

Management options for shark diving in Fuvahmulah, Maldives

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Management options for shark diving in Fuvahmulah, Maldives: Development of Codes of Conduct for shark interactions, and Scoping Shark Dive Guide Certification

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Contributors

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Executive Summary

Fuvahmulah, a UNESCO Biosphere Reserve in southern Maldives, has rapidly gained international recognition for its exceptional shark diving experiences, particularly the 'Tiger Harbour' dive site, where up to 40 tiger sharks can be encountered on a single dive. This industry contributes significantly to the local economy, with an estimated annual value of up to \$15.75M in 2023. As the industry continues to grow, stakeholders have identified the need for standardized operational practices to ensure diver and shark safety, and the long-term sustainability of the sector, as highlighted by a review of shark diving practices in 2024.

In collaboration with local and national authorities, and the dive industry in Fuvahmulah, four Codes of Conduct aimed at different shark species, including thresher sharks, non-provisioned sharks, and provisioned tiger shark at 'Tiger Harbour' were developed. These guidelines were formulated through stakeholder engagement, international best practices, and structured workshops, culminating in a consensus-driven framework. Key considerations include maintaining safe distances, restricting direct interaction, defining dive procedures, and introducing enforcement mechanisms.

Additionally, recognizing the critical role of dive guides in ensuring safe and responsible interactions, a parallel initiative explored the feasibility of a Shark Dive Guide Certification programme. Insights from global shark diving operations underscored the need for specialized training in shark behaviour, diver management, emergency response, and medical preparedness. Stakeholders overwhelmingly supported the establishment of a formal certification process, emphasizing local knowledge integration and continuous professional development.

Next steps include pilot implementation, consideration of the need for policy integration, and ongoing monitoring to refine and enhance these initiatives, helping to ensure a sustainable shark diving industry in Fuvahmulah.

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Chapter 1: Development of Codes of Conduct for shark interactions in Fuvahmulah, Maldives

1. Introduction

Fuvahmulah, a single-island atoll and UNESCO Biosphere Reserve in southern Maldives, has become globally recognised in recent years for its reliable interactions with predatory sharks, which have contributed to the growth of its dive tourism industry. Notably, the provisioned tiger shark dives at ‘Tiger Harbour’ - where up to 40 individual tiger sharks can be seen on a single dive (Vossgaetter et al. 2024) - has become a sought-after product (Zerr et al. 2024).

A comprehensive review of shark diving practices at Fuvahmulah was undertaken in 2024, in collaboration with the Fuvahmulah City Council and the Ministry of Tourism and Environment. This review highlighted that Fuvahmulah now caters to >12,000 divers annually through 11 dive operators (excluding seasonal safari or liveaboard divers), with an estimated annual value of the industry in 2023 of up to U\$15.75M, making it a substantial contribution to the island’s economy (Araujo et al. 2024). In consideration of this, and given the continued growth of the sector, stakeholders in Fuvahmulah expressed their support for the development of a sustainable shark diving industry, with 91% of dive operators (n=11) highlighting the need to standardise operational practices (Araujo et al. 2024).

As a result, this work aimed to facilitate the development of Codes of Conduct for shark diving in Fuvahmulah. It collates stakeholder perceptions and integrates best practices from global shark diving operations to develop unified guidelines, tailored to Fuvahmulah’s unique ecological and economic context.

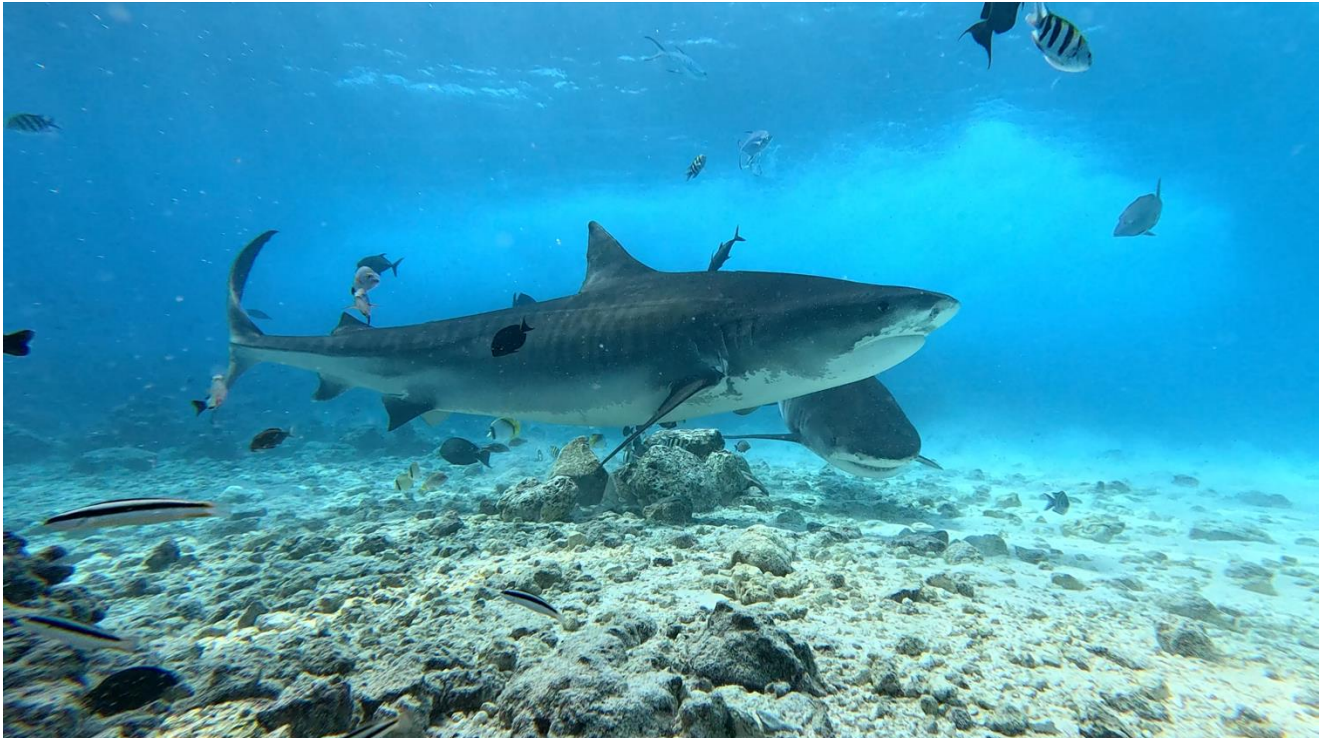


Figure 1. Tiger sharks patrol the shallows at Tiger Harbour, Fuvahmulah, Maldives.
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Codes of Conduct are a set of guidelines designed to regulate human behaviour that may have adverse or detrimental effects on the target species, while also mitigating risks to divers or snorkelers (Colman, 1997; Scarpaci et al. 2003). The active involvement and ownership of Codes of Conduct by local stakeholders is essential for their development, adoption and implementation, as well as to ensure their long-term relevance and adequacy.

2. Methodology

Stakeholder engagement is key to any social-science and people-based project, with local insights and expertise shaping practical outcomes. This not only fosters collaboration within local stakeholder groups from the outset but increases the likelihood of long-term success and sustainability.

Introductory information about the project was shared with local stakeholders in Fuvahmulah via in-person meetings throughout June and July 2024, aimed at building capacity ahead of pre-workshop interviews and main workshops.

The 2024 Shark Diving Review (Araujo et al. 2024) was reviewed to identify recommendations that could be starting considerations for the development of Codes of Conducts. These themes provided key elements to consider in the formulation of the Fuvahmulah shark diving Codes of Conduct, and served as the foundation for discussions with the local diving industry (see Table 1).

Table 1. Common themes and considerations for shark diving Codes of Conduct as identified in Araujo et al., (2024). Please note these are not exhaustive.

#	Theme	Recommendations
1	Dress code	Dark apparel, no shiny accessories or jewellery, no strobes and camera lights.
2	Environmental conditions	Determine a minimum in-water visibility and maximum swell deemed safe.
3	Distance and positioning to sharks	Position in the water, minimum distance to sharks and positioning in relation to bait.
4	Touching of sharks	Touching should be prohibited, or guests trained how to redirect a shark.
5	Speed of vessels	Keep a maximum knot on approach/departure and indicate whether engines should be left on/off.
6	Introductory briefing	Include shark ecology and biology, threats to sharks, risks of injury to diver and sharks, dive procedure, emergency response plan.
7	Group size	Maximum divers in the water at one time, minimum guide to diver ratio, minimum number of guides at all times.
8	Diver behaviour	Minimise time at the surface, no splashing or thrashing, remain stationary in the water column/at the bottom, no swimming away from sharks or blocking their path.
9	Scuba diving	Divers should be suitably qualified and previous shark diving experience is recommended.
10	Provisioning	Bait should be locally sourced, only specific species and quantity of bait used, bait should be thoroughly

		rinsed so it doesn't over stimulate the sharks, and total quantity limited at a dive site per day.
11	Containment of bait	Guests should not handle the bait, and it is recommended that bait should be contained within a drum/bait crate to reduce by-products in the water.
12	Enforcement and monitoring	Define who is in charge, what will happen if rules are not followed, self-monitoring and reporting, feedback discussions with stakeholders for continuous improvement.

Semi-structured pre-workshop interviews with 11 registered dive operators and three local NGOs based in Fuvahmulah were conducted remotely via Zoom and telephone throughout September and early October 2024 (see Appendix 1). The primary objectives of these interviews were to collect initial feedback from stakeholders on proposed Code of Conduct content, assess the requirements for shark diving guides, and explore the feasibility of a guide certification programme (see Chapter 2). These preliminary conversations aimed to build understanding of stakeholder perceptions and opinions, aimed at facilitating more informed and productive discussions during the in-person workshop held in October 2024. Following the completion of 11 interviews, no new themes or considerations emerged for inclusion in the Codes of Conduct; suggesting that the number of interviewees was adequate to reflect different perspectives (Guest et al. 2006).



Figure 2. Group photo from one of the sessions during the October 2024 workshops developing Codes of Conduct for shark interactions in Fuvahmulah, Maldives.

Workshops were conducted daily from 13th to 17th October, between 20:00 and 22:30-23:00 (local time) to support stakeholder attendance and participation, and were held at the Fuvahmulah City Council events building. Each session followed a structured agenda, beginning with an introduction to Codes of Conduct and guidelines for interactions with marine wildlife, alongside an overview of the workshop ground rules (e.g. maintaining respectful dialogue and ensuring constructive participation). A breakdown of attendees is provided in Table 2.

The development of four Codes of Conduct was proposed at the workshops, to address shark diving with different species given that some are site-specific with different logistical challenges: one for thresher sharks *Alopias pelagicus*, one for non-provisioned shark species and two specifically for provisioned shark diving with tiger sharks *Galeocerdo cuvier* at Tiger Harbour (one for operators and one for guests). This latter one was divided into two as it was identified as more logistically challenging and one requiring further discussion and input from stakeholders. The key considerations for developing a Code of Conduct, as outlined in Table 1, were discussed in great detail.

Table 2. Summary of attendees in each stakeholder category present at the Codes of Conduct workshop between 13th and 17th October 2024 in Fuvahmulah.

Stakeholder categories	Number of representatives in attendance
Ministry of Tourism and Environment	2
Fuvahmulah City Council	4
Dive Operators (owners, managers, dive guides)	28
Researchers	2
TOTAL	36

The first workshop (Oct 13th) was focused on the thresher shark; the second (Oct 14th) on other predatory sharks; the third and fourth (Oct 15th and 16th) on tiger sharks at Tiger Harbour; and the last workshop (Oct 17th) addressed any outstanding issues or concerns, and outlined the next steps in the development and implementation of the Codes of Conduct.

3. Results

The following information provides a summary of key points discussed during the workshops. Please note that this is a general overview and not exhaustive of stakeholder views nor a verbatim account of what was shared. The draft Codes of Conduct are attached in Dhivehi in Appendix 2 and in English in Appendix 3.

3.1 Code of Conduct for interactions with Thresher Sharks

Interaction Guidelines for *divers* (see Figure 3 for infographic)

- 1. No touching, chasing, or harassing the sharks.**
Physical contact or harassment can stress thresher sharks, disrupting their natural behaviour and potentially causing avoidance and/or harm. Observing these magnificent creatures from a respectful distance allows them to remain undisturbed and ensures a more authentic encounter.
- 2. Maintain a distance of at least 5 meters from the sharks.**
Keeping at least 5 meters away helps protect the sharks from feeling threatened or cornered. This distance also ensures divers' safety, as sudden movements by the sharks can be unpredictable.
- 3. Max 6 divers per guide.**
Limiting group sizes reduces underwater crowding and minimizes noise or activity that might disturb the sharks. A smaller group also ensures the guides can manage diver behaviour effectively and maintain adherence to the guidelines.
- 4. No tank banging, shakers, or other noise.**
Thresher sharks can be skittish, and loud or artificial noises can startle thresher sharks, driving them away or interrupting their activities. Maintaining a quiet environment allows for more natural and prolonged interactions.
- 5. Stay close to the reef and follow your guide.**
Remaining near the reef minimizes disturbances to the sharks that are typically away from the reef over open water or cleaning stations. Following the guide ensures divers respect the sharks' space and adhere to the guidelines.
- 6. No flash, strobes, or video lights.**
Thresher sharks are night hunters with relatively sensitive eyes. Bright lights can disorient thresher sharks and interfere with their vision and/or spook them and thus ending the encounter. Relying on ambient light preserves the natural atmosphere of the dive and reduces stress on the animals.
- 7. Stay off the cleaning stations.**
Cleaning stations are vital ecosystems where sharks rid themselves of parasites with the help of cleaner fish. Avoiding these areas ensures this crucial behaviour is not disrupted by divers' presence. If sharks are observed cleaning, divers should remain careful to ensure distance is maintained as best as possible and follow their guide.
- 8. Avoid erratic or sudden movements.**
Sudden movements can be perceived as a threat by thresher sharks, causing them to flee. Calm, deliberate actions help create a serene environment for both divers and the sharks, thus ensuring longer encounters.

- Do not obstruct the path of the sharks or approach them from above.**
Blocking a shark's path can make it feel trapped or threatened, potentially leading to stress or unpredictable behaviour. Approaching from above can mimic predator behaviour, so staying level or below them is crucial to ensure a good interaction.

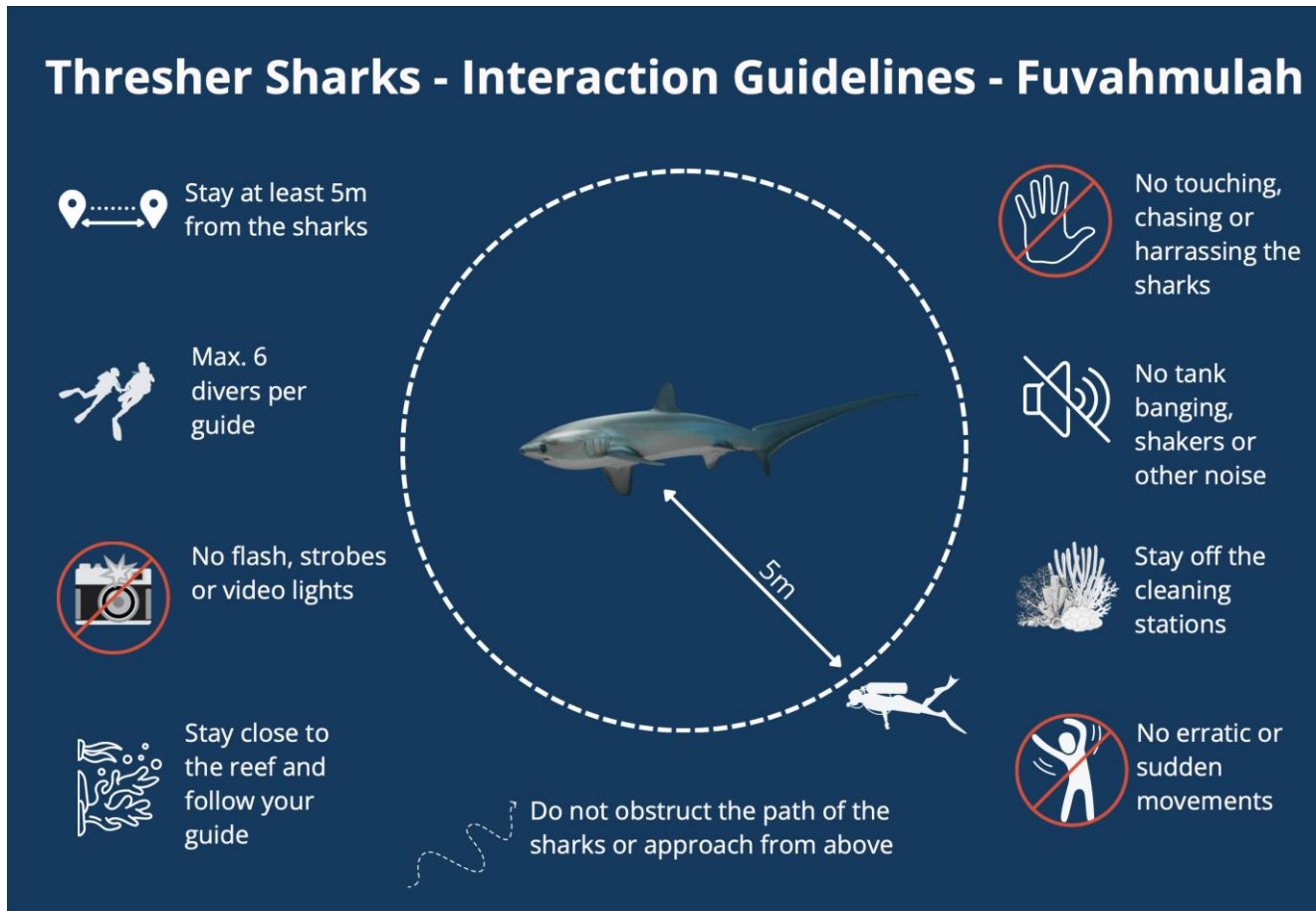


Figure 3 Final Code of Conduct for interactions with thresher sharks in Fuvahmulah.

3.2 Code of Conduct for interactions with other predatory sharks

Interaction Guidelines for *divers* (see Figure 4 for infographic)

1. Stay as a group and follow your guide.

Remaining as a group ensures divers are less intimidating to sharks and minimises the risk of disturbance. For more skittish sharks, such as scalloped hammerhead sharks, staying as a group determines whether it's a good or short encounter. Following the guide helps maintain a safe, structured interaction and ensures adherence to the guidelines. A cohesive group also allows for better coordination in case of unexpected situations.

2. Be mindful of light and strobe use.

Bright lights or strobes can startle or disorient sharks, disrupting their natural behaviour. Avoiding excessive or unnecessary light use ensures a more comfortable environment for the sharks and a more authentic encounter for divers. Natural lighting or low-intensity settings are preferred to minimize disturbance.

3. Wear dark exposure suits and gear.

Dark-coloured suits help divers blend into the underwater environment, reducing the chance of attracting unwanted attention from sharks. Bright or reflective gear can cause curiosity or confusion, leading to unpredictable reactions. Proper attire ensures a safer and more seamless interaction.

4. Do not obstruct the path of the shark(s) or break up the group.

Blocking a shark's path can make it feel threatened, leading to evasive behaviour – a sign of disturbance. Breaking up a group of sharks can lead to shorter encounters as sharks scatter and avoid divers. Clear pathways enable sharks to move naturally and maintain their space.

5. No erratic or sudden movements.

Abrupt movements can alarm sharks, potentially causing stress or avoidance behaviours. Slow, deliberate actions help create a calm atmosphere, fostering safer and more meaningful interactions. Controlled behaviour also ensures better opportunities for observation and photography.

6. Keep noise to a minimum to avoid disturbance.

Noise from equipment or diver activity can distract or irritate sharks, disrupting their behaviour or lead to avoidance. Maintaining a quiet presence ensures sharks remain relaxed and engaged in their natural routines. Minimizing noise is essential for respectful and non-intrusive observation.

7. No touching, chasing, or harassing the sharks.

Physical contact or harassment stresses sharks, disrupts their natural behaviour, and can pose safety risks to divers. Observing from a distance allows the sharks to remain undisturbed and maintains the integrity of the interaction. Respectful behaviour is key to fostering positive and ethical encounters.

8. No provisioning outside of Tiger Harbour.

Feeding or baiting sharks outside designated areas disrupts their natural feeding patterns and can lead to unintended consequences with other Fuvahmulah marine users. Keeping provisioning limited to Tiger Harbour ensures controlled and responsible interactions following the set guidelines. This guideline helps maintain ecological balance and prevents interactions with humans in areas where they are unwanted and unwarranted.

9. Max. 6 divers per guide.

Limiting the group size to six divers per guide ensures close supervision and effective management of diver behaviour. Smaller groups reduce underwater congestion and stress on the sharks, creating a more serene environment. This limit also enhances the quality of the experience for divers.

10. Stay at least 3 meters from the sharks.

Maintaining a distance of at least 3 meters provides sharks with the space they need to feel comfortable and reduce the risk of avoidance. This distance minimizes the risk of startling the sharks while allowing divers to observe safely. Respecting this buffer zone is crucial for maintaining harmony between divers and marine life.

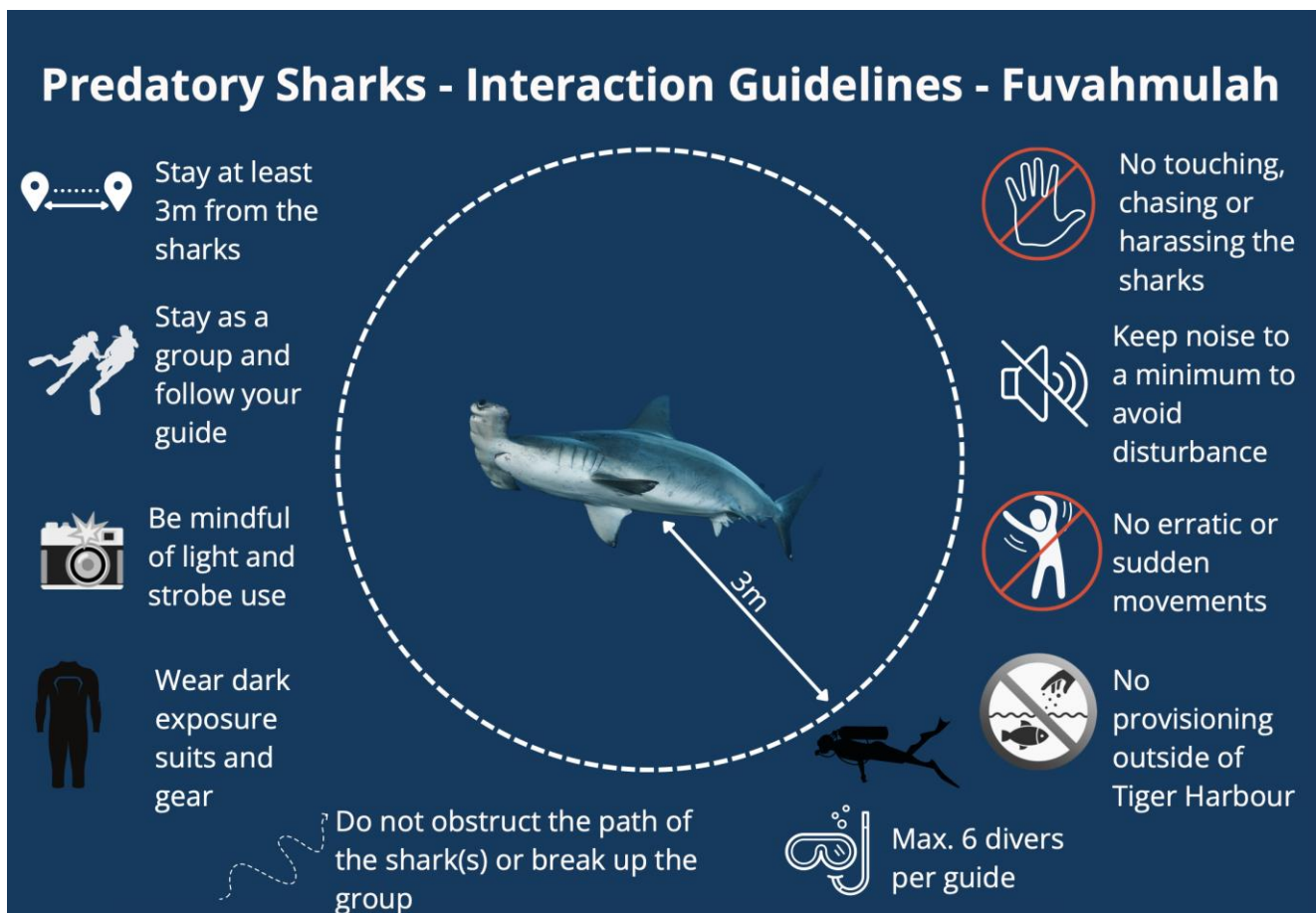


Figure 4. Final Code of Conduct for interactions with other predatory sharks in Fuvahmulah.

3.3 Code of Conduct for interactions with Tiger Sharks at Tiger Harbour: *divers*

Interaction Guidelines for *divers* (see Figure 5 for infographic)

1. No touching, chasing, or harassing sharks.

Physical interaction with tiger sharks can stress, injure or interfere with their natural behaviours. Chasing or harassing sharks may cause unpredictable reactions, endangering both the shark and the diver. Respectful observation helps maintain their natural calm and ensures a safer encounter for everyone involved.

2. Maintain a distance of at least 5 meters from the sharks.

A safe distance of 5 meters allows the shark plenty of space to manoeuvre at the Tiger Harbour site. This space also ensures that divers can observe the sharks' behaviour without interfering or intruding in the shark's space. Maintaining this distance is crucial to fostering a safe and non-intrusive environment for both sharks and divers.

3. Max 4 divers per guide.

4. Limiting the group size ensures the guide can manage diver behaviour effectively and prevents overcrowding, which can add stress to an already high energy dive. Smaller groups reduce noise and movement in the water, making the experience more serene and controlled. This guideline allows for a better overall encounter, and allows the guides dedicated attention on the divers and to intervene as needed.

5. **Dark-coloured, full exposure suits must be worn.**

Bright or reflective gear can attract unwanted attention from tiger sharks, potentially leading to curiosity or misinterpretation as prey. Full exposure suits provide additional protection from potential scrapes or stings from local marine fauna (e.g. jellyfish, urchins, etc.). Such dark attire ensures a safer and more inconspicuous presence for divers. N.b. an exposure suit does not mean wetsuit only, but it includes rash guard and leggings, skin suits and others.
6. **Maintain eye contact with the shark(s) and remain vigilant at all times.**

Tiger sharks are naturally curious and may approach divers, making eye contact is critical to signal awareness and prevent surprising the shark. Staying vigilant helps divers anticipate the shark's movements and respond appropriately. This practice reduces the risk of misunderstandings and helps maintain a respectful interaction.
7. **Kneel on the seabed and do not swim around.**

Staying low and stationary minimizes disturbances in the water and makes divers less intimidating to the sharks. Swimming around can attract unnecessary attention or appear threatening, especially to a large predator like the tiger shark. By kneeling, divers create a calm and controlled atmosphere that encourages natural shark behaviour. It also helps the guides stay on top of any unexpected attention.
8. **No flash, strobes, or video lights.**

Bright lights can disorient tiger sharks, disrupting their navigation and potentially causing stress. Using natural light ensures the sharks are not startled, maintaining a calm and undisturbed environment. Tiger Harbour is a shallow site, and artificial light is not needed nor recommended.
9. **Do not obstruct the path of the shark or approach from above.**

Blocking a shark's path may make it feel trapped or cornered, prompting defensive behaviour. Approaching from above can mimic the behaviour of predators, which might alarm the shark. Allowing the shark to swim freely without feeling threatened is vital for a safe and respectful encounter.
10. **No erratic or sudden movements.**

Sudden movements can startle tiger sharks, causing them to react unpredictably or flee. Slow, deliberate actions help maintain a calm atmosphere and signal to the sharks that divers are non-threatening. Controlled movements also ensure the safety of both the diver and the animal.
11. **Hood and gloves recommended.**

Wearing a hood and gloves minimizes exposed skin (see point 4 above), reducing the chance of accidental bites from curious sharks, while also reducing the impact of damage from any potential bites. These protective measures are especially important when interacting with large predators in close proximity. Additionally, the gear helps divers blend into the environment, making encounters safer and less intrusive for the sharks.

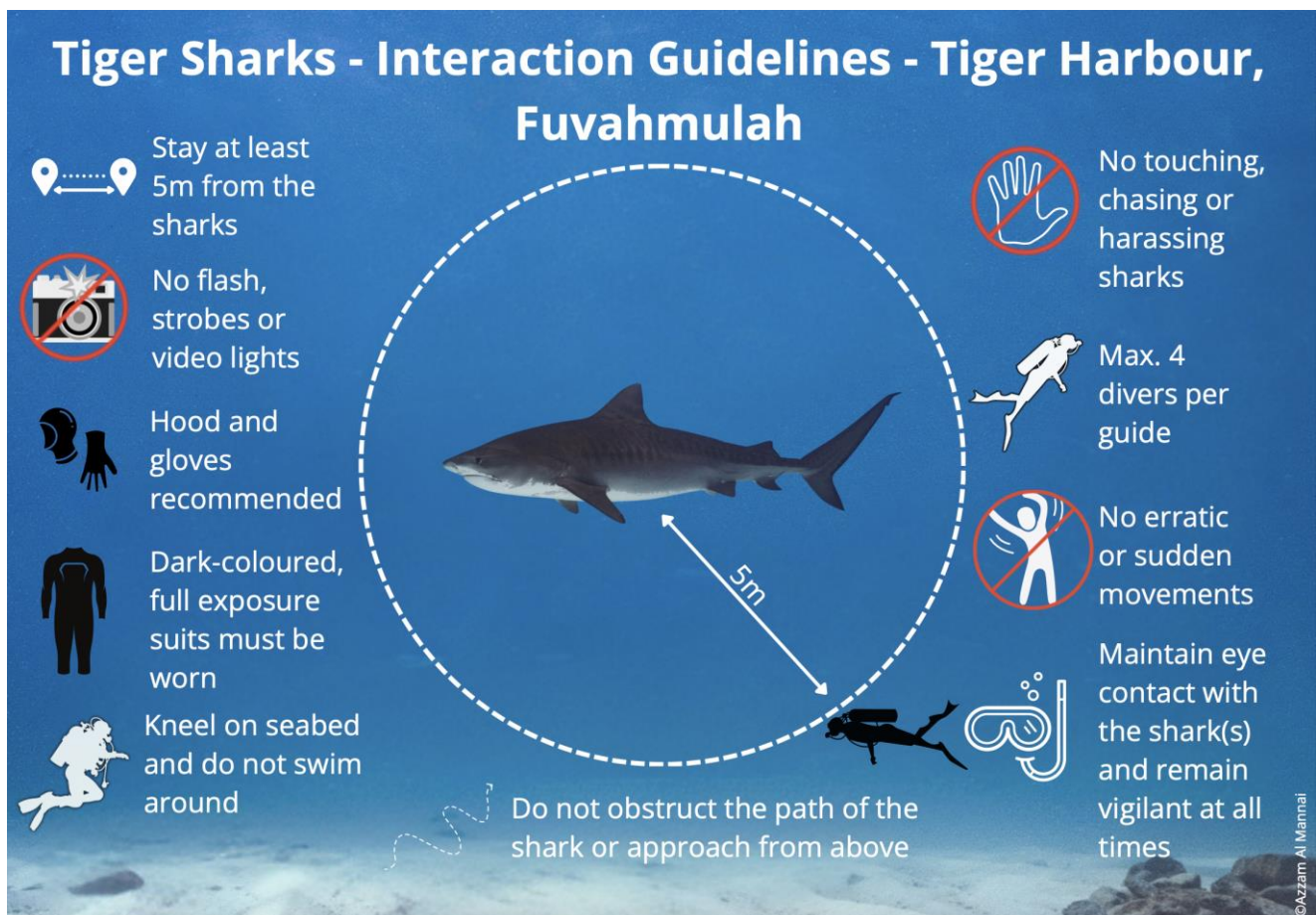


Figure 5. Final Code of Conduct for interactions with tiger sharks at Tiger Harbour in Fuvahmulah.

3.4 Code of Conduct for interactions with Tiger Sharks at Tiger Harbour: operators

Interaction Guidelines for *operators* (see Figure 6 for infographic). This was deemed necessary by stakeholders and was raised during the workshops given the logistical challenges of the site, and the need for a more proactive approach by operators at Tiger Harbour.

1. No handling of bait/fish heads.

Neither guests nor guides are permitted to handle bait or fish heads to prevent accidents and reduce the likelihood of accidental bites. Improper handling can disrupt shark behaviour, causing unnecessary risk to both guests, guides and sharks. Tiger sharks are driven by the plume (scent) of the bait/fish heads, and as such minimising diver interaction at the source of the stimulus will reduce the risk of any potential incident.

2. A minimum of 5 metres between bait/fish heads and divers.

Maintaining at least 5 metres between bait and divers helps create a buffer zone, ensuring the sharks can focus on the bait without distraction or confusion. This reduces the risk of sharks associating divers with food, a critical safety precaution. A minimum of 5 metres distance gives the sharks plenty of space to manoeuvre away from divers and reduce the risk of entanglement with people and other sharks.

3. Divers to stay up-current of the bait/fish heads at all times.

Positioning divers up-current ensures that the scent of bait does not draw sharks towards the divers. This precaution minimizes the likelihood of sharks approaching divers unintentionally while they follow the bait scent/plume trail. Staying up-current also allows divers to observe the sharks' natural movements from a safer perspective.

4. Bait/fish heads may not be necessary on every dive depending on shark activity and local conditions (Lead Guide's decision).

The use of bait is left to the discretion of the Lead Guide, who evaluates shark activity and environmental conditions. This flexibility helps prevent over-reliance on baiting while allowing more natural shark interactions when conditions are suitable. Responsible use of bait ensures a balanced approach that prioritizes both diver safety and shark conservation.

5. Prohibited use of marlin or other billfishes.

Using marlin or other billfish as bait is prohibited given the reported change in tiger shark behaviour at Tiger Harbour following the introduction of billfish as chum. Minimising unpredictable and/or erratic behaviour of tiger sharks will help manage the dive safely.

6. No hand-feeding by guides or guests.

Hand-feeding is strictly prohibited as it can create dangerous situations by encouraging sharks to associate humans with food. This behaviour increases the risk of accidental bites or overly aggressive interactions. Keeping the bait/fish heads strictly controlled and at a distance ensures safer, more predictable shark behaviour.

7. Minimum of three guides on all provisioned dives, with a ratio of at least one guide for every four guests.

Having at least three guides ensures adequate supervision and coverage of all divers during the Tiger Harbour dive. Maintaining a guide-to-guest ratio of 1:4 allows guides to closely monitor guest behaviour and enforce safety guidelines. This ensures that all participants follow protocols while maintaining a safe and organised diving experience.

8. Guides can only carry cameras under the Lead Guide's discretion.

Guides may carry cameras only if the Lead Guide deems it appropriate, ensuring their primary focus remains on guest safety and shark interactions. This minimizes distractions and allows guides to maintain their supervisory responsibilities. When approved, camera use should not interfere with the operational procedures or diver safety.

9. Maximum of 20 divers.

Capping the number of divers at 20 ensures that group size remains manageable for the guides. Smaller groups reduce underwater crowding and stress on sharks, creating a safer and more controlled environment. This limit helps preserve the quality of interactions while prioritising the well-being of both divers and marine life.

Tiger Sharks at Tiger Harbour - Procedure for Operators

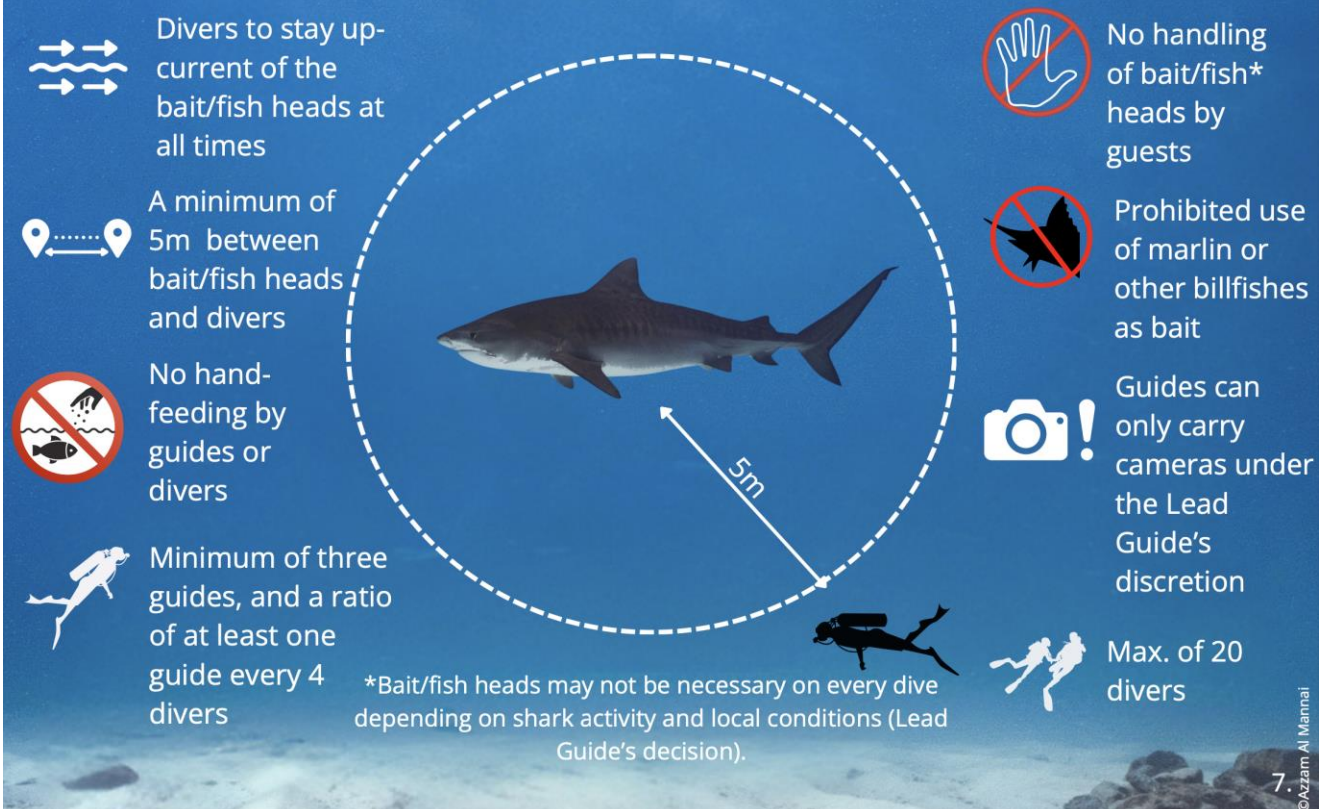


Figure 6. Final Code of Conduct for Dive Operators Procedure for interactions with tiger sharks at Tiger Harbour in Fuvahmulah.

3.5 Further Considerations

The workshops were planned in an accessible and inclusive manner, to allow different participants to voice their opinions whilst allowing for a respectful environment. Although heated exchange took place through the workshops, eventually consensus was met for the final points integrated into the Codes of Conduct – which explains the minimum further input from stakeholders once the draft infographics were shared (see below). Open discussions were held to overcome some of the most difficult points, for example on bait containment. Although consensus could not be met on whether or not bait should be contained, it was agreed that to reduce risk, no bait would be handled by divers (guests or guides), and that a minimum of 5 metres would be set between any bait and the divers. Although there were differing views initially, by the end of the workshops, those in attendance appeared supportive of the proposals.

During the pre-workshop interviews, and during the workshops themselves, implementation and enforcement points were discussed – albeit not concluded. The majority of operators (82%, n = 11) agreed that the Codes of Conduct should not be self-regulated and that an external body needed to be in charge of that. There was also agreement (91%, n = 11) with having a way for tourists to report or share violations to the Codes of Conduct observed during dives with said external monitoring body. Such an approach would help with self-regulation, whilst avoiding potential conflict between operators.

Similarly, it was unanimously agreed that implementation of the Codes of Conduct should take place after the industry's peak season, and suggesting June 2025 as the start of a trial period.

A review of the Codes of Conduct was proposed at bi-annual intervals to adapt and adjust as necessary.

During discussions around Tiger Harbour, multiple stakeholders raised concerns regarding the fishing and trolling that takes place therein. According to some operators, recreational fishing is carried out by different individuals at the edge of Royal restaurant which overlooks Tiger Harbour. It was also highlighted that certain dive operators engage in fishing from their boats after dropping divers in. There was a strong consensus that fishing should not be taking place while divers are in the water, regardless of who does it. Additionally, the disposal of fish and fish waste by both fishers and council-hired staff responsible for managing fish waste at the landing site was also raised as a concern. In this instance, the Council highlighted that there is currently no Fishers Association, and that as most of the above-mentioned fishing is done by opportunistic fishers on a recreational basis, it would be challenging to engage with those involved. However, in the case of disposal by Council staff, it was agreed that communications with these staff members would be strengthened, while urging them to dispose of waste away from the island and only after 5:30 pm, once the dive operations have concluded at the harbour. In both instances, the Council expressed their willingness to find a viable solution for these issues. As the Royal restaurant located on privately owned land, it was also suggested that the Council engage with the restaurant owners to implement stricter management of fishing from their premises. Additionally, it was also suggested that placing a signboard in the area might reinforce existing measures while also encouraging compliance.

3.6 Finalisation of Codes of Conduct

Following the workshops, infographics of the Codes of Conduct were drafted based on feedback from stakeholders from the interviews and workshop discussions. These drafts were circulated to stakeholders for review and input on November 25th, 2024. Stakeholders were given nine weeks for input (until the week commencing January 20th, 2025). No major changes were suggested, with the exception of a line to be added to the Disclaimer stating that “It is worth highlighting that the current Diving Regulation of the Maldives, which emanates from the Tourism Act (No.2/99), prohibits the feeding of sharks”.

No further comments or suggestions were received from stakeholders, and the final version was translated into Dhivehi and adapted into infographics for online dissemination and display in dive shops.

4. Discussion

Codes of Conduct are an important component of sustainable marine tourism as the main objective is to reduce any potential impacts from the industry on the target species (Colman, 1997). Based on our consultation with operators around the world, and building on insightful knowledge from the work conducted in 2023-2024 (Araujo et al. 2024), it was clear that Codes of Conduct need to be relevant in a local context and cannot therefore be generic and broadly applied everywhere. However, it is possible to identify a minimum set of rules and guidelines that would apply to multiple species and sites, and thus potentially having a more positive impact for marine wildlife tourism.

Given that wildlife tourism, and marine wildlife tourism especially, has had a recent increase in popularity globally (Catlin et al. 2010; Bentz et al. 2016; Ziegler & Dearden, 2021), ensuring its proper management is essential to minimise any impact on the target species. Shark diving is of special concern given the inherent risks of bringing tourists in close proximity with some of the world's largest marine predators. This is the case for Fuvahmulah, Maldives, where daily, year-round interactions with tiger sharks *Galeocerdo cuvier* are facilitated in close proximity to the island's harbour with up to 40 individual animals present at one time (Vossgaetter et al. 2024). In such examples, having unified rules or guidelines in the form of Codes of Conduct not only aim at ensuring shark safety, but also diver safety.

Through the use of multiple social science tools, we worked with stakeholders in Fuvahmulah to develop four Codes of Conduct for shark interactions with the purpose of minimising risk for divers and impacts on the target species. In Fuvahmulah, diving can take place with several threatened species, including the Endangered pelagic thresher shark *Alopias pelagicus*, the Critically Endangered scalloped hammerhead shark *Sphyrna lewini* and the Endangered grey reef shark *Carcharhinus amblyrhynchos* amongst others. These sharks not only inhabit the waters around Fuvahmulah, but are among some of the most threatened species of elasmobranchs, and as such reducing any potential detrimental effect on them is important for their management and conservation.

The use of mechanisms such as Code of Conducts, that can manage impacts on key species, can play an important role that aligns with the Maldives Fifth Tourism Master Plan 2023–2027 (Ministry of Tourism, 2023) the United Nations Sustainable Development Goal 14 'Life Below Water' and the Convention on the Conservation of Migratory Species of Wild Animals Resolution on Sustainable Tourism (UNEP/CMS/Resolution 12.23) amongst others. Balancing tourism growth with local needs, sustainable development goals, and animal ethics is complex. A successfully used model that moves away from a more simplistic approach (e.g. carrying capacity), is the Limits of Acceptable Change (LAC; Stankey et al. 1985). The LAC defines the threshold of what are the acceptable social and environmental limits for stakeholders, defines them, and integrates socio-economic, political and bio-ecological aspects (e.g. Bentz et al. 2016). Codes of Conduct feed into a LAC approach when planning for sustainable tourism management.

The Codes of Conduct presented herein were developed in collaboration with the Fuvahmulah dive industry, the local council and with participation from the Ministry of Tourism and Environment, and the Maldives Government Protected Species Committee. It was imperative that the input necessary to dictate the appropriate guidelines came directly from those at the forefront of the industry and those that can play a critical role in their implementation, monitoring and long-term relevance.

During the workshops, it was highlighted that due to the fast-moving and fast-growing industry, it is essential to provide regular check-in opportunities for stakeholders to offer feedback, share

insights and potentially update the Codes of Conduct. The adoption and implementation of the Codes of Conduct rest primarily with the stakeholders, and it is therefore crucial to establish a working group or committee to represent the needs of the different sectors. This approach will help ensure its longevity and relevance, whilst fulfilling the role of minimising risk to divers and disturbance to the target species.

4.1 Challenges, Lessons Learned and Further Actions

As the Fuvahmulah shark diving industry continues to grow, it is important that stakeholders continue to work together to ensure a sustainable and well-managed industry. Building upon previous experience working with the same stakeholders in 2023 and 2024 (see Araujo et al. 2024), and incorporating the work presented in this report, lessons and challenges have been identified that can guide the next steps in refining and strengthening industry practices.

This research employed a series of social science-based approaches to harness the expertise of local stakeholders and global operators, as well as to further understand their needs, current concerns and options for future management. This methodology included virtual and in-person meetings, structured in-person workshops and virtual and in-person follow-ups with stakeholders. Through this participatory approach, the development of the Codes of Conduct were successfully facilitated, ensuring that best practice guidelines were specifically tailored to Fuvahmulah's unique shark diving and were supported by those directly involved in the industry.

4.1.1 Challenges

The process of developing Codes of Conduct revealed several challenges. This included concerns regarding guest perceptions over restrictions, which was viewed as a drawback that could potentially have a negative impact on businesses, given that no formal rules or restrictions had been applied to date. Research on the willingness to pay for shark tourism suggests that tourists are willing to pay more for sustainably-run operations which typically comes with strictly-enforced guidelines (Davis & Tisdell, 1998; Techera & Klein, 2013). Operators also raised concerns regarding the enforcement effectiveness of Codes of Conduct, along with doubts over the success and practicality of self-regulation until a formal committee and system is established. This was followed by pushback over how a more formal enforcement system would work and who would fund it.

The biggest identified challenge was the resistance to change, especially when the outcome could be unfamiliar. In particular, this seemed a bigger concern during peak season when operators are busiest, and keen to drive profit and prioritize business continuity, sometimes in ways that could overlook the sustainability of the resource. For example, adhering to the Codes of Conduct points on guide to diver ratio, and minimum number of guides, is something that requires hiring of additional guides: for some of the smaller operations this was viewed as undesirable. Overall, apprehension to change is normal and expected when there has been sustained growth of the industry *modus operandi*.

Similarly, provisioning of tuna heads/bait for facilitating interactions with tiger sharks at Tiger Harbour, and including parts of this into the Codes of Conduct and standardisation around this, was also met with some conflict within operators. This was due to several factors, including the Maldivian Diving Regulation that currently prohibits the feeding/provisioning of sharks and how to overcome this, as well as on a more practical level, how bait could be contained - a point highlighted by global operators as a way of reducing risk (see table 1). Despite the contention surrounding bait containment, most operators agreed that including some guidelines regarding bait in the Codes of Conduct was a necessary step as provisioning continues at Tiger Harbour, and they viewed standardisation of this as a necessary step in

ensuring safety and sustainability of the resource. Further discussions and engagement, and potentially the development of a long-term strategy on the matter might be necessary in order to meet management objectives.

4.1.2 Lessons Learned

Active participation by dive operators within the development of the Codes of Conduct was seen as one of the most successful and crucial outcomes of this work. From the outset, care was taken to ensure all relevant stakeholders were identified and involved, and that each, in turn, had an opportunity to participate and input. This approach assured maximum engagement at all stages of the work, resulting in a higher chance of industry buy-in, ensuring a representative and comprehensive outcome.

Throughout the pre-workshop meetings, and during the workshops, stakeholders shared their experiences and years of local knowledge on their very own dive sites. The workshops in particular served as a great platform to integrate insights and guide discussions for decision making regarding the different elements of the Codes of Conduct. As this was done in a way that allowed equal involvement within the participants, it ensured the resulting Code of Conduct was location- and context-specific, and thus, deemed achievable by the dive industry on Fuvahmulah. An approach such as the one employed here, ensures stakeholder buy-in and ownership, as thus an important role in the development of sustainable marine tourism.

While the resulting Codes of Conduct can be considered a good starting point, they will require regular reviews and continuous refinement as the industry develops. The timeline for reviewing should be decided early on and arranged in a way all operators can get involved and give input. During the workshops, stakeholders tentatively agreed to a review process occurring every six months. As presented in previous chapters, a formal timeline for these reviews will be critical to ensure sustained engagement and continuous improvement. A designated committee or subset of stakeholders may be necessary to streamline decision-making and facilitate the review process effectively.

5. Further Actions

Upon reflection of the lessons and challenges presented above, further action on these could include, but are not limited to:

- Ensure operators retain ownership over the Codes of Conduct to self-regulate until an enforcement system is developed and established;
- Ensure the Codes of Conduct are supported by local or national policy or legislation;
- Exploring management approaches to integrate socio-economic, political and bio-ecological needs to support local policy or legislation (e.g. Limits of Acceptable Change) in relation to shark diving as a major economic incentive;
- Ensure a timeline is developed and maintained by stakeholders;
- Consider a potential trial implementation starting in June 2025;
- Remind stakeholders of the Precautionary Principle and its importance when dealing with top, long-lived predators;
- Review the Codes of Conduct and update them as deemed fit by local stakeholders – as proposed, this could be every 6 months;
- Consider delineating the structure and responsible parties for implementation, monitoring and enforcement of the Codes of Conduct;
- The creation of a committee or working group with representatives from industry, government and other relevant parties would streamline these processes;

- Revisit the provisioning component of the dive industry in Fuvahmulah once the Codes of Conduct are implemented;
- Operators could share these Codes of Conducts within the wider tourism industry, in particular with those diving around Fuvahmulah from liveboards to ensure standards for Fuvahmulah shark diving are maintained.
- Develop an online survey/feedback system for divers to report on the successes or failures of the Codes of Conduct in place; and
- Limit fishing activities and fish disposal in Tiger Harbour through awareness, signage and engagement of recreational anglers and fishers.

Chapter 2: Fuvahmulah Shark Dive Guide Certification Scoping Report



Figure 7. A shark dive guide keeps a close eye on a tiger shark at Tiger Harbour in Fuvahmulah, Maldives ©Gonzalo Araujo.

1. Introduction

1.1 Shark guides

Guides play critical roles within diving tourism, especially in regions where there are large aggregations of predatory sharks and where provisioning takes place. Within this context, the term 'provisioning' refers to the use of any attractant (e.g. bait, chum, feeding, etc.) as defined by Meyer et al. (2021). Depending on the location and dive-specific conditions, it might be a guide's responsibility to ensure the safety and well-being of both their guests and sharks during these interactions (Hassan et al., 2024). For example, in some parts of the world, guides are not in charge of diver safety, but their sole role might be to facilitate close encounters with sharks through provisioning. Duties of a dive guide might include but are not limited to:

- Educating divers on local shark species, ecology and behaviours, alongside providing valuable insights into their conservation status;
- Promoting environmental stewardship by adopting best dive practices (i.e. reducing any potential impacts on the target species and their habitats);
- Navigating dive sites by utilising their knowledge of local conditions e.g. currents and topography; and
- Managing emergencies, implementing safety protocols to minimise risks and coordinating rescue efforts if needed.

The absence of appropriate guide training and safety procedures could potentially lead to harm to guests, guides and sharks, alongside negative publicity for the diving industry. For the

purpose of this review, we define a ‘shark guide’ as ‘a specialised diving professional who leads or supervises a provisioned or non-provisioned diving interaction with sharks’.

1.2 Shark guides in Fuvahmulah

The ‘Review of Shark Diving Practices in Fuvahmulah’ (Araujo et al. 2024) showed that dive guides in Fuvahmulah are typically Maldivian nationals with extensive knowledge and experience diving in Fuvahmulah. This is exceptionally important, especially when it comes to familiarity with dive sites, changing local conditions, understanding shark behaviours, recognising individual sharks and understanding their different personalities. Although the majority of shark guides have grown up in these waters, these experiences may not currently be formally documented or recognised as a qualification and asks the following questions:

1. What minimum experience or qualification should a guide possess, outside of their scuba certification?
2. How could a formal certification be developed that recognises the skills and experience of local guides, whilst addressing industry needs?

As the diving industry continues to develop and expand in Fuvahmulah, stakeholders and management authorities recognise the need for unified Codes of Conduct, training and certification in Fuvahmulah to ensure a sustainable dive industry (see Araujo et al. 2014). Dive guides in Fuvahmulah are interacting with up to 40 tiger sharks (the second largest predatory shark in the world) on a single dive at Tiger Harbour, suggesting it has increased potential risk to divers than in non-provisioned or non-tiger shark dives. For example, there have been a few ‘close calls’ involving sharks and guides in Fuvahmulah in the last year, primarily associated with shark guides handling bait during a dive, reflecting the timely manner and importance of this work. These experiences have highlighted the importance of safety standards and training options to ensure dive guides are as prepared as possible for potential emergency situations. For this report, we aim to build on existing knowledge of local guides and training practices around the globe to provide an overview of different training options that could be considered for Fuvahmulah.

2. Guide training

2.1 Guide training across different global sites

2.1.1 Dive operator interviews

A total of five semi-structured interviews (Appendix 4) took place during October 2024 over the Zoom platform with diving operators based in Fiji, Florida, South Africa and The Bahamas that offer provisioned shark diving interactions. Operators included business owners, shark guides and shark feeders. These interviews were designed to understand what certification and training shark dive guides require in other parts of the world, to help inform the development of a potential guide certification programme in Fuvahmulah. Individual responses from operators will remain anonymous, numbered 1-5 herein.

When asked to define a ‘shark guide’, operators expressed that this was difficult as there were key differences between the lead dive guides, bodyguards, safety divers, shark feeders and shark handlers, each operation having guides of varying roles and responsibilities. For example, some shark guides simply lead dives, whereas feeders and handlers solely deal with the bait, and bodyguard guides are exclusively responsible for guarding both guests and shark feeders, redirecting sharks if necessary, with or without poles. Similarly, some guides are just responsible for the sharks, not the guests, and vice versa. Some operators have safety divers whilst others do not. Despite these differences, the collective roles and responsibilities of ‘shark guides’ across global operations include:

- Safeguarding guests in the water;
- Leading dives and establishing the dive procedure;
- Feeding and handling sharks;
- Monitoring and managing shark movements and behaviours;
- Ensuring sharks don't get too close to guests;
- Communicating with guests and guides in-water;
- Ensuring guests aren't too close to the bait;
- Monitoring environmental conditions;
- Managing guest behaviours in the water (e.g. not touching sharks);
- Managing guest positioning in the water;
- Ensuring guests are okay at all times;
- Taking control if a shark gets too close or if anyone is in danger;
- Ensuring everyone is diving safely in the presence of sharks.

All operators (100% of respondents, n=5) could see the benefit of having a specific and standardised diving training certification programme for shark diving where they operated. They could also recognise the benefits of having standardised programmes for somewhere like Fuvahmulah where provisioned diving takes place with tiger sharks, highlighting that with these being large sharks, the potential consequences of an incident are likely more dangerous.

A summary of guide training, experience and certification from operators in Fiji, Florida, South Africa and The Bahamas is found in Table 3 below.

Table 3. Summary of guide training and certification from interviews with shark diving operators around the globe. Operators have been numbered 1-5 for anonymity.

Notes on Table definitions:

- Minimum guide certification – the minimum certification or qualification required by each operator to become a ‘shark guide’.
- Minimum guide experience – the minimum number of shark dives required by each operator before a ‘shark guide’ is able to lead a shark dive.
- Specialised shark-related incident training – any specialised first aid, emergency response or rescue training required for a ‘shark guide’ to deal with an incident related to sharks.
- Specialised training courses – any specific accredited courses relating to sharks required by each operator for ‘shark guides’ e.g. courses relating to shark ecology, individual sharks, shark behaviours, how to redirect sharks and shark feeding (if applicable).

Operator Number	Minimum guide certification	Minimum guide experience	Specialised shark-related incident training	Specialised training courses
1	<p>PADI Divemaster or equivalent.</p> <p>All dive guides require rescue training to assist in an emergency.</p> <p>10-15 staff (12 are Divemaster with two in training).</p>	<p>No specific number of shark dives required before a guide can lead a shark dive.</p> <p>It is at the operator’s discretion whether they deem a guide capable based on ability, experience and confidence.</p> <p>Guides will typically have at least 30-50 dives during their Divemaster training (at around 100 dive sites).</p>	<p>Trauma response, first aid and CPR.</p> <p>Operators provide regular refreshers, group scenario training and protocols for emergencies.</p> <p>Guides practice scenarios that run through exactly what to do in an emergency including: signals below and above water, how to prepare the boat, radio cover, docking, ambulance location and medical personnel, how to apply quikclot (haemostatic used to prevent blood loss) and tourniquets, how to get divers to the boat and out of the water safely.</p>	<p>No specific accredited shark training course required for guides.</p> <p>Knowledge and experiences are passed on from local villagers ‘shark whisperers’ who are experts in shark behaviours, hierarchy’s and individual shark responses.</p> <p>Their knowledge and experiences are passed on to younger, less experienced guides during training.</p> <p>Guides work their way up to feeding sharks with experience.</p>
2	<p>PADI Divemaster or equivalent.</p>	<p>No specific number of shark dives required before a guide can lead a shark dive.</p> <p>It is at the operator’s discretion</p>	<p>Emergency response, CPR, secondary response are required - all training needs to be in date.</p> <p>Guides have to refresh their training</p>	<p>No specific accredited shark training course required for guides.</p> <p>Guides receive extensive training in-house that covers local sharks, local conditions and what to expect. Training</p>

		<p>whether they deem a guide capable based on ability, experience and confidence.</p> <p>Around 100 dives would be typical before operators give them access to guiding so they know what they are doing.</p> <p>Guides in training are also required to have experience in strong currents.</p>	<p>according to medical insurance standards.</p> <p>All relevant equipment is stored on the boat. Use of sanitary pads to best absorb the blood.</p> <p>Tourniquets are stored on the boat in one place and all guides know how to access and use them.</p>	<p>builds experience in different situations before individuals can interact with sharks.</p> <p>The operator has strict diving rules that the guides must adhere to.</p>
3	<p>PADI Divemaster or equivalent for shark specific dives.</p> <p>Instructor level if directly feeding the sharks.</p>	<p>No specific number of shark dives required before a guide can lead a shark dive.</p> <p>It is at the operator's discretion whether they deem a guide capable based on ability, experience and confidence.</p>	<p>All staff are trained in first aid, including courses specifically for applying tourniquets to deal with heavy blood loss, laceration or puncture wounds.</p> <p>Guides are not required to carry tourniquets in water, but they are stored on the boat.</p>	<p>No specific accredited shark training course required for guides.</p> <p>Operators have their own training in-house to deal with specific species and dive sites.</p> <p>Dive guides build up their experience leading guides and observing shark feeders before directly feeding sharks themselves.</p>
4	<p>Minimum PADI Divemaster or equivalent, ideally Instructor level.</p> <p>Instructor level isn't always necessary, as a guides' comfort in the water and experience with sharks is most important.</p>	<p>A minimum of 10-20 dives is required at the site before handling any bait (assuming the guide has no background in shark feeding).</p> <p>It is at the operator's discretion whether they deem a guide capable based on ability, experience and confidence.</p> <p>The minimum number of dives could be more like 50 dives for divers with less experience. Each diver is different.</p> <p>Shark guides need to be comfortable feeding sharks in general before they can lead as a</p>	<p>Emergency response training and how to deal with incidents.</p> <p>Guides are required to carry tourniquets in the water.</p> <p>Developed their own skills for rescue over the years and consistent, safety guidelines to prevent an incident.</p> <p>Have reassessed some of their procedures and tightened safety after an incident that occurred in their area last year.</p>	<p>No specific accredited shark training course required for guides.</p> <p>Operators carry out their own training specific to handling sharks underwater and training from shark handlers is passed on.</p> <p>A specific behaviour course was suggested as a good idea. Dr Erich Ritter (now deceased) used to offer a shark interaction course to teach shark behaviours.</p> <p>Operators rely on previous shark handlers teaching new shark guides, who help make the assessment when</p>

		<p>shark feeder.</p> <p>Experiences cannot be taught by certification alone.</p>		a guide is ready.
5	<p>PADI Divemaster or equivalent due to the necessary medical training required to deal with potential dive accidents.</p>	<p>No specific number of shark dives required before a guide can lead a shark dive.</p> <p>Established operators require a year as a safety diver before being allowed to handle bait.</p> <p>Guides are required to learn dive site layouts so stressful tasks (e.g. feeding/emergency response) can be performed with ease.</p>	<p>Guides are trained in emergency response training, first aid and how to deal with diving incidents step by step from the bite, getting divers safely to the surface, onto the boat and to a medical facility.</p> <p>All dive boats are required to have specific medical equipment within their first aid kits including tourniquets, gauze and other bandages.</p> <p>Guides are encouraged to carry their own tourniquet in water.</p>	<p>No specific accredited shark training course required for guides.</p> <p>In-house training provided by individual operators through their preferred training methods and time spent in the presence of sharks.</p> <p>Guides in training are to observe guest and shark interactions, and learn, providing the chance to objectively view the varying behaviours among different shark species as well as learning the recurring individual sharks.</p>

Overall, the key message from global operators was to prioritise dive guide safety training with a focus on medical evacuation and emergency response procedures. The importance of developing protocols, scenario training to prepare for every circumstance, staying calm in an emergency and consistency with operations was also highlighted by all, as well as ensuring the appropriate medical equipment was always available and all staff knew how to use it.

Operators also collectively emphasised the importance of:

- bespoke procedures for specific dives and locations because one set of rules, guidelines or procedures wouldn't be relevant or applicable elsewhere with different species, dive sites, dive plans, conditions and resources;
- most operators highlighted that tiger sharks needed specific guidelines, with one operator stating that they essentially abort the dive if a tiger approaches because of their unpredictable nature around the bait; and
- containment of the bait when tiger sharks were present was highly recommended by one operator.



Figure 8. A tiger shark cruises the wall in Fuvahmulah, Maldives ©Gonzalo Araujo.

Another operator gave us insight into a recent shark-related fatal incident that occurred in their area of operation (with a different operator). They stressed the importance of the safety briefing, how to act underwater, positioning in the water in relation to bait and currents, ensuring diver formation does not block the sharks entry and exit to the bait, carrying safety equipment in the water (tourniquets) and having appropriate emergency response and evacuation. They stated that guides can never learn everything, there is always more to learn even for experienced guides, especially in relation to shark behaviours. Ultimately, this operator highlighted that these are “wild animals”, “the danger really is there” and this is “the reality” of what could potentially occur to “any operator regardless of their experience” on any shark dive.

It was also highlighted across multiple operations that certification alone shouldn't be used as an indicator of a guide's abilities. One operator stated that "more qualifications doesn't necessarily mean you are a better diver" and that you "can't rely on certifications even if they have them". Similarly, another operator questioned if certification could cover real-life experiences. High importance was placed on guide experience in the water across operators, with guides being comfortable with their own diving, the sharks, learning individual behaviours and their role as a lead guide/feeder/handler/bodyguard before they can think about the responsibility of a guest's safety. The importance of an appropriate attitude was mentioned, ensuring risks were identified, managed and given due consideration.

2.1.2 Desk-based analysis

A database of shark guide training was also collated by the authors to coincide with the interviews with global operators. This involved an exploratory analysis of specialty courses and training certification programmes that exist elsewhere in the form of different case studies. These next examples are just cases of some readily-available courses, and these are not recommendations nor endorsements. Examples of shark specific training courses include:

- PADI AWARE Shark Conservation Speciality Course;
- SSI Shark Ecology Diver;
- Sharklife Shark Species Course, Shark ID Course, Master Shark Diver Certification and Sharklife Trainer Certification;
- Management of Catastrophic Bleeding Course/Major Incident Management Courses;
- Shark Bite First Aid - Atlantic White Shark Conservancy; and
- Ocean Ramsey's Guide to Sharks and Safety.

Together, these courses are designed to equip divers with lifesaving skills, learn about shark behaviours and how to treat catastrophic bleeding. Most of these courses require participants to have a Divemaster certification or equivalent, and pass a written exam to be awarded the training.

In Mexico, The Whale Shark Biosphere Reserve and the Yum Balam Flora and Fauna Protection Area saw the rapid growth of tourism in 2002, with many unregulated tourism operations (Lawrence et al., 2016). Following large stakeholder engagement workshops with local government agencies, scientists and NGO's started to establish effective management and conservation strategies. A Code of Conduct and training to all guides was introduced. This training included first aid, in-water rescue, shark biology and shark ecology, with guides having to pass a final exam to become certified. Local operators are also required to comply with the Code of Conduct to get their permits renewed alongside documenting every whale shark encounter in a logbook for monitoring local populations (Lawrence at al., 2016).

Also in Mexico, The Travel Foundation worked with local and international experts to develop a training course for whale shark guides in the states of Quintana Roo and Baja California Sur (The Travel Foundation, 2008). This training was delivered by EcoColours and is now a mandatory requirement for whale shark guides in these regions. A local tour guide stated: "I am happy to get the official accreditation through this course. Now that I have this training I feel more confident when giving information to my clients during the tours, and they feel as well more secure as they are doing the activity with a certified guide. Thank you for this opportunity to improve myself". This training course also resulted in greater income for guides by providing better customer experience with 60% of interviewed guides

reporting an increase in income from tips; three-quarters of tips had increased by more than 50% (The Travel Foundation, 2008).

Closer to home in Maldives, tourists are guided by certified Hanifaru guides at the Marine Protected Area Hanifaru Bay in Baa Atoll Biosphere Reserve (Lawrence et al., 2016). Here, tourists pay a fee into the Baa Atoll Conservation Fund (BACF) where funds go towards training and managing operations including rangers for monitoring and enforcement. Guides must pass an exam to receive their certification and the certification is awarded by the Environmental Protection Agency (EPA). However, it was raised during interviews with stakeholders that the training in Baa Atoll might currently be insufficient, whereby more thorough/regular training might be necessary. It was highlighted that any certification for Fuvahmulah, and in particular Tiger Harbour, should be as comprehensive as possible and involve a practical element, due to the inherent risks involved.

In summary, there are only a few examples where unified training and certification for shark guides has taken place, with no recognised global shark guide training programme as standard. This highlights a significant opportunity for the diving industry in Fuvahmulah, and the skilled dive guides at Tiger Harbour, to have certification recognition that could serve as a standard thus providing job security and increased employability of guides in Fuvahmulah and beyond.

2.2 Shark guide training in Fuvahmulah - stakeholder views

There is an opportunity in Fuvahmulah to develop a unified training programme, balancing tourism growth with shark diving safety standards. During the pre-workshop interviews for Code of Conduct development (see Chapter 1), 100% (n=11) of diving operators and 100% (n=3) of local NGO's saw the benefit of having certified Fuvahmulah dive guides that are trained for local diving conditions.

During the workshop discussions, one operator highlighted that “beyond dive experience”, these dive guides should also “go through some sort of training that is agreed upon by everyone”. Another guide stated that “it has to be comprehensive” and also “address finer details”. Operators also addressed that liveboards coming to dive Fuvahmulah's Tiger Harbour dive site should “become affiliated with one of our dive centres” or “have a Fuvahmulah-trained guide to do this dive”.

One approach to measure and verify guide experience that was suggested by operators during these interviews was to set a minimum requirement for the number of dives (50, 100 or 200 dives were suggested) at a particular dive site such as Tiger Harbour. Another suggestion was to introduce an assessment process that requires passing a comprehensive exam (example given of 150 questions, with a 75% pass mark) that tests knowledge of shark behaviour and diver safety protocols. Such an approach through an examination would need to ensure that it is an accessible, inclusive and of equal opportunity for anyone required to complete and pass the test. For example, during an interview with a global operator, it was raised that a theoretical exam would not always work for them as their guides are villagers and do not have the tertiary education or necessarily the capacity to pass a written exam.

Other suggestions by operators in Fuvahmulah include a shark safety programme and rescue course for in-depth training in medical treatments and medical evacuation including, but not limited to:

- what to do in an emergency;
- how to deal with blood loss and real life-threatening scenario training (e.g. severe blood or limb loss, etc.);
- ensure in-water, boat and land teams are prepared; and
- ensure the appropriate medical facilities (e.g. dive chambers and blood banks), equipment (first aid kits and tourniquets) and personnel (e.g. dive doctors and military doctors) are in place in Fuvahmulah.

It was recommended by multiple operators that the diving industry should come together to customise their training, share their experiences and knowledge on local sharks and partake in training workshops alongside refresher courses every six months as an example. One operator expressed that a lot of their guests ask the guides about their experience and certification, adding that a unified training programme would make guests feel safer. Operators also noted that the government or a Divers Association would need to invest or support the training as any further requirements e.g. medical equipment will come at an added cost to operators. Such financial support would then lead to greater buy-in from guides. One NGO also raised the importance of any training or certification standards to have flexibility, allowing them to be modified when appropriate by stakeholders in Fuvahmulah based on lessons learned along the way. Flexibility would need to be structured and in-keeping with overarching stakeholder decision making.

3. Considerations for developing a shark dive guide training programme in Fuvahmulah and possible next steps

Based on input from the dive industry in Fuvahmulah, and case studies from global operations, the following considerations could be explored to develop a shark dive guide certification programme in Fuvahmulah:

1. **Definitions** - clearly defining the role and responsibilities of shark dive guides in Fuvahmulah e.g. the roles of lead guides, safety guides, etc.
2. **Experience** - determining an appropriate and minimum certification dive guides are required to have and the number of dives required at each dive site (e.g. 50, 100, 150, etc.).
3. **Further training** - deciding what theoretical or practical training may be necessary in Fuvahmulah (e.g. shark behaviours, diver behaviours, recognising individual sharks and their personalities, as well as further medical training in severe blood loss response and evacuation) and how this could be delivered (e.g. theory from experts on sharks/shark behaviours and group discussions sharing local knowledge and experiences, and from field medical professionals). Consideration should be given to accessibility of any training.
4. **Medical facilities and personnel** - deciding what relevant medical facilities or personnel may currently be lacking on the island to deal with a shark-related incident more effectively e.g. diving doctors, military doctors, dive chambers or blood banks.
5. **Certification** - identifying what certification bodies could accredit or award the training under existing Maldivian frameworks. For example, this could follow the Hanifaru/Baa Atoll example with Ministry of Tourism and Environment or develop a new body with Fuvahmulah City Council, Ministry of Tourism and Environment and

Divers Association of Fuvahmulah (or other dive industry representation) to oversee the process and the certification.

6. **Equipment** - determining the relevant medical equipment that operators are required to possess e.g. trauma kits with quick-clotting agents on dive boats/tourniquets to take underwater.
7. **Stakeholder engagement** - formalise training needs from key stakeholders including the local diving industry e.g. shark behaviour and identification, emergency response, medical evacuation and what a certification framework might look like for them, including time frames and responsible bodies.
8. **Pilot programme** - a trial programme designed to test training, evacuation and medical scenarios.
9. **Monitoring and enforcement** - determining who will monitor and ensure safety standards are followed and that certifications are in-date and training regularly refreshed by operators. As mentioned above, it could be multi stakeholder-led, including representatives from the Fuvahmulah City Council, the Ministry of Tourism and Environment, and the diving industry in Fuvahmulah. A Steering Committee could help oversee the training programme and could deal with updates and other *ad hoc* requirements that might present themselves.
10. **Training body** – determining who the best possible training provider(s) could be and ensuring the trainers understand the unique context of the Fuvahmulah dive industry.

3.1 Next Steps

Possible next steps based on the above considerations include, but are not limited to:

- Create a steering committee or working group with representatives from relevant stakeholders;
- Develop a timeline for the shark dive guide certification;
- Develop the content, including required qualifications and experience to participate in the said programme;
- Identify the training and certification body; and
- Trial the programme with readily qualifying guides in Fuvahmulah.

As the industry continues to grow on the island, the demand for trained guides has also increased. There is clear appetite for a coordinated, appropriate shark dive guide certification programme. Further training was recommended, and supported by stakeholders on Fuvahmulah, which could also become part of the requirements to complete the programme. In conclusion, a shark dive guide certification programme could help mitigate risks, improve diver experience, and provide tangible work recognition to a growing industry in Fuvahmulah.

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Appendices

Appendix 1. Pre-workshop interview questions with Dive Operators in Fuvahmulah.

Ethical Statement/Disclaimer

Fuvahmulah City Council, the Ministry of Tourism and Environment, and the UK-led Ocean Country Partnership Programme (OCP) are working in collaboration to support sustainable guidelines for shark diving in Fuvahmulah, Maldives.

Pre-workshop interviews with Dive Operators in Fuvahmulah

The purpose of this interview is to get initial feedback to help guide discussions between stakeholders at the October 2024 workshop for the development of Codes of Conduct for shark interactions in Fuvahmulah. This is part of a social-science and people-based project that seeks to incorporate local and professional dive knowledge into guidelines that works for the industry and the government. Specifically, we are gathering information from those involved in shark diving activities in Fuvahmulah, and other relevant stakeholders that can shape these important next steps for the dive industry in Fuvahmulah. Any guidelines or Codes of Conduct are to incorporate local knowledge and expertise, and this project seeks to guide how these can come together for all stakeholders involved.

The following questions are based on, but not limited to, 'Chapter 3: Best Practice Options for Ethical and Sustainable Shark Ecotourism at Fuvahmulah' part of the Review of Shark Diving Practices at Fuvahmulah, Maldives conducted in 2023-2024.

Q0. Do you think different Codes of Conduct are needed in Fuvahmulah for different shark species and interactions? Please describe.

- Follow-up if they mention Tiger Harbour only: should this code of conduct differ from other shark interactions? Please explain.
- If no thresher is mentioned: what about interactions with thresher sharks – should these be the same as with other sharks?

Q1. Would you consider a detailed introductory briefing relating to shark ecology, biology, conservation, dive procedure, risks to divers and emergency response plan as part of a Code of Conduct?

Yes/No

If not, why?

Q2. Would you consider diver behaviour in response to sharks in the water e.g. kneeling at the bottom, not blocking the shark's direction of travel, standing their ground, maintaining eye contact and minimising splashing/time on the surface as part of a Code of Conduct?

Yes/No

If not, why?

Q3. Would you consider environmental conditions e.g. determining a minimum in-water visibility (m) and maximum swell (m) deemed safe for shark diving activities as part of a Code of Conduct?

Yes/No

If not, why?

Q4. Should a maximum speed (knots) for vessels on approach/departure to a dive site be considered as part of a Code of Conduct?

Yes/No

If not, why?

Q5. Should vessels keeping their engines on or off whilst divers are in the water be considered as part of a Code of Conduct?

Yes/No

If not, why?

Q6. Should divers distance to sharks and positioning on a dive be considered for a Code of Conduct e.g. stationed at the bottom, remaining a certain distance from the sharks and bait crate and staying up-current of the bait crate?

Yes/No

If not, why?

Q7. Should a maximum group size, minimum number of guides and guide-to-guest ratio be considered for a Code of Conduct?

Yes/No

If not, why?

Q8. Should measures such as touching and redirecting sharks be considered for a Code of Conduct?

Yes/No

If not, why?

Q9. Should a minimum SCUBA certification and previous shark diving experience for guests be considered for a Code of Conduct?

Yes/No

If not, why?

Q10. Should dress code and accessories e.g. full exposure, dark coloured suits/gloves/hoods/fins/tanks and no fluorescent/bright colours or flashing lights/strobes be considered for a Code of Conduct?

Yes/No

If not, why?

Q11. Would you consider topics regarding provisioning e.g. divers handling the bait, type of bait, amount of bait used, bait containment and the type of bait container used as part of a Code of Conduct?

Yes/No

If not, why?

Q12. Do you feel it is important for signs and infographics of the Code of Conduct to be displayed in dive centres/on boats/online for tourists prior to shark diving interactions and translated into different languages for increased understanding?

Yes/No

If not, why?

Q13. Do you feel that having certified Fuvahmulah dive guides is important for a Code of Conduct? Further discussions on dive guide requirements and training will be conducted as part of this project.

Yes/No
If no, why?

Q14. How do you think a Code of Conduct could be enforced and monitored in Fuvahmulah? E.g. How do you see it working successfully?

Q15. Do you think any of the following measures would work successfully?

a) Self-regulation and monitoring (documenting and reporting practices)

Yes/No
If no, why?

a) Wardens or rangers employed by the government or members of the local community trained to enforce the Code of Conduct

Yes/No
If no, why?

b) Fines for breaching the regulations set out by operators in the Code of Conduct

Yes/No
If no, why?

c) Clearly communicating the Code of Conduct to staff with regular training and orientation sessions

Yes/No
If no, why?

d) Regularly reviewing and keeping the Code of Conduct up to date and relevant to current operational practices with regular workshops between operators

Yes/No
If no, why?

Q16. Is there anything else that you think should be considered before developing a Code of Conduct for shark diving interactions with stakeholders?

End of interview.

Appendix 2. Codes of Conduct document in Dhivehi.

[Click here to download the Codes of Conduct in Dhivehi as a pdf file.](#)

Appendix 3. Codes of Conduct document in English.

[Click here to download the Codes of Conduct in English as a pdf file.](#)

Appendix 4. Guide certification and training for global shark diving operators.

Guide Certification and Training - Global Shark Diving Operators

Ethical Statement/Disclaimer

Fuvahmulah City Council, the Ministry of Tourism and Environment, and the UK-led Ocean Country Partnership Programme (OCP) are working in collaboration to support sustainable guidelines for shark diving in Fuvahmulah, Maldives.

Following our review of shark diving practices in Fuvahmulah last year, we continue to work closely with dive industry stakeholders in Fuvahmulah to develop Codes of Conduct with sharks. These are important to ensure industry standards, unified guidelines, and with the overall aim of ensuring diver, shark and environmental safety. The project will also provide stepping stones for the development of a **shark dive guide certification programme**, that might be relevant in the future for Fuvahmulah and the Maldives.

We are keen to explore what **certification and training dive guides require in other parts of the world** that offer shark diving tourism to help guide our research in Fuvahmulah.

Do you have to take part?

You do not have to take part in this interview, do not have to answer all the questions and you can withdraw at any time.

How long will it take?

This interview will take around 15 minutes to complete.

Use of your information

Your personal information will not be used in any way and any information you give within this interview will be used only for the purpose of the research.

Information will be anonymised, and no personal information nor opinions will be distributed.

Consent (note date and time of consent).

Do you understand all the information I've provided? Do you have any questions?

Do you give consent for me to carry out this interview?

Q1. How would you define a 'dive guide' in relation to shark diving where you operate?

Q2. What are the responsibilities of a dive guide where you operate?

Q3. What level of certification and/or affiliation are dive guides required to have before guiding a shark dive where you operate?

Q4. Do dive guides require any specific training to deal with shark-related incidents? If yes, please elaborate.

Q5. Do dive guides carry tourniquets or other ways to prevent blood loss in the water should an incident occur?

Q6. Do dive guides require a certain level of experience diving at a dive site before they can guide or lead a dive there? E.g. a minimum number of dives in local conditions/interactions with sharks at a specific site?

Q7. Do dive guides have to undertake any specialised shark training or wildlife handling courses before guiding a dive E.g. pass a shark Awareness or Shark Diving Specialty Course relating to local species, shark behaviours or safe interaction techniques?

Q8. Do you feel like having a specific shark diving training certification for guides is important or would be beneficial?

Q9. Hypothetically, if you were hiring a new dive guide, what skills or experience would you be looking for?

Q10. Is there anything else that you would like to add or share relating to guide certification or training that may help us with our research?

--- END OF INTERVIEW ---

Reliability related questions:

Do I believe that the answers given today have been accurate?

What was the atmosphere of the interview?

(Relaxed, Tense, Guarded, Rushed, etc)