



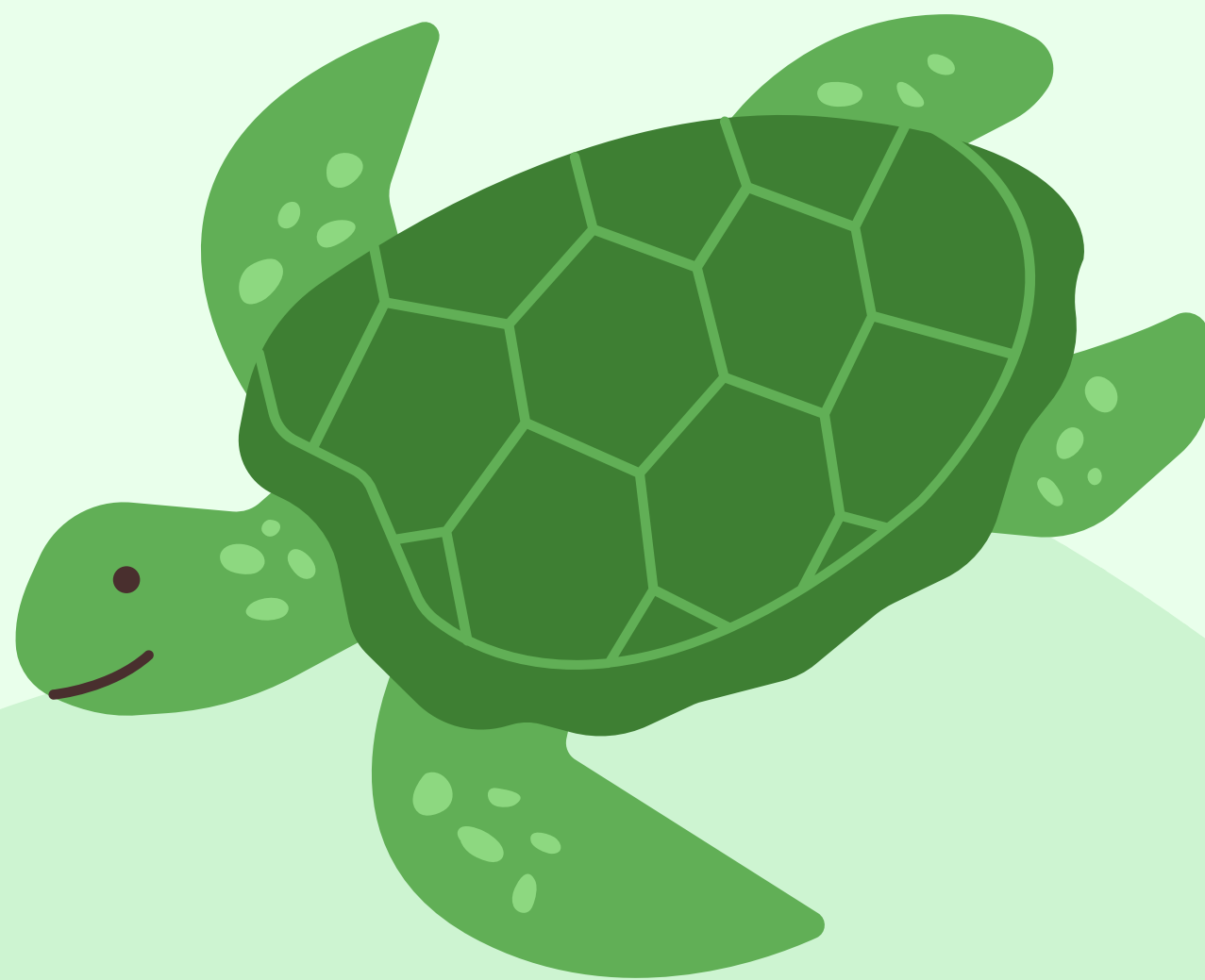
**P A W I K A N
P R O J E C T**

**THE
MEAD
FOUNDATION**



SUNDOWNERS
BEACH VILLAS
ZAMBALES

PAWIKAN
Project



End of Season Report
2021-2022

Project Overview

The Philippines lies within the Coral Triangle, regarded as the most biodiverse marine environment in the world. With this ecological richness comes the responsibility to manage human activities in a way that attempts to support the natural balance and maintain a healthy environment, sustain millions of Filipinos, and wherever possible advance education, awareness and environmental stewardship.

Five of the world's seven marine turtle species are found in the Philippines, known locally as the "Pawikan" a catch-all term that refers to all local sea turtle species.

Common name	Scientific Name	IUCN Red List Status
Green	<i>Chelonia mydas</i>	Endangered
Hawksbill	<i>Eretmochelys imbricata</i>	Critically Endangered
Olive Ridley	<i>Lepidochelys olivacea</i>	Vulnerable
Loggerhead	<i>Caretta caretta</i>	Vulnerable
Leatherback	<i>Dermochelys coriacea</i>	Vulnerable

Table 1: Sea turtle species and their conservation status. In addition, all species are considered CITES Appendix I. (IUCN – International Union for Conservation of Nature, CITES – Convention on International Trade in Endangered Species)

In the Philippines, all marine turtles are protected pursuant to the Wildlife Resources Conservation and Protection Act (Republic Act No. 9417) of 2001, also known as the Philippine Wildlife Act. This law provides prescriptive regulations designed to protect the Pawikan and also provide a framework for the handling of those caught accidentally, injured or sick turtles that need to be rescued. Despite the existence of this legislative framework, poor enforcement of environmental laws, and under-resourcing of those government departments charged with enforcement and oversight, all result in lack of enforcement and continued pressures to the Pawikan population of the Philippines.

Because the different species of sea turtles inhabit a variety of ocean habitats (from near-shore to pelagic), and mature females, eggs and hatchlings interact with human impacts, the list of threats also varies. Whilst a number of threats exist at sea – such as predation, pollution (oil or other toxic chemicals, plastic debris), vessel strikes, bycatch from fishing operations – the Pawikan Project initiative will focus on conservation within the on and near shore human interaction zone. These threats include poaching of turtles and eggs, predation, and coastal development.

The five Pawikan species found in the Philippines are in need of dedicated conservation efforts, to not only attempt to relieve pressures on their population, but support nesting grounds and undertake broad education initiatives designed to promote conservation awareness and compliance with the Philippine Wildlife Act. The Pawikan Project has designed a program to achieve this.

Why Zambales?

Zambales is a coastal province, with in approximately 200 kilometers of coastline. Due to the structure of Philippine laws the waters within 15 kilometers of the beach also remain under Provincial jurisdiction. The entire Zambales coastline has been designated a Pawikan protected zone. There are 11 Municipalities in Zambales with identified nesting sites, namely:

Sta. Cruz	Brgy Sabang, Brgy. Bolitoc, Hermana Menor Island
Candelaria	Brgy Uacon, Brgy. Sinabacan, Brgy. Libertador, Brgy. Malimanga, Potipot Island
Masinloc	Brgy. Bani, San Salvador Island
Palauig	Brgy. Lipay-San Juan, Brgy Lioson, Magalawa Island
Iba	Brgy. San Agustin, Brgy. Bangantalinga, Brgy. Amungan, Brgy. Lipay-Dingin, Brgy. Palanginan
Botolan	Brgy. Danacbunga, Brgy. Beneg, Brgy. Capayawan, Brgy. Binoclutan, Brgy. Porac, Brgy. Panan
Cabangan	Brgy. Felmida Diaz, Brgy. Arew, Brgy. Sto. Nino, Brgy. Camiing, Brgy. Lomboy, Brgy. Tondo, Brgy. San Isidro, Brgy. Laoag
San Felipe	Brgy. Sto. Nino, Brgy. Maloma, Brgy. Sindol
San Narciso	Brgy. La Paz
San Antonio	Brgy. San Miguel, Brgy. Pundaquit
Subic	Brgy. Cawag

Table 2: Zambales Municipalities and Barangays

Presently, one other Pawikan conservation project is active in the Province of Zambales, however this project has a conservation strategy is to engage a team of rangers to patrol the beaches each night during nesting season to spot and collect the eggs after nesting. The Pawikan Project initially adopted this strategy of ranger patrols but evolved the strategy to employ the Pawikan Hotline as it was seen as a superior method to align and engage the community, as well as lower manpower costs.

Whilst in situ nesting – with non-disturbance of the nests – would be preferable, the local conditions in Zambales including lack of enforcement of environmental laws, lack of ability close public beaches during nesting season, and rampant Pawikan egg poaching, lend support to the success Pawikan egg relocation strategy. This is an accepted practice globally when in situ nesting cannot be assured of being uncompromised.

Project Stakeholders & Supporters

Project Sponsors

The Mead Foundation, Inc.

A Philippines-registered non-profit foundation focused on the advancement of the United Nations Sustainable Development Goals. With a diverse range of interests, including coral reef restoration, reforestation and medical missions, The Mead Foundation engages with activities anytime it can add value, scale, impact and sustainability of actions. The Mead Foundation has been active in Zambales for some time, and the Pawikan Project is a natural extension of the current environmental and social programs being undertaken.

For more information refer to www.mead-foundation.org.

Sundowners Zambales

A luxury beachfront villa resort located in Botolan, Zambales. With a high standard of accommodation and beautiful beachfront location, Sundowners Zambales has seen considerable success both for visitor numbers but also visibility and marketing presence. Sundowners Zambales is a sister resort of Sundowners Vacation Villas, another waterfront resort located in Bolinao, Pangasinan (Sundowners Bolinao). The Sundowners experience is inextricably linked to the local natural environment and as such Sundowners places a major priority on the stewardship of the local area.

Sundowners Zambales opened on 3 January 2019 and became an immediate success, welcoming 40,000 visitors during calendar year 2019. Social media presence grew quickly, and Sundowners Zambales now has 38,000 Instagram followers and 87,000 Facebook followers. This visibility is further magnified by Sundowners Bolinao which has 45,000 Instagram followers and 265,000 Facebook followers. In total, the Sundowners Group social media impact exceeds 500,000 individuals across all platforms including YouTube, TripAdvisor, etc. This visibility will be supportive for the success and scale of the Pawikan Project.

For more information refer to <https://sundowners.ph/zambales>.

Project Supporters

Loveland Living Planet Aquarium

Loveland Living Planet Aquarium (LLPA) is a Utah, USA based 501(c)3 non-profit dedicated to inspiring people to explore, discover and learn about Earth's diverse ecosystems. LLPA provides learning opportunities at all ages. Since March 2014 more than 5 million visitors from every State in the US have visited. LLPA is accredited by the Association of Zoos and Aquariums.

For more detail refer to <https://thelivingplanet.com/>.

LLPA engages with the project in a mentoring and stewardship role, to provide:

1. Assurance of the adoption of best practices consistent with Association and Zoos and Aquariums guidelines;
2. Access to experienced professionals in the fields of Marine Biology and Science; and,
3. Visibility and awareness.

Department of Environment & Natural Resources - Biodiversity Management Bureau (DENR-BMB)

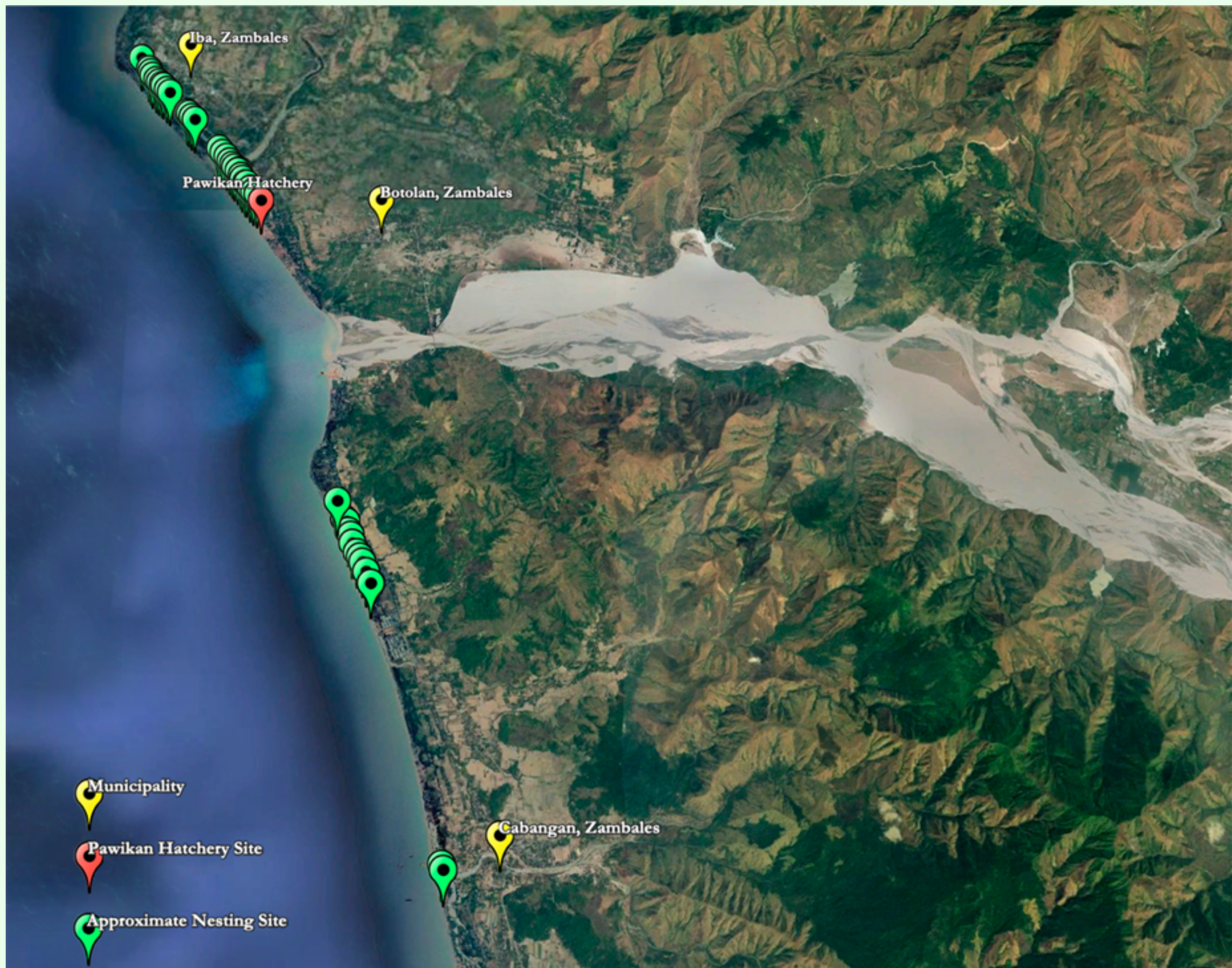
DENR-BMB is the department of the Philippines Government charged with overseeing protection of endemic and endangered Philippines flora and fauna and has supported the Pawikan Project in a number of ways including technical training and strategic guidance, education materials, and assistance with strategies for dealing with poachers including that allocation of government enforcement resources.

Government of Zambales, Provincial Agricultural Office

In Zambales, ocean conservation initiatives have been assigned to the Provincial Agricultural Office, as sustainable oceans are seen to be central to food security. The Provincial Agricultural Office has endorsed the Pawikan Project and plays an active role in project planning and implementation.

Project Implementation

The Pawikan Project commenced project implementation in October 2020. After initially considering constructing two hatcheries for the first season, ultimately a decision was made to construct just one hatchery and use vehicle transport to gather eggs from the coastline across three municipalities (Botolan, Iba and Cabangan). This was seen to be easier to manage during the first season of operations. The total coastline area covered during the season was 25 kilometers. In the future as the project matures and expands, it is planned such that each municipality will have one or more hatcheries.



Map 1: 25 kilometer extent of the Pawikan Project reach

Sundowners Hatchery

A 220 square meter hatchery was constructed immediately south of Sundowners Zambales. This site was constructed for the safe keeping of the Pawikan eggs, but also to provide an area to engage tourists to understand the conservation initiative, for education, awareness and the solicitation of donations or volunteer support. In addition, local government and community groups were invited to attend to enhance community awareness and engagement.

The hatchery was built without use of metal, as metal is seen to affect the magnetic sensitivity of the Pawikan hatchlings and possibly negatively impact the female turtles return to the same beach site upon reaching sexual maturity. The hatchery was constructed with bamboo and monofilament, with netting covering the exterior for protection of the nests but also to permit the airflow and prevent the interior from overheating. A flexible shading design was used to allow the project to target a 3:1 female to male ration, which is seen as optimal due to the desire to rapidly increase population of the Pawikans. It was advised by technical supporters of the project that sand temperature above 30°C produces a majority female hatchlings, where as sand temperature below 30°C is reported to produce males. In addition the shading of the hatchery was to prevent sand temperature from exceeding 35°C which can be fatal for the nests. Testing showed that temperatures in the surrounding unshaded areas could reach 35°C approximately 30-40cm below the surface.

Within the hatchery, nests were further segregated to protect the hatchlings upon emergence, allow for coordinated release to the ocean, and for data recording purposes. The sand was cleaned of all organic matter prior to the commencement of the season, and vegetation was cleared from around the edges. In addition, red lights were installed so as to permit night visibility but not disturb the hatchlings, and infographics were included at the exterior for education and engagement of local beachgoers.



Sundowners Zambales Hatchery

Abstract

This document records the season 2021 experience for the Pawikan Project where 22 nests were successfully relocated in a protected hatchery. This season's hatching rate is 80.01%, producing almost 1,513 Olive ridley hatchlings. Core to Pawikan Project success is participatory conservation, efficient data and knowledge management, and creation of new partnership and strengthening existing ones. With egg poaching as the most common threat to marine turtle population in Municipalities of Iba and Botolan, the conservation initiatives of the Pawikan Project and the strengthened partnership forged this season is hoped to make a significant difference for the local population of this protected species.

Season 2021/22 Background

This second season commenced in November 2021. Building on the success and lessons from the previous season. It aims to foster stronger relationship with project partners and create a pool of community partners acting as liaison between the community and the project team.

On the onset, the Pawikan Project is designed to implement global best practices to:

1. Support Pawikan breeding habitats through structured programs designed to safeguard the eggs and protect from poaching and other threats.
2. Initiate the Pawikan Hotline, a 24/7 service for community members to report pawikan nests and receive a P10 per egg reward. Following a report, our trained rangers relocate the eggs using best practices, to a secure hatchery site.
3. Engage local community members to become Pawikan Rangers, to both relocate eggs and become project advocates amongst community members and general public.
4. Broadly promote education and awareness:
 - a. Local Community: Laws and regulations, importance of Pawikan nest stewardship, how to manage community conditions to promote sea turtle nesting, the potential impact of ecotourism for positive community development, and educating local community and school children generally about ocean ecosystems
 - b. Broader Public: Generating support and awareness for conservation
5. Encourage other participants in the local area and around the Philippines to adopt the best practice model for sea turtle conservation.

The Project Scheme is the same as last season, with established hotline where community members can report observed nesting. A ready team from The Mead foundation, with support of the Maritime Police and other Project partners (ie DENR, LGUs of Iba and Botolan, and Sundowners Beach Villas), retrieves the eggs and relocate it to the established hatchery in Sundowners.

Established Pawikan Project Standard Operating Procedures are strictly being followed during clutch retrieval, transport, and relocation. The eggs are incubated in a protected 50m x 50m rectangular hatchery. Data management and upkeep are put in place to ensure efficient hatchery operation and management.

Season 2021/22 Updates

A. Project Scheme

The Pawikan Project Scheme is innovative in utilizing hotline reporting of observed nests, making the project inclusive and participatory. A flyer (Figure 1) describing the Project Scheme and reflecting the hotline numbers was distributed at the onset and throughout the duration of the nesting season. There are 2 mobile numbers designated as Pawikan Project hotline that observers can call to report observed nesting pawikan. The hotline is being monitored by a contracted Pawikan ranger, who also liaise the nest retrieval with the maritime police.

Once arrangement with nest observers and the maritime police are underway, the Pawikan Project team heads to the site. When community members are present during the retrieval, an information dissemination is conducted by the Pawikan Project team pertaining to marine turtle conservation and the importance of reporting observed nests for successful conservation of these protected species.

A Php10.00 per egg is rewarded to the nest observer for untouched nest. This reward is given the same day the eggs are relocated, together with a certification that was aimed to empower pawikan nest observers and to encourage them to continue reporting their observations or influence their neighbors to do the same.

“WAG HAWAKAN, IREPORT LAMANG.”

Ma'am/Sir may pugad ng itlog ng Pawikan dito, pwede paki puntahan po?

Walang bayad pag ginalaw. 30 itlog pataas kadalasan sa pugad. Kung 100 itlog, P1000.00.

1 itlog = **P10.00** pabuya.

Call/Text Hotline:
GLOBE
0927-563-0844
SMART
0949-859-0830

Bawal kumuha at mag benta ng Pawikan at mga itlog nito alinsunod sa batas: "Wildlife Resources Conservation & Protection Act." Kulong hanggang 12 taon at multa hanggang P1,000,000.00 sa mga lalabag.

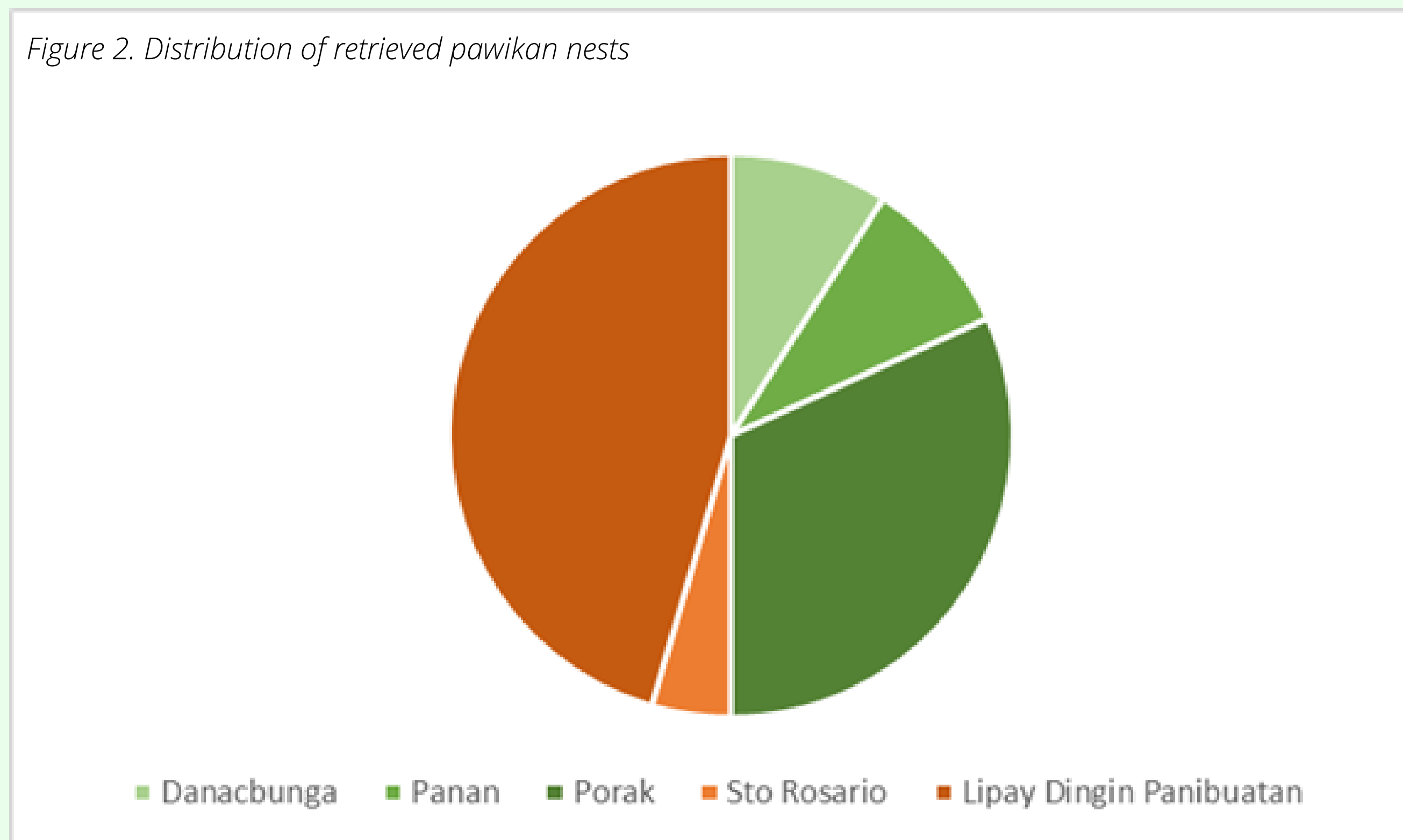
THE MEAD FOUNDATION PAWIKAN PROJECT SUNDOWNERS BEACH VILLAS ZAMBALES

Figure 1. Copy of the IEC flyer distributed this season

B. Hatchery Production

This season, the Pawikan Project was able to retrieve 22 nests from Municipalities of Iba (Barangay Lipay Dingin Panibuatan and Sto Rosario) and Botolan (Barangays Danacbunga, Porak, Panan), see Fig. 2. Nesting in the area is relatively late compared to other nesting sites in the north-western Philippines ie La Union and Southern Luzon area (Cavite and Bataan).

Figure 2. Distribution of retrieved pawikan nests



Our first nest of the season was turned over by a concerned citizen who allegedly bought the eggs from poachers. The remainder of the nests for the current season was recovered through hotline reports from the community and project partners (ie LGU, and maritime police).

The number of retrieved nests (total 22) were equally distributed between municipalities of Iba and Botolan (Fig. 2), but most frequent nest reports came from Barangay Lipay Dingin Panibuatan (LDP), municipality of Iba (n=10). The nesting area in LDP is characterized by a stretch of nonoperational resorts, thus beach area is relatively undisturbed compared to other areas.

A total of 1,961 eggs, distributed across 22 nests (average 89 eggs per nest) were retrieved and relocated this season. As per the Project's Standard Operating Procedures (SOP), data such as number of eggs, nest temperature, nesting site, and time of observed nesting are recorded in source site. The time of relocation to the hatchery is also recorded. Identifying labels (Fig 3) are installed in each nest to include the above data as well as the expected date of hatching



Figure 3. Installed nest guards and label

In the later part of the season (end of December), the Pawikan Project team initiated to divide the eggs into 2 nests if clutch size is over 90 eggs. This adjustment was made to improve hatching rate for bigger-sized clutch. Nest label then reads nest number A and B (example nest 12A and 12B).

The average incubation period (date to hatching) recorded for this season is 51 days. Five days prior to the expected hatching date, a fine-mesh net is added to the bottom half part of the nest guard (Fig 3) to ensure that upon emergence, hatchlings are kept within the designated nests. This is especially helpful in recoding hatching and emergence rates in each nest.

Nests are excavated (Fig 4) on the third day of first emergence to check for late emergence and to collect data necessary for calculation of hatching and emergence rates. Hatching rate (ratio of developed and hatched hatchlings from total incubated eggs) and emergence rate (ratio developed and alive hatchlings from total incubated eggs) of are calculated and recorded as follows:

$$\text{Hatching rate (\%)} = \frac{\text{TE} - \text{UH}}{\text{\#oE}} \times 100$$

Where

TE-Total number of eggs in a clutch

UH-Total unhatched eggs

$$\text{Emergence rate (\%)} = \frac{\text{TE} - \text{UH} - \text{D}}{\text{\#oE}} \times 100$$

Where

TE-Total number of eggs in a clutch

UH-Total unhatched eggs

D-Dead hatchling



Figure 4. Nest account 3 days after first recorded emergence

As of date of writing, 22 of the 22 nests have already hatched. The average hatching rate across these 22 nests is 80.01% and the emergence rate is 79.60%. Clutch of over 80 eggs that were split into 2 separate incubation nests resulted to increased hatching rates, with nest achieving almost or up to 100% hatching success (see Table 1). Nest 19 have a drastic hatching success, that may be attributed to heavy rainfall in early April, extremely high temperature starting mid-April, and a fairly strong (magnitude 5.0) earthquake with an epicenter in nearby Cabangan municipality last 30 March 2022. The eggs in nest 19 is on its mid-term incubation period when the earthquake and the heavy rainfall happened. Upon excavation, most of the eggs were undeveloped, and no physical evidence of predation (ie puncture holes) were observed, suggesting natural causes of underdevelopment.

From the onset of the season, until 3rd week of February, nest temperature is monitored daily, starting the second trimester prior the expected hatching (starting day 17 of the incubation period). This is the period where temperature plays a major role in sex determination of the hatchlings, wherein warmer temperature (from 31°C) will produce female turtles while lower temperature produces male turtles.

Upon the recommendation of DENR-BMB personnel during the Cavite-Bataan-Zambales (CABATALES) marine turtle network meeting (held on February 22-24, 2022), nest temperature is monitored starting day 1 of nest incubation. Temperature is recorded three times a day (7am/12nn/5pm). The average temperature recorded in the hatchery is 31 ± 2.03 .

As per the Project's SOP, hatchlings are released upon emergence if timing is favorable. Normally, marine turtle hatching is triggered by cooler temperature, thus hatchlings usually happen late in the afternoon, or towards the evening. However, this season, the Project team recorded mid-day (not overcast) hatching of 11 (58%) nests. This poses significant desiccation-related stress to the hatchlings, and thus, would need close monitoring.



Figure 5. Hatchlings kept in holding basins and covered with dark cloth to prevent air and light exposure that could trigger "swimming frenzy"

In case of mid-day hatching, hatchlings are placed in a dry basin and covered with black porous cloth to limit air and light exposure that could trigger the hatchlings "swimming frenzy", the urge to actively swim to break through the breaking coastal waves. This "swimming frenzy" exhaust the yolk reserve of the hatchlings, diminishing the energy they would need to swim past the breaking waves, finding their first food, and avoiding predators.

To keep the hatchlings cool, a slightly wet (seawater) towel (not dripping) is placed at the bottom of the holding basin. It is not advisable to keep hatchlings in holding basins for over 6 hours, as this could induce irreversible damage to physiological responses of the hatchlings.

Nest Number	Number of eggs	Hatching Rate	Remarks
1	78	87.18%	
2	103	52.43%	
3	80	83.75%	
4	111	90.99%	
5	78	83.33%	
6	60	96.67%	
7	88	100%	
8	85	97.65%	
9	95	97.89%	
10A	54	100%	split
10B	54	100%	
11A	56	99.11%	split
11B	56	100%	
12	84	92.86%	
13A	53	99.06%	split
13B	53	100%	
14	56	46.43%	
15A	49	94.95%	split
15B	50	96%	
16	84	90.48%	
17	85	78.82%	
18A	52	97.12%	split
18B	52	94.23%	
19A	50	4%	split
19B	49	4.08%	
20	73	34.25%	
21	84	25%	
22A	35	100%	split
22B	41	80.49%	
TOTAL	1,961 EGGS COLLECTED	80.01% HATCHING RATE	1,513 HATCHED EGGS
₱19,610.00 (NINETEEN THOUSAND SIX HUNDRED TEN PESOS) PAID OUT TO COMMUNITY MEMBERS FOR NEST REPORTS			

Prior to release, the carapace length of the hatchlings is recorded. A representative sample of a batch (at least 30%) is measured (carapace length and width) to the nearest centimeter using a Vernier caliper. The average length of hatchlings for this season is 3.9cm while average width is 3.3 ± 0.21 cm. Length data can be used to compare size distribution of these hatchery-produced hatchlings to natural (unrelocated) nests and can also be a good determinant of biological success of these hatchlings. It is also recommended to complete the biometrics data, to include weight of sampled hatchlings.



Figure 6. Measuring hatchlings prior to release

Though effort was made to remove vegetation and its roots within a meter of the nursery perimeter fence, roots of creeping beach flora was still present. These roots can potentially penetrate incubating eggs, affecting the morphology of developed hatchlings (Fig 6). Though these hatchlings were alive, their natal deformities are a huge factor for surviving the wild.

For the upcoming nesting seasons, it can be worth to consider moving the hatchery away from beach flora, in an area that could be inside the premises of Sundowners Beach Villas. This can also limit natural predation (from ghost/fiddler crabs), & ant infestation. It has been commonly observed throughout the nesting season that the hatchery provides a bit of shelter & beachgoers, that picnics are commonly laid by the hatchery perimeter fence. Leftover food and other food debris are left, attracting ants, which could potentially be attracted to the incubating nests. Spatial considerations between incubating nests are not really a determinant of successful hatchery production, such that a distance of 0.5m on all sides is not necessary. A hatchery established in a more controlled scenario, wherein natural disturbances are fully addressed (ie roots, natural predation, overexposure to the sun) can increase hatching rates.



Figure 7. Deformed hatchling caused by entangling in roots of creeping beach flora. Arrows pointing to parts of carapace with pronounced deformities

As of date of writing, a total of 1,513 hatchlings from 22 nests were released by the Pawikan Project. Release is done early in the morning (before 7AM) and late in the afternoon (mostly when the sun is just setting), and is mostly attended by representatives of the Project partners (see next section), Sundowners guests, and other local beachgoers. In the earlier part of the season, the process of hatchling release was patterned from season 2020 (Fig. 8A) wherein hatchlings were allowed to crawl a distance of at least 6m from the waterline in a safely enclosed area, away from foot traffic of observers. However, upon the recommendation of Dr. Rizza Salinas of DENR-BMB, this process was modified, to include a turtle “runway” a prepared track guide where turtles can safely crawl in an orderly and safe manner to the waterline. The prepared runway length is minimum of 10m long and at least 1m wide.

During the release a 5-10mins information drive about the conservation objectives of the Pawikan Project, and an overview of the biology of the species is shared with the observers. The observers are made aware of the ecological importance of marine turtles, as well as their conservation status (all protected species that are either endangered or critically endangered), and how efforts like the Pawikan Project are helping in ensuring survival of the species.



Figure 8A. Conventional release scheme, without the hatchling “runway”



Figure 8B. Adopting the pawikan runway for a more controlled, and safer hatchling release. Inset shows the preparation of the runway

The marine turtle species being conserved by the Pawikan Project is the Olive Ridley, *Lepidochelys olivacea*, the smallest of the five marine turtle species found in the country. Though other turtle species has been documented in coastal areas of Zambales, all of the relocated eggs to the hatchery are Olive Ridley eggs. The identifying features of olive ridley hatchlings is shown in Fig 9.

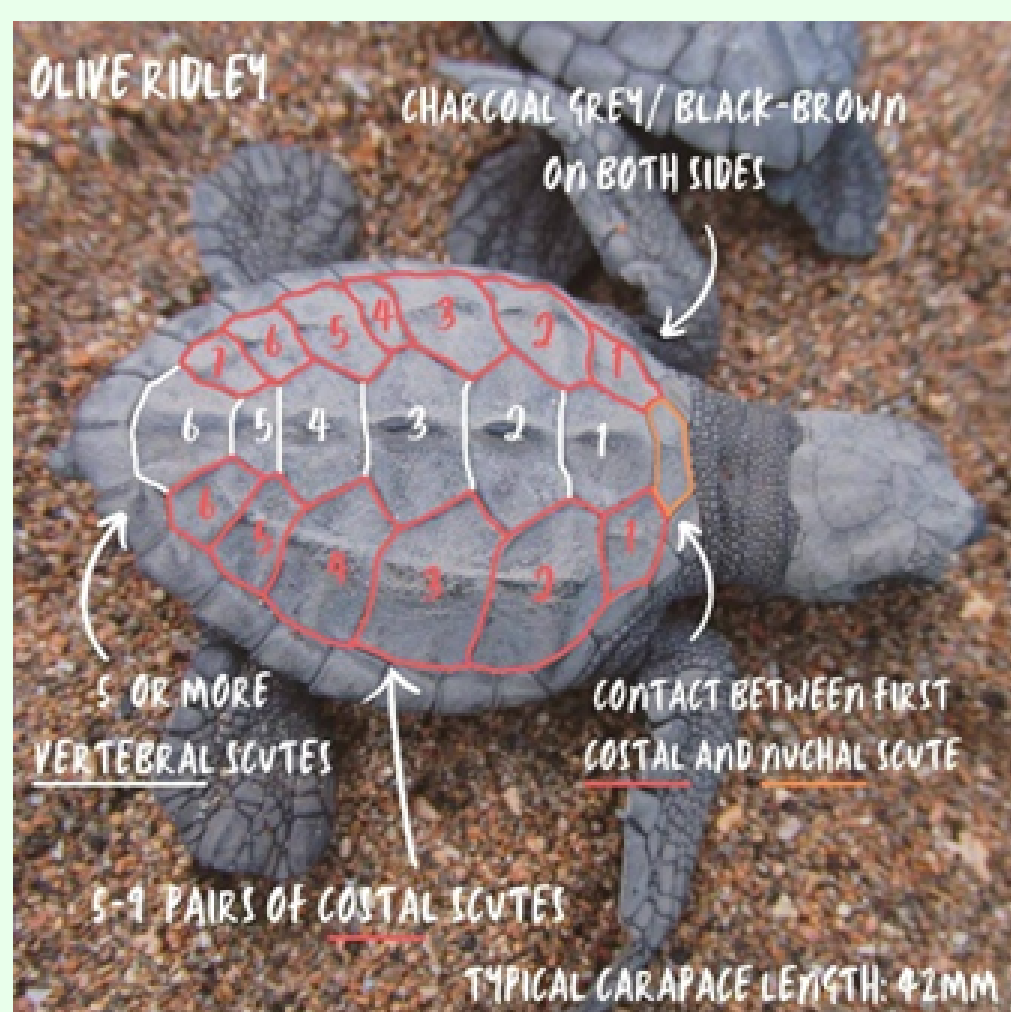


Figure 9A. Identifying features of olive ridley hatchling (adopted from Olive Ridley Project, <https://oliveridleyproject.org/>)



Figure 9B. Hatchling produced in Pawikan Project hatchery, March 2022

Though community and tourist observations are highly encouraged during the release, it is for the sole purpose of increasing these observer's awareness about marine turtle conservation. One of the best practices of the Pawikan Project is tagged as "conservation over tourism", wherein handling of release is limited only to the project team and representatives of project partners. Aside from physical handling of the hatchlings, observers are also prohibited from using flash photography and making excessive noise that could distract the turtles.

Project partners (see next section) play an important role in the success of the Pawikan Project, in all aspect of project implementation-nest retrieval, hatchery operations, and hatchling release. These project partners are informed of anticipated hatchlings release and are often allowed to document the release for their respective offices' documentation process.



Figure 11A. Pawikan Project Partners from Maritime Police and their community volunteers from Brgy. Porac, LGU Iba and Botolan, and DENR-CENRO Masinloc

Partnerships Created

MOA signing (LGU Botolan, PENRO Iba)

The partnership between the LGU Botolan, and DENR-PENRO Iba has been formalized through a MOA signing on 17 January 2022. The MOA documented the partnership of the 3 parties in furthering the marine turtle conservation in the Municipality of Botolan through the Pawikan Project. The MOA was signed by Botolan Mayor Doris M. Jeresano, The Mead Foundation's founder Mr. Benjamin Mead, and PENRO-Iba PENR-Officer Marife Castillo.



Figure 12. Photo opportunity at the Pawikan Project Hatchery at Sundowners Beach Villas after the signing of the Tripartite MOA (LGU Botolan-The the Mead Foundation-DENR-PENRO Iba) for Pawikan Project Partnership

(from left to right: LGU Botolan MENRO Staff [in solid red shirts] and LGU MENRO Annadine Manzinares [stripped red shirt], PENRO Zambales Marife Castillo, TMF Project Devt Officer Aleja Genisan, TMF Director of Conservation Karen Chan, CENRO, Sundowners Zambales President Regis Bruant, Jr., TMF Founder Ben Mead

Eramen Minerals

The Eramen Minerals, Inc., (EMI) through its Environmental Protection and Enhancement Program (EPEP), a mining-specific compliance under the Mining Act and its Revised Implementing Rules and Regulations, DENR AO 96-40, initiated a partnership with the Pawikan Project. As such, there is a possibility of long-term support from EMI for Pawikan conservation in Zambales through the Pawikan Project as EPEP is a permanent compliance throughout the project life of mining industries



Figure 13A. Initial hatchery visit of Eramen Minerals personnel



Figure 13B. MOA Signing with Eramen Minerals Corp. to support Pawikan Project

Maritime Police

The Maritime Police Office in Iba has been an active partner of the Pawikan Project, both for information dissemination in the community, and in ensuring the safe and secure retrieval and translocation of the Pawikan eggs. The Pawikan Project also benefitted from the community volunteers of the Maritime Police, especially from Barangay Porac, municipality of Botolan where community volunteers were the ones calling the Pawikan hotline to report observed nesting in the area. This partnership resulted to retrieval of 32% of total nest from Barangay Porac.

The Maritime Police also sends representatives during hatchlings release to ensure crowd control are being practiced.



Figure 14. PNP-Maritime Group photos assisting Pawikan Project

From escort to egg collection, to reward disbursement, transferring of eggs to hatchery, and releasing hatchlings, the PNP-MG has been present when able to support.

SIBOL - Sustainable Interventions for Biodiversity, Oceans, and Landscapes

A 5-year multipartite initiative of conservation NGOs and DENR aimed to conserve the biodiversity of 5 Key Biodiversity Areas including the Masinloc-Oyon Bay Protected Landscape and Seascape (MOBPLS), partnered with the Pawikan Project to train the local community in Magalawa Island, Municipality of Palauig in marine turtle conservation. The training aimed to: promote marine turtle conservation including its habitat as provided for in RA 9147 otherwise known as the Wildlife Act; capacitate local community, resort owner and other stakeholders on the conservation of marine turtles including potential hatchery establishment and management; and develop multi-stakeholders' collaboration on the conservation of marine turtles in the coastal barangays of MOBPLS, particularly in Magalawa island.

The training was conducted last March 1-3, 2022 in Armada Resort, Magalawa island and participated by 20 representatives from the community (Barangay police of Magalawa), Armada resort, LGU Palauig, MOBPLS Protected Area Management Office (PAMO) staff, and Gigasol Solar Farm. The training was conducted by DENR-BMB through Dr. Rizza Salinas, and co-facilitated by the Pawikan Project.



Figure 15. Photodocumentation of the Marine turtle conservation training held in Magalawa island on March 1-3, 2022

Recommendations and Next Steps

Last 03 March 2022, Dr. Rizza Salinas of DENR-BMB visited the Pawikan Project Hatchery and witnessed the Project's hatchling release activity. Dr. Salinas made a few recommendations for improvement of our hatchery operations and these are outlined below:

1. Hatchery net enclosure-the upper portion (above bamboo fence) of the hatchery enclosure is unnecessary, we are advised to remove it next season or replace it with bigger (palm-size) mesh size. This is to allow better airflow in the hatchery that is crucial for Pawikan egg development.
2. Hatchery net "roofing"- we are advised to divide the hatchery into 2 parts, one with net shading, the other half should be kept open, without any roofing. The 1st half with net roofing should be enough to keep the sand "cool" and would potentially be a factor for producing male Pawikan. This being said, Doc Rizza is suggesting that next season, all our nest should be divided into 2, one placed under the shaded part of the hatchery, and the other one on the open side
3. Hatchery size-Doc Rizza commented that our hatchery is too big for our current operations. The 1m x1m distance between nests is not the minimum standard for Pawikan hatchery operations.
4. Hatchlings Holding - In case of untimely hatching (ie midday or midnight), it is necessary to keep the hatchlings in a cool/dark place in moist sand/towel. Also, cover the basin with porous/thin cloth (ONLY White/gray/black color) to ensure breathability while minimizing hatchlings exposure to air. Air exposure triggers infantile frenzy, where the hatchlings can be very mobile and exhaust themselves before release
5. Pawikan release
 - a. runway length needs to be kept at least 6m from tide mark (can be up to 10m long)
 - b. assisting the baby Pawikan: it was observed that hatchlings could sometimes climb over the sides of the runway, and project partners inside the release enclosure (net) should not place the hatchling farther away from where they were situated in the runway. This would ensure that the hatchlings will be able to crawl most of the length of the prepared runway
 - c. footprints/other notches within the runway: pre-release briefings should be made with project partners (ie Maritime police, LGU representations, DENR representatives, etc) to ensure that they don't make footprints/notches in the runway, otherwise the hatchlings get stuck
6. More structured engagement to boost mileage and awareness of the project to Sundowners Beach Villas In-house guests.
 - a. Merchandise for visibility - t-shirts, tote bags, keychain that can also raise funds
 - b. More publicity materials within the resort's premises to make the guests aware
 - c. Make a gallery to showcase past season's highlights for appreciation
 - d. Guest engagement by giving a short spiel during guest check-in
 - e. Have professional promotions in social media compared to basic social media posts
7. Procurement of Multi-cab (a small light truck in the Philippines that is usually used as public transport) for better egg transport versus using a tricycle/chariot which have so much vibration and less stability that can affect the eggs.

For further information:

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THANK YOU!