Design the harvest strategy model so that it responds to the state of the stock and its elements work together to achieve the objectives reflected in the IP 1.1.1. | IMIPAS | IMIPAS Fishers Research institutions PNO | January 2024 | December 2025 | Annual reports on the progress of the harvest strategy in which they are registered: the definition of management objectives, benchmarks, and integration of the components of the harvest strategy (control rule, control system information and monitoring, and stock assessment); and final report with the harvest strategy finalized in its design and agreed upon |
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Table 6. Performance Indicator Action Plan Table for Action 4.

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| Action Number and Name | Action 4. Design the evaluation model of the harvest strategy. |
| Action Goal | Evaluate the harvest strategy |
| Action Description | The work group will suggest preliminary design to evaluate the effectiveness of the harvest strategy. This will provide indicators to detect the effectiveness or gaps in the tools that structure fishing decisions. |
| Expected Completion Date | December 2026 |
| Priority | High |
| Estimated Cost | |
| Responsible Parties | IMIPAS PNO Fishers Research institutions |
| MSC Performance Indicator(s) Addressed by the Action | 1.2.1 Harvest strategy |

| Action | Tasks/ Milestones | Responsible (lead) | Responsible (supporting role) | Starting date | Expected completion date | Evidence of completion / results |
|---|---|--------------------|--|---------------|--------------------------|--|
| Action 4. Design the evaluation model of the harvest strategy | 4.1. Make an initial design to test the efficiency of the harvest strategy. | IMIPAS | IMIPAS Fishers Research institutions PNO | January 2025 | December 2026 | Preliminary design to evaluate the effectiveness of the harvest strategy |

Table 7. Performance Indicator Action Plan Table for Action 5

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| Action Number and Name | 5. Design of a HCR that responds to the state of the resource, ensuring that the sea urchin fishery is maintained according to the reference points. |
| Action Goal | Develop a HCR |
| Action Description | A HCR will be developed to obtain the best performance, allowing banks to recover where necessary and to ensure that the stock is kept around the level consistent with MSY in the context of environmental variability. Modeling analyses will be conducted to determine whether the HCR is robust against uncertainty, evaluating alternative scenarios and measuring the effectiveness to achieve the levels of exploitation required by the control rule. |
| Expected Completion Date | December 2027 |
| Priority | High |
| Estimated Cost | 2930 USD |
| Responsible Parties | PNO IMIPAS Research institutions |

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| | Fishers SEST |
| MSC Performance Indicator(s) Addressed by the Action | PI 1.2.2 Harvest control rules |

| Action | Tasks/ Milestones | Responsible (lead) | Responsible (supporting role) | Starting date | Expected completion date | Evidence of completion / results |
|---|---|--------------------|--------------------------------------|---------------|--------------------------|---|
| 5. Design a HCR that responds to the state of the resource, ensuring that the sea urchin fishery is maintained according to the points of reference | 5.1. Organize workshops for the development and discussion of a control rule that allows the fisherman to obtain the best cost-benefit performance and allows the stock to recover, maintain the stock around the level produced by the MSY | PNO | IMIPAS Fishers Research institutions | July 2024 | December 2025 | Workshop on the definition of simulation methodologies. |
| | 5.2. Perform a modeling analysis to determine that the control rule is robust to uncertainty. The analysis incorporates management tools and alternative scenarios to achieve the levels of exploitation required by the control rule. | PNO | IMIPAS Fishers Research institutions | July 2025 | December 2027 | Modeling analysis report. Review of tools and procedures complementary to the control rule. |

Table 8. Performance Indicator Action Plan Table for Action 6

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| Action Number and Name | 6. Define the mechanisms for the implementation of the control rule. |
| Action Goal | The fishery has well-defined and in place harvest control rules. |

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| Action Description | Procedures will be identified and agreed upon within the Management Committee of the BC sea urchin fishery to ensure the implementation of the HCR that is designed to maintain the sea urchin stock fluctuating around the MSY. |
| Expected Completion Date | December 2026 |
| Priority | High |
| Estimated Cost | 2930 USD |
| Responsible Parties | PNO Management committee of the sea urchin fishery of Baja California |
| MSC Performance Indicator(s) Addressed by the Action | PI 1.2.2 Harvest control rules |

| Action | Tasks/ Milestones | Responsible (lead) | Responsible (supporting role) | Starting date | Expected completion date | Evidence of completion / results |
|--|--|---------------------------|---|----------------------|---------------------------------|---|
| 6. Define the mechanisms for implementation of the control rule. | 6.1. Clearly determine the procedures to ensure that the control rule is in place. | PNO | Management committee of the sea urchin fishery of Baja California | January 2025 | December 2026 | Procedures established and agreed upon within the Management Committee of the sea urchin fishery of BC. |

Table 9. Performance Indicator Action Plan Table for Action 7

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| Action Number and Name | 7. Design of a standardized monitoring program with trained monitors that collect adequate information for the management of the sea urchin fishery. |
| Action Goal | Identify the information needs and develop a monitoring program |

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| Action Description | Determine the information needs of the fishery to carry out stock assessments to inform the control rule and to identify the interaction of the fishery with other environmental elements and associated species. Consolidate a monitoring program that includes participation and capacity building with fishermen from participating organizations. The quality of the information will be the basis for management decisions and control rules for the fishery in question. |
| Expected Completion Date | December 2025 |
| Priority | High |
| Estimated Cost | 4979.44 USD |
| Responsible Parties | CONAPESCA IMIPAS Fishers PNO |
| MSC Performance Indicator(s) Addressed by the Action | 1.2.3 Information and monitoring |

| Action | Tasks/ Milestones | Responsible (lead) | Responsible (supporting role) | Starting date | Expected completion date | Evidence of completion / results |
|---|---|---------------------------|--------------------------------------|----------------------|---------------------------------|---|
| 7. Design a standardized monitoring program with trained monitors that collect adequate information for the management of the sea urchin fishery. | 7.1. Determine the information needs of the fishery to be able to carry out stock assessments that inform the control rule and to identify the interaction of the fishery with other environmental elements and associated species. | CONAPESCA IMIPAS | IMIPAS PNO Fishers | July 2020 | June 2021 | Workshop discussion to identify information needs, establishing whether the current system is sufficient or requires something more and thorough of the workshop. |

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| | 7.2. Rescue the monitoring program that meets the needs of the fishery. | CONAPESCA IMIPAS | IMIPAS Fishers | July 2020 | December 2022 | Workshop on sources of information, standardization, use of information, etc. Workshop minute, agreed sampling protocol and definition of the monitor training process |
| | 7.3. Train fishing technicians to function as monitors. | CONAPESCA IMIPAS | IMIPAS CONAPESCA PNO Fishers | January 2021 | December 2023 | Monitor training. |

Table 10. Performance Indicator Action Plan Table for Action 8

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| Action Number and Name | 8. Generate adequate knowledge of the impacts of the UoA on the ecosystem. |
| Action Goal | Implement a continuous gathering information program relative to the impact generated to ecosystem by UoA |
| Action Description | The working group will identify indicators of the coastal benthic ecosystem of Baja California that will assist in the development of the fishery monitoring program. These indicators should detect changes in the ecosystem that could be related to the subtraction of urchin biomass. The performance of the action is substantial to generate information that supports the best available knowledge about the fishery. |
| Expected Completion Date | June 2025 |
| Priority | Medium |
| Estimated Cost | 2930 USD |
| Responsible Parties | PNO IMIPAS Research institutions Fishers |

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| MSC Performance Indicator(s) Addressed by the Action | 2.5.3 Information on the ecosystem |
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| Action | Tasks/ Milestones | Responsible (lead) | Responsible (supporting role) | Starting date | Expected completion date | Evidence of completion / results |
|---|--|---------------------------|--|----------------------|---------------------------------|---|
| 8. Continuously generate adequate information to understand the key elements of the ecosystem, its main functions and the main impacts of the sea urchin fishery on them. | 8.1. Identify indicators of the coastal benthic ecosystem of Baja California to develop a monitoring program aimed at detecting changes in the ecosystem that could be related to the subtraction of sea urchin biomass. | PNO | IMIPAS Research institutions Fishers | January 2020 | June 2025 | Annual reports on: the indicators of the ecosystem to be monitored, the monitoring program to detect changes in the ecosystem, and the status of the information bank with the information collected in the monitoring program. |

Table 11. Performance Indicator Action Plan Table for Action 9

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|---------------------------------|---|
| Action Number and Name | 9. Establish a solid, transparent and permanent decision-making process that seeks to achieve the specific objectives of the sea urchin fishery. |
| Action Goal | Enable a transparent management and decision-making mechanism of the fishery and continuously gather the information of the fishery management and get accessible on request |
| Action Description | The Management Committee of the BC sea urchin fishery will be established as a tool that contributes to the decision-making process. The Committee will provide a space with rules, procedures and functionality for the consolidation and flow of information generated by the fishery. The Committee will aim to create an information bank that will serve as a basis for the fishery's decision making processes. |
| Expected Completion Date | December 2026 |

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| Priority | High |
| Estimated Cost | 2930 USD |
| Responsible Parties | SEST CONAPESCA PNO Fishers Management committee of the sea urchin fishery of Baja California |
| MSC Performance Indicator(s) Addressed by the Action | 3.2.2 Decision making process |

| Action | Tasks/ Milestones | Responsible (lead) | Responsible (supporting role) | Starting date | Expected completion date | Evidence of completion / results |
|---|--|---------------------------|--------------------------------------|----------------------|---------------------------------|---|
| 9. Establish a solid, transparent and permanent decision-making process that seeks to achieve the specific objectives of the sea urchin fishery | 9.1 Install the Management Committee of the sea urchin fishery of BC as a decision-making process; and space for the consolidation and supply of the information generated from the fishery. | SEST | SEST CONAPESCA Fishers | January 2022 | August 2026 | Installation of the Management Committee of the sea urchin fishery of BC. |
| | 9.2. Generate the rules of operation, procedures, roles and responsibilities of the Management Committee of the sea urchin fishery of BC. | SEST | PNO Fishers | January 2025 | December 2026 | Internal regulations approved. |

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| | 9.3. Generate an updated information bank that serves as the basis for decision-making in the management of the sea urchin fishery and as a timely supply of information on request. | SEST | IMIPAS CONAPESCA PNO Fishers | July 2021 January 2025 | December 2026 | Internal regulations approved. |
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Table 12. Performance Indicator Action Plan Table for Action 10.

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| Action Number and Name | 10. Development and implementation of an efficient and transparent inspection and surveillance program for the sea urchin fishery with a consistent sanction system |
| Action Goal | - Sanctions are applied to deal with non-compliances that are expected to produce a deterrent effect. |
| Action Description | The working group evaluated the Inspection and Surveillance system of the sea urchin fishery with the objective of strengthening the management and protection of the sea urchin resource with inter-institutional support. Evidence of compliance with regulations and sanctions will be collected annually and annual reports will be generated on the actions of the community groups that contribute to the management and protection of the sea urchin resource, to monitor their performance in the implementation of the inspection and surveillance program of the sea urchin fishery. |
| Expected Completion Date | December 2027 |
| Priority | High |
| Estimated Cost | 2930 USD |
| Responsible Parties | CONAPESCA? SEST Fishers PNO Management committee of the sea urchin fishery of Baja California Community groups |

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| MSC Performance Indicator(s) Addressed by the Action | 3.2.3 Compliance and enforcement |
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| Action | Tasks/ Milestones | Responsible (lead) | Responsible (supporting role) | Starting date | Expected completion date | Evidence of completion / results |
|---|---|---------------------------|--|----------------------|---------------------------------|--|
| 10. Develop and implement an efficient and transparent inspection and surveillance program for the sea urchin fishery with a consistent sanctions system. | 10.1. Conduct a diagnostic evaluation of the Inspection and Surveillance system for the sea urchin fishery. | SEST | CONAPESCA? PNO Fishers | January 2020 | December 2020 | Inspection and surveillance diagnostic report. |
| | 10.2. Strengthen surveillance to help to the administration and protection of the sea urchin resource with inter-institutional support. | SEST | SEST | January 2021 | December 2021 | Surveillance logbook and link with inspection and surveillance authorities. |
| | 10.3 Generate annual reports on the actions of the community groups that contribute to the administration and protection of the sea urchin resource, to monitor their performance in the implementation of the inspection and surveillance program. | SEST | Management committee of the sea urchin fishery of Baja California Community groups | January 2022 | December 2027 | Annual activity report and minutes of meetings on the performance of community groups and agreements for their subsequent actions. |

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| | 10.4 Collect annually evidence of non-compliance with regulations and penalties | SEST | Management committee of the sea urchin fishery of Baja California | January 2021 | December 2027 | Information bank updated annually. |
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Table 9. Performance Indicator Action Plan Table for Action 11

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| Action Number and Name | 11. Establish a mechanism to conduct regular internal and occasional external reviews of the specific management system of the sea urchin fishery. |
| Action Goal | The specific management system of the fishery is subject to periodic internal and occasional external reviews. |
| Action Description | A technical commission will be appointed by the BC Sea Urchin Fishery Management Committee to evaluate the management system. This system will be evaluated internally every three years and on occasion to achieve improvements in the mechanisms that evaluate the fishery management system. |
| Expected Completion Date | December 2027 |
| Priority | Low |
| Estimated Cost | 2930 USD |
| Responsible Parties | Management committee of the sea urchin fishery of Baja California |
| MSC Performance Indicator(s) Addressed by the Action | 3.2.4 Evaluation of the specific management system of the fishery |

| Action | Tasks/ Milestones | Responsible (lead) | Responsible (supporting role) | Starting date | Expected completion date | Evidence of completion / results |
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| 11. Establish a mechanism to conduct regular reviews the specific management system of the sea urchin fishery, with occasional external reviews. | 11.1. Designate a technical commission on the Management Committee of the sea urchin fishery of BC to review the management system. | Management committee of the sea urchin fishery of Baja California | Management committee of the sea urchin fishery of Baja California | August 2026 | August 2027 | Technical Commission installed |
| | 11.2. Evaluate the management system by the technical commission every two years. | Management committee of the sea urchin fishery of Baja California | Management committee of the sea urchin fishery of Baja California | December 2026 | December 2027 | Result of the internal evaluation |
| | 11.3. Submit the management system to external evaluation | Management committee of the sea urchin fishery of Baja California | Management committee of the sea urchin fishery of Baja California | December 2026 | December 2027 | Peer evaluation report. |

Additional Impacts

Some FIPs include objectives that go beyond the MSC PIs. Please provide additional detail below on additional impacts that FIP stakeholders are working to address.

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| Addition Impact Title | Traceability improvements |
| Status Summary | Pronatura Noroeste A.C., the company Gochain and Eripac have designed a pilot project to describe the traceability of the catch. |
| Improvement Recommendation | Challenges and opportunities for implementing a traceability system in the fishery are identified. |