

ANNALES

Anali za istrske in mediteranske študije
Annali di Studi istriani e mediterraneei
Annals for Istrian and Mediterranean Studies
Series Historia Naturalis, 32, 2022, 2





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Annals for Istrian and Mediterranean Studies

Series Historia Naturalis, 32, 2022, 2

ISSN 1408-533X
e-ISSN 2591-1783

UDK 5

Letnik 32, leto 2022, številka 2

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Založništvo PADRE d.o.o.

Izdajatelj/Editori/Published by:

Zgodovinsko društvo za južno Primorsko - Koper / Società storica del Litorale - Capodistria®

Inštitut IRRIS za raziskave, razvoj in strategije družbe, kulture in okolja / Institute IRRIS for Research, Development and Strategies of Society, Culture and Environment / Istituto IRRIS di ricerca, sviluppo e strategie della società, cultura e ambiente®

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Address of Editorial Board:**Nacionalni inštitut za biologijo, Morska biološka postaja Piran / Istituto nazionale di biologia, Stazione di biologia marina di Pirano / National Institute of Biology, Marine Biology Station Piran
SI-6330 Piran / Pirano, Fornace/Fornace 41, tel.: +386 5 671 2900, fax +386 5 671 2901;
e-mail: annales@mbss.org, **internet:** www.zdjp.si

Redakcija te številke je bila zaključena 23. 12. 2022.

**Sofinancirajo/Supporto finanziario/
Financially supported by:**

Javna agencija za raziskovalno dejavnost Republike Slovenije (ARRS) in Mestna občina Koper

Annales - Series Historia Naturalis izhaja dvakrat letno.

Naklada/Tiratura/Circulation:

300 izvodov/copie/copies

Revija Annales, Series Historia Naturalis je vključena v naslednje podatkovne baze / La rivista Annales, series Historia Naturalis è inserita nei seguenti data base / Articles appearing in this journal are abstracted and indexed in: BIOSIS-Zoological Record (UK); Aquatic Sciences and Fisheries Abstracts (ASFA); Elsevier B.V.: SCOPUS (NL); Directory of Open Access Journals (DOAJ).

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VSEBINA / INDICE GENERALE / CONTENTS

BIOTSKA GLOBALIZACIJA
GLOBALIZZAZIONE BIOTICA
BIOTIC GLOBALIZATION**Murat BILECENOĞLU & M. Baki YOKeŞ**

New Data on the Occurrence of Two Lessepsian Marine Heterobranchs, *Plocamopherus ocellatus* (Nudibranchia: Polyceridae) and *Lamprohaminoea ovalis* (Cephalaspidea: Haminoeidae), from the Aegean Sea 267
 Novi podatki o pojavljanju dveh lesepskih morskih polžev zaškrgegarjev, *Plocamopherus ocellatus* (Nudibranchia: Polyceridae) in *Lamprohaminoea ovalis* (Cephalaspidea: Haminoeidae), iz Egejskega morja

Gianni INSACCO, Aniello AMATO, Bruno ZAVA

& Maria CORSINI-FOKA Additional Capture of *Halosaurus ovenii* (Actinopterygii: Notacanthiformes: Halosauridae) in Italian Waters 273
 Novi ulov vrste *Halosaurus ovenii* (Actinopterygii: Notacanthiformes: Halosauridae) v italijanskih vodah

Christian CAPAPÉ, Christian REYNAUD & Farid

HEMIDA First Record of Marbled Stingray, *Dasyatis marmorata* (Chondrichthyes: Dasyatidae) from the Algerian Coast (Southwestern Mediterranean Sea) 281
 Prvi zapis o pojavljanju marmorirane morskega biča, *Dasyatis marmorata* (Chondrichthyes: Dasyatidae) iz alžirske obale (jugozahodno Sredozemsko morje)

Maria CORSINI-FOKA & Bruno ZAVA

Second Occurrence of *Siganus javus* (Siganidae) in the Mediterranean Waters 287
 Drugi zapis o pojavljanju progastega morskega kunca, *Siganus javus* (Siganidae), v sredozemskih vodah

Daniel GOLANI, Haim SHOHAT & Brenda APPELBAUM-GOLANI

Colonisation of Exotic Fish Species of the Genera *Pseudotropheus* and *Aulonocara* (Perciformes: Cichlidae) and the Decline of Native Ichthyofauna in Nahal Amal, Israel 293
 Naseljevanje eksotičnih vrst rib iz rodov *Pseudotropheus* in *Aulonocara* (Perciformes: Cichlidae) in upad domorodne ribje favne v reki Nahal Amal, Izrael

Panayotis OVALIS & Maria CORSINI-FOKA

On the Occurrence of *Velolambrus expansus* (Brachyura, Parthenopidae) in Hellenic Waters 301
 O pojavljanju rakovice vrste *Velolambrus expansus* (Brachyura, Parthenopidae) v grških vodah

Saul CIRIACO, Marco SEGARICH, Vera CIRINÀ & Lovrenc LIPEJ

First Record of the Long-Jawed Squirrelfish *Holocentrus adscensionis* (Osbeck, 1765) in the Adriatic Sea 309
 Prvi zapis o pojavljanju vrste veveričjaka *Holocentrus adscensionis* (Osbeck, 1765) v Jadranskem morju

Christian CAPAPÉ, Vienna HAMMOUD,

Aola FANDI & Malek ALI First Record of Moontail Bullseye *Priacanthus hamrur* (Osteichthyes, Priacanthidae) from the Syrian Coast (Eastern Mediterranean Sea) 317
 Prvi zapis o pojavljanju lunastorepega velikookega ostriza *Priacanthus hamrur* (Osteichthyes, Priacanthidae) s sirske obale (vzhodno Sredozemsko morje)

SREDOZEMSKI MORSKI PSI

SQUALI MEDITERRANEI

MEDITERRANEAN SHARKS

Hakan KABASAKAL, Erdi BAYRI & Görkem ALKAN

Distribution and Status of the Great White Shark, *Carcharodon carcharias*, in Turkish Waters: a Review and New Records 325
 Status in razširjenost belega morskega volka (*Carcharodon carcharias*) v turških vodah: pregled in novi zapisi o pojavljanju

Alen SOLDI

200 Years of Records of the Basking Shark, *Cetorhinus maximus*, in the Eastern Adriatic 343
 Dvesto let opazovanj morskega psa orjaka, *Cetorhinus maximus*, v vzhodnem Jadranskem morju

Hakan KABASAKAL, Ayşe ORUÇ, Cansu LKILINÇ, Efe SEVİM, Ebrucan KALECİK & Nilüfer ARAÇ

Morphometrics of an Incidentally Captured Little Gulper Shark, *Centrophorus uyato* (Squaliformes: Centrophoridae), from the Gulf of Antalya, with Notes on Its Biology 351
 Morfometrija naključno ujetega globinskega trneža, *Centrophorus uyato* (Squaliformes: Centrophoridae), iz Antalijskega zaliva z zapiski o njegovi biologiji

Christian CAPAPÉ, Almamy DIABY, Youssouph DIATTA, Sihem RAFRAFI-NOUIRA & Christian REYNAUD Atypical Claspers in Smoothhound, *Mustelus mustelus* (Chondrichthyes: Triakidae) from the Coast of Senegal (Eastern Tropical Atlantic) 359
Netipična klasperja navadnega morskega psa, Mustelus mustelus (Chondrichthyes: Triakidae) iz senegalske obale (vzhodni tropski Atlantik)

Hakan KABASAKAL, Ayşe ORUÇ, Ebrucan KALECIK, Efe SEVİM, Nilüfer ARAÇ & Cansu ILKILINÇ Notes on a Newborn Kitefin Shark, *Dalatias licha*: New Evidence on the Nursery of a Rare Deep-Sea Shark in Northeastern Levant (Turkey) 367
Zapis o najdbi skotenega klinoplavutega morskega psa, Dalatias licha: novi dokaz o jaslicah redkega globokomorskega morskega psa v severovzhodnem levantu (Turčija)

IHTIOLOGIJA
 ITTIOLOGIA
 ICHTHYOLOGY

Nadia BOUZZAMMIT, Hammou EL HABOUZ, El hassen AIT-TALBORJT, Zahra OKBA & Hassan EL OUIZGANI Diet Composition and Feeding Strategy of Atlantic Chub Mackerel *Scomber colias* in the Atlantic Coast of Morocco 377
Prehrana in prehranjevalna strategija lokarde (Scomber colias) ob atlantski obali Maroka

FLORA
 FLORA
 FLORA

Amelio PEZZETTA Le Orchidaceae di Albona (Labin, Croazia) 393
Kukavičevke Labina (Hrvaška)

FAVNA
 FAVNA
 FAVNA

Murat BILECENOĞLU & Melih Ertan ÇINAR The Mauve Stinger, *Pelagia noctiluca*, Has Expanded Its Range to the Sea of Marmara 405
Mesečinka (Pelagia noctiluca) je razširila svoj areal do Marmarskega morja

Marijana HURE, Davor LUČIĆ, Barbara GANGAI ZOVKO & Ivona ONOFRI Dynamics of Mesozooplankton Along the Eastern Coast of the South Adriatic Sea 411
Dinamika mezozooplanktona vzdolž vzhodne obale južnega Jadrana

Abdelkarim DERBALI, Kandeel E. KANDEEL, Aymen HADJ TAIEB & Othman JARBOUI Population Dynamics of the Cockle *Cerastoderma glaucum* (Mollusca: Bivalvia) in the Gulf of Gabes (Tunisia) 431
Populacijska dinamika navadne srčanke Cerastoderma glaucum (Mollusca: Bivalvia) v Gabeškem zalivu (Tunizija)

Vasiliki K. SOKOU, Joan GONZALVO, Ioannis GIOVOS, Cristina BRITO & Dimitrios K. MOUTOPOULOS Tracing Dolphin-Fishery Interaction in Early Greek Fisheries 443
Sledenje interakcij med delfini in ribiči v zgodnjih grških ribiških dejavnostih

Pavel JAMNIK, Matija KRIŽNAR & Bruno BLAŽINA Novi najdišči pleistocenske favne pod Kraškimi robom. Smo končno našli tudi jamo *Grotta dell'Orso*? 451
Two New Sites of Pleistocene Fauna under Karst Edge. Has a Grotta dell'Orso Cave Been Finally Found?

OCENE IN POROČILA
 RECENSIONI E RELAZIONI
 REVIEWS AND REPORTS

Andreja PALATINUS Book Review: Plastic Pollution and Marine Conservation. Approaches to Protect Biodiversity and Marine Life 471

Kazalo k slikam na ovitku 473
Index to images on the cover 473

received: 2022-04-26

DOI 10.19233/ASHN.2022.44

TRACING DOLPHIN-FISHERY INTERACTION IN EARLY GREEK FISHERIES

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ABSTRACT

An exhaustive review of anecdotal references related to dolphin-fishery information in the Greek seas during the early phase of fishery development (1900-1975) was conducted. In that period fishers perceived dolphins as competitors and would intentionally kill them in retaliation for the loss that the dolphins caused by obstructing fishing operations and damaging fishing gear. This review highlights that dolphin-fishery interaction has been a major cause of concern to Greek fishers since the early 20th century, escalating with the way of life of modern society.

Key words: historical accounts, cetaceans, occurrence, historical ecology, marine environmental history

TRACCIA DELL'INTERAZIONE DELFINO-PESCATORE NELLE PRIME ATTIVITÀ DI PESCA GRECHE

SINTESI

È stata condotta una revisione esaustiva dei riferimenti aneddotici relativi alle informazioni sulla pesca dei delfini nei mari greci durante la prima fase dello sviluppo della pesca (1900-1975). In quel periodo i pescatori percepivano i delfini come concorrenti e li uccidevano intenzionalmente come ritorsione per le perdite che i delfini causavano ostacolando le operazioni di pesca e danneggiando gli attrezzi da pesca. Questa rassegna evidenzia come l'interazione tra delfini e pesca sia stata una delle principali cause di preoccupazione per i pescatori greci fin dall'inizio del XX secolo, intensificandosi con lo stile di vita della società moderna.

Parole chiave: testimonianze storiche, cetacei, occorrenza, ecologia storica, storia dell'ambiente marino

INTRODUCTION

Human-marine environmental interaction has occurred throughout history and the study of the dynamics of ecosystems and their biota needs to be temporarily broadened (Holm, 2022; Thurstan, 2022). The understanding gained and passed on from earlier periods, when human impact was limited (Moutopoulos & Stergiou, 2011), could serve as a useful knowledge repository in the efforts toward a re-evaluation of management thresholds (Zeller & Pauly, 2018). In this context, the body of historical and “forgotten” science combined with modern natural observations has increased significantly, particularly within the frameworks of marine historical ecology and marine environmental history (Fortibuoni *et al.*, 2017a; Mazzoldi *et al.*, 2019), and nowadays incorporates findings from a wide range of multidisciplinary scientific fields (e.g., Engelhard *et al.*, 2016).

The Mediterranean Sea provides ample possibilities of interaction between human activities and the surrounding communities (Coll *et al.*, 2010). In this context, dolphins represent important elements of historical and cultural heritage of marine ecosystems (e.g., Greek waters: Papadopoulos *et al.*, 2002; Portugal: Brito & Vieira, 2010; Brito & Sousa, 2011). The importance of dolphins for the marine ecosystems is reflected in their very appellation, namely, the origin of the word dolphin is the ancient Greek word δελφίνι, meaning “womb”, as the sea is the womb of all life on the planet. Although the number of historical dolphin-human interaction studies for Mediterranean waters has considerably increased over the past decades (for review see: STECF, 2019) and corresponding data are easily found for the western Mediterranean (e.g., Brito & Vieira, 2010; Brito & Sousa, 2011; Sousa & Brito, 2011), such information is generally lacking for the eastern part of the basin.

The present study aims to evaluate dolphin-human interaction in Greek waters during the early phase of fishery development (1900–1975). The data collection method has been harmonised with the European Commission for Marine Knowledge 2020 and the information incorporated into the European Marine Observation and Data Network (EMODnet).

MATERIAL AND METHODS

Greek fisheries officially started to organise in 1911, and by the mid-1970s, they had passed from an essentially pre-industrial stage to the industrialisation of fishing activities (Moutopoulos & Stergiou, 2012). An exhaustive search of traditional and digital libraries (i.e., newspapers, technical reports, and books) related to dolphins was conducted using the keyword “dolphins” for retrieving issues on dolphin-human interactions in the Greek seas during the early phase of fishery development (1900–1975). The following Athenian and regional journals were found in the National Library of Greece (http://efimeris.nlg.gr/ns/main.html?fbclid=IwAR0n__4AKJQ-

[ci7BFewxCxZmu-90qQRZhlGhyMSmmcpkvB9gThXnwQmwi8E](http://efimeris.nlg.gr/ns/main.html?fbclid=IwAR0n__4AKJQ-ci7BFewxCxZmu-90qQRZhlGhyMSmmcpkvB9gThXnwQmwi8E)): Eleftheria (1944–1967), Empros (1896–1969), Macedonia (1911–1981), Rizospastis (1917–1983), Scrip (1893–1963), Acropolis (1883–1884), and Tachydromos of Egypt (1958–1977). For the journals published on the island of Crete and in the Dodecanese, old archives were found in an online database (<http://vikelaia-epapers.heraklion.gr/%CE%B5%CF%86%CE%B7%CE%BC%CE%B5%CF%81%CE%AF%CE%B4%CE%B5%CF%82/>). Duplicate records of the same report published in different journals were excluded.

RESULTS

Overall, 28 historical records on dolphin-fishery interactions and dolphin occurrences were retrieved from the 1900–1975 period (Tab. 1). Records were more frequent for the Aegean Sea and mostly focused on conflicts between dolphins and fisheries, rather than on natural history reports. The first record (1906) of the presence of dolphins in the Greek seas refers to a shipwreck incident in Messinia, in which seamen were rescued by dolphins (Fig. 1) (Anonymous 1906). Later on, during the interwar period (1920–1940), dolphin conflicts with fisheries were increasingly reported (Tsakakis, 1950) creating the impression that “dolphins are enemies of the fishers” (Tsakakis, 1950). The first post-World War II reference describes nets destroyed by dolphins in the Chalkida area (Yakoumis, 1948). The fishers’ appeals to the competent authorities continued throughout the 1950s, describing damaged nets, calling for action against dolphins in cooperation with competent bodies and ichthyologists (Anonymous, 1953a, 1954c), asking for compensation for damaged nets, requesting permission to hunt dolphins with firearms (Tsakakis, 1950), and claiming monetary rewards for killed dolphins (Anonymous, 1959a).

During the 1950s, dolphins were described as “the plague of the Greek seas” (Anonymous, 1952) (Fig. 2). The spatial extent of this conflict encompassed the Kavala and Thessaloniki Bays, Limnos, Mytilene, and Chalkida in the northern and central Aegean. In 1951, a petition for the granting of the right to use weapons against dolphins was signed by professional fishers from all around Greece and sent to the Directorate of Fisheries (Anonymous, 1952). The same trend continued in the following decades with reports of damaged nets (Anonymous, 1952), calls for culling, compensation claims for damaged fishing gear, tips for “fighting” dolphins (Anonymous, 1975a), and demands for effective dolphin tracking measures (Anonymous, 1970). In 1975, trawlers and purse seiners from the Kavala port (Thracian sea) demanded that the government allocate 500,000 Greek drachmas (an amount equivalent to € 7,000 today) for extermination of dolphins by professional shooters (Anonymous, 1975a). However, during the 1970s the first signs of a changing human attitude towards dolphins appeared in local periodic magazines, describing dolphins as “the intellectuals of the seabed” (Katiforis, 1970).

Tab. 1: References on dolphin-fishery interaction in the Greek seas during the 1900–1975 period.**Tab. 1: Reference o interakciji med delfini in ribištvom v grških morjih v obdobju 1900–1975.**

Year	Area	Details	Reference
1906	South Ionian (Messinia)	Ship-wreckers were rescued by dolphins.	Anonymous (1906)
1948	Evvoikos Gulf (Chalkis)	Nets destruction by dolphins. The Chalkis Coastal Fishers' Association has made an official request to the Ministry for allowing the use of harpoons in order to hunt and kill dolphins.	Anonymous (1948)
1951	Greek Seas	Nets destruction by dolphins. in the Greek seas, according to letters provided from fishers all throughout Greece. Fishers asked the Custom Port Authorities for permission to kill dolphins using guns.	Anonymous (1951)
1952	North Aegean (Kavala)	Appeals from fishers to the Ministry authorities for effective dolphin prosecution. A memorandum was signed from the Fisher's Association in Kavala port. Dolphins were responsible for net destruction and fish catch losses. Dolphins are referred to as "beasts". Fishers applied for a gun license allowing killing dolphins.	Anonymous (1952)
1953	North and Central Aegean (Kavala, Lesbos and Chios Islands)	Request by the professional fishers for the use of guns for the repelling of dolphins.	Anonymous (1953a)
	Greek Seas	At the first professional fishers' workshop, fishers reported that the cost of losses due to dolphin attacks were equal to 10 fishing days each month..	Anonymous (1953b)
1954	Thracian Sea (Kavala)	A request has been made to the Governor of Thrace by an editor of the Kavala newspaper "Proini" to take action to prosecute dolphins in collaboration with competent ichthyologists.	Anonymous (1954c)
	North Aegean (Kavala)	Fishers' memorandum to the Governor of Thrace, citing dolphin-caused fishing gear destruction. Fisher's associations request funding for the replacement of damaged nets. A request for the repelling of dolphins has been also made.	Anonymous (1954d)
	Eastern Aegean (Limnos)	Reports on net damages and loss of the catches. Report about ineffective use of hunting weapons on dolphins.	
	Greek Seas	Claims from fishers to the Directorate of Fisheries for an official allowance of the use of fire gun for the repulsion of dolphins.	Anonymous (1954b)
	Greek Seas	The Ministry of Industry is considering the introduction of awards for professional fishers who will catch dolphins. According to the available data, the damage to the purse seiners is the most serious.	Anonymous (1954a)
1956	North Aegean (Kavala, Thessaloniki)	Nets damages caused by dolphins. A craft with guns was reported for pre-war employment in the Thermaikos Gulf for killing dolphins, whereas the use of this method was outlawed in 1956. Fishers proposed measures to kill dolphins by using explosive capsules. Proposal for the exploitation of the dead dolphins (skin, fat).	Tsakakis (1956)
1958	Pagassitikos Gulf (Volos)	Reports were made for dolphins' attack on the fishing gears.	Anonymous (1958)
1959	Thracian Sea (Kavala)	A compensatory measure was proposed by the Fisher Association of Kavala to the Ministry of Industry by a payout of 200 drachmas (current value of 55 €) per dead dolphin.	Anonymous (1959c)
	Inner Ionian Archipelagos (Astakos)	Two dolphins bycaught by a nylon fishing net.	Anonymous (1959b)
	Greek Seas	Fishers proposal to the Ministry of Marine for the persecution of dolphins by using firearms.	Anonymous (1959a)
	Eastern Aegean (Lesvos Island)	Fishers claim that purse seine catches were reduced due to dolphins.	Anonymous (1959d)
1960	Thracian Sea (Kavala)	Nets damages caused by dolphins. The vessels of the Port Authority were pursuing dolphins. Request for persecution of the dolphins.	Anonymous (1960)
1961	Amvrakikos Gulf (Ionian Sea)	According to a local newspaper 3,000 dolphins devastating the Amvrakikos Gulf.	Gonzalvo <i>et al.</i> (2015)
1962	Thracian Sea (Kavala)	From July to September 1961, the hiring of Turkish crews for hunting dolphins has resulted from a 15% to 20% increase in fish catches, as well as the avoidance of expenses of 800,000 drachmas (current value of 210,000 €) for repairing fishing gear. A grant of 250,000 drachmas (approximately 66,000 €) was requested to re-establish three hunting teams to kill dolphins during the 1962 fishing season.	Anonymous (1962)
	Saronikos Gulf (Athens)	Rescue of an injured dolphin in July 1962.	Katiforis (1970)
1963	North Aegean, Central Aegean (Kavala, Volos, Lesbos Island)	Net losses have been reported, similar to those caused by the olive fruit fly and downy mildew. Dolphins were considered as "beasts of the seas". The Fisheries Directorate has been requested to coordinate dolphin hunts and allocate fundings for this purpose.	Anonymous (1963)
1965	Saronikos Gulf (Athens)	Schooling dolphins can be seen.	Anonymous (1965)
1966	Patraikos Gulf (Ionian Sea)	A grant of 600 drachmas (current value of 1.76 €) have been petitioned to subsidize the pursuit of dolphins by fishers.	Anonymous (1966)
1970	Greek Seas	The request for effective dolphin hunting was one of the outcomes of the 8 th Pan-Hellenic Conference of Fishers (March 1970).	Anonymous (1970)
1975	Thracian Sea (Kavala)	The owners of trawl and purse seine vessels have petitioned the government for 500,000 drachmas (current value of 70,000 €) to subsidize the pursuit of dolphins by shooters.	Anonymous (1975a)
1975	Thracian Sea (Kavala)	Fisher's association from Kavala issued a memorandum on dolphin killing and extinction (December 23, 1975). The Custom Port Authorities and the Navy have asked the Ministries of Agriculture and Merchant Marine to prosecute dolphins by hiring special shooters. There have been reports of extensive gear damages as well as a loss of catch. Dolphins have been compared to "sea wolves".	Anonymous (1975b)
1945-1970	Thermaikos Gulf (Thessaloniki)	Dolphins attacked on purse seine nets. Fishers change their fishing tactics in response to the dolphins' net destruction.	Fragoudi (2010)

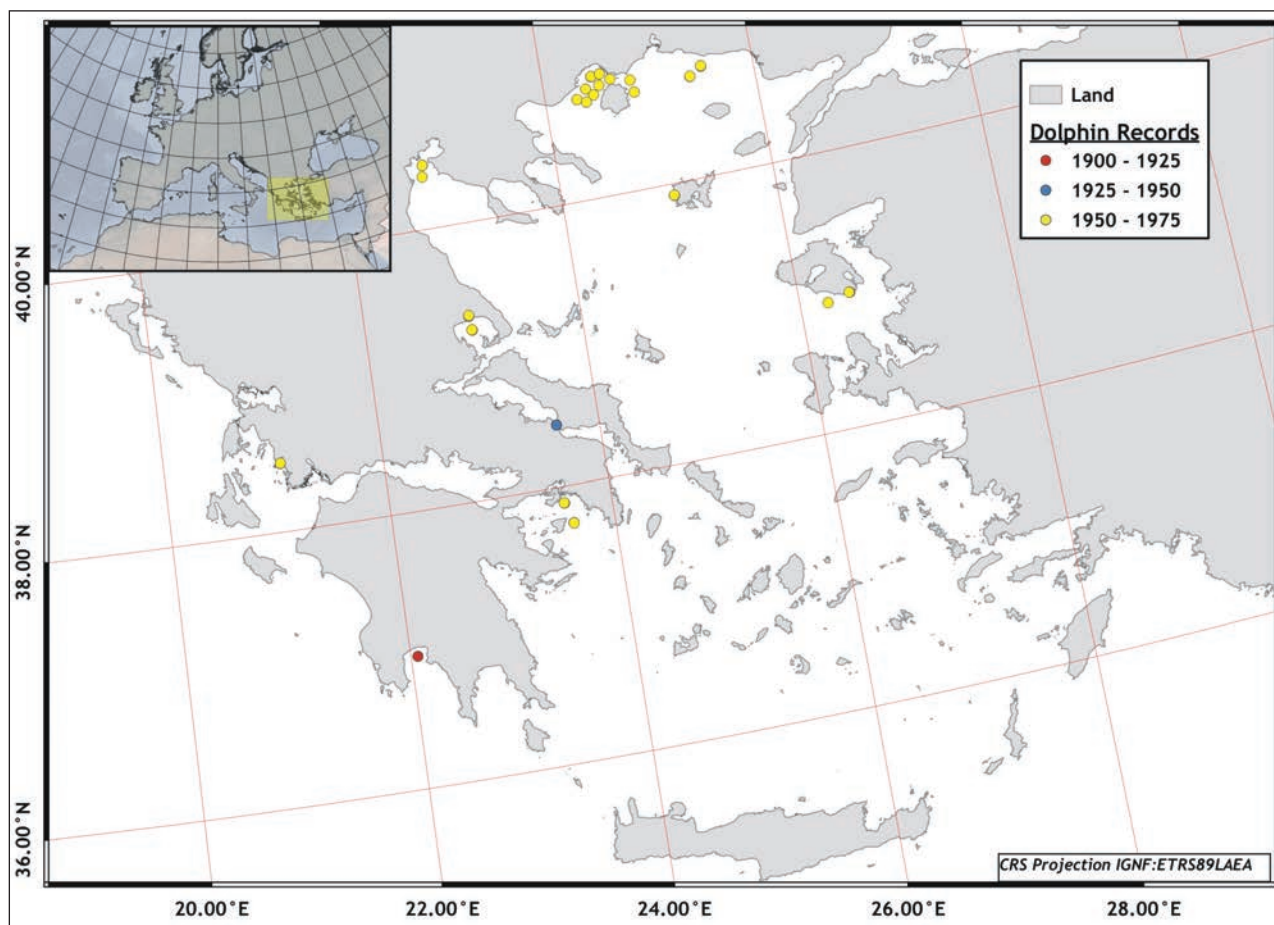


Fig. 1: References on sightings and strandings indicating the presence of dolphins during the early period of Greek fishery development (references for historic data up to 1975 presented in Tab. 1).

Sl. 1: Reference o opažanjih in primerih naseljih delfinov, ki kažejo na njihovo prisotnost v zgodnjem obdobju razvoja grškega ribištva (reference za zgodovinske podatke do leta 1975 so predstavljene v Tabeli 1).

DISCUSSION

Greek waters have always been a key habitat for coastal dolphin populations (Frantzis, 2007; Crowley, 2010). After the official organisation of the fishery sector (1911) (Moutopoulos & Stergiou, 2011) the dolphin-human interaction in Greek Seas increased, especially in the wake of fishing gear depredation, catch and income losses, a pattern that was present throughout the Mediterranean and beyond (STECF, 2019). This negative development in the human-dolphin relations, which emerged in Greece later than in other regions of the world (Brito *et al.*, 2016), shaped new attitudes and resulted in the characterisation of dolphins as “beasts” (Anonymous, 1952) and “sea wolves” (Anonymous, 1975b). Ten years after the end of World War II, Greek fishers proposed using explosive capsules to kill dolphins (Tsakakis, 1950) and for almost two decades the extinction and deliberate killing of dolphins was one of the main activities of Greek

fisheries (Anonymous, 1975b). Dolphin hunting and killing were legal (Fragoudi, 2010), and anyone killing a dolphin was entitled to compensation from the port authorities for each individual killed (Bearzi *et al.*, 2003, 2004; Fragoudi, 2010). This highly conflictive period extending into the mid-1970s coincided with the reported decline of the species that started in the late 1960s (Bearzi *et al.*, 2021). However, as it is indicated in our review, all reports of dolphin-fishery interaction were gathered in enclosed gulfs adjacent to large ports and cities on the mainland, and on large islands (Fig. 1). This is because during the first mid-1900s most Greek fisheries were characterised by poorly equipped fishing vessels, which limited the spatial and temporal extent of their operations (Moutopoulos & Stergiou, 2011). This likely had a strong impact on local populations of dolphins living in continental shelf waters, particularly on common and bottlenose dolphins, as the total biomass otherwise removed by fisheries in such areas may exceed that predated by dolphins (Bearzi *et al.*, 2009).



Fig. 2: Articles published in the fisheries magazines during the 1950s and 1960s on the topic of dolphin-fishery interaction: Main article title “Dolphins, plague of the Greek seas” (top), images of killed dolphins (bottom).

Sl. 2: Članki, objavljeni v ribiških revijah v petdesetih in šestdesetih letih prejšnjega stoletja na temo interakcije med delfini in ribištvom: Naslov glavnega članka »Delfini, kuga grških morij« (zgoraj), slike ubitih delfinov (spodaj).

At the time of ancient Greece, dolphins were considered fishers’ friends, an incarnation of gods helping them herd fish schools towards their fishing gear, and indicators of fish abundance (Fragoudi, 2010). However, with the modernisation and spatiotemporal expansion of Greek fisheries, strong competition gradually developed, not only with dolphins but with marine mammals in general, (Vergitsi & Trova, 1997). In more recent times, unsustainable fishing and habitat degradation have contributed to dramatic ecological changes in the Mediterranean Sea (Fortibuoni *et al.* 2017b) and also in Greece (Tsikliras *et al.*, 2021), exacerbating the perception that dolphins reduce fishery yields (Reeves *et al.*, 2001), which was also present among Greek fishers during the 1950s and 1960s (Table 1).

The protection of dolphins - which is supported by a variety of legal provisions, both national and European, such as for instance the Habitats Directive, which is related to the conservation of habitat types and of habitats of species (Council Directive 92/43/EEC) - cannot solely rely on legislative measures, both because of the long time the relevant laws take to be enacted and/or ratified and because of the far too common lack of law enforcement, which often translates as non-compliance on the part of the stakeholders (e.g., fishers). Formal commitments to protect the dolphin population conflict with geopolitical complexity and socio-economic benefits, and a generally weak political will results in inaction (Bearzi *et al.*, 2016). Although nowadays the dolphin-human interaction is still a critical topic, information on the presence, distribution and status of dolphin populations is spatially limited. The

present study provides valuable data for implementing marine strategy policies, such as the Common Fisheries Policy of the European Union and the EU Marine Strategy Framework Directive (2008/56/EC).

CONCLUSIONS

Historical anecdotal data can improve our understanding of past system dynamics and rising concerns about long-term human impact on the ecosystem (Brito & Vieira, 2016; Thurstan, 2022). These sources of historical information can also help us curb the phenomenon of shifting environmental baselines described by Pauly (1995), who noted that each generation subconsciously views as “natural” the way the environment appeared in their youth. The present study showed that some attitudes and behaviours that were once acceptable and even presented by the media as commendable, are nowadays illegal and socially unacceptable. Historical science may play an important role in comprehending present-day effects and conditions (Brito & Vieira, 2010). Historical accounts of cetaceans may also be extremely useful in adding new data to the occurrence and distribution of marine mammals in poorly studied areas, many of which are distributed along the coasts of eastern and southern Mediterranean (Brito & Vieira, 2010).

ACKNOWLEDGMENTS

The authors wish to thank the editor and the two anonymous referees for their valuable comments, which improved the content and quality of the article.

SLEDENJE INTERAKCIJ MED DELFINI IN RIBIČI V ZGODNJIH GRŠKIH RIBIŠKIH DEJAVNOSTIH

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POVZETEK

Avtorji so izvedli izčrpen pregled anekdotičnih sklicevanj v zvezi z informacijami o ribolovu na delfine v grških morjih v prvi fazi razvoja ribištva (1900-1975). Takrat so ribiči delfine dojemali kot tekmece in jih namenoma ubijali zaradi izgub, ki so jih delfini povzročili z oviranjem ribolova in poškodovanjem ribiškega orodja. Ta pregled poudarja, kako je bila interakcija med delfini in ribištvom glavni vzrok za zaskrbljenost grških ribičev od začetka 20. stoletja, ki se je stopnjevala z življenjskim slogom sodobne družbe.

Ključne besede: zgodovinski pregled, kiti, pojavljanje, historična ekologija, zgodovina morskega okolja

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