Urgent actions needed in Formicula to protect monk seals in their critical habitat

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Executive summary

The islet of Formicula, part of a Special Area of Conservation (SAC) in the Inner Ionian Sea Archipelago, Greece, contains key breeding, resting and feeding habitat for an important nucleus of the Endangered Mediterranean monk seal, a priority species in European legislation.

However, the continued presence of monk seals in Formicula is at risk due to disturbance caused by uncontrolled human presence, including boat-based tourism and fishing. In particular, the highest concern derives from the observed increase of private boat tourism in recent years, which has become extremely intense at the site, with visitors clearly seeking close encounters with the seals, both from their boats and in the water, and even entering caves containing neonate seals, without any form of control.

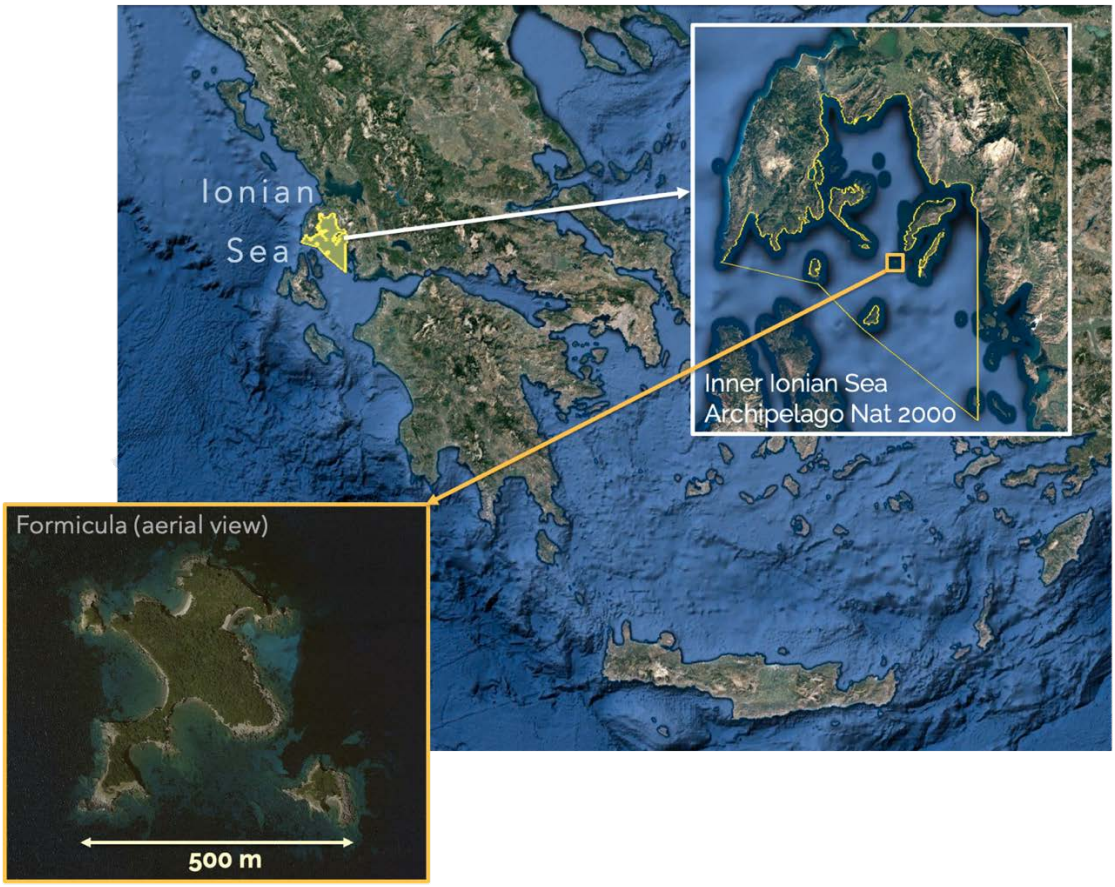
While the procedure for the implementation of appropriate management and conservation measures is ongoing as part of the process for the adoption of the SAC management plan, in consideration of the need for an urgent intervention before the start of the 2022 summer tourist season, we respectfully urge the competent authorities to consider adopting provisional limitation measures.

Such measures should contemplate the establishment of a 200 m-wide no-entry zone around Formicula, with the exception of a corridor to allow the access to a single bay on special permit to organised tours, subject to limited duration of visits and adoption of a code of conduct.

Background

The islet of Formicula is part of the Inner Ionian Sea Archipelago, 2.2 km southwest of the island of Kalamos and 14 km southeast of the island of Lefkada. Formicula is included in the Special Area of Conservation (SAC) "*Esoteriko Archipelagos Ioniou - Meganisi, Arkoudi, Atokos, Vromonas*" (Site Code: GR2220003), established by the Hellenic Republic with the intent of protecting marine habitats and species of European importance, including the endangered Mediterranean monk seal *Monachus monachus*. Formicula is also included in IUCN's global list of Important Marine Mammal Areas (IMMAs), as part of the "Ionian Archipelago IMMA" (https://www.marinemammalhabitat.org/portfolio-item/ionian-archipelago/) with Mediterranean monk seals as qualifying species.

Formicula is a small, uninhabited islet, with a maximum elevation <15m and covered with Mediterranean scrub. The islet hosts a variety of marine bird species and is part of a proposed Important Bird & Biodiversity Area (IBA) by Birdlife International. Its geology is conducive to the formation of numerous caves and cavities, both above the water line and underwater, creating ideal habitat for Mediterranean monk seals.



Mediterranean monk seals have been investigated and monitored by our organisation in Formicula since 2012[1], including with support from the Fondation Segré (2019– ongoing) and the Monk Seal Alliance (2021 – ongoing). This research has resulted, among other things, in the compilation of a catalogue of approximately 30 different monk seal individuals[2], suggesting that Formicula is one of the species' most valuable habitats at the global level.

Monitoring of some of Formicula's caves frequented by the seals and surrounding open waters is also possible through two autonomous and continuous monitoring systems[3] installed and maintained by the

Octopus Foundation (https://octopusfoundation.org/), a Swiss-based organisation concerned with the conservation of the marine environment, which we have been collaborating with for the past three years.

The regular monitoring of dolphins and seals conducted by us throughout a large portion of the Inner Ionian Sea since 1991 [4, 5, 6, 7, 8, 9, 10] brings us to consider Formicula a site of exceptional naturalistic value because of its faunal richness, and specifically for what concerns monk seals. Evidence from our observation and those provided through the Octopus Foundation cameras demonstrates that Formicula is an important monk seal breeding, resting, and feeding habitat.

Risks to monk seals in Formicula and recent trends

Leaving a site of such outstanding natural value without any form of protection, as it currently is, is of high concern. If no urgent action is taken, we fear that disturbance deriving from uncontrolled human activities may cause monk seals to abandon the area. **Possible threats to continued monk seal occupation of their key habitat in Formicula derive to a large extent from disturbance from boat-based tourism, to which possible negative interactions with fishing activities should be added.**

Boat-based tourism

Between May-October, and most dramatically July and August, boat-based tourism can be an intense source of disturbance for the seals in Formicula because of a combination between the small size of the site and the fact that the islet has become a popular destination for boaters.

The two types of tourism targeting Formicula are: organised and private. Organised tourism is conducted primarily by two vessels with a combined capacity of 200 passengers (*M/S Christina:* 50 and *Nikolaos:* 150), based in Nidri, which bring their customers on daily excursions across different locations in the Inner Ionian Sea Archipelago, including Formicula. When arriving in Formicula, these boats drop the anchor in the main bay (marked with a red star in the map on the following page), and the customers are allowed a 30-minute swim before they leave for a successive destination. By contrast, private tourism involves a multitude of medium to small pleasure craft – mostly sailing vessels, motorboats and RIBs – that go anywhere along the island's coast, at any time of day, and for whatever length of time they wish. During the summer months, it is not rare to see sailing boats and catamarans spending the night anchored in the above-mentioned bay.

Whereas organised tours present a minor concern, because their impact is spatially circumscribed and limited in time, and because the tour organisers are amenable to being made aware of the conservation concerns and even to collaborate through the spreading of awareness to their customers and the request for keeping to a code of conduct (the boat M/S Christina, one of such operations, is already actively cooperating with us in such manners), the uncontrolled behaviour of private boaters in Formicula is potentially devastating, and has already demonstrated its damaging potential last summer.

19 July 2021: M/S Christina (dark blue hull, second from left) and Nikolaos (double-decker, far right).

29 July 2021: M/S Christina together with other recreational boats.

Formicula: the red star indicates the bay where the two photos on the top were taken.

30 March 2020: adult male monk seal resting on the beach (arrow in the map on the previous page) of an empty Formicula during the pandemic lockdown (photos courtesy of G. Lilas, Ithaka).

Throughout the past five years we have observed a crescendo of highly concerning behaviour by private boaters in Formicula. The phenomenon, however, has been quite extreme in 2021 not only in terms of number of boats present in Formicula on any summer day, but also in terms of the observed behaviour of many visitors, who had come to Formicula unambiguously to have a "monk seal experience": searching for seals by boat, entering the water to swim with them, and even entering the caves. We have had reports that boat rental businesses in the area have started already in 2020 to advertise the presence of monk seal in Formicula and to encourage their customers to go there.

4 July 2019: tourist paddle-boarding in Formicula (we had to intervene to prevent this woman from getting in the water and swimming with the pictured seal). We noticed a recent important increase in this practice. Most companies chartering sailing vessels carry boards for their clients' use.

6 August 2019: tourists approaching a juvenile monk seal (arrow) both by dinghy and swimming.

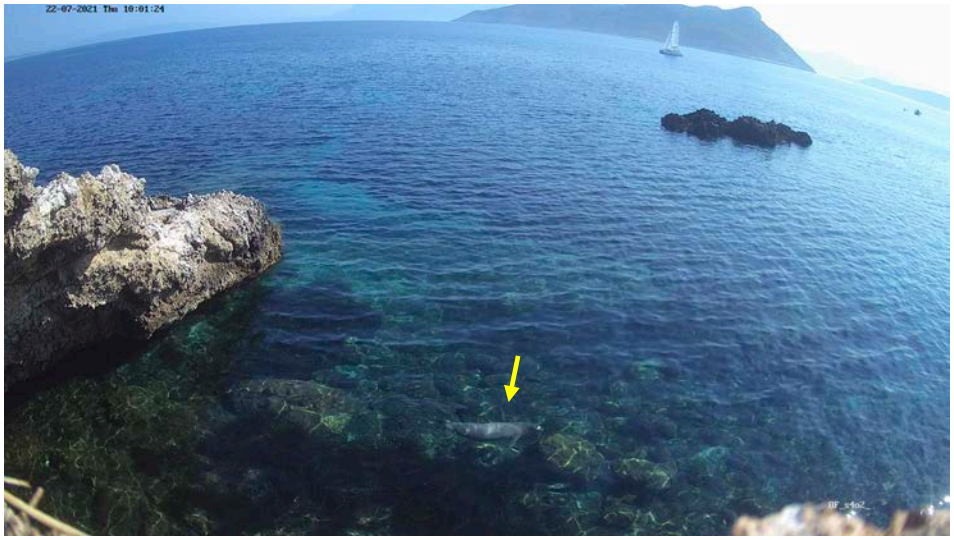
30 July 2021: tourist snorkelling around Formicula and disrupting monk seal key habitat.

A particularly disturbing incident took place in July 2021, when a newborn monk seal pup was observed during a couple of days in a cave on the northern side of Formicula through the Octopus Foundation autonomous monitoring system, and was never seen again quite likely as a consequence of reiterated disturbance by unwitting tourists inside and outside the cave.

20 July 2021: an adult female swimming erratically in front of the cave where the Octopus monitoring system is installed (orange dot). These observations lasted for about two hours and the seal behaviour remained the same. We left Formicula before 10:30 when the recreational tourist boats start to arrive.

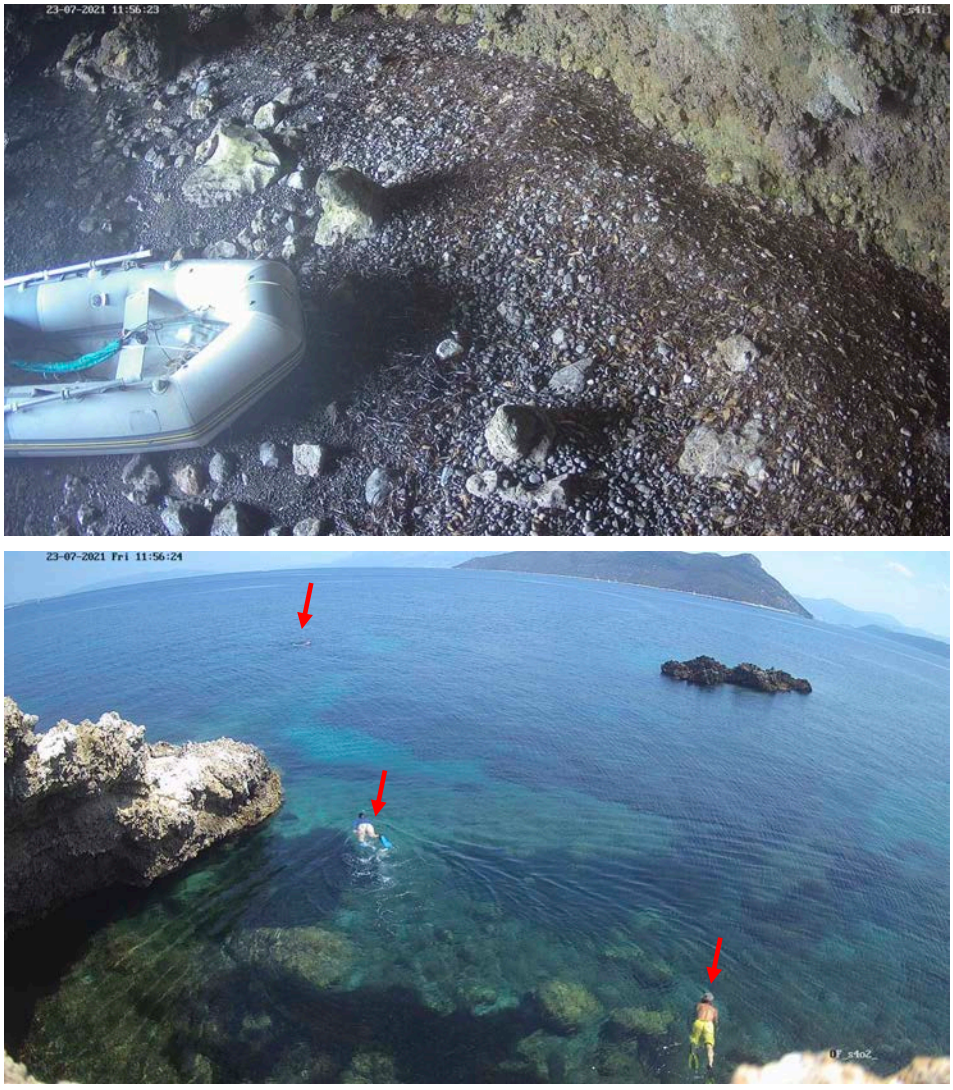
21 July 2021: monk seal newborn seen for the first time in the cave (images inside and outside of the cave by Octopus Foundation; date and time at top left corner)

22 July 2021: monk seal newborn still in the cave (last observation at 7:00 that same day)



22 July 2021: Large female (presumably the mother of the pup) still regularly milling in front of the cave

23 July 2021: a seal (presumably the newborn pup's mother) still swimming in front of the cave



23 July 2021: less than one hour later, a tourist dinghy beached inside the cave (top). Meanwhile, three tourists (arrows) snorkelling just outside (bottom)

After 23 July 2021, neither the newborn pup nor the presumed mother were seen again, despite continuous observations through the autonomous monitoring system and during the 12 additional surveys we did around Formicula between 29 July and 13 October.

The above observations support the notion that the word has been spreading lately that Formicula is a place where it is possible not only to sight but also to swim with monk seals, and to watch them by entering the caves where they rest and breed, without any control nor regulation. A brief tour over the Internet (Google, YouTube, Facebook, etc.) illustrates the increasing popularity of Formicula as a seal-watching destination.

3.2. Fishing

For most of the year, based on our observations, we surmise that small-scale fishing activities, as they are currently conducted in the vicinity of Formicula, are unlikely to negatively impact the continued frequentation of the site by monk seals.

Nevertheless, in September and October, we have seen a boat operate beach-seines off Formicula, which raises strong concern not only about the monk seals but also about the impact this fishing gear has on the *Posidonia oceanica* beds and on the conservation of demersal and inshore diversity[11].

Due to the high induced mortality of undersized fish of both commercial and non-commercial species, beach seining has been banned from EU waters since 2001.[12] However, implementing the ban of beach seines in Greece was prolonged until 2010[13].

Since the Government of Greece finally implemented the EU's ban on beach seining in May 2010, this highly destructive fishing gear has been occasionally used under exceptional circumstances (i.e. official derogation or experimental fishing) until 15th Dec 2020; a deadline given by the Greek government for fishermen to have access to subsidies (as much as 25,000 EUR/boat) in exchange for the withdrawal of this gear.[14] Since then, with no exceptions, beach seining is not allowed anywhere in Greece. Therefore, the beach seining currently happening in Formicula is illegal.

Beach seiner fishing on 13th September 2021 right in front of two of the monk seal caves present in Formicula (top). Same boat on 13th October 2021 (centre and lower images) with a monk seal swimming nearby while the net is being hauled out (arrow)

4. Possible impacts

The Mediterranean monk seal is one of the world's most threatened marine mammals, listed as Endangered in IUCN's Red List, and only a few hundred of them are estimated to survive in the whole of the Mediterranean Sea. The main causes of such status are direct killing by fishermen, bycatch in fishing gear and human encroachment and disturbance in their critical habitat.

Formicula contains monk seal critical habitat and is subject to intense human encroachment and disturbance for a portion of the year (the summer months) which is key to their survival because it involves breeding.

The levels of disturbance to monk seals we have observed in Formicula and documented in Section 3 above are consistent with the risk of discouraging the seals from continuing the frequentation of the islet's water and coasts, ultimately extirpating the species from a portion of its critical habitat. This is likely to have a seriously adverse effect not only on possible monk seal recovery but even on survival.

5. Measures needed

The actions in Formicula that we envisage as urgently needed are: a) area-limitation measures and b) awareness activities targeting specifically private boaters.

A management plan for the SAC prepared by a consulting company, which we had the opportunity of providing input to, is about to be submitted to the Greek Ministry of Environment and Energy. Based on our long-term research and observations in Formicula, the area-limitation measures that we have proposed for inclusion in the SAC management plan involve the delimitation of a 200 m-wide no-entry zone surrounding Formicula (in red in the map below), except for a corridor (in green, with "!") to allow access to the main bay under special permit released to the organised tours under precise conditions (e.g., code of conduct, time limitation).

Aware that once measures are in place the challenge to ensure compliance and enforce the rules needs addressing, we are planning to request permission to install cameras in Formicula to allow the remote control of human presence in the no-entry zone by the authorities.

Awareness activities are necessary because human behaviour generating disturbance to monk seals in their habitat is largely caused by a lack of knowledge and of understanding of the delicate conservation status of the monk seals and their behavioural requirements. We will conduct such activities at sea during our routine research and monitoring operations, as required in the projects supported by the Fondation Segré and the Monk Seal Alliance. We intend to conduct such awareness activities only with boaters found in Formicula to avoid spreading the word too broadly about the presence of seals in the site before legal protection is in place.

6. Request for urgent intervention

Based on the observed damage to monk seal breeding and resting behaviours in key habitat, caused by uncontrolled human activities; aware of the need of urgent intervention to mitigate such damage; and realising the complexity and time requirements of the finalisation of implementation of the SAC management plan (which may require years before real protection will be in place),

we respectfully urge the competent authorities

to consider adopting the following provisional measure: the delimitation of a 200 m-wide no-entry zone surrounding Formicula, except for a corridor to allow access to the main bay under special permit released to the organised tours under precise conditions (e.g., code of conduct, time limitation) (see map on previous page).

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[1] Currently under research permit ΑΔΑ: ΨΕΤΥ4653Π8-694, issued in March 2021 by the Greek Ministry of Environment and Energy, valid until 31 Dec 2023.

[2] Available on-line at https://www.ioniandolphinproject.org/mediterranean-monk-seals/idp-mediterranean-monk-seal-photoid-catalogue/ (updated to 2020; data from 2021 to be entered in the coming months).

[3] https://octopusfoundation.org/en/project/mediterranean-monk-seal-greece-iucn/#technologie

[4] Bearzi G., Politi E., Agazzi S., Bruno S., Costa M., Bonizzoni S. 2005. Occurrence and present status of coastal dolphins (*Delphinus delphis* and *Tursiops truncatus*) in the eastern Ionian Sea. Aquatic Conservation: Marine and Freshwater Ecosystems 15:243-257.

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[7] Bearzi G., Politi E., Agazzi S., Azzellino A. 2006. Prey depletion caused by overfishing and the decline of marine megafauna in eastern Ionian Sea coastal waters (central Mediterranean). Biological Conservation 127(4):373-382.

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[11] Stergiou K.I., Petrakis G. & Politou C.Y. 1996. Small-scale fishery in the South Euboikos Gulf (Greece): species composition and gear competition. Fisheries Research 26, 325–336.

[12] EU Regulation 1626/1994.

[13] Katsanevakis, Stelios & Maravelias, Christos & Vassilopoulou, Vassiliki & Haralabous, John. 2010. Boat seines in Greece: Landings profiles and identification of potential métiers. Scientia Marina. 74. 65-76. 10.3989/scimar.2010.74n1065.

[14] Government Gazette B 4680/2020 of 22-10-2020