

Belize Spiny Lobster – casita and free-diving FIP Three-Year Evaluation Report

Version 1.3, November 2022

Purpose

The three-year evaluation report template was developed by FishChoice. The objectives of the three-year evaluation report are:

1. To assess the fishery's MSC performance indicator scores
2. To verify the results of the FIP's environmental workplan progress as reported on [FisheryProgress](#)
3. Optional: To provide recommendations to the FIP on environmental workplan actions that should be modified, including recommendations for additional actions/tasks that should be taken or suggested changes to timelines, to help the FIP achieve their stated objectives.

Completing and Submitting the Evaluation

FisheryProgress requires the use of this three-year evaluation report template, and the information must be submitted in English. FIPs should update the template below with evaluation results. *Note that text in italics provides additional guidance about information that should be included in each section and should be removed from the final version of this document, and highlighted text should be replaced to reflect the information for your fishery.* Save this document as a PDF upon completion and submit it to FisheryProgress. Once the evaluation is complete, FIPs should update all relevant data fields on FisheryProgress based on the evaluation report.

FIP Information

Fill in the following table. The management authority is the regulatory authority with fishing management responsibilities; there may be multiple authorities where joint jurisdictional responsibilities occur.

Target species scientific name(s) and common name(s) [state target stock(s), if relevant]	Spiny Lobster (Caribbean), (<i>Panulirus argus</i>)
Fishery location	Area 31 (Atlantic, Western Central). Belize EEZ.

Gear type(s)	Casita/Condominium – also known as “shade” in Belize. Hook sticks Free-diving hand collection. Pots/Traps.
Estimated FIP Landings (weight in tons)	709 metric tons per year
Vessel type(s) and size(s)	Fiberglass skiff (20-35 ft) Wooden sailboats (30-40 ft)
Number of vessels	Approx. 1,500
Management authority	Belize Fisheries Department
Assessor name(s)	Tom Evans, Emily Wardrop, Becky Caton
Assessor Organization/Affiliation	Key Traceability
Date of report completion	25.04.2023

FIP Background (Optional)

The Belize spiny lobster – freediving and casitas FIP is a comprehensive FIP to meet the MSC standard's unconditional pass by November 2025. The FIP has the following objectives:

- To test the validity and potential of a FIP+ model (Environment, Social and Economic) as a way of enhancing FIP progress in Belizean Lobster throughout 2020-2025 and use this as a test case for other fisheries globally.
- To coordinate and continuously promote the collaboration of national and international stakeholders of the Belizean lobster fishery to work on improvement across environmental, social, and economic components of the fishery throughout the life of the FIP, minimally until Dec 2025.

- To develop a blended finance approach to fund the FIP long term, beginning in Q1 of 2020.
- To develop and test tools which can support this and other FIP+ projects globally, by the end of 2021.
- To create measurable change environmentally, socially, and economically within the fishery based on an extended FIP+ workplan, by 2025.
- To build social and economic capacity within the Belizean based co-operatives as a way to enhance the co-operatives' ability to engage in environmental improvements long term, by 2023.

The FIP consists of approximately 1,500 boats. Of these, there are a combination of sailboats and skiffs. They boats are flagged to Belize and operate in Belize coastal waters only. The fishery targets Caribbean spiny lobster (*Panulirus argus*).

Stakeholder Consultation & Meetings

In-person and virtual interviews with stakeholders are meant to inform the assessor with regards to the fishery's performance and to elicit information regarding the contributions that the FIP's participants have provided in making environmental progress towards the FIP's objectives. Stakeholders represent the most critical source of information regarding a fishery, independent of the FIP lead and FIP participants. Stakeholders can shed light on the diversity of perspectives on the fishery and can highlight any areas of controversy. The stakeholder consultation process allows an assessor to hear a range of perspectives and make an objective and balanced evaluation of the fishery against the MSC Fisheries Standard and the environmental workplan results.

A successful stakeholder consultation process will instill confidence in stakeholders that the assessment of a given fishery was well informed by a balanced, accessible, and equitable process to which they were able to contribute meaningfully. It should not be a forum to debate issues, but to identify the full range of relevant information and issues and bring them to the attention of the assessor. It should also help the assessor identify the improvements that have occurred in the fishery as a direct result of the FIP's activities and provide a foundation upon which the assessor can provide recommendations for potential adjustments that need to be considered for the FIP to fulfill the environmental objectives that they have set out to achieve. For additional guidance on conducting stakeholder consultation, see Section G4.2 of the [MSC Fisheries Certification Process Version 3.0](#)

Fill in the following table and include a high-level summary of the subjects that were discussed. Additional rows may need to be added or modified depending on the number of participants and meetings completed. Stakeholders may include official participants in the fishery improvement project, as well as government representatives, industry (fishers, processors, exporters, mid supply chain and end buyers, etc.), environmental and social NGOs, and the scientific community, or those who are impacted by the project or have a role in making changes to address environmental challenges in the fishery.

Name	Affiliation	Date and Subjects Discussed
James Foley: FIP Coordinator Jané Salazar Mcloughlin: FIP Coordinator	Name: The Nature Conservancy (TNC) Role: FIP coordination	<u>20/02/2023</u> The first interview was conducted with the FIP coordinator, James Foley. James provided a detailed introduction and summary of the FIP, including information about the recent progress made.

		<p>The summary demonstrated that there are approximately 1,500 licensed vessels operating within the lobster fishery. It is difficult to gain a full understanding of the accurate number because they are typically small and some use multiple canoes for easier access.</p> <p>There are two types of boats used: fiberglass skiffs, and wooden sailboats with a range of canoes onboard dependent on the number of fishers per trip. The fiberglass skiffs and wooden sailboats range between 28-35 ft in length.</p> <p>The fishery is divided into nine distinct fishing areas as per the Belize Managed Access Program, of which the vessels are licensed to operate in a maximum of two. The vessels are painted with the color that corresponds to the zone. If a fisher wishes to change their designated zone, a new license has to be obtained and the vessel's allocated fishing area would have to change too. Likewise, the corresponding color of the vessel must be updated to reflect these changes.</p> <p>The different boat types spend different times at sea. For the larger sailboats, the fishing effort is typically three to seven days and there are, on average, eight-to-ten people working on them. The fiberglass skiffs operate for one day before returning to their fishing camp (often offshore) before returning to the mainland to land their catch and have only three-to-four people working on them. Days at sea also range from one to seven days.</p> <p>Both vessel types use a combination of both lobster traps and casitas (known in Belize as shades), and hook sticks and/or nooses/snare to catch lobster. Shades are structures that act as an area that the lobsters can find refuge under but are free to move about easily. A proposed study in 2023 will research the impacts of the different fishing methods to identify if there are any costs or benefits to them. It is currently hypothesized that the traps may induce stress in the lobsters, which in turn releases lactic acid into their flesh and reduces the quality of the product and further research is required to verify this. The research aims to determine the catchability and quality of lobster by gear type to provide scientific support of a premium standard of product and fetch a higher purchase value.</p> <p>The lobsters are processed at the two fishermen's cooperatives (National Fishermen Producers Cooperative Society Ltd. and Northern Fishermen Cooperative Society Ltd.), where they are either kept and sold alive, frozen directly, or cooked and frozen. Fishers also land their product at any of the two</p>
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		<p>private export companies. The products are largely exported to the US, but some are shipped to Asia and Taiwan specifically.</p> <p>The members of the FIP are the two aforementioned Coops, the Belize Fishermen Cooperative Association, University of Belize Environmental Research Institute (UB ERI), Belize Department of Cooperatives, Belize Fisheries Department, Wildlife Conservation Society, The Nature Conservancy, and Future of Fish. the Turneffe Atoll Sustainability Association (TASA), and the Wildlife Conservation Society (WCS) Belize. There are other affiliated members through the various Task Forces that provide technical support to the FIP.</p>
<p>Robert Usher: Manager</p> <p>Gregory Lambey</p> <p>Isaac Lambey</p>	<p>Northern Fishermen Cooperative Society Ltd.</p> <p>Role: Member of FIP steering committee</p>	<p><u>21/02/2023</u></p> <p>The Northern Fishermen Cooperative Society Ltd. (Northern Coop) joined the FIP when it started in 2019.</p> <p>The Northern Coop collaborates with fishers by monitoring and purchasing their catch, processing the lobsters, and exporting the products.</p> <p><u>Data collection:</u></p> <p>All lobster landings are recorded by the Tally system, which acknowledges the boat name, license number, boat type, gear type, location of catch, landing site, at sea duration, fishing days, the type of product caught (whole lobster, lobster tails, lobster heads), and weight of catch. This system is extensive and used by all catches. The information collected by the Tally system can also be used for traceability, improve operational efficiencies, lower costs, and inform fisheries management.</p> <p>The auditors were provided with a tour of the processing plant, including the landing site. The plant manager gave us a demonstration of how the Tally system is used and we took photos of the App as evidence. The system is robust and demonstrates a clear and effective method of data collection for the lobster fishery. The data collected by the app includes, landing date, fisher name, fisher number, name of boat, boat license number, boat type, fishing zone, number of days fished, fishing method, type of sale, product type, and weight of catch.</p> <p>All information is submitted to the Belize Fisheries Department on a weekly basis, and a monthly report is produced to demonstrate catch effort.</p>

		<p><u>Management:</u></p> <p>The fishery has a closed season, from March 1st to June 30th. During the closed season, there is no permitted lobster fishing activity.</p> <p><u>VMS database:</u></p> <p>One of the questions asked to the Coop was about the Vessel Monitoring Systems (VMS) that was demonstrated on the FIP profile and recent actions. Unfortunately, no VMS data is available because the systems were damaged and no longer functional. The Belize Fisheries Department has secured 56 VMS units in February 2023. Some members of the FIP are determining the most efficient way to deploy them onboard the vessels because the previous issues damaging the VMS units have not been resolved.</p> <p><u>Lobster Fisheries Management Plan:</u></p> <p>The Coop was asked about the lobster fisheries management plan. However, issues arose at the last meeting with the Fisheries Department because one of the recommended updates to the management plan was to increase the minimum catch size of lobster tail from 4oz to 4.5oz. Research has demonstrated that juvenile lobsters tend to favor shallow habitats, whereas larger, slow moving adults inhabit deeper regions with more shelter from reefs and rocks (GMFMC and NOAA, 2018). The update to the minimum catch size is based on the minimum catch sizes regulated in other Caribbean lobster fisheries, where the operational sites are deeper and lobster individuals are larger. However, the Belize fishery is shallow and there is no SCUBA diving fishing permitted. The Northern Fishermen Cooperative believes that the lobsters caught in Belize are generally smaller than those in the other fishery sites, so increasing the size limit is not appropriate for this area. The lobster fisheries management plan is set to be finalized in 2023.</p> <p>There are no plastics used in fishing operations. All of the traps are made from repurposed wood, and the shades usually consist of corrugated zinc as the roofing material, affixed to a wooden frame.</p> <p>The auditors were then given a tour of the processing plant to view the processes and practices when the catch is landed, including an initial check of</p>
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		<p>the catch, data collection using the Tally App., cleaning stations, the packaging process, and freezer storage.</p>
<p>Elmer Rodriguez: Manager</p>	<p>National Fishermen Producers Cooperative Society Ltd.</p> <p>Role: Member of FIP steering committee</p>	<p><u>22/02/2023</u></p> <p>The National Fishermen Producers Cooperative Society Ltd. (National Coop) has over 500 members. The National Coop pays the fishers for their lobster catch in two stages: the initial payment upon purchase of lobsters, and the second payment is provided at the end of the financial year.</p> <p>All members of the National Coop have access to purchase ice, water, and fuel to supplement their fishing trips, as well as credit for the lobster that they sell to the Coop.</p> <p>This Coop also uses the Tally system to collect information about the fishers' hauls. Please see the description of the Tally system above for more information.</p> <p><u>VMS database</u></p> <p>Like the Northern Coop, the National Coop worked with WCS on a pilot project to install VMS on the boats in order to track fishing areas and duration at sea. However, due to the location of the VMS placements, they became damaged and are no longer usable. OSPESCA have donated more VMS units, which are designed to be more suitable but are still not installed yet.</p> <p>All the fishers were happy to install VMS onto their boats because this also ensures their safety at sea by acting as a locator if they get into any difficulties at sea.</p> <p><u>IUU Fishing</u></p> <p>The Fisheries Department often comes to the National Coop to ensure that there is no IUU fishing taking place. They have specific members of the processing plant that examine the lobsters when they arrive to ensure that they meet the minimum size requirements, and that none of the individuals are pregnant. The Coop has been well trained in assessing the status of the lobsters to identify where (if any) lobsters had eggs that have been removed by a fisher. Any lobsters that are found to be pregnant are not accepted by the Coop and not paid for to the fisher.</p>

		<p>Belize is considering increasing the size limit of landed lobster tails from 4oz to 4.5oz. It is currently the only Caribbean country and lobster fishery that still accepts 4oz. Research has demonstrated that juvenile lobsters tend to favor shallow habitats, whereas larger, slow moving adults inhabit deeper regions with more shelter from reefs and rocks (GMFMC and NOAA, 2018). The spiny lobster fishery in Belize is shallow, and SCUBA diving is prohibited, which limits the potential for free-diving fishers to catch the larger lobster individuals. Some of the lobsters in Belize are naturally smaller because of the shallower habitats, so the Coops think it would be unfair to impose the same regulation of 4.5oz in Belize lobster fisheries as the other, deeper Caribbean fisheries. Nonetheless, the US market requires that all lobster measure at least 4.5oz, so it is in the Coops' best interest to only accept lobsters of this size, or else those that measure under this will only be able to be sold in domestic markets, or where prices are much lower.</p> <p>In a collaborative project from the Turneffe Atoll Sustainability Association (TASA), all traps must be removed from the fishing areas before the start of the closed season. Failing to do so will lead to the destruction of any remaining traps by the Fisheries Department. The Coop is also working with TASA on their trap tagging and inventory project to be able to demonstrate that all traps are accounted for at the end of the fishing season.</p> <p>The auditors were given a tour of the processing plant, including an introduction to where the fishers land their boats, the initial inspection and measurements area, data collection using the Tally App., cleaning stations, packaging areas, and frozen storage.</p>
<p>Julio Maaz: Technical Coordinator Sustainable Fisheries</p>	<p>Wildlife Conservation Society (WCS) Program Belize</p> <p>Role: NGO partner and member of FIP steering committee</p>	<p><u>21/02/2023</u></p> <p>The Wildlife Conservation Society (WCS) has been involved in the FIP since its establishment in 2019. This partnership focused on the enforcement, monitoring, and policy work. They have tried to develop and introduce projects to the FIP over the years, but these have not been implemented yet. They are currently working on implementing best practices for lobster fisheries in Belize.</p> <p><u>Data recording</u></p> <p>WCS records independent catch effort data, community catch data, habitat information, and corals and lobster densities every month. Currently this information is collected using pen and paper only, but the WCS are working with TASA to try and develop the SMART App. to input this data electronically. WCS</p>

		<p>does not use the Tally App because it is too costly and does not suit their needs of recording.</p> <p><u>VMS tracking</u></p> <p>The fishers were compliant with trialing the VMS devices. However, the device design and placement on the boats was an issue that led to damage and breakages, so they have been removed. The Belize government has partnered in the program and has bought 56 VMS units to be deployed. However, the repair of damage on these devices will be expensive and difficult so WCS is working with the government to try and reduce the operational maintenance and cost of the repairs.</p> <p>VMS is an expensive, long-term investment that requires monthly payments of up to 25 Belize dollars. The fishers will not be willing to pay this without government subsidies.</p> <p>The VMS devices also need to record locations at least every 15 minutes to ensure that a true depiction of the location is received. If the transmission signals are any longer than 15 minutes apart, a boat could sail in and out of a restricted area within that time and go undetected.</p> <p><u>IUU fishing</u></p> <p>The rate of fisher interaction with patrolling rangers is very high in Belize because patrols are so active. Each fishing boat is checked at least once per trip.</p> <p>Marine Protected Areas (MPAs) are all restricted or have specific fishing activities, but there are certain MPAs that are completely restricted. These areas are monitored by rangers during their patrols to ensure that there is no illegal fishing taking place.</p> <p>If there is IUU fishing demonstrated in the fishery, fines are imposed dependent on the activity. Everything is documented by the rangers and recorded at the fisheries department. All rangers have training and have been designated authority to arrest anyone that is caught doing illegal activity. However, WCS have worked with some rangers in the past and have seen that more of them need to develop their knowledge.</p>
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		<p><u>Enforcement</u></p> <p>The WCS also mentioned that between 2013-2014, drones were trialed in some of the MPAs to monitor fishing activity or any other activity within the area as this reduces the need for high fuel consumption of the ranger vessels. Nonetheless, drones are also prone to damage from oceanic conditions, so need development to reduce the potential breakage because they are expensive to replace.</p> <p>The WCS has been developing a different strategy to train the patrol rangers. Working in collaboration with the Fisheries dept. to improve communication, emotional intelligence (engaging their partners, colleagues etc.), boarding procedures, safety, and security of officers at sea, inspection at sea protocols. This ensures that the rangers are fully equipped with the knowledge in enforcement handling.</p> <p>The rangers have been designated authority, in the capacity of fisheries officers to impose fines and arrest offending fishers. These fines are dependent on the offense and activity of the fisher but can reach up to \$500,000 USD or imprisonment of repeated offenses.</p> <p>The WCS is looking at a new management system for community-based management methods.</p> <p><u>Principle 2 progress:</u></p> <p>WCS has been involved in habitat and ecosystem research to understand more about the potential impact of casitas and traps on mangroves and seagrasses. Planning to start the project in 2024 once they receive funding from the Blue Action Fund, in collaboration with TNC.</p> <p>All traps are made from repurposed, biodegradable wood, so that if they do become lost or damaged, they will eventually break and reduce the negative impact on the environment. The traps can and have demonstrated non-target species bycatch, but these are in very small numbers.</p> <p>The casitas are made from corrugated zinc sheets that act as roofing affixed to a wooden frame. The casitas are non-invasive and are placed in an area for long periods of time to reduce the potential impact on seafloor environments. The fishing methods used in this fishery result in very limited bycatch because the free divers hand-pick the lobsters. However, undersized, and pregnant</p>
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		<p>individuals are sometimes difficult to identify in the water, and if they are caught with hook sticks, they may die before they can be identified. Switching hook sticks to nooses is in consideration and being advocated by WCS via the FIP, which is driven by TNC under its development of the Verified Premium Standard to avoid this issue.</p>
<p>Valdemar Andrade: Executive Director</p> <p>Virginia Burns Perez: Adaptive Management Program Director</p>	<p>Turneffe Atoll Sustainability Association</p> <p>Role: NGO partner, providing scientific advice.</p>	<p><u>22/02/2023</u></p> <p>The Turneffe Atoll Sustainability Association (TASA) is the Turneffe Atoll Marine Reserve co-managers and provides scientific advice to better understand the fishing effort of the Belize spiny lobster fishery, including the fishing effort.</p> <p><u>Data collection:</u></p> <p>One of the big questions that TASA looks at is what happens to the lobsters that are not sold to the Coops. Even though the fishers are encouraged to use the Coops because this ensures that they are supported in the future, some fishers will sell their lobster catch to private companies for a bigger profit. Therefore, these catches are not recorded in the same way as the ones on the Tally App and aren't available to the FIP for comparison. The private companies do collect lobster landing data as required by law and submit these data to the Belize Fisheries Department weekly.</p> <p>As mentioned above with the WCS, TASA is developing the SMART App. to record daily information and to be used in enforcement duties. A member of the TASA group will train the rangers in using this App. and how to collect the following information: type of vessel, number of fishers, fishing area, target species, fishing gear type, and hours worked.</p> <p><u>Enforcement:</u></p> <p>TASA has a team of rangers that patrol the Turneffe Atoll Marine Reserve and ensure that all traps are removed at the end of the fishing season to prevent ghost fishing. All of the traps are registered, and a new inventory project is being trialed in the 2023 closure period to ensure that all are accounted for.</p> <p>The rangers are all trained to arrest offending fishers and impose fines at sea. They are given mandatory training between three-to-four times a year to ensure they are updated and able to perform their duties efficiently.</p>

<p>Rigoberto Quintana: Senior Fisheries Officer</p> <p>Kenneth Esquivel: Assistant Fisheries Officer</p> <p>Mauro Gongora: Fisheries Officer</p>	<p>Belize Fisheries Department</p> <p>Role: Fisheries management and enforcement practices. Member of FIP steering committee. Member of the Tech-based Taskforce.</p>	<p><u>01/03/2023</u></p> <p>The Belize Fisheries Department is a regulatory agency for Belize fisheries management and conservation, providing leadership and support to the FIP and ensuring that the FIP workplan actions are being implemented and adhered to.</p> <p><u>Fisheries Resource Act 2020</u></p> <p>The Belize Fisheries Department is ultimately responsible for the management of all reserves and collaborate with TASA as comanagers for the Turneffe Atoll Marine Reserve.</p> <p>The previous Fisheries Resource Act (2010) was lacking in some critical areas, which is why it was updated to incorporate new legislations, regional policies, and national laws surrounding conservation and management. Preserving the ecosystem, preventing, and eliminating overfishing, enforcing management, and improving the welfare and livelihood of fishers.</p> <p>The auditors asked about how the Fisheries Resource Act 2020 follows an ‘ecosystems-based approach’ to fisheries management as described in the workplan. The Belize Fisheries Department informed the auditors that it is the only country in the Caribbean basin that has implemented a management regime of this kind that identifies where the vulnerable marine ecosystems and habitats are located and has implemented stringent licenses to limit the use of these areas. There are vulnerable marine ecosystems within the Belize basin, including seagrasses, mangroves, and coral reefs. All zones of fishing require specific licenses and fishers are required to provide catch and effort data to fisheries enforcement.</p> <p><u>Lobster stock assessment 2022</u></p> <p>A new stock assessment for this lobster species was conducted in 2022, and while the FIP provided evidence of the public conference and presentation that was held in July 2022, the final assessment report has not yet been finalized and published. Nevertheless, the assessment identified that the lobster stocks are “<i>trending towards unsustainability</i>” because the stocks are close to MSY. However, at this stage, the trend is reversable if the fishery is proactive in its approach to fisheries management. The Fisheries Department stated that the way that the stock was assessed was not considerate of the specific conditions of the Belize fishing area and the actual practices of the fishers, compared to</p>
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		<p>other Caribbean lobster fisheries. In other regions of the Caribbean, lobster fishing is conducted in a different manner due to the different conditions, including greater depths. As previously mentioned, lobsters found at greater depths are typically larger than the younger, shallow-water individuals found in Belize fisheries (GMFMC and NOAA, 2018). Likewise, a key driver of harvesting smaller lobster individuals is from the consumer demand for plate-sized individuals that are of a higher quality. Therefore, the BFD were concerned that the lobsters used in the stock assessment would be considered undersized and potential lead to the “<i>trending towards unsustainability</i>” result. The stock assessment results also demonstrated that historical catch landings from 1999-2021 demonstrate very slight increases in catch rates, which does not account for overfishing.</p> <p>There are requirements in Nicaragua and Honduras regarding the size limit of lobsters that are allowed to be landed. The limit now is 4.5oz rather than the 4oz that the Belize fisheries currently permit. There are also regulations about introducing a route to escape for non-target species in the lobster traps/pots that permit smaller individuals to leave. However, the Belize government has not implemented this requirement yet because of push-back from stakeholders due to proposed estimates of a 20% reduction in total catch, which would cause not only economic but also social impacts. However, this would be a short-term impact that would eventually lead to long term gain, whereby over a few seasons the total catch would eventually increase from the present day due to greater reproductivity of the stock. The government will speak to OSPESCA to try and compromise with these regulations ahead of slowly implementing them at the start of the July 2023 season.</p> <p><u>Tech-Based Taskforce 2021</u></p> <p>The Belize Fisheries Department is also involved in the Tech-Based Enforcement Taskforce and specializes in compliance and enforcement of fisheries laws. There are land-based, and sea-based operations conducted on a weekly basis. The patrol rangers are equipped with the SMART App. for data collection of total catch, number of fishers, fishing area, etc.</p> <p>Between 2013 and 2014, drones were trialed in lieu of human patrols to test if this would make patrolling more efficient. The drones were able to fly autonomously for more than one hour at a time up to a range of 50 km. They captured photos and videos (WCS, 2014). However, the salt water and damage risk were too high and caused issues with the devices. Instead, over the past</p>
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couple of years, the Taskforce has collaborated with WCS to pilot a vessel monitoring system (VMS) project on the vessels. With additional support from OSPESCA, another 75 vessels will be fitted with VMS devices to trial in 2023. The VMS devices will also be equipped with an emergency button for fisher security. However, the VMS devices are very expensive and at risk of damage, so the fishers will need to be trained in how to maintain and clean them.

Lobster management plan

This is a working document because the original one was produced in 2014 and needs updating. There is active management, which means that an official management plan would have to be regularly updated. Once the new stock assessment has been finalized, it will be integrated within the management plan, and this is expected to take place before the end of 2023.

Harvest strategies and harvest control rules

As the stock assessment has not been finalized, the harvest control rules have not been able to demonstrate their effectiveness at improving stock status and managing the fishery.

However, there are three initiatives that will be implemented in the near future, including the introduction of escape gaps in the pots/traps to reduce the fishery's impact on non-target species and undersized lobsters, which will be implemented at the start of the fishing season in July 2023. The other two initiatives include increasing the minimum carapace length to 3.25 inches and increasing the minimum tail weight requirement to 4.5oz instead of 4oz. The latter two initiatives have not yet been confirmed in the fishery, however, would be good examples of harvest strategies to improve the stock health.

Casita and pot inventory project

This is a new project and a collaboration with TASA. In the 2022 lobster fishing season, TASA conducted and completed the first lobster gear inventory at Turneffe Atoll Marine Reserve. It will be finalized and submitted to FisheryProgress as part of the annual update. There was an earlier report (March 2021) submitted to FisheryProgress, which provided an update about the progress of the gear tagging program but was not completed due to various Covid-19 restrictions.

		<p><u>How does the Department work with the Coops to incentivize fishers?</u></p> <p>The two Coops in Belize are critical to fishers' welfare and livelihoods. The Belize Fisheries Department supports fishers to deliver their catches to the Coops, but it cannot deter them from selling to private companies. However, it clearly informs the fishers that although the private companies may offer a higher price now, in the future if there was no competition from the Coops, they would be able to drop their prices and the fishers would be forced to sell to them only.</p>
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Summary of Findings and Recommendations

Summarize the environmental progress the FIP has made in the past three years. Optional: provide any recommendations for the FIP (e.g., regarding modifications to FIP actions, or potential gaps in the FIP's workplan necessary to achieve the FIP's objectives).

The FIP is a collaboration of a large network of different interested stakeholders, including two NGOs and governing bodies. Subsequently, this scale of collaboration has led to some demonstrable actions over the past three years across all MSC scoring principles (1,2, and 3). The FIP has taken into consideration the weaknesses determined by the pre-assessment and has tried improving these areas.

Strengths:

Principle 1:

The FIP partners actively facilitated the recent lobster stock assessment conducted in June 2022, which was critical for understanding more about the current stock health for the target species. The Belize Fisheries Department led the procedure and were able to provide knowledge and information about the fishery where required. This stock assessment report has not yet been published but will be instrumental in outlining the next steps for the FIP.

Principle 2:

The FIP's continual efforts in implementing VMS devices across the fleet is testament to the dedication to sustainability and fishery improvements. There has been a series of data collected during the time when the VMS devices were functional, however the issues with damages have meant the project can no longer collect present data. Unfortunately, a solution to improve on the VMS devices has not yet been developed, so data collection is halted. TASA is working with the University of Belize Environment Research Institute (UB-ERI) to research the potential impacts that casitas have on seagrass beds to understand more about the risks to habitats and ecosystems.

Principle 3:

The passing of the Fisheries Resource Act in 2020 was beneficial for the improved scoring of two of the Principle 3 performance indicators: 3.1.3 (Long-term objectives) and 3.2.2 (Decision-making processes).

Weaknesses:

Principle 1:

The stock assessment carried out in 2010 mentioned that the stock is overfishing is possibly occurring. A lobster fishery management plan is currently being produced, and the 2020 Fisheries Resources Act demonstrates that the Belize Fisheries Department and the government are attempting to improve the management of Belize national fisheries. Statutory Instrument 128 demonstrates the country's ambition to improve the sustainability of the lobster fishery operations but until these measures are implemented and can demonstrate effectiveness, the score cannot meet SG60. The auditor believes that the original score given to PI 1.1.1 (stock status) is not accurate because there was not enough empirical data to demonstrate that it is 'likely' that the stock is above the point where recruitment would be impaired (PRI) as a direct result of the 2010 stock assessment. Similarly, the summary of the 2022 stock assessment mentioned that the stock is "trending towards unsustainability" due to average recent fishing mortality approaching MSY ([Belize Lobster Stock Assessment Presentation - Key outcomes and recommendations 20220624.docx | Powered by Box](#)). The FIP should review the 2022 stock assessment when it is published to identify if there have been any changes in stock health, but also to understand where stock rebuilding practices need to be implemented.

There is currently limited information about the number of gears (pots/traps, and casitas) that are used in the fishery. This is important information for harvest strategy and harvest control rules requirements (1.2.1, 1.2.2). The FIP should try to improve data collection on gear numbers and continue with the inventory project started by TASA to extend across the national waters of Belize.

Principle 2:

The fishery cannot demonstrate non-target species interactions with the fishing gears. For casitas, the non-target species are expected to be zero because of the high selectivity of the fishing method but the pots and traps may catch non-target species including fish and crabs. The Belize Fisheries Department is implementing a rule that all pots/traps must have an escape gap built in to enable undersized lobsters and non-target species to escape. This has not yet been installed but is planned for the commencement of the 2023 season. Nonetheless, the paucity of information regarding this data is why the auditor reduced the MSC performance indicator scores for secondary species performance indicators (2.21, 2.2.2, 2.2.3).

The habitats information score has been precautionarily scored 60-79 because there is not enough information to demonstrate.

Recommendations:

1. Review the 2022 lobster stock assessment to learn about the current stock health. If there is evidence of improvement, these needs to be addressed and used to improve the score for this PI. (1.1.1)
2. Encourage the government to implement a robust stock rebuilding plan, where necessary. (1.1.2)
3. The harvest strategies and harvest control rules in particular could be improved and developed to ensure that the target stocks are harvested at a sustainable rate. The FIP should also continue the efforts to improve gear handling and best practices, electronic traceability to ensure the fishing methods are aligned with sustainability fisheries management (1.2.1, 1.2.2)
4. Conduct a fishery-independent survey of the fishing area to understand more about the non-target species that inhabit there. (2.2.1, 2.2.2, 2.2.3)
5. Conversely, use fishery observers to record any and all bycatch from the pots and traps to provide an estimate of how much these species contribute to the total catch biomass. (2.2.1, 2.2.2, 2.2.3)
6. For habitats information, there needs to be more distinct information about the number of traps used, recovered, and lost in the fishery in order to meet SG80. The FIP is recommended to expand the pre-existing inventory program taking place in the Turneffe Atoll Marine Reserve to implement a national inventory program that can demonstrate these data annually (2.4.3).
7. Continue efforts to implement VMS devices onto the fishing vessels in order to demonstrate where the boats are operating and how this may interact with vulnerable habitats and ecosystems. (2.4.1, 2.4.2, 2.4.3, 2.5.1, 2.5.2, 2.5.3).

8. Continue discussions within the FIP about introducing the private sector into the conversation regarding incentivizing fishers to use the Cooperatives.

Summary of MSC Performance Indicator Scores

Fill in the “previous score” scoring category (<60, 60–79, ≥80) for each performance indicator (PI) according to the most recent set of scores available on FisheryProgress (see the Improvement Progress tab of the FIP’s profile — the most recent scores will be on the right-most column).

Fill in the “current score” scoring category (<60, 60–79, ≥80) for each performance indicator (PI) by referring to the [MSC Fisheries Standard v2.01](#) or [MSC Fisheries Standard v3.0](#). **Provide a rationale that explicitly addresses each of the performance indicator’s scoring issues (and references when applicable).**

Fisheries that contain combinations of multiple target species, gear types, and/or governing jurisdictions (UoAs) have the option to complete the [Multi-species/Gear/Jurisdiction Indicator Score spreadsheet](#) but **please note that the table below must provide the lowest score for each performance indicator. For Multi-species/Gear/Jurisdiction FIPs, the assessor may choose to address only the scoring issues for the lowest scoring UoA(s) for that performance indicator in the rationale.**

Principle	Component	Performance Indicator		Previous Score 2022	Current Score 2023	Rationale or Key Points
1	Outcome	1.1.1	Stock status	60-79	<60	<p>The last stock assessment for spiny lobster in Belize was published in 2010 but there was no information provided regarding estimated MSY. Likewise, there was no empirical evidence to demonstrate that the stock has not met the point of recruitment impairment (PRI). The conclusion also mentions that fishing efforts need to be reduced and that over-fishing is possibly occurring. This does not meet the requirements of scoring indicator (SI) a, and therefore, SIa cannot meet SG60 and should have been scored thusly when the FIP was initiated.</p> <p>Whilst a new lobster stock assessment took place in 2022, the findings have not yet been published so we are not able to verify, empirically, if the outcome is positive or negative. The FIP will be able to increase the allocated scoring provided by the auditor if the results of the stock</p>

						assessment consider MSY and LRP or appropriate proxies and are able to demonstrate that the stock status is not meeting the PRI.
		1.1.2	Stock rebuilding	<60	<60	The pre-assessment scored this PI 'n/a' because it deemed that there was no need for a rebuilding plan if the stock is not at PRI. However, there is no evidence to demonstrate that the stock is fluctuating around MSY and until the 2022 stock assessment is published, we cannot verify that there has been an improvement in stock health. However, the Belize Fisheries Department has attempted to improve the sustainability of the lobsters in Belize national waters, including passing the 2020 Fisheries Resources Act, which includes Statutory Instrument 128, providing more stringent regulations aimed at stock rebuilding. Statutory Instrument 128 is aiming to increase carapace length to 3.25 inches, increase the minimum tail size from 4 oz to 4.5 oz, and introduce a new escape gap to permit undersized and non-target species to escape pots/traps. However, these have not yet been implemented and cannot demonstrate that they are effective at improving stock status. Therefore, precautionary scoring of <60 is required. When the measures from Statutory Instrument 128 are implemented, the FIP should reevaluate the scoring.
	Management	1.2.1	Harvest Strategy	<60	60-79	<p>Since the pre-assessment was published, and in the past year in particular, the FIP has worked towards improving the knowledge of the total numbers of gears used by developing a casita and pot inventory project. If the FIP can show these numbers, then this will be helpful in identifying the fishing effort. Likewise, using the catch data information provided from the Tally App. the FIP will be able to demonstrate fishing effort. Sla meets SG60.</p> <p>There is a closed season which prohibits any form of lobster fishing from March 1st-to-June 30th, during the spawning season to protect reproduction. Likewise, there is a size limit on the individuals that can be landed, and</p>

						<p>prohibited landing of pregnant individuals. SIb meets SG60. The stock assessment should be able to demonstrate if these harvest strategies are effective but the information from the 2022 assessment has not yet been released so SIb does not meet SG80. This score may be able to be updated when the new stock assessment is released if it looks positive.</p> <p>The fishery recently conducted a stock assessment in 2022, which demonstrates that there is monitoring in place to assess the efficacy of the harvest strategies. SIc and SId meet SG60.</p> <p>The fishery does not catch sharks, so no shark finning is occurring. The hook sticks are selective, and the pots are too small to capture sharks. SIe meets SG80.</p> <p>The FIP mentioned that they are currently reviewing the viability of using nooses rather than hook-sticks to target lobster individuals because this is less invasive and means that if a fisher catches a pregnant or undersized individual by mistake, it can be released unharmed rather than dead. This demonstrates that there are efforts in place to review the current fishing practices and make changes to minimize UoA mortality of unwanted target stock. SIf meets SG60.</p>
		1.2.2	Harvest control rules and tools	<60	<60	<p>There are effort limitations in place in the fishery through the closed season and minimum landing sizes but based on the results of published stock assessment (2010) and summary of the 2022 stock assessment (yet to be published), it cannot be suggested that these controls are expected to reduce the exploitation rate as PRI is approached. However, the FIP should be advocating for these to be implemented once the new lobster stock assessment results are published to ensure the sustainability of the fishery.</p>

		1.2.3	Information and monitoring	60-79	60-79	The auditor agrees with the original scoring rationale and no score change is made.
		1.2.4	Assessment of stock status	<60	<60	The auditor agrees with the original scoring rationale and no score change is made. However, the FIP may be able to reconsider the scoring for this PI when the 2022 lobster stock assessment is published and if it is positive.
2	Primary species	2.1.1	Outcome	80+	<p>Casitas (80+)</p> <p>Pots and traps (<60)</p> <p>Total score: <60</p>	<p>Casitas provide conditions that permit highly selective fishing operations and mean that the fishers can accurately and reliably catch only target lobster individuals. Therefore, SG80 is met for casitas.</p> <p>Pots and traps can lead to non-target species bycatch as described in the pre-assessment and as seen in similar lobster fisheries in the Caribbean (Gascoigne, et al., 2018). The fishery does not conduct independent data collection of non-target catches, which means there is no method in place to identify if there are secondary species that get caught in these fishing gears. Thus, the stock status of these unknown primary species cannot be verified and the impact on their stocks is unknown. Sla and Slb cannot meet SG60.</p> <p>The likelihood is that there are no main primary species, but the lack of independent bycatch data precludes a higher score, and the precautionary approach has been adopted for scoring in its absence. With improved independent data collection on species bycatch, this PI may be able to improve.</p>
		2.1.2	Management strategy	80+	<p>Casitas (80+)</p> <p>Pots and traps (<60)</p>	<p>The casitas have no bycatch potential so there are no primary species management methods required. SG80 is met for casitas.</p> <p>There are no current measures in place for primary species, so the auditor considered the “if necessary” clause in the PI. The conclusion here was without information on bycatch species in the fishery, it is not</p>

					Total score: <60	<p>clear whether management measures are indeed necessary. SG60 is not met on this basis.</p> <p>Ahead of the 2023 fishing season, the Belize Fisheries Department will be implementing a requirement that pots/traps have an escape gap added to their construction in order to permit non-target species to escape and thus reduce the interaction rate. When these requirements have been introduced, the FIP will be able to increase the scoring for this PI.</p>
		2.1.3	Information	60-79	<60	<p>There is some qualitative information available to estimate the potential primary species interactions with the lobster fishery so SIa meets SG80. However, there is no quantitative data to be able to demonstrate the percentage impact that the secondary species contribute to the total catch biomass, so SIb cannot meet SG100.</p> <p>While the FIP has trialed VMS devices across the fishery, the devices are susceptible to damage and breakage, so until there are improvements made in the devices, there is no information available to demonstrate quantitative data about the impact of the UoA on primary species. SIc cannot meet SG60. The auditor recommends introducing independent bycatch data collection or conducting surveys of the types of species that could interact with the fishery to learn more about the potential interaction rate with the</p>
	Secondary species	2.2.1	Outcome	80+	<p>Casitas (80+)</p> <p>Pots and traps (<60)</p>	<p>Casitas provide conditions that permit highly selective fishing operations and mean that the fishers can accurately and reliably catch only target lobster individuals.</p> <p>Pots and traps can lead to non-target species bycatch as described in the pre-assessment and as seen in similar lobster fisheries in the Caribbean (Gascoigne, et al., 2018). The fishery does not conduct independent data collection of non-target catches, which means there is no</p>

					<p>Total score: <60</p> <p>method in place to identify if there are secondary species that get caught in these fishing gears. Thus, the stock status of these unknown secondary species cannot be verified and the impact on their stocks is unknown. Sla and Slb cannot meet SG60.</p> <p>The likelihood is that there are no main secondary species, but the lack of independent bycatch data precludes a higher score, and the precautionary approach has been adopted for scoring in its absence</p>
		2.2.2	Management strategy	80+	<p>Casitas (80+)</p> <p>Pots and traps (<60)</p> <p>Total score: <60</p> <p>The casitas have no bycatch potential so there are no secondary species management methods required. SG80 is met for casitas.</p> <p>There are no measures in place for secondary species, so the auditor considered the “if necessary” clause in the PI. The conclusion here was without information on bycatch species in the fishery, it is not clear whether management measures are indeed necessary. SG60 is not met on this basis.</p>
		2.2.3	Information	60-79	<p><60</p> <p>There is some qualitative information available to estimate the potential secondary species interactions with the lobster fishery so Sla meets SG80. However, there is no quantitative data to be able to demonstrate the percentage impact that the secondary species contribute to the total catch biomass, so Slb cannot meet SG100.</p> <p>While the FIP has trialed VMS devices across the fishery, the devices are susceptible to damage and breakage, so until there are improvements made in the devices, there is no information available to demonstrate quantitative data about the impact of the UoA on secondary species. The auditor recommends introducing independent bycatch data collection or a survey of the types of species that could interact with the fishery.</p>

	ETP species	2.3.1	Outcome	80+	80+	The auditor agrees with the original scoring rationale and no score change is made.
		2.3.2	Management strategy	80+	80+	The auditor agrees with the original scoring rationale and no score change is made.
		2.3.3	Information	60-79	80+	The auditor has increased the scoring for this PI because there are no ETP species that could negatively interact with the fishery and the specific fishing gears described. Therefore, all scoring issues meet SG80.
	Habitats	2.4.1	Outcome	80+	80+	There is regular monitoring of the fishing activity carried out by government patrols and rangers to ensure that fishers are not operating on sensitive habitats including the mangroves. Some activity does take place on the seagrass beds, and the casitas are made of heavy materials like metals, which could damage the habitat. However, as demonstrated in the pre-assessment, only 1% of the seabed is used by casitas, and seagrasses are resilient plants, so the impact of the fishing gears is not considered detrimental. The pots are made from biodegradable recycled wood, which means if any do become lost then they will not persist in the marine environment forever and will degrade.
		2.4.2	Management strategy	80+	80+	There are eight well-defined marine protected areas (MPAs) around the Belize lobster fishery, which reduce fishing pressure. The Belize Fisheries Department and co-managers also are heavily involved in ensuring that the fishing zones are patrolled with trained rangers that can enforce management and make arrests if there is any IUU activity.
		2.4.3	Information	80+	80+	There is long-term academic research available and a National Marine Habitat Map that describes the habitats and environments of the Belize lobster fishery.

						<p>The pre-assessment demonstrated that scoring issue (SI) b did not meet SG80 because “the number and location of casitas is not known” in the fishery. This should have led to the PI originally scoring 60-79, not SG80.</p> <p>After the audit, it was deemed that the score should increase to SG80 for SIb because there is some current <i>‘reliable information on the spatial extent of interaction and on the timing and location of use of the fishing gear’</i> as is required by the SG80 scoring guideline. The TASA TAMR pots and traps inventory, while currently only operating in the Turneffe Atoll Marine Reserve, accounts for approx. 23% of the total lobster catch in Belize. This inventory project is a great step in understanding more about the number of gears used and is able to verify if and when those gears are retrieved at the end of the fishing season. The plan in Belize is to increase this inventory project across the whole national fishery to learn more about the potential risk to habitats, and this meets the requirements of SIc <i>“adequate information continues to be collected to detect any increase in risk to the main habitats”</i>. Therefore, SIc meets SG80, and the whole PI meets SG80.</p> <p>Nevertheless, the FIP should continue to expand the project and continue to collect gear inventory data over time in order to demonstrate its impact on overlapping habitats.</p>
	Ecosystem	2.5.1	Outcome	80+	80+	The auditor agrees with the original scoring rationale and no score change is made.
		2.5.2	Management strategy	80+	80+	The auditor agrees with the original scoring rationale and no score change is made.
		2.5.3	Information	80+	80+	The auditor agrees with the original scoring rationale and no score change is made.

3	Governance and Policy	3.1.1	Legal and customary framework	80+	80+	The auditor agrees with the original scoring rationale and no score change is made.
		3.1.2	Consultation, roles, and responsibilities	80+	80+	The auditor agrees with the original scoring rationale and no score change is made.
		3.1.3	Long term objectives	80+	80+	The auditor agrees with the original scoring rationale and no score change is made.
	Fishery specific management system	3.2.1	Fishery specific objectives	60-79	60-79	No score changes at the moment. However, when the new lobster stock assessment is published, this should be able to inform an updated stock rebuilding and harvest strategy for the fishery, which will then be able to demonstrate that the fishery-specific objectives are in relation to Principle 1.
		3.2.2	Decision making processes	80+	80+	The auditor agrees with the original scoring rationale and no score change is made.
		3.2.3	Compliance and enforcement	60-79	80+	The auditor reviewed the rationale for this performance indicator and disagrees with the score given to scoring issue c. The audit identified that there is extensive use of rangers and patrol vessels that are well-equipped in handling enforcement procedures. Any fisher that is found operating outside of their license will be fined and can be arrested. The Fisheries Resource Act of 2020 demonstrates these penalties and sanctions clearly. Therefore, Slc meets SG80. This increases the PI score to SG80.
		3.2.4	Management performance evaluation	60-79	60-79	The auditor agrees with the original scoring rationale and no score change is made.

Environmental Workplan Results

Fill in the following table by reviewing the latest FIP's environmental workplan (see the FIP's Documents section on the Details tab of the FIP's FisheryProgress profile) and summarizing the results that have been achieved over the past three years (or since the last evaluation report was completed) by the FIP. A result is defined as:

- A regulatory policy change or regulatory action to improve the fishery (e.g., a new bycatch provision), or fishing practice change (e.g., a change in fishing gear developed voluntarily and implemented by the FIP) to improve the fishery.
- A publicly verifiable positive change in the water (e.g., an increase in biomass of target stock, an increase in population of impacted protected species, a decrease in habitat or ecosystem impacted)
- An activity that led to an MSC performance indicator score change in the fishery.

It is advised that assessors determine results through stakeholder consultation, however the FIP's Action Progress tab on FisheryProgress may also be a useful resource. For results to be valid, FIP participants must have directly worked on or contributed to the improvement through one or more actions/tasks in the FIP's environmental workplan. For each result:

1. Summarize the result in a short sentence.
2. Identify the most closely related action(s), as they are listed on the FIP's Action Progress tab on the FisheryProgress profile.
3. Identify the most closely related MSC performance indicator(s) impacted by the result.
4. Provide an explanation of steps that the FIP participants took, or how the FIP's work played a role in supporting and achieving the result.

Result	Related Action on FisheryProgress	Related MSC Performance Indicator	Explanation
Stock status analyzed	Complete robust stock assessment	1.2.4; 1.1.1	<p>There was a lobster stock assessment conducted in June 2022 by the Belize Fisheries Department. However, the report has not yet been published so there is no way that the auditor can review the results of the assessment and make a comment about the current health status of the stock. A general summary was provided and showed that fishing effort is trending towards unsustainability (overall increase in fishing effort over time). A recommendation was made to the Department that the fishing effort needs to be controlled and/or reduced to achieve sustainability of the fishery.</p> <p>The auditor discussed the stock assessment with the Department, and it became clear that the way that the Belize lobster fishery operates is distinct from the other Caribbean lobster fisheries because it does not permit SCUBA diving and the habitats are much shallower. The result of this means that the lobsters caught in Belize are generally smaller than the other Caribbean fisheries. Comparisons between these other fisheries, therefore, are not</p>

			<p>appropriate and should not influence the results of the current stock assessment. Nonetheless, the finalized report has not been published.</p> <p>The recommendation made was to strengthen the monitoring and data collection system, including increased collaboration with other in-country efforts for data collection. The increasing adoption of traceability across the industry is addressing these concerns.</p>
Data sharing program to gather robust landings data.	Conduct long-term fisheries-dependent monitoring program	3.2.3; 3.2.2; 3.2.1; 3.2.4	Both the National and Northern Cooperatives collect catch and fishing effort data using the Tally App. This is a comprehensive piece of software that records important data that can be used for traceability. At the moment, it doesn't seem like the two Cooperatives share this data with each other and this is an important next step for the FIP to be able to demonstrate accurate catch data moving forward with the project.
Passing Aquatic Resources Act	Coordinate campaign to pass aquatic resources act.	1.2.3; 3.2.3; 3.2.2; 3.2.1; 3.1.3; 3.2.4	The Fisheries Resource Act passed January 2020, shifts from a focus on fish stocks and harvests of traditional commercial species to ecosystem-based management. The management considers the different environments and habitats that the fishers operate in, including sensitive mangrove and sea grass bed ecosystems. Furthermore, Belize is currently the only Caribbean lobster fishery that separates the operational area into distinct fishing zones that are allocated using scientific information and knowledge about the ecosystems within the areas.
Tech Based Enforcement Task Force launched and operational	Develop coordinated on-water enforcement program	3.2.3	<p>The Tech-based Taskforce was initiated to identify enforcement needs and work with technology providers to develop optimal solutions and strategies to add to current enforcement model. The enforcement covers both land-based and sea-based activity, including patrolling rangers that monitor fishers' activity and ensure no IUU fishing is occurring. The rangers are fully qualified in conducting patrols and are able to make arrests where appropriate. Joint patrols also occur with other authorities, including the Belize Coast Guard for a multistakeholder approach. They are equipped with a new technological software, SMART, to collect at-sea data about catch rate, number of fishers, operating area, etc.</p> <p>The Taskforce are also considering the use of drones to supplement the rangers because they can provide more immediate information especially</p>

			regarding IUU fishing, and require less fuel than the patrol boats, which is one significant hinderance in the ranger system.
Defining technology needs	Develop Lobster Fisheries management plan under passed Act	3.2.3	There is a working group to develop the Lobster Management Plan, but the plan has not yet been finalized. It was mentioned that it is a constant work in progress because the management is updated regularly, so it acts as a working document rather than a final report.
Researching casita impact	Execute short-term research on impact of Casitas on ETP and habitat	2.3.3; 2.5.3	Focusing on critical data currently missing regarding the biology of lobsters and species associated with the lobster fishery. Two proposals to fund research looking at casita impact on seagrass submitted (July 2021). TASA are working with some students from the University of Belize to research this topic and understand more about the potential impacts that the fishing gears have on the seabed around Belize and within the fishing areas.
VMS program, create, pilot, and expand to entire fleet	Implement a long-term VMS program.	2.3.3; 2.3.1; 2.4.3; 2.1.3; 2.2.3; 2.2.1; 3.2.3.; 3.2.2; 3.2.4	The FIP has tried continuously to introduce VMS program across the boats within the fleet but has been met with a variety of difficulties. The size of the boats makes it difficult to fit the devices in a secure place that avoids human damage and prevents salt and seawater damage. Therefore, previous programs have only had short-term success. More research into smaller VMS devices, or those that can be easily cleaned, is ongoing. WCS and TASA both mentioned that the initial price and the ongoing monthly fees for the devices are too expensive for the fishers to pay. Incentivizing them by supplementing the payments may need to be the way forward.
Casita Inventory	Turneffe Casita Inventory Pilot	1.2.4; 1.2.2; 1.2.3; 2.5.3	The casita inventory project has been initiated and the first set of complete data is expected to be produced in the 2023 closed season. Following this initial dataset, an inventory will be collected every two years to monitor the number of casitas being deployed and retrieved. This will be critical data in determining the fishing effort on the lobster fishery and help inform sustainability objectives in the future. The tagging and inventory project should extend beyond the Turneffe Atoll in order to be effective across the whole Belize spiny lobster fishery.
Education of fishers	Outreach and education of fishers	3.1.2	The FIP hired Blue Ventures to design and produce an educational video about the FIP, including the importance of it in helping advance the lobster fishery to meet its sustainability goals and become MSC certified. This was

			<p>posted on the FIP's dedicated Facebook page and there are regular updates provided on there for fishers to consume and learn about their fishery.</p> <p>As of July 2022, the fisheries communication platform has been developed in the form of the FIP Facebook page. https://www.facebook.com/BelizeLobsterFIP/.</p>
Research to incentivize high quality product	<p>Update policies for co-ops to incentivize best practices.</p> <p>Update and enforce membership policies within coop</p>	3.2.3, 3.1.2	<p>The FIP participants are anxious to ensure the fishers continue to supply and sell their catches to the two Coops because they are important institutions that support the fishers both economically and socially. There is a discussion happening at the moment within the FIP to initiate a conversation with the private sector so that they are aware of the importance of the FIP and the Coops for fisher livelihoods. Whilst the private sector can offer a premium price for their catch now, if there is no competition from the Coops because they have gone out of business, the private sector will be able to offer significantly reduced prices for the same catch.</p> <p>As of January 2021 – an assessment which identified potential market opportunities for the cooperatives products on the local market which supports the National Fishermen's Cooperative (NFC) with a realistic market panorama. This study also identified a potential export for sales.</p>

Supporting References

Provide a list of references that are referred to within this document.

Gascoigne, J., Matthews, T. & Groeneveld, J., 2018. *Marine Stewardship Council (MSC) Public Certification Report The Bahamas Spiny Lobster Fishery*, Lymington: Control Union Pesca Ltd..

GMFMC and NOAA, 2018. *Modifications to the spiny lobster gear requirements and cooperative management procedures. Final Amendment 13 to the fishery management plan for spiny lobster in the Gulf of Mexico and the South Atlantic*. [Online]

Available at: <https://repository.library.noaa.gov/view/noaa/21139>

[Accessed 12 April 2023].

MSC, 2018. *MSC Fisheries Standard*, London: Marine Stewardship Council .

WCS, 2014. *WCS News: News from WCS's Zoos, Aquarium and Field Conservation Programs across the Globe*. [Online]

Available at: <https://newsroom.wcs.org/News-Releases/articleType/ArticleView/articleId/6334/Wildlife-Conservation-Society-Helps-Safeguard-Belizes-Barrier-Reef-With-Conservation-Drones.aspx>

[Accessed 12 04 2023].

