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Considerations for the Legalization of Spearfishing in Aruba

- FPNA Position Paper –

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Cover photo: Terminal phase Stoplight Parrotfish (Gutu), *Sparisoma viride* (Armando Goedgedrag / Artmando Multimedia).

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Introduction

Spearfishing is an activity that generates passionate debate and controversy on our island. Within the legal framework of Aruba, the 'Natuurbeschermingsverordening' (AB 1995 no. 2; NBV) guides regulations to protect the unique nature and environment of Aruba. Article 9 of the NBV allows by a national decree for the prohibition or regulation of equipment, tools or weapons that can be used to capture or kill fauna. In 2001, such a national decree was introduced: 'Landsbesluit verbod op onderwaterjachtmiddelen' (AB 2001 no. 115) prohibiting the import, possession and use of all underwater hunting gear. At that time, spearfishing was mainly considered a recreational sport (Harms, 2020), hence it was not regulated as a fishing practice under the Fisheries Ordinance (Visserijverordening, AB 1992 no. 116).

The introduction of the prohibition of underwater hunting gear was intended to reduce the impact on the Aruban marine environment and especially on the coral reef ecology and marine biodiversity. Although humans have been spearing fish for thousands of years, spearfishing as a popular sport is a post-World War II phenomenon. The technological advances in underwater hunting gear (spear guns) and the addition of SCUBA ensues spearfishing to have high catch rates with little effort, which could deplete fish stocks and negatively impact the marine life in a very short time span. Especially considering that it is yet another additional stressor to the marine environment, next to the already existing pressures such as climate change, water pollution and contamination, increased recreational activities and increased fishing activities.

Based on the reaction of most (spear)fishermen to this law it could be concluded that the time and effort invested to explain its necessity and create a broad base of support for the law was insufficient, if not overlooked completely. This has undermined the law and its enforcement since its introduction. Even today, almost 20 years after the introduction of this prohibition, there are many people that own spears and spear guns and they are even publicly sold through social media without any consequences. There are people hunting on the reefs almost daily, also catching species that are protected by law. These are all indications that the law is not being enforced effectively, and when enforcement does occur, it is challenged in court (ECLI:NL:PHR:2015:175, 2015).

Since its introduction, the decree on underwater hunting gear has been on the (administrative) agenda several times for review to allow certain underwater hunting gear and to increase the effectivity of the spearfishing regulation and enforcement on Aruba. Such reviews, as well as the discussion between nature conservation, enforcement capacity and the perspective of the spearfishermen, has been a frequent topic in press and social media during the current COVID-19 crisis (unknown a. , 2020) (unknown b. , 2020) (unknown c. , 2020) (unknown d. , 2020) (unknown e. , 2020) (unknown f. , 2020) (unknown g. , 2020). Most recently, a group of some forty persons sought media attention and protested the law inside and outside of Parliament (unknown h. , 2020).

Many spear fishers base their arguments on it being a tradition as well as their need to practice spearfishing for subsistence, it is often a challenge for the Coast Guard enforcement capacity, while nature conservation organizations are concerned about the irreversible impacts on the environment of the uncontrolled spearfishing currently occurring.

As part of this recent discussion two online surveys have circulated in social media, one in favor of the removal of the spearfishing prohibition (Thielman-van der B., 2020) and one against (CuidoArubaHunto, 2020) the change or removal of the prohibition, resulting in 823 and 2534 signatures respectively. This illustrates that there is more support in the (online) community to maintain the prohibition than to allow and/or regulate spearfishing.

This position paper by Fundacion Parke Nacional Aruba (FPNA), is directed at the government agencies charged with the conserving and regulation of the marine environments, being specifically written to advice the Minister of Spatial Development, Infrastructure and Environment, but also to inform the public at large.

As a nature conservation organization and the management organization of multiple terrestrial nature reserves, covering approximately 20% of the island surface area, and the four Marine Protected Areas (MPAs) that are collectively called Parke Marino Aruba, FPNA is very concerned about the current tolerance of illegal spearfishing activities and the potential harm in legalizing the activity without strict regulations and enforcement in place. Spearfishing, if not controlled properly, can have devastating impacts on the already impacted marine environment and its biodiversity, while it is exactly the marine environment and its biodiversity - in combination with our pristine white beaches and turquoise blue waters - that is Aruba's top product for our primary economic pillar: Tourism.

In this position paper FPNA elaborates on the arguments for and against spear fishing in Aruban waters in general. After all, choices made in coastal zone management and anthropogenic activities undertaken outside of the Parke Marino will ultimately impact the MPAs, and this may determine the further management of the MPAs as well.

Pro-Spearfishing and counterarguments

The primary sector claims that legalizing spearfishing is necessary for human survival. Many people that have partial lost income or their jobs entirely (including in tourism) due to the current COVID-19 pandemic are turning to their illegal hobby of spearfishing to put food on the table. However, **it should be carefully considered whether anyone can claim to be solely dependent on an illegal activity that has been prohibited since 2001 for their survival**. Does that also mean that theft or drugs should be legalized because some people solely depend on these illegal activities for their survival? Also do consider that spearfishing is not the only method available to catch fish. There are other fishing methods that are already legal, both from shore and by boat and some of these even require less expensive equipment than spears. Moreover, it has been proven that the effectiveness and efficiency of spearfishing, compared to other fishing practices, has resulted in overharvest of select species jeopardizing the balance of the fragile coral reef ecosystem (NOAA).

Many spear fishers refer to the cultural or subsistence value of spearfishing as international treaties, like the SPAW Protocol Article 14, state that traditional practices should be considered. However, "we've always done it this way" does not apply as the situation is not the same as it was decades ago. The sport of spearfishing is a relatively new practice on Aruba as it only emerged after WWII, especially as a sport (Harms, 2020). Although the practice of fishing as a whole goes back

centuries and hence is an old tradition in the Caribbean islands and also on Aruba, it is debatable whether the use of spear guns can be considered traditional.

Moreover, the environment is already severely degraded, and the number of inhabitants and visitors of Aruba has increased to unsustainable levels over a relatively short time span. Aruba is already rated among the most densely populated countries in the world (Worldometer, 2020). The Aruba Tourism Authority (ATA) even indicates tourism has surpassed the carrying capacity (ATA, 2018) of our natural resources. The same international treaty (SPAW, Art. 14) that fishermen refer to for legalizing spearfishing also indicates that **cultural or subsistence practices can only be allowed if they do not cause harm or potential risk to endangered or protected species or the necessary habitat or ecological structure for these species**. Even small-scale fisheries or independent subsistence fishers can cause harm to an already degraded marine environment. Hence the need to regulate all forms of fishing to ensure its sustainability. This is also the reason why most countries in the region are moving toward increased regulation or prohibition on spearfishing[1]. Saba, for example, has allowed spearfishing through a permit system for Sabans (Saba born or of Saba born parents). However, they are now changing that law to prohibit spearfishing altogether[2]. It is by all means questionable that Aruba is moving in the exact opposite direction based on Saban laws that are currently being reviewed to no longer allow spearfishing.

While the current prohibition on spearfishing falls under the NBV, it is important to note that all legal fishing practices according to the Fisheries Ordinance (Visserijverordening, AB 1992 no. 116) are **only allowed as long as the survival and natural development of fish stocks are not impacted to unsustainable levels** ("voor zover het voortbestaan en de natuurlijke ontwikkeling van de visstand zich er niet tegen verzetten"). Even the Department of Fisheries (DLVV) has developed a proposal to enhance the effectiveness of the Fisheries Ordinance to increase sustainability[3]. So long as the Fisheries Ordinance combined with effective administration by the Fisheries Department and strict enforcement by respective authorities does not occur, the Ministry responsible for nature and environment is obligated to protect Aruba's natural resources through the NBV.

In order to successfully regulate sustainable fisheries within the Fisheries Ordinance, it is of utmost importance that a transparent and recognized authority is in place and responsible for the monitoring of fish population dynamics (migration, health, reproduction, sizes, numbers, catch data), especially of target species for the fishing industry, also taking into account the cumulative effects of multiple fishing methods on each species. As this is currently not administrated, it will either mean extra resources for the current Department of Fisheries (DLVV) and/or Department of Nature and Environment (DNM), or a designated new authority.

Based on the continued monitoring by these authorities, the legal framework should be adapted accordingly to safeguard fish stocks that can sustain our fishing community now and in the future. This pleads the necessity for a proper regulatory and monitoring authority and begs the question: Who will be responsible for this regulation and monitoring? And who will be responsible for providing and allocating the necessary (financial) resources to create the administrative, monitoring and enforcing capacity? A paid licensing system and high fines for violations could fill some of these gaps, however, the number of licenses given must be minimal (i.e. 10 to 25) in order to be sustainable. Therefore, the licenses and fines on their own will not generate enough resources to have effective regulation and

[1] Unpublished Communications with Tadzio Bervoets of DCNA (18-09-2020).
[2] Unpublished Communications with Ayumi Kuramae Izioka of Saba Conservation Foundation (01-10-2020)
[3] Brief DLVVM aan Minister van Transport, Communicatie en Primaire Sector, 3 juli 2018, Ref: L 127/18; Advies DLVV omtrent LB Verbod Onderwaterjachtmiddelen & LB Beschermde Inheemse Soorten Flora en Fauna.

enforcement. Meaning these costs will need to be covered by the Government of Aruba, who currently does not have these resources available.

Spearfishing could be considered a more sustainable fishing practice compared to other fishing methods. Compared to netting or longlines, spearfishing can be highly selective, fishing only species and sizes that are sustainable and can be limited in number of individuals as each catch is targeted individually. Therefore, spearfishing does not have the risks of leaving unattended equipment (lines, nets, i.e. pollution) and should not have the issue of bycatch. However, as we all see in the field today, most of the spear fishers do not avoid protected species as they are currently catching anything and everything they can find within reach; on Aruba it is basically a 'free for all' as far as fisheries is concerned. What's more, with spearfishing, there is no such thing as catch and release. Spearfishing when practiced recklessly, with little training or information, can be very damaging to marine ecosystems. Spearfishing activities may also compete with and impact other local communities that depend on fish for their livelihood or on the marine environment in general. **Only with strict regulation and adequate enforcement can spearfishing be considered as a sustainable practice.** This strict regulation must include a regulation on the fishing of (locally) vulnerable species, a prohibition on the fishing of (locally) endangered species and be restricted to locations outside of the coastal reef zone, seagrass beds and mangrove areas.

It is important to note that during the stakeholder engagements organized in 2018 by the Government of Aruba and TNO as part of the BEST project to establish Parke Marino Aruba, the fishermen also voiced the necessity of strict regulation on spearfishing (GoA, 2018). "Most fishermen are in favor of legalizing spearfishing again, but in regulated fashion and with a permitting system. Regulations include a limited number of permits, no spearfishing near coastal rocks (baranca), no spearfishing in coral areas, and no spearfishing on coral fish. Furthermore, spearfishing should not be practiced near areas of recreational swimming or dive sites. No spearfishing inside the Marine Protected Areas (MPAs). A spearfishing course should be attended before giving a permit."

Another argument to revoke the prohibition of underwater hunting gear is the challenges it has had in enforcement since its introduction. Spearfishing has been illegal since 2001, yet many spears have been imported and there is a local market for this gear. As the law prohibits the import and use of all underwater hunting equipment, there is also an exemption or permitting system to be made for hunters of the invasive lionfish, as ELFs and Hawaiian slings are the only effective and selective mitigation method for this invasive species. Not all lionfish hunting occurs without harming the reefs, therefore these permits should be carefully controlled as well.

The continued inadequate enforcement should not be a reason to legalize spearfishing. It should, however, be a signal that the enforcement should be reevaluated. Who is responsible to control the illegal import? Who is responsible to ensure underwater hunting equipment is not used? And, maybe more importantly, who is responsible to allocate the resources (financial and human) to execute this enforcement effectively? Is it fair to burden the taxpayer with the costs of controlling an activity that does not contribute to the economy of the island in any way? Regulation requires more resources to effectively enforce compared to prohibition, where it could (have) simply be(en) controlled at the import.

Underwater hunting gear, especially trigger fired spears, can be considered lethal weapons and the possession of lethal weapons should be carefully regulated (if not prohibited) as for firearms. In

Sint Maarten for example[4], trigger fired spear guns fall under Weapons Act (Vuurwapenverordening) and also requires a phycological evaluation as part of the screening and permitting system. The added public safety risks of especially trigger fired spears can also be presumed to be the reason why most countries that do allow regulated spearfishing, only allow pole spears, Hawaiian slings and/or ELFs.

On behalf of the fishermen, the Ministry of Justice, Security and Integration and the Ministry of Transport, Communications and Primary Sector are proposing - in addition to revoking the prohibition on spearfishing - to remove several marine fauna species from the protected species list (AB 2017 no. 48). The proposed marine species to be removed from protection are: all species of parrotfish (Scaridae), Nassau grouper (*Epinephelus striatus*), Goliath grouper (*Epinephelus itajara*), sawfish (*Pristis pectinata*), and bluefin tuna (*Thunnus thynnus*).

Due to the importance of parrotfish to coral health and our white beaches (i.e. tourism), this family of species is to be considered keystone species. Billfish, sharks, rays, giant trevallies, groupers, large snappers, eels and certain species of sea urchins, starfish and corals are other examples of keystone species. Keystone species are species that are of such crucial importance that its removal from or reduction within an ecosystem, entails its collapse. All other species that have been proposed to remove fall under international treaties, either the SPAW protocol or CITES laws because of the Endangered or Critically Endangered status[5]. Moreover, sharks and rays are minimally protected under current local legislation and fishing them continues to be tolerated, thereby violating international treaties such as SPAW, while recent – not yet published – research indicates that Aruba is uniquely rich in cartilaginous fish biodiversity. **Removal or omission of such species from the protected species list would be a violation of our international obligations.**

Impacts of spearfishing on natural resources

The current prohibition on underwater hunting gear is in place as part of the legal framework to protect our natural resources (NBV). Therefore, it would be logical to only change this law if the natural resources it is aimed at protecting no longer need such protection. This paragraph discusses the state of our natural resources as well as the impacts of spearfishing on these resources.

The legal protection of marine species should be increased instead of reduced.

The Nature Protection Ordinance 'Natuurbeschermingsverordening' (NBV) and the different decrees that are introduced in its context are currently the only existing framework protecting our natural resources, both on land and below water. The Marine Environment Ordinance 'Marienmilieuverordening' (MMV, AB 1980 no. 18) is no longer effective since the introduction of the decree for the protected flora and fauna list; 'Landsbesluit bescherming inheemse flora en fauna' (AB 2017 no. 48) as part of Article 4 of the NBV. This new list of protected species does include sea turtles, conch, corals and several coral reef fish species that are required by international treaties or because of their significant value to our ecosystems. However, the extensive list of protected coral reef fish

[4] Unpublished Communications with Tadzio Bervoets of DCNA (18-09-2020)
[5] IUCN Red List of Species

species (AB 1992 no. 70, as part of Article 6 of the MMV) was nullified with the introduction of the NBV Article 4. **Unfortunately, the protection of reef associated fish species is minimal in the current legislation** (as part of the NBV Article 4, AB 2017 no. 48).

There are multiple species missing from the protected species list (AB 2017 no. 48) that according to SPAW Protocol should be protected: i.e. Largetooth sawfish (*Pristis pristis*), Oceanic whitetip shark (*Carcharhinus longimanus*), Silky shark (*Carcharhinus falciformis*), Whale shark (*Rhincodon typus*) and Smooth hammerhead shark (*Sphyrna zygaena*). Some of these species were only recently added to the SPAW Annexes, in 2019, which could explain why they are currently not on the list. This also illustrates the necessity for a legal framework that allows for regular monitoring, evaluation and adaptation to meet international standards and adapt to the dynamics of the natural resources.

The Dutch Caribbean island of Sint Maarten already recognized the ecological importance of all cartilaginous fish – sharks, rays and skates – and protected these by prohibiting their catch for a ten-year period (AB 2011 no. 35). By extension, our local fishermen have indicated during the Parke Marino Aruba stakeholder engagement in 2018 that additional protection is necessary, especially for parrotfish (Gutu), billfish, coral reef fish in general, Goliath and Nassau groupers, sharks, rays, sea turtles, young lobster, young conch, grunts, tarpon and sailfish (GoA, 2018).

<u>Spearfishing can have detrimental impacts on our marine environment, our top tourism product.</u>

Coral reef ecosystems form complex food webs where almost everything is connected to each other in some way. The corals feed on plankton, sometimes even on fish, but more commonly on what the little algae, called zooxanthellae, inside the coral polyp produces. Grazing reef fish, like the parrotfish and surgeonfish, regulate and maintain the coral reef habitat. If left to grow, algae (seaweed) can quickly dominate reefs and stop coral larvae settling and starting the next generation of coral colonies. Plant-eating fish remove algae from reefs, keeping seaweed levels under control and are critical for reef health. Then there's larger predatory fish, like groupers and snappers, that in turn hunt and maintain grazer fish populations under control. At the top of the food chain there are apex-predators such as sharks.

All these trophic levels should be in balance with each other to maintain a healthy reef ecosystem. That means that there should be plenty of corals to feed the grazers, less predatory fish and apex-predators to not deplete the lower levels, but to keep each level (and by extension the different fish populations) healthy by sifting out (eating) the weaker specimens.

Besides maintaining that balance amongst each other on the reef, parrotfish during their grazing activity produce the white sand we have on our beaches as a by-product. Our main tourist attraction, our pristine white beaches, fully depend on parrotfish excrements. **Without enough parrotfish poop, no more white beaches, and no more tourism!**

Spearfishing has been associated with severe biodiversity losses and it can cause severe physical damage to corals and coral structures. Spearfishing is a highly efficient way of selectively targeting and harvesting larger fish. However, as these – for whichever reason - become depleted and spearfishing continues, it has been proven to alter the size structure and abundance of fish. It is also known to alter fish behavior: fish exhibit avoidance behavior or move to other (and perhaps less favorable) habitats (NOAA).

Moreover, research has shown significantly reduced populations of predatory fish such as snapper, jacks and grouper where spearfishing occurs. Spearfishing has also been shown to have a

greater overall impact on reef fishes than hook-and-line fishing, relative to effort expended. Overall, spear fishers remove larger fish (often those with the highest potential spawning output) and more biomass per outing than fishers using other modes. Whereas the largest fish are important as predators in maintaining a balanced and complete ecosystem; their selective removal causes ecological imbalance (NOAA). Available data indicate a variety of important negative effects of catching larger (female) fish, effecting egg productivity, reproduction experience and success, spawn survival rates and spawning periods, which are generally higher with larger fish (Nevill, 2005).

Another point of consideration is that in spearfishing there is effectively no catch-and-release as discards are severely damaged or dead; discard rates of dead fish by spear fishers are three times higher what they are for hook-and-line fishers (Nevill, 2005). Conversely, when best practices are adhered to spearfishing can have little or no by-catch (Smith, 2016).

Despite the socio-economic benefits of spearfishing, studies have also shown that spearfishing has been implicated in the local extinction of some species. One example is the Goliath Grouper in the Dutch Caribbean island of Bonaire (Roberts, 2007). A case study in Jamaica shows that the legalization of spearfishing expanded the industry 10-fold, with protected and vulnerable species being caught, such as reef fish, lobster, octopus, queen conch and great barracuda. Fish were caught at high rates and even small sizes (before reproductive age), and that nighttime and SCUBA spearfishing leave the fish at a complete disadvantage with no chance of escape (Ennis & Aiken, 2014). Note that depleting areas and unbalancing marine - including reef - ecology not only negatively impacts biodiversity but also makes the marine environment less attractive for alternative touristic activities such as snorkeling and diving - activities which if not practiced sustainably may also result in damage to marine habitats.

Aruba's marine environment is already heavily impacted

Since the seventies Aruba has experienced a decline in fish stocks. With the advanced boats and gears nowadays, fish do not stand a chance and fishing is not regulated effectively, which is in violation of the national Fisheries Ordinance (AB 1992 no. 116). Nevertheless, Aruba's current parliamentary and public discourse centers upon upholding tradition, preventing hunger for these sustenance spear fishers under the current Covid pandemic and maintaining 'a balance' between the needs of humans as opposed to the needs of nature. However, these discussions seem oblivious to the fact that the island's carrying capacity has been overreached - being one of the world's most densely populated countries and receiving more than one million tourists annually - and as a consequence there is already an enormous pressure on the environment and biodiversity. Moreover, these discussions also ignore the fact that fisheries have never been regulated on Aruba and that middle-aged and elderly locals anecdotally report degradation of our coastal environment and a decline of marine species since their youth**. It is clear that we need a fundamental shift in our understanding of the word 'balance'. We also need to incorporate this notion within a framework of sustainability.**

During an initial marine park stakeholder session in December 2018, fishermen have even suggested a fish population reduction of approximately 80% between June 2016 and December 2018, although fishermen especially relate this to diverse sources of anthropogenic threats such as, pollution, climate change and other increased (recreational) activities. Water temperature changes have been detected as well as changes in water quality. The fishermen observe a decline in plankton, which occurs in less oxygenated waters, and in turn has a negative impact up the food chain and on

the cycle of life. Although this could be considered a snapshot, there is a consensus among the fishermen that a sustainable approach to fisheries is needed (GoA, 2018).

The FAO describes Aruba's stocks of the main catch species of snapper, grouper and wahoo as overfished. Overall, the total catch of Aruba's fisheries combined is estimated at 140 tons per annum, which the FAO acknowledges as a 'very small' total catch. Nonetheless, overfishing risks and concerns remain, especially in the artisanal subsector (Mehlhart, 2020). Moreover, it would be worthwhile to evaluate if the relatively small total catch registered at the FOA could be the result of insufficient control and administration.

The preliminary presentation[6] of the coral reef survey conducted by CARMABI for the Department of Nature and Environment (DNM) also illustrated the severely degraded conditions of Aruba's coral reefs. Most strikingly, Aruba's coral reefs score as one of the least healthy in the region. However, the coral grazer populations were relatively high compared to other countries in the region. This mismatch between food source and consumer is a clear indication that our coral reef ecosystems are out of balance and are in urgent need of restoration.

The same presentation from CARMABI also indicated that the areas outside of Palm Beach that used to have a living coral reef as well in the past, now have indicators of a very toxic environment in the form of large amounts of algae and cyanobacteria. This is not only bad for coral reefs, but for the entire marine ecosystem (including seagrass meadows, which normally are also high in biodiversity and effective in carbon sequestration) and our tourism industry. Unhealthy and toxic marine environments are both a threat to marine life and humans, ultimately compromising our economic pillar.

Conversely, a healthy, thriving and resilient marine environment not only benefits tourism (and creates even more opportunities) but can also contribute to sustainable fisheries. Scientists are now beginning to understand the warning signs for transition from a coral dominated state to an algal dominated state. The findings show that maintaining adequate reef fish biomass could be a key to managing for resilient coral reef ecosystems (Ocean Tipping Points, 2020).

<u>Applying the precautionary principle and avoiding establishing a precedent.</u>

For management approaches to have a chance at success they must embrace uncertainty and the absence of complete data, as is the case for Aruba. This begs for a precautionary approach to environmental and biodiversity management. The Food and Agriculture Organization of the United Nations (FAO) and the United Nations (UN) champion the conservation approach of Ecosystem Based Management (EBM), which incorporates such uncertainties, as well as the precautionary approach, urging countries to implement it too (Mehlhart, 2020).

The FAO has established technical guidelines for responsible fisheries. In the FOA Precautionary Approach (FAO, Precautionary approach to fisheries., 1995) it is indicated that ***"all fishing activities have environmental impacts, and it is not appropriate to assume that these are negligible until proved otherwise"***. And that ***"the precautionary approach to fisheries requires that all fishing activities be subject to prior review and authorization; that a management plan be in place that clearly specifies management objectives and how impacts of fishing are to be assessed, monitored and addressed"***.

[6] Presented by CARMABI at DNM on May 22, 2019.

Can it be proven at this moment that Aruba's natural resources and fish stocks can sustain the additional pressures of legalized spearfishing? If not, then legalizing spearfishing now, without taking proper measures to evaluate and mitigate potential environmental and biodiversity impacts would establish a precedent for other legislation to be nullified without regard for its purpose, namely: the conservation of nature for current and future generations.

Determining the fate of legislation from one single perspective, with no further research or investigation on the counter arguments and possible (detrimental) effects, and ignoring its original purpose is dangerous and faulty reasoning. This is of great concern to FPNA as it can create a precedent for further derailing of legislation, not only legislation that protects nature and the environment, but also legislation that protects human health and safety for example. Tolerance policies are – from this perspective – a real danger. How will one prevent transgression to tolerance policies for other impactful and non-sustainable activities in protected nature areas, areas designated in the Spatial Development Plan 2019 as 'Natuur en Landschap' and the rest of Aruba?

<u>MPAs offer the highest protection in Aruba's coastal zone and marine biodiversity management.</u>

Marine Protected Areas (MPAs) can function as spaces of recovery for various species in their most vulnerable life stages. When MPAs are sufficiently connected, they act as a wildlife corridor: allowing marines species to move freely between habitats (Mehlhart, 2020). However, note that Aruba's MPAs are not yet connected in this fashion. Moreover, while only protecting the marine environment inside the MPAs will be insufficient to prevent further degradation island round, it is important to safeguard the biodiversity that is left and enhance the potential of recovery at least in these areas.

As part of the Preliminary Management Plan for Parke Marino Aruba (FPNA, 2019) FPNA adopted the current[7] legislation (including spearfishing prohibition) as the rules for these areas until additional rules and regulations have been established during the transition phase with stakeholder engagement. If the Government of Aruba decides to legalize spearfishing on Aruba, spearfishing will remain prohibited inside the MPAs, as also proposed by fishermen (GoA, 2018) and endorsed by FPNA.

Moreover, there is an urgent need to establish marine no-take areas with buffer zones (the MPAs might suffice for this). **FPNA therefore strongly advises to proceed with developing the island-round marine park for sustainable coastal zone management, integrated with ecosystem-based management** to protect the additional features of natural value that are not in the MPAs, such as coral reefs (i.e. Arashi and North-East coastal area) and seagrass meadows (i.e. Palm Beach and Savaneta area). **Properly managed and connected key biodiversity areas ensure resilience and 'spill-over', which also benefits fisheries and our tourism economy.**

[7] As effective on April 16, 2019 when Parke Marino Aruba Management was officially assigned to FPNA

FPNA encourages Best Practices

Aruba has committed to the United Nations Sustainable Development Goals (SDGs). One of these goals, SDG 14, refers to 'Life Below Water' and aims to 'Conserve and sustainably use the oceans, seas and marine resources'. One of the targets of SDG 14 is specifically aimed at fisheries. SDG Target 14.4: *By 2020,* ***effectively regulate harvesting and end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices and implement science-based management plans, in order to restore fish stocks in the shortest time feasible, at least to levels that can produce maximum sustainable yield as determined by their biological characteristics*** (UN, 2015). Measured by SDG Indicator 14.4.1: Fish stocks within sustainable levels. This indicator measures the proportion of global fish stocks which are overexploited, fully exploited and not fully exploited. Sustainable levels of fish stocks are those which are underexploited or fully exploited. Overexploited fish stocks are unsustainable. Unlike most SDG targets, which have a target year of 2030, this indicator is set to be achieved by 2020 (Ritchie, 2018). However, Aruba has not yet made any move or progress to achieve this target.

It is therefore of the utmost importance that the Government of Aruba starts today with applying best practices in marine fisheries in order to meet the SDG goal and target needs.

There are several examples of legislation regarding spearfishing specifically or overall sustainable fisheries within the region. **The FAO has established a Code of Conduct for Responsible Fisheries (FAO, UN Food and Agriculture Organization, 1993) as a guideline for governments and fisheries departments.** This document should be integrated in the way forward towards sustainable fishing practices as a whole or sustainable spearfishing specifically in order to comply with the SDG target on fisheries. Within our region, there is currently only one country, one island, that is considered sustainable when it comes to fisheries and that is Barbados (Oceaneos, 2018).

Within the Caribbean, all Dutch islands have prohibited spearfishing or are moving from regulation to prohibition. In the BES islands (Bonaire, St. Eustatius and Saba) spearguns are listed under the respective legislation (Wapenwet BES Article 1, 2-a) as prohibited items without a permit, with permits only given for conservation purposes such as ELFs for invasive lionfish mitigation. However, even lionfish certification is regulated, and only selected and qualified locals are permitted to hunt lionfish to prevent lionfish hunting tourism.

In Sint Maarten, spearfishing is regulated similarly within the Ministerial Decree for the Establishment of the MPA as an execution of Landsverordening Maritiem Beheer Article 29, 1 sub 2, the Landsverordening houdende natuur voorzieningen Article 8 A, and the approved management plan for the Marine Park. The use of spearguns, spears or any other similar item is strictly prohibited in officially designated conservation zones (the MPA and surrounding all dive sites), even if an individual has a permit for the possession of a speargun. The only exemption is de '*vrijstelling*' given by the designated management authority for the capture of lionfish using approved devices. This information must be shared with the VROMI, TEATT and Justice Ministries. Curaçao also has a prohibition on the use of spearguns, with the exception of ELFs for lionfish. While Curaçao has been quite consistent and effective in its enforcement on spearfishing, there are still some challenges as the import, sale and carrying of spearguns is not prohibited[8].

[8] Unpublished Communications with Paul Stokkermans of CARMABI (05-10-2020)

While prohibition is considered the best practice for regulating spearfishing, as it is the best enforceable regulation, there are some islands in the region that allow spearfishing under strict regulation and permit systems. Bermuda allows only Bermudan residents to apply for a spearfishing license. Each license has a fee and an expiration date, there is a requirement to submit data each month, and there are conditions: only pole spears allowed, no SCUBA, not within one nautical mile (1.85 km) from shore, a bag limit of two fish of any one species per license per day, no lobsters may be speared and any catch may not be sold (Bermuda, 2020). These conditions limit the impact of spearfishing as it will be away from coastal reef zones and only a limited number of persons (local) will be licensed and they can only fish for personal consumption.

The Bahamas also regulates spearfishing. Spear guns are not allowed and only pole spears are allowed with a permit and outside of the 1-mile (1.6 km) radius of the islands coast. It is important to note that the Bahamas have protected all species of shark and have catch limits for all sport fishing practices (Government Agency, 2011). The Bahamian regulations illustrate that not only spearfishing should be strictly regulated. The addition being that regulations for all fisheries compensates for the limited spearfishing that is allowed.

Hence, spearfishing in a strictly regulated form could be sustainable. However, this is only the case if other pressures on the marine environment are relieved by regulating all fisheries, recreation and other anthropogenic threats to sustainable levels. Therefore, best practices should not only determine sustainable spearfishing practices, as all forms of anthropogenic threats are to be regulated in order to become truly sustainable.

Discussion

FPNA is not against fisheries. However, **FPNA can only support Sustainable Fisheries**. With the current degraded state of our (marine) environment there is reason to argue that sustainable fisheries do not and cannot exist in Aruban waters at this moment. From the numerous considerations indicated in this position paper, it has been made clear that FPNA has serious concerns on the sustainability of legalizing spearfishing in Aruba. Considering the precautionary principle, **it should be proven first that our marine environment is healthy enough and fish stocks resilient enough to sustain (spear)fishing.**

It is lamentable that up to now Aruba has not invested in Sustainable Development Goal (SDG) 14 'Life Below Water', which includes sustainably managing, protecting and restoring marine and coastal ecosystems as well as the conservation and sustainable use of ocean, sea and marine resources. Aruba has a commitment to meet this target.

It is also important to realize that depending on the target species and location there are different variants of spearfishing that each should be considered separately. There is (1) spearfishing on reefs, (2) targeted invasive species spearing of lionfish with ELFs, and (3) spearfishing of pelagic fish. The first has no possibility of being a sustainable fishing practice. The second is currently the only effective mitigation measure to control the population of invasive lionfish on the reefs in the region. However, this should still be a regulated activity as severe damage can occur if the 'hunters' are not properly trained to prevent harm to corals and/or other coral-related species. The third form of spearfishing, on pelagic fish and away from coral reefs, has the potential of being a sustainable fishing practice provided it is strictly regulated and enforced, and accompanied by continued monitoring of local and regional fish stocks of the target species as well as the environmental effects.

Besides categorization by target species and site, the purpose of spearfishing can also be categorized into (1) spearfishing for sport or hobby, (2) spearfishing as a livelihood and source of income, (3) spearfishing for personal (or family) consumption. Here, again, the first cannot be considered sustainable. The second would not be sustainable either, as to generate enough income, the threshold of sustainable catch rates would be surpassed. Only the third, spearfishing for personal consumption - if limited, regulated and enforced - could possibly be sustained by our current state of marine environment.

Considering the different impacts and implications of different target species and or purposes of spearfishing, regulated spearfishing should only be permitted on pelagic fish and for personal consumption. Hunting of invasive lionfish species with ELF should also be regulated. FPNA would strongly recommends adhering to the following restrictions, should the Government of Aruba decide to introduce a legal form of spearfishing.

Before revoking the current prohibition (AB 2001 no. 115) the Government of Aruba should:

1. Have a species and environmental monitoring system in place that has already produced sufficient data (local and regional) on target species to determine sustainable quota, allotted size and permittable seasons.
2. Establish an island-round Marine Park with proper zoning in order to manage and connect key biodiversity areas to ensure resilience and spill-over, which only benefits fisheries and tourism economy.

3. Have a new ironclad legal framework in place not only for spearfishing but for fisheries in general.
4. Have incorporated a registration, regulation (as described below) and legal sanctioning system with penalties into the new legal framework.
5. Have allocated funds for additional training of enforcing authorities, and for reporting, communication and awareness efforts, including information and publications on a website made available to the general public.
6. Have a framework for Sustainable Fisheries and implement the FAO Code of Conduct for Responsible Fisheries.
7. Have conducted proper stakeholder engagement with all stakeholders (including other authorities such as Police Force, Coastguard and Ports Authority), not only fishermen for whom this legalization will apply.

Minimum requirements for spearfishing legal framework and regulation:

1. Spearfishing should have a paid licensing system:
    a. A highly limited number of licenses exclusively for sustenance
    b. Local residents only
    c. Mandatory training
    d. Mandatory registration of personal engraved spear gear
    e. Psychological test as for firearms
2. The list of protected species is expanded in general or specifically for spearfishing to include all parrotfish and other reef fish, all grouper species, all sharks, all rays, sea turtles, lobster and conch. Or a (shorter) list is developed of permitted species for spearfishing based on monitoring data.
3. A minimum and/or maximum size is determined for each permitted species to eliminate the capture of immature specimens and/or optimal reproduction sizes.
4. Catch limits (quota) are determined for each species and per timeframe.
5. In addition to the general restrictions on taking fish, there is a bag limit of two fish of any one species per person per day.
6. Designated open and closed seasons per species to reduce fishing pressure during specific spawning and migration seasons.
7. Only pelagic spearfishing is allowed. The areas where spearfishing is allowed are 2 km or more offshore, and outside of the MPAs or their buffer zones. No spearfishing is allowed on coral reef areas, in or near recreational swimming or diving areas, wrecks or other highly visited sites, nor near coastal rocks (baranca).
8. Spearfishing is not allowed in combination with SCUBA.
9. Spearfishing is not allowed at night.
10. Spearfishing license holders are required to submit statistics of their activities by the end of each month.
11. Annual public reporting of catch, resources monitoring and sustainability by the responsible authorities.

Conclusion

FPNA is in principle against the re-introduction of spearfishing after an almost 20-year ban, certainly in view that all other nations are moving towards (or maintaining) banning. Aruba's marine environment and ecosystems have only been further degraded in this time frame, due to additional stressors - such as the effects of climate change, water sports and marine pollution - but also due to lack of national/administrative policy, inadequate or lacking legislation, as well as insufficient regulation and enforcement, and more recently even the categorical explicit tolerance of the still illegal spearfishing by the regulating and enforcing authorities.

While FPNA understands the socio-economic pressures for food security that are triggered by the current COVID-19 crisis, FPNA has serious concerns on the sustainability of legalizing spearfishing in Aruba: (1) The added pressure to the already fragile state of our marine environment and primary product of our economic pillar, (2) the necessity to apply the precautionary principle and lay the burden of proof at the activity, (3) concerns on the available capacity for the necessary strict monitoring, regulation and enforcement of spearfishing and (4) the potential of a spear to be used as a (lethal) weapon; are all reasons to not revoke the prohibition on spearfishing (AB 2001 no. 115). Let alone the additional costs that reintroduction will entail, be it for administration, regulation and enforcement, or for environmental rehabilitation. The question remains whether there are not more viable and sustainable alternatives for food security?

If spearfishing were to be legalized, this should only occur after baselines studies have been conducted and under strict regulation and precaution - and should explicitly include legal sanctioning and penalties - as to prevent further environmental, ecosystem and biodiversity impacts and to ensure that it is limited to pelagic spearfishing for personal consumption. Monitoring and enforcement capacity need to be allocated in order to mitigate the impacts of spearfishing. This entails amongst others the registration and strict regulation of spears as a firearm and designating spearfishing areas 2 kilometers from the coast and outside the buffer zones of the MPAs and 'high use coastal areas' (with numerous forms of local and touristic recreation). Note also that numerous coral reefs and seagrass meadows exist outside of the MPAs that are nonetheless also areas of high value for ecosystem services. The lack of local protection thereof should not entail its unsustainable exploitation with disregard for international treaties.

FPNA wishes to emphasize that as a nature conservation and management organization, the Foundation is not opposed to fisheries. However, the Foundation strongly subscribes to sustainability as a framework for an economy based on wellbeing of both citizens, visitors and nature. Sustainable fisheries reconciles fisheries, science and conservation biology and should form the basis of a sustainable blue economy to sustain Aruba's peoples far into the future.

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