

2012-2019 Sea turtle stranding·bycatch & Discussion of using the cultural identity of sea turtles for conservation

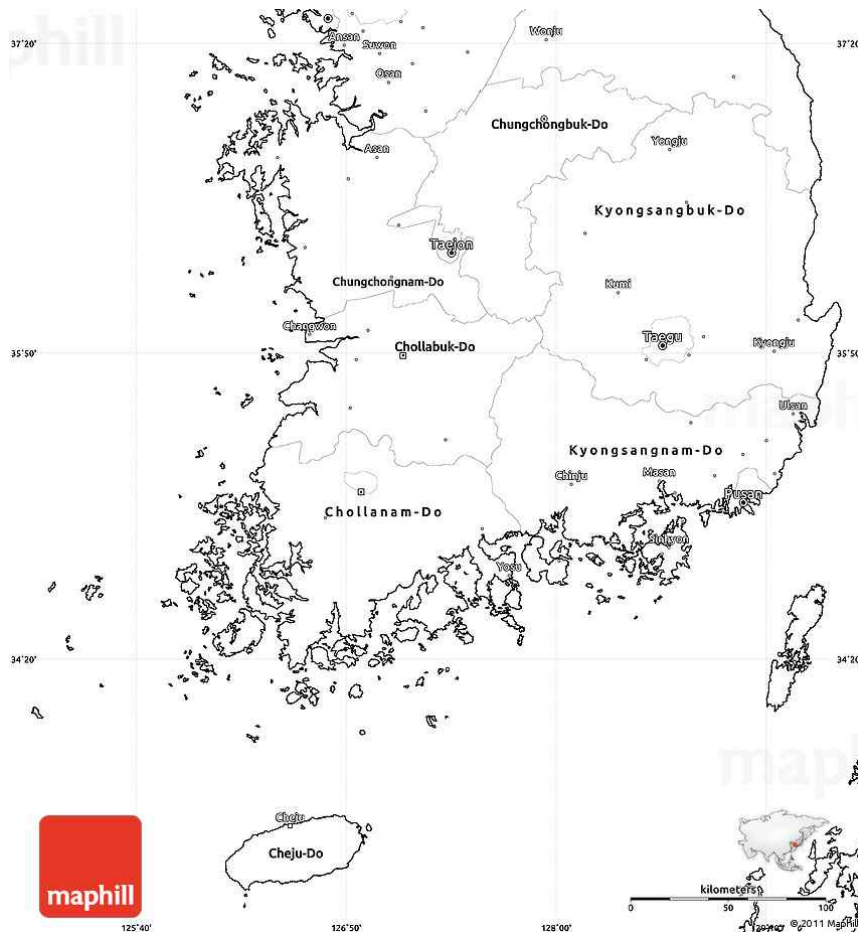
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Jeju Island

The biggest island of South Korea, Jeju Island is geographically located in the temperate zone (33° - 34° N, 126° -127° E).



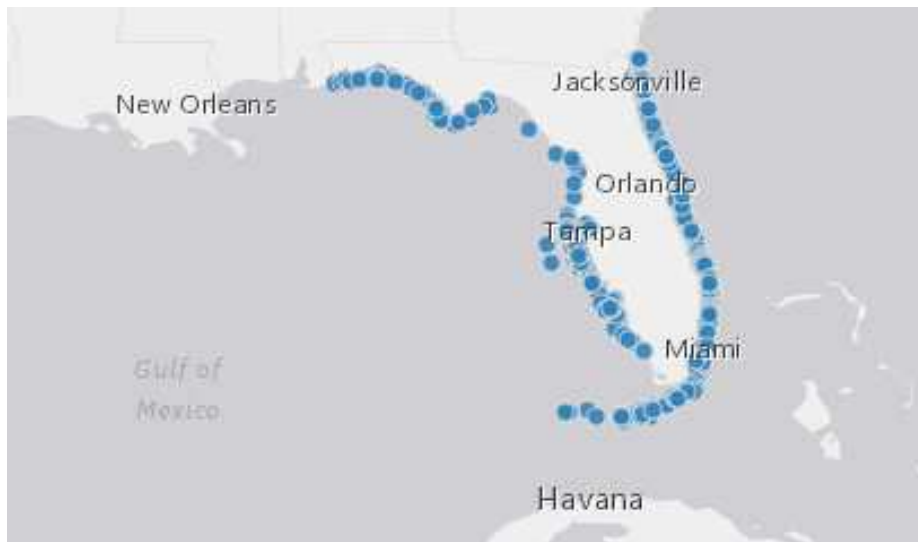
→ Surrounded by the northern part of East China Sea.

→ Influenced by several currents such as Kuroshio Current and Tshushima Warm Current.

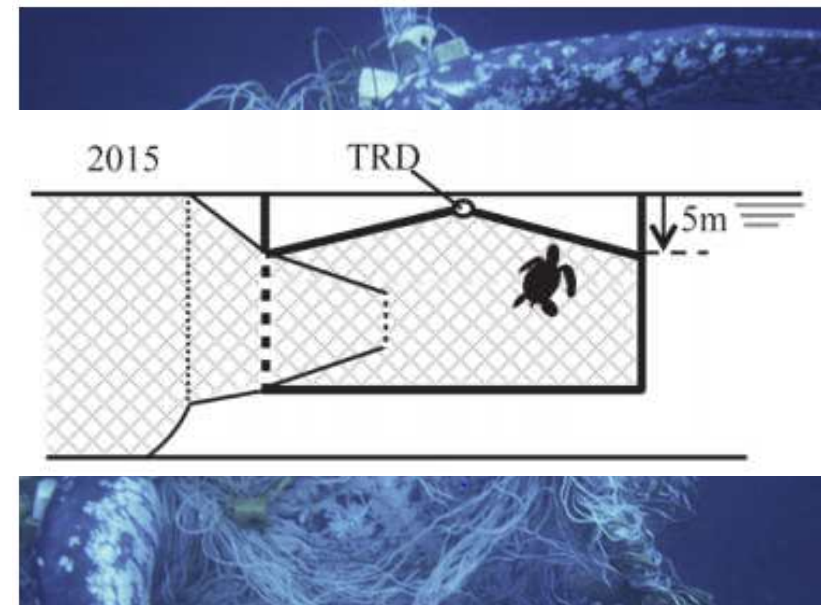
(Ichikawa & Beardsley, 2002)

Stranding & Bycatch

Strandings of marine vertebrates being stranded either dead, sick or alive, along shorelines have been widely used to not only infer species diversity but infer threats and causes of mortality in adjacent waters.



Bycatch of all marine animals during a fishing activity throughout the world is one of the largest threats for the marine animals including sea turtles.



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(SHIOZAWA et al., 2018)

Bycatch and stranding in Korea



Stranding in Jeju Island

Stranded sea turtles are often found at the rocky shoreline of the island. Since 2012, as the protected marine species, the founder or the locals need to report the finding to the marine police.



Stranding in Jeju Island



a. *C. mydas* found entangled in drift gillnet



b. stranded *E. imbricate*

Stranding in Jeju Island



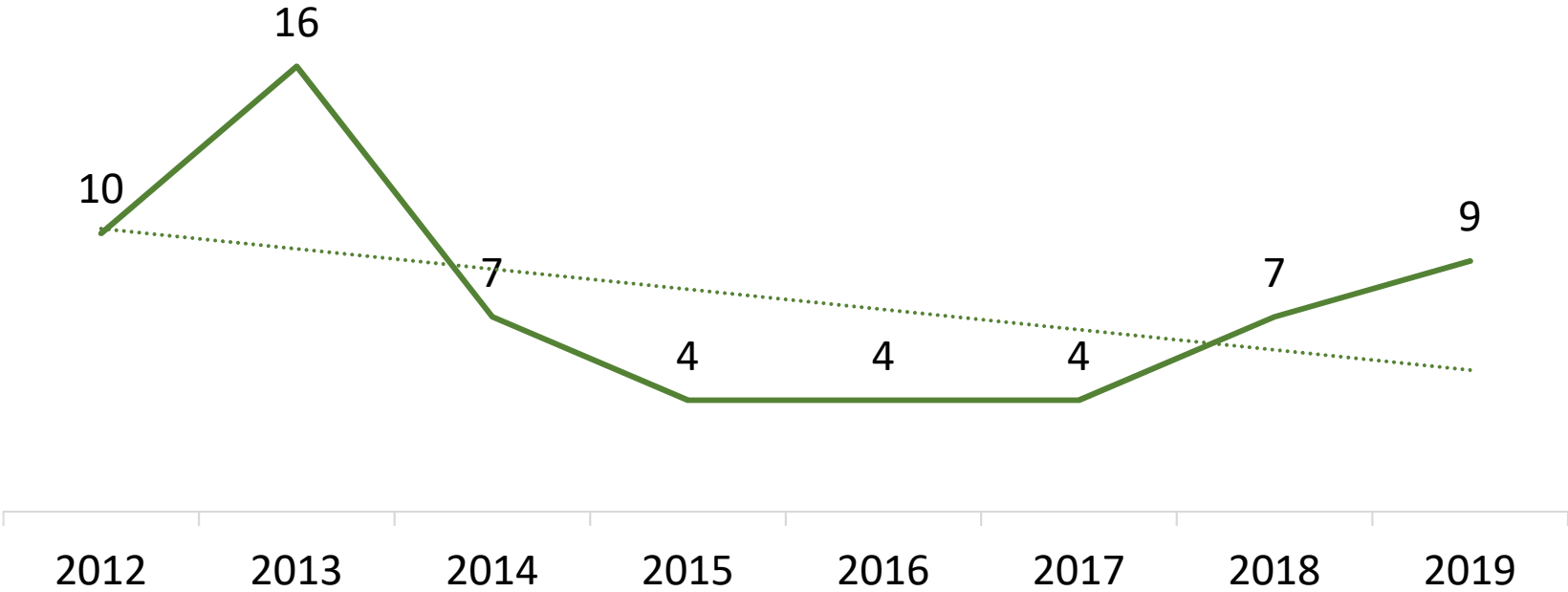
c. *C. mydas* entangled drift gillnet



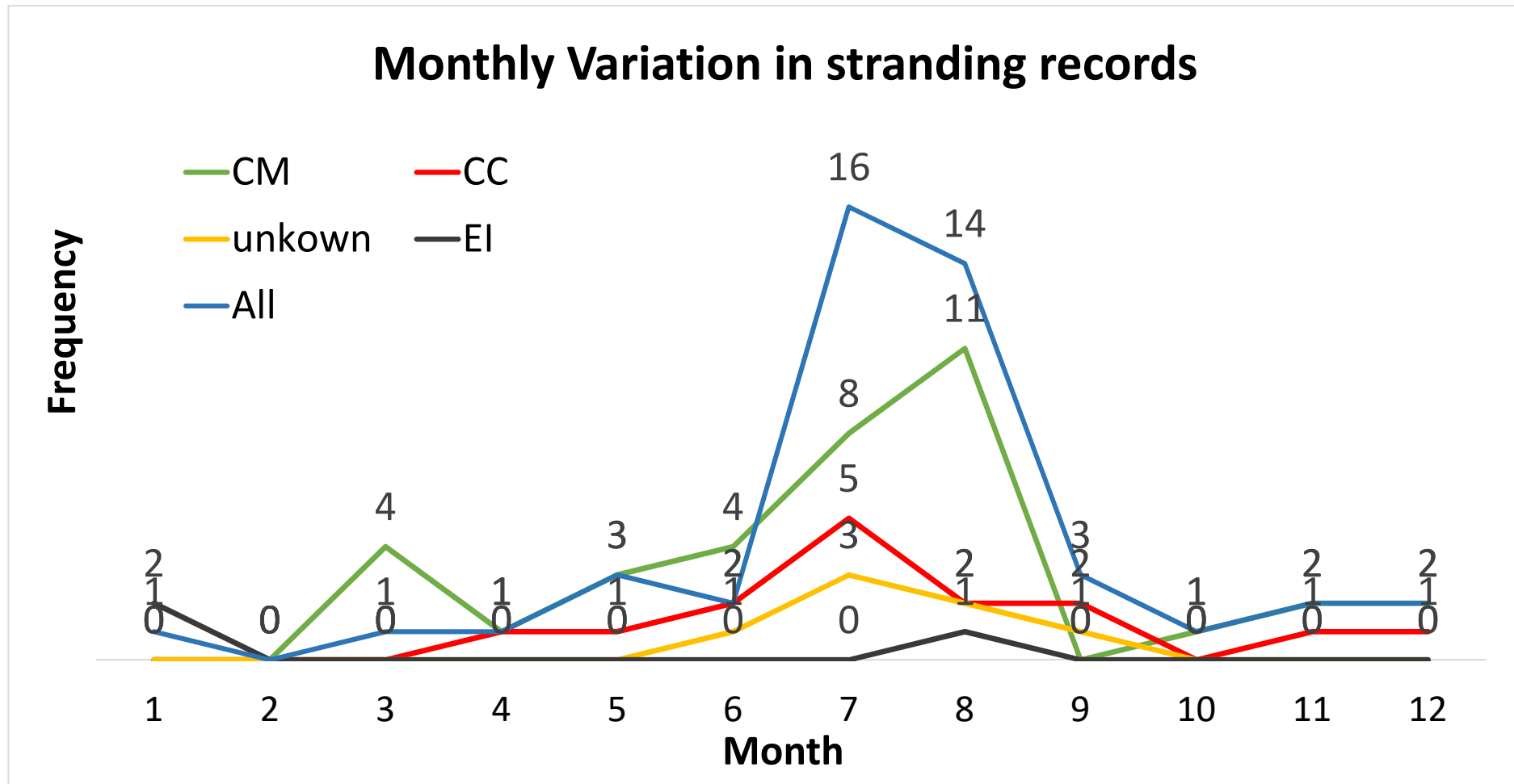
d. *C. mydas* with fishing hook and fishing line

Stranding in Jeju Island

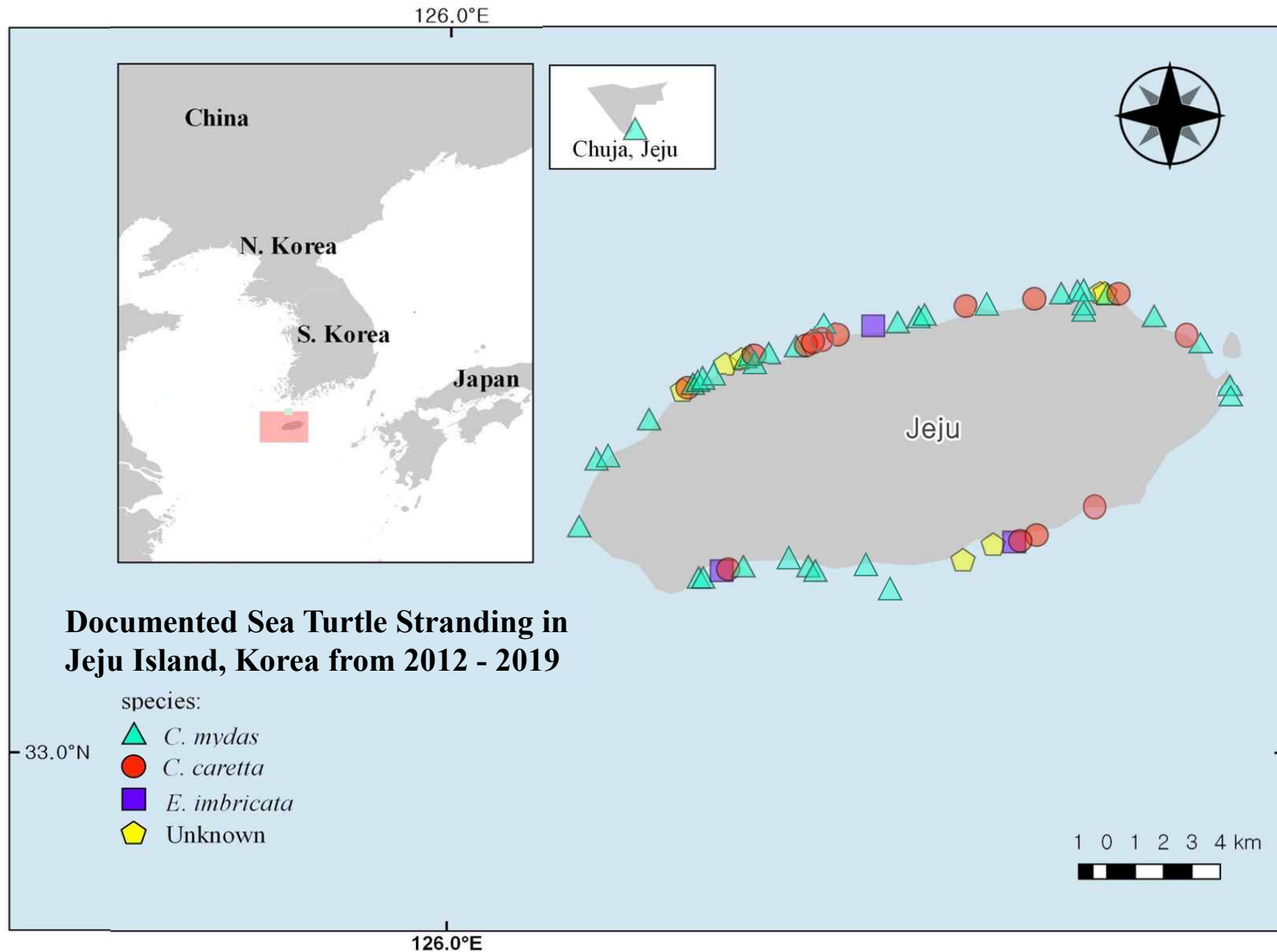
Number of Sea Turtle stranding record per year



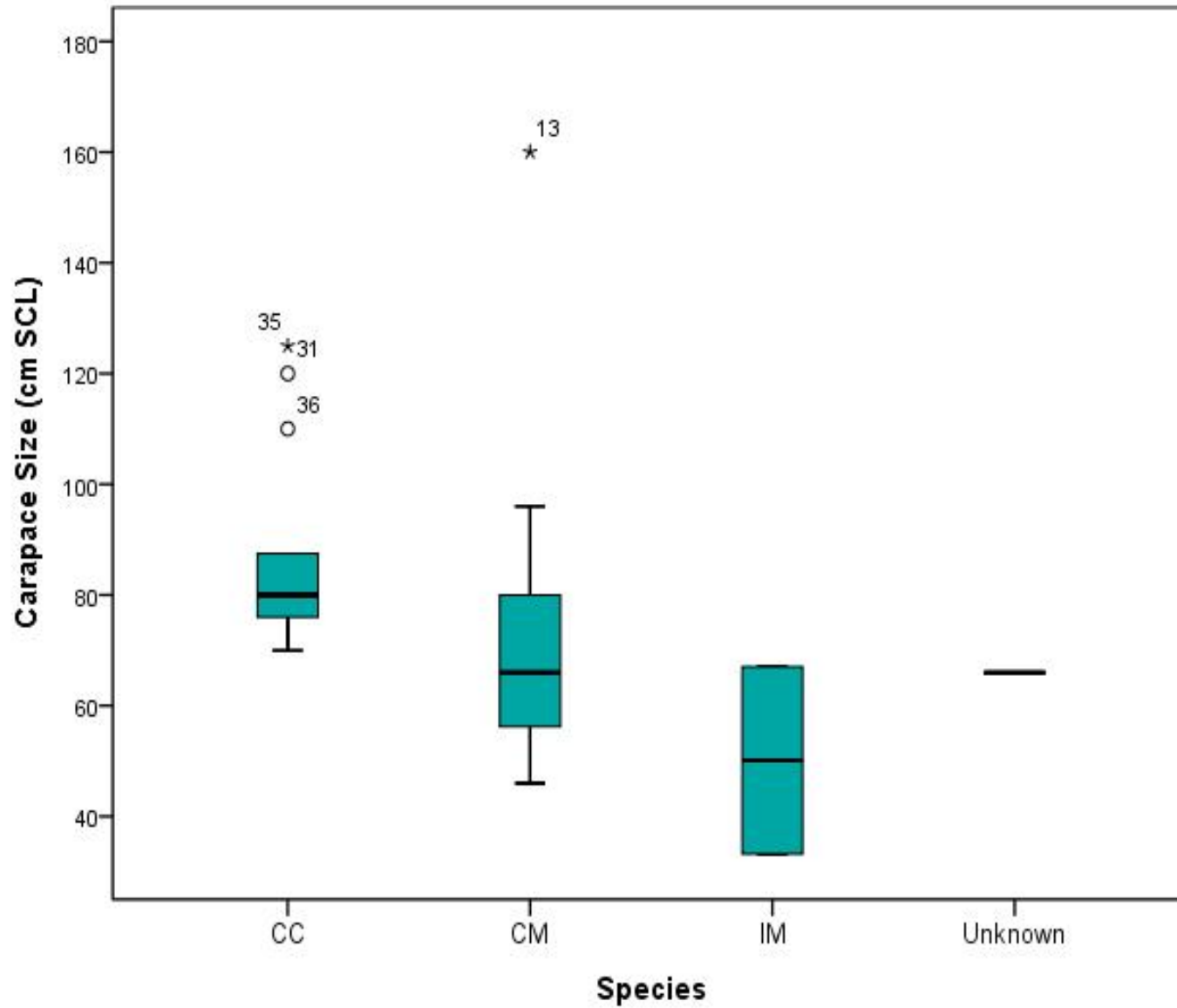
Stranding in Jeju Island



Stranding in Jeju Island



Stranding in Jeju Island



Stranding in Jeju Island

Cause of death for all individual is unclear, however there are few autopsy conducted that might give us a clue into it.

| | Total | Dead | Alive |
|---------------------|-------|---|----------------------------------|
| Unidentified | 7 | 7 | 0 |
| <i>C. mydas</i> | 24 | Gillnet(1), Unknown(6) | - |
| | | 34 | 2 |
| <i>C. carata</i> | 12 | Drift gillnet(3), Heavy impact(3), Fishing gear(1), Unknown(15) | Buoyancy problem (1), Weather(1) |
| | | 14 | 2 |
| <i>E. imbricata</i> | 3 | Heavy impact(2), Unknown(10), Drift gillnet(1) | Unknown(1), Drift gillnet(1) |
| | | 3 | 0 |
| | | Drift gillnet (2), Unknown (1) | - |

Stranding in Jeju Island

Between 2017-2019, necropsy was conducted with 38 sea turtles (including few from Jeju Island), and 20 individuals had plastic in the stomach content, and most of them had lesions in the stomach.



폐사한 바다거북 소화기관에서 나온 해양쓰레기. 국립해양생물자원관 제공.

(Min Seup Kim, 2019)

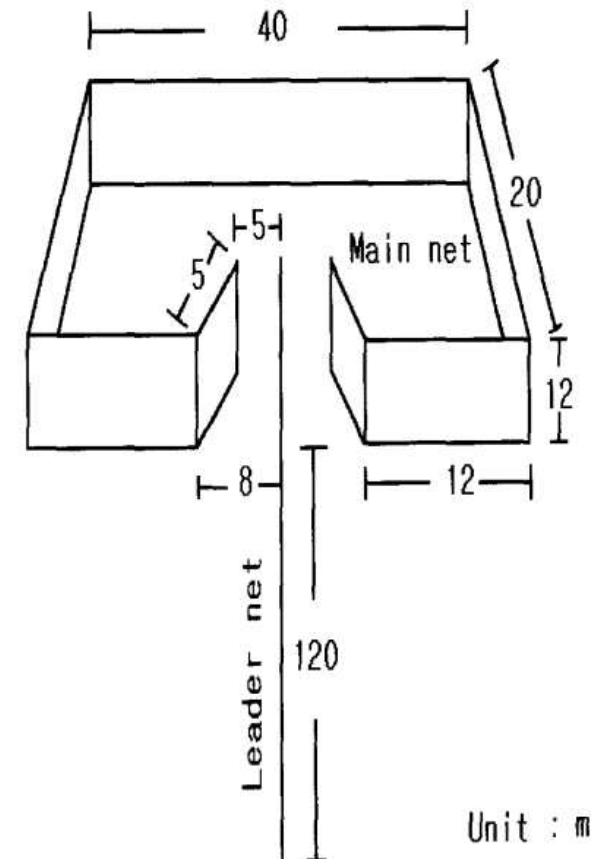
Stranding in Jeju Island

- The quality of data collection **needs** to be improved through providing data recording training for those who are responsible to respond to the stranded marine animals: marine police.
- The stranding report system should be synchronized in detail and data should be collected and organized by a single department.
- There should be a law placed to protect the marine protected species when they are encountered in the ocean by fishing boats or other large ships that pass by.

Bycatch in Jeju Island

Majority of reported bycatch in Jeju Island happens with the open set-net (pound net) distributed around the Island.

| | Total | Dead | Alive |
|------------------|-------|---------------|--------------|
| Unidentified | 6 | 0 | 6 |
| | | - | open set-net |
| <i>C. mydas</i> | 35 | 0 | 35 |
| | | - | open set-net |
| <i>C. carata</i> | 1 | 1 | 0 |
| | | drift gillnet | - |



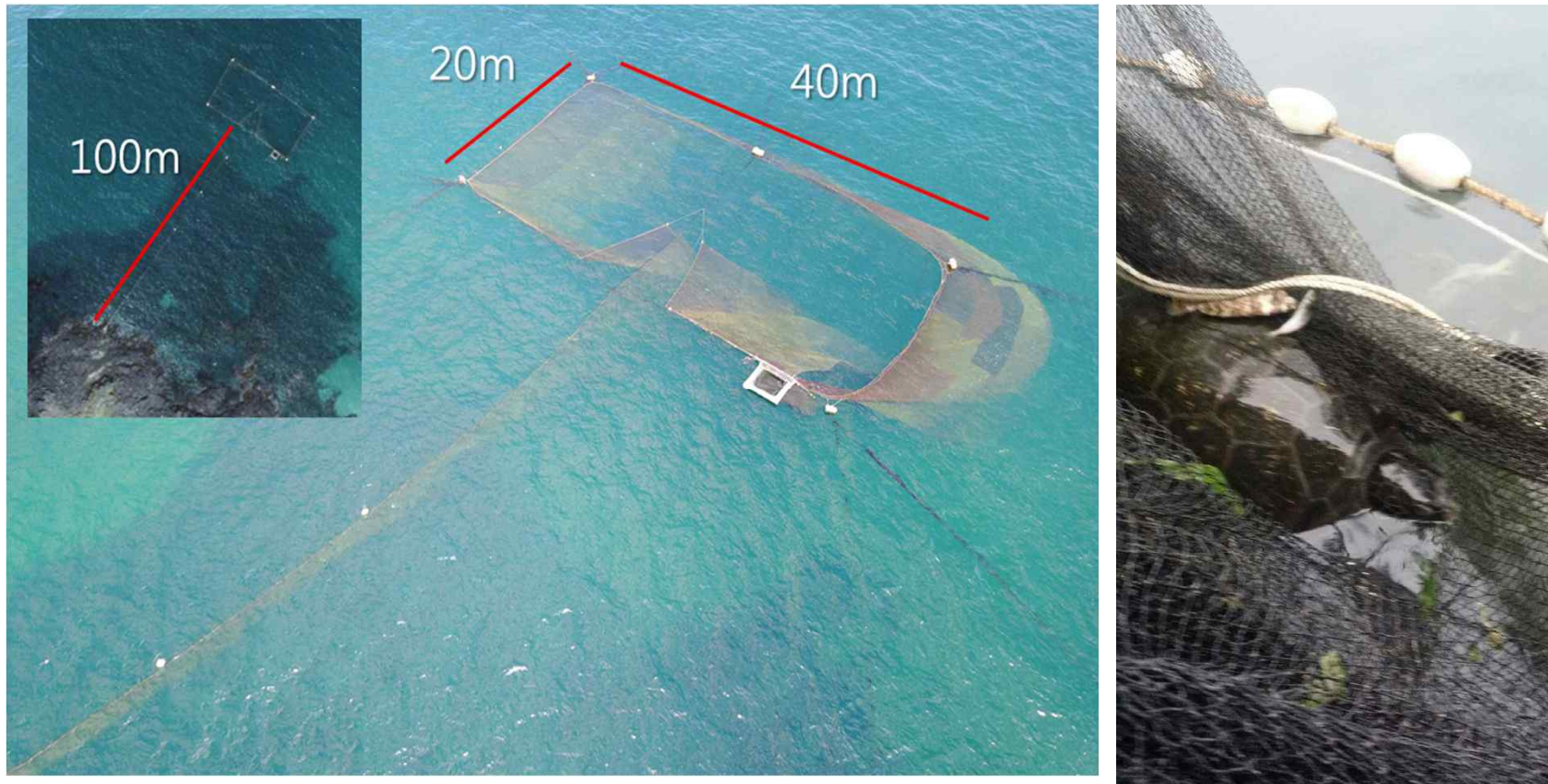
(Kim et al., 2004)

Bycatch in Jeju Island



Bycatch in Jeju Island

All except one cases of bycatch were reported from the open-set net and all individuals found in open-set net were found alive and sent back to the wild (97.6%).



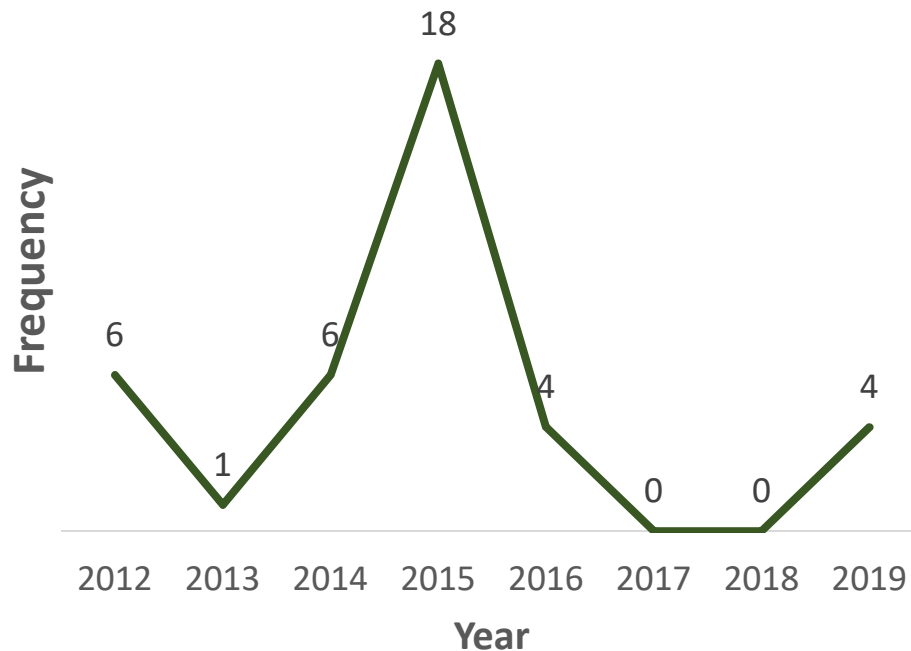
An example of open-set pound net used throughout Jeju Island (located at Jong-Dal Ri)

Bycatch in Jeju Island

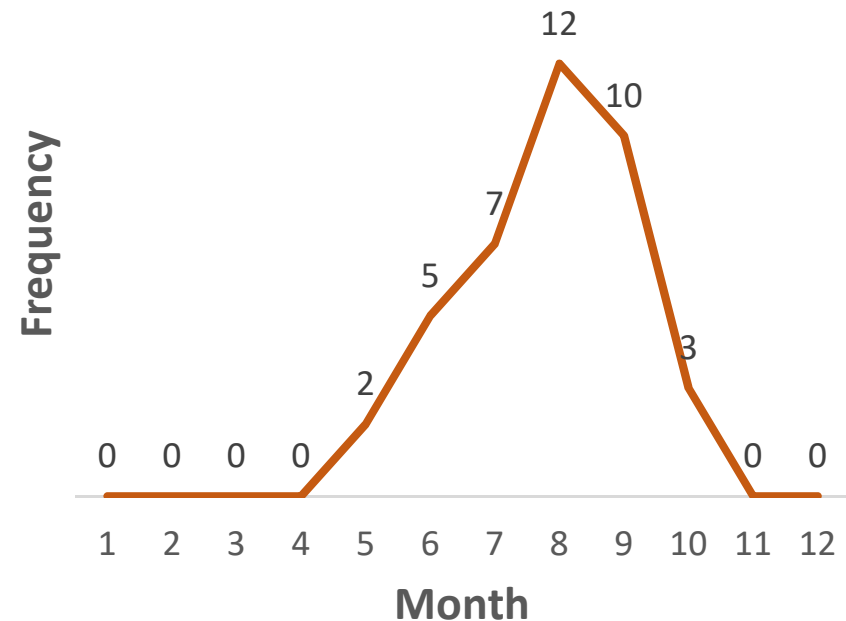
There are about 60 open-set nets around the Jeju Island and they are set out between April to November.

66.7% of the bycatch were reported in year 2015, 2016, and 2019 when researchers were looking to attach GPS tags.

Yearly variation

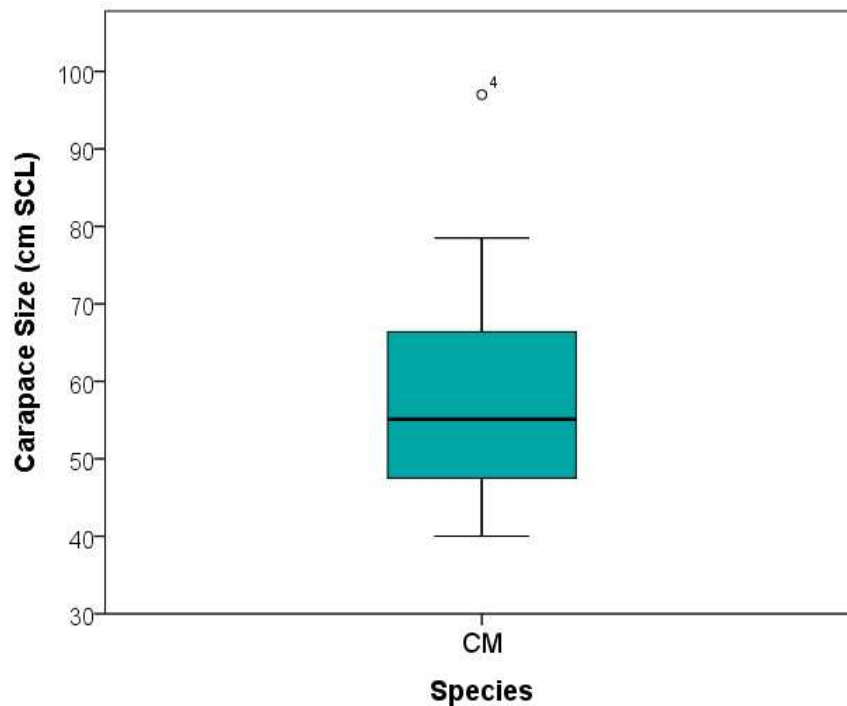


Monthly variation



Bycatch in Jeju Island

The size of the bycatch individuals is limited to the weight of the sea turtle because the fishermen need to lift it into the boat in order for the measurement to be made.



Bycatch in Jeju Island

- If all or majority of bycatch sea turtles from open-set nets around the island are collected the data could be used to estimate population density, migration pattern, and habitat use. All the baseline data necessary to build and perform long-term conservation plan for sea turtles found in Jeju Island.
- Training course and rewards for the fishermen could be useful in collecting uniform and useful data on bycatch sea turtles.

Cultural Identification of Sea Turtle

The belief of dragon king/queen of the ocean and turtle as the third and youngest daughter of the king/queen by Jeju Islanders who highly depend on the sea for their livelihood is still active and strong. It is especially true for woman shellfish divers in Jeju Island, Haeyeo, who free dives to collect shellfish, octopus, and other marine animals for their livelihood.



©Brian Miller

Haeyeo from Jeju Island (UNESCO Culture Intangible Heritage)

Cultural Identification of Sea Turtle

The listed are some of the belief systems related to sea turtles (Min 2011):

1. Sea turtles should NOT be harmed.
2. If a diver witnesses a front face of the sea turtle, the turtle will make your wish come true.
3. When encountered with a sea turtle in the ocean, they should serve conch or other sea shells.
4. If a sea turtle is found dead, a traditional ritual should be performed and send it back to the ocean.
5. If a gigantic sea turtle is witnessed, you will die.
6. Sea turtles die 9 times and come back to life 12 times.

Cultural Identification of Sea Turtle



Image 2. Haeyeo feeding sea turtle.

The folktale states that the sea turtles are sacred and it serves as a messenger between the people and the ocean god.



시리즈 (종료) 핫핑크돌핀스의 해양동물 이야기

용왕의 사신 '바다거북'에게
쓰레기를 대접하다니...

동그라미 2018.01.12. 10:10 | 16,030 읽음

2013년 7월에 제주 앞바다에서 나이가 무려 200~300살로 추정되는 암컷 푸른바다거북 한 마리가 정치망 그물에 걸렸다가 구조되어 곧바로 다시 야생으로 방류된 일이 있었다. 이 거북은 다행히 별다른 부상 없이 건강했기 때문에 해양 동물 구조치료기관으로 이송하지 않고 바로 바다로 돌려보낸 것이다. 하지만 바다거북을 돌려보내면서 등딱지에 위성추적장치를 달거나 하지 않았기 때문에 이후 거북이가 어느 바다로 이동했는지, 또는 지금도 잘 살아있는지 알 길이 없다.

다만 많은 네티즌들은 거북의 나이가 무려 300살로 추정된 것에 대해 놀라움과 호기심을 표현했다.

https://youtu.be/_Ppvl6VZGkU

Cultural Identification of Sea Turtle

Haeyeo and traditional ritual before sending the sea turtle back to the wild. (Left) While sacred cloth and branches represents a “Door of Ocean god”. The dead sea turtle is wrapped with the with cloth and sent back to the ocean. (Right) Haeyeo is having their fortune told.



(Kang 2011)

Cultural Identification of Sea Turtle



Cultural Identification of Sea Turtle



Cultural Identification of Sea Turtle



Cultural Identification of Sea Turtle

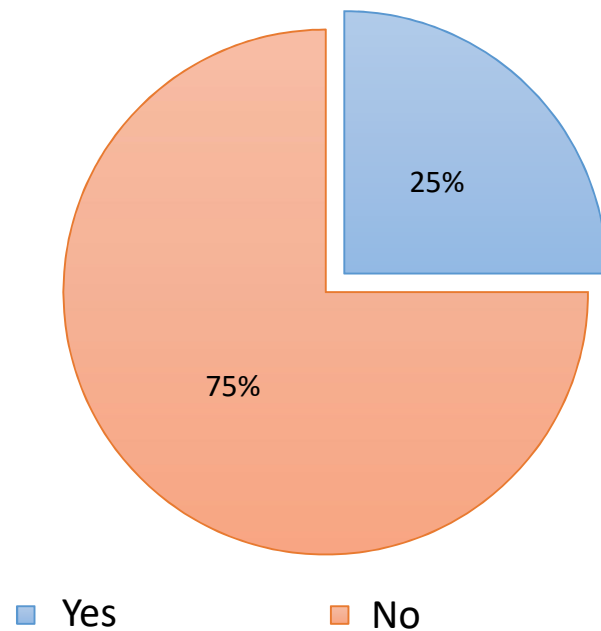


Cultural Identification of Sea Turtle

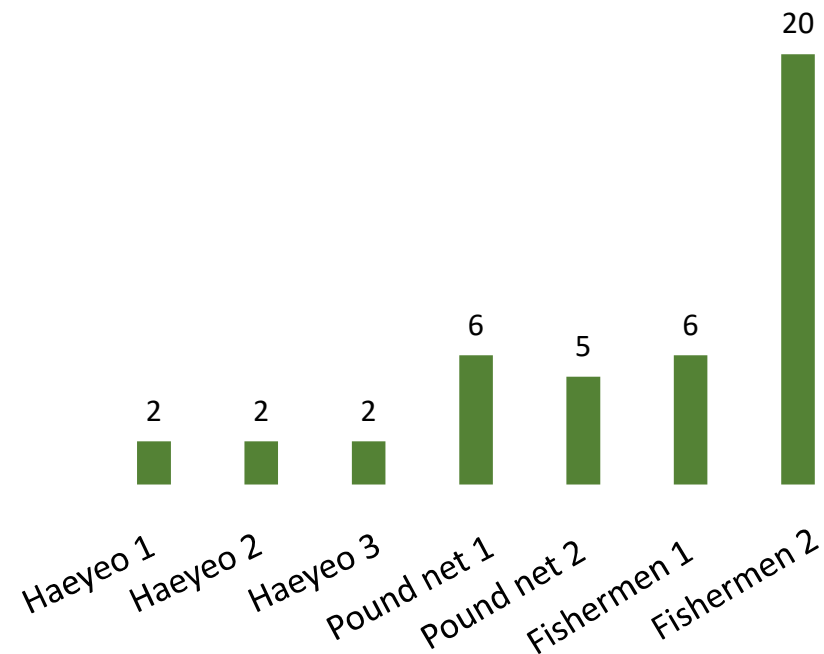
In 2018, 8 Haeyeo and fishermen with 20-50 years of experience working in the ocean were interviewed on the occurrence of sea turtles and their perspective of sea turtles.



Sea turtle egg observation



Frequency of yearly sea turtle observation



Cultural Identification of Sea Turtle

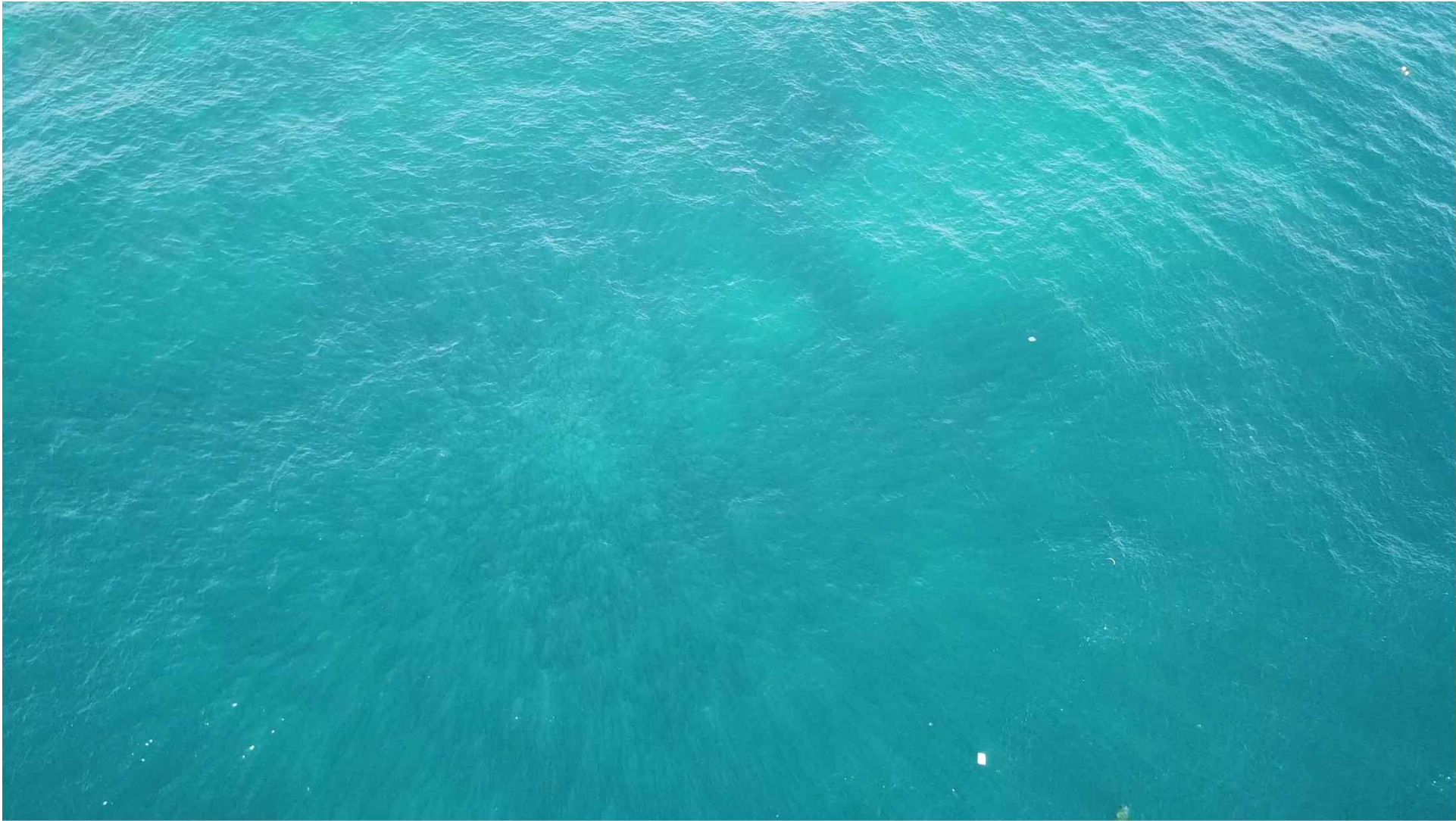
Details of cultural identification of sea turtles were slightly different between interviewed individuals.

| | Do you actively capture sea turtles? | Do you release bycatch back to the sea? | Do you believe in the folk religion? |
|-------------|---|--|---|
| Haeyeo 1 | X | - | X |
| Haeyeo 2 | X | - | O |
| Haeyeo 3 | X | - | O |
| Pound net 1 | X | O | X |
| Pound net 2 | X | O | X |
| Fishermen 1 | X | O | X |
| Fishermen 2 | X | O | X |

Cultural Identification of Sea Turtle

- More interview is necessary for better understanding of the use of the cultural identification of sea turtle for long-term conservation.
- The use of cultural identification of sea turtles to the younger generation, scuba divers and visitors of Jeju island might be effective to increase the awareness of both sea turtle and Jeju ocean conservation.





*Thank you for
your attention!*

Special gratitude towards:
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Soojin Jang, Jung-Joo Ha,
Interviewees around Jeju
Island, and Sea Turtles



**Marine Animal
Research &
Conservation**



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