

Alien Fish Species In The Eastern Mediterranean Sea

Humans have moved organisms around the world for centuries but it is only relatively recently that invasion ecology has grown into a mainstream research field. This book examines both the spread and impact dynamics of invasive species, placing the science of invasion biology on a new, more rigorous, theoretical footing, and proposing a concept of adaptive networks as the foundation for future research. Biological invasions are considered not as simple actions of invaders and reactions of invaded ecosystems, but as co-evolving complex adaptive systems with emergent features of network complexity and invasibility. *Invasion Dynamics* focuses on the ecology of invasive species and their impacts in recipient social-ecological systems. It discusses not only key advances and challenges within the traditional domain of invasion ecology, but introduces approaches, concepts, and insights from many other disciplines such as complexity science, systems science, and ecology more broadly. It will be of great value to invasion biologists analyzing spread and/or impact dynamics as well as other ecologists interested in spread processes or habitat management.

A total of 1,354 introductions of 237 species into 140 countries are analysed. The number of introductions carried out rose from the middle of the last century until the 1960s and have lessened since then.

The book is divided into two sections and represents the current trend of research in aquatic bioresource. In the section "Biology, Ecology and Physiological Chemistry", high-impact articles are contributed on reproduction, population genetics, evolution, biodiversity, biology and ecology of different aquatic faunas. Physiological chemistry of lipid, bioactive pharmaceuticals and chemical ecological aspects of aquatic organisms were discussed. In the section entitled "Conservation and Sustainable Management", authors highlighted conservation- and management-related issues of various bioresources in different regions of the earth. The book mentions the biological, ecological, physiological and genetic significance of aquatic organisms with resource potential. The authors stressed on rational utilisation and management of bioresource ensuring minimal damage of the aquatic ecosystem. This book would provide a direction towards sustainable ecological management of bioresource.

In this age of increased fundamental and applied research on biodiversity, no single volume was as yet devoted to the various temporal and spatial aspects of aquatic biodiversity. The present book is published in honour of Professor Henri Dumont (Ghent, Belgium) at the occasion of his retirement as Editor-in-Chief of *Hydrobiologia*. The volume presents a selection of contributions on aquatic biodiversity, written by colleagues from the editorial board, fellow editors of aquatic journals and former students and collaborators. Contributions deal with a wide spectrum of topics related to aquatic biodiversity and cover fields such as actual- and palaeolimnology, taxonomy, and fundamental and applied limnology. Even reconnaissance chapters on management and cultural impact of water bodies are included. The book combines state-of-the-art contributions in aquatic sciences.

This guide seeks to help by providing national law and policy makers with practical information and guidance for developing of strengthening legal and institutional frameworks on alien invasive species, consistent with Article 8(h) of the CBD, as well as

pertinent obligations under other international instruments. It provides a structured framework for dealing with alien invasive species issues and contains illustrations and practical examples to assist in understanding their impact.

All over the planet, organisms of many species are appearing outside of their natural habitats—often carried by that particularly peripatetic species *Homo sapiens*. This book marks the first comprehensive attempt to address problems posed by expanding populations of exotic plant and animal species in the Sonoran Desert and adjacent grasslands and riparian areas. It describes the arrival and spread of non-native species as diverse as rats and saltcedar, covering both their impacts and the management of those impacts. It is estimated that as much as 60 percent of the vegetative cover of the Sonoita Creek-Patagonia Reserve, the first Nature Conservancy area designated in Arizona, is dominated by exotic plants, and that introduced fish pose a recurrent threat to the native fish of that area. Meanwhile at the Grand Canyon, invasives such as tamarisk, red brome, carp, and catfish are pervasive either in the Colorado River or in the patches of desert scrub along its shores. Throughout the Sonoran Desert and adjacent areas, from islands in the Sea of Cortés to desert grasslands, some six hundred species of non-native plants and animals have become established, with bullfrogs and Mediterranean grasses now common where they once never existed. The book brings together contributors from academia, government, and nonprofit organizations, including such experts as Gary Paul Nabhan, Richard Mack, and Alberto Bøerquez-Montijo. They review historic and even prehistoric origins of non-native species—not only exotic plants, amphibians, and mammals but also insects, fish, and birds. They then examine significant problems in each major subregion and ecosystem and discuss control efforts. The volume contains the first compiled list of more than 500 naturalized exotic species in the Sonoran region. Invasive species issues are rapidly emerging as major environmental concerns both locally and worldwide. This book will assist professionals—ecologists, conservation biologists, and policy makers—involved in invasive species control in the Southwest and will be a rich resource for all concerned with protecting native species and their habitats.

This open access volume presents a comprehensive account of all aspects of biological invasions in South Africa, where research has been conducted over more than three decades, and where bold initiatives have been implemented in attempts to control invasions and to reduce their ecological, economic and social effects. It covers a broad range of themes, including history, policy development and implementation, the status of invasions of animals and plants in terrestrial, marine and freshwater environments, the development of a robust ecological theory around biological invasions, the effectiveness of management interventions, and scenarios for the future. The South African situation stands out because of the remarkable diversity of the country, and the wide range of problems encountered in its varied ecosystems, which has resulted in a disproportionate investment into both research and management. The South African experience holds many lessons for other parts of the world, and this book should be of immense value to researchers, students, managers, and policy-makers who deal with biological invasions and ecosystem management and conservation in most other regions.

The introduction of alien species can upset ecosystems and have been identified as the second main cause of species

extinction at a global level after habitat loss or deterioration. This publication sets out a European strategy to address this issue, developed in the framework of the Bern Convention and in line with guidelines adopted in 2002 on biological diversity. This strategy seeks to encourage the implementation of co-ordinated measures in all European states which are designed to prevent or minimise adverse impacts of non-native species on native biological diversity.

The present book offers an overall up-to-date overview of the biological diversity, comprising many interesting chapters focussing on the different aspects of biodiversity. Most of the chapters include findings of investigations and observations on biodiversity, whilst a few are based on statistically and theoretically derived information. The book produced sufficient information on the occurrence and distribution of many plant and animal species or groups of organisms with environmental estimates from a wide variety of interesting terrestrial and aquatic habitats. With 18 interesting and elaborately prepared chapters, the present book would definitely be an ideal source of scientific information to the advanced students, junior researchers, scientists and a portion of the public involved in ecology and other research areas involving biodiversity studies. It will also help to the development of the growing awareness of the close linkage between the conservation of biodiversity and economic development.

Readers are shown evidence of animal adaptation and the complexity of the food chain in Invasive Freshwater Species. Analyses of cases such as the troublesome zebra mussel illustrate the major impact one unchecked species can have on human life and the environment. Patterns of species introduction and takeover in freshwaters teach students the key details of invasive species and illustrate the impact humans and animals have on each other.

INVASIVE ALIEN SPECIES Invasive Alien Species: Observations and Issues from Around the World Volume 1: Issues and Invasions in Africa Invasive alien species are spreading into new ecosystems each year. The impacts caused by these invaders can be swift and devastating. The topic of invasive alien species is large, complex, and globally significant at various scales, exacerbated by the globalization of world economies and increased trade and commerce that has overcome natural barriers to species movement. Invasive alien species threaten global food supplies, water quality and availability, and energy production and delivery. With the added risks associated with global climate change, the global homogenization of plants, animals, and microbes is a major factor in the decline in ecosystem health and ecosystem services worldwide. To counter this trend, there is a critical need to unify governments, cultures, and programs to improve cross-boundary coordination to effectively address the wide range of invasive alien species threats to the environment, economies, and to plant and animal health; particularly human health. This 4-volume work is the first to compile a set of useful material for key topics, to provide a better understanding of the overall global threat of invasive alien species and the diverse array of problems faced around the world, and assemble material that includes potential

replicable solutions to overcome these threats. The books also highlight the threat posed by invasive alien species in terms of a global 'call to action'. Since invasive species know no boundaries, it is our hope that by compiling material from different scientific and social perspectives around the world, and sharing knowledge and examples of a diverse array of associated topics, we can advance global awareness and improve unified national responses to the threat posed by invasive alien species.

Essay from the year 2006 in the subject Biology - Ecology, grade: A, University of Bremen (Center of Marine Tropical Ecology), course: Essay for M.Sc. course, 57 entries in the bibliography, language: English, abstract: In the first part, this essay aims at providing a rough overview about the most important topics in the literature dealing with alien invasive species. This overview tries to answer questions about the general biology of alien invasive species and the existence of a perfect invader. However, some ecosystems seem to be more susceptible to invasion than others do. General assumptions are that the tropics are less invasible than temperate regions and that islands are more vulnerable than continental areas. An alien species must complete three stages of human-mediated spreading which are transportation, introduction and establishment in order to become invasive. An alien invasive species might then have positive or negative impacts. Either it adds to the species richness or it has detrimental effects on the ecological, economical or human health sector. However, sophisticated treatments are available to prevent several means of introduction. The second part of this essay will provide a critical evaluation about the literature reviewed. There still exists a great deal of uncertainty and variety of opinions within publications. The need of increased prevention of introductions and collaboration are conclusions that can be drawn. Furthermore, public awareness has to be raised and a clear definition of terms is a must. Finally, it is important to recall that many alien species are responsible for human well-being by providing food and aesthetics.

Bioinvasion is fast becoming one of the world's most costly ecological problems, as it disrupts agriculture, drastically alters ecosystems, spreads disease, and interferes with shipping. The economic and environmental damages from alien plant, animals, and microbes in the United States, British Isles, Australia, South Africa, India, and Brazil are staggering. Provides information on invasive plants and animals in Ohio.

North America is under attack by a wide range of invasive animals, pushing native breeds to the brink of extinction. Combining thrilling hunting adventures, a keen culinary imagination, and a passionate defense of the natural environment, *Eating Aliens* chronicles Landers' quest to hunt 12 invasive animal species and turn them into delicious meals. Get ready to dig into tacos filled with tasty black spiny-tailed iguana!

Examines the biological invaders that are infiltrating and threatening our ecosystems, discussing such concepts as biodiversity,

endangered species, and climate change.

Aquaculture, the youngest, fastest-growing, and most dynamic protein-producing industry, has the key advantage of efficient use of feed that allows farmed fish to be competitively priced compared with terrestrial proteins. *Sustainable Aquafeeds: Technological Innovation and Novel Ingredients* explores the present and future evolution of feeds, explains the current challenges for aquaculture, and considers how advances in technologies and ingredients can produce aquafoods for the increasing world population. International contributors to this book provide state-of-the-art information on the profile of the aquafeed industry, including factors affecting supplies and prices of key ingredients for aquafeed production. An entire set of chapters covers the scientific advances and feed industry initiatives in accordance with modern consumer trends, updating readers on the most promising strategies. These include the use of novel ingredients for nutrient supplementation and the enhancement of their use by genetic selection. The authors hope to inspire a collaboration of NGOs, researchers, and private partnerships to replace wild-caught ingredients by accelerating and supporting the scaling of innovative, alternative, aquaculture feed ingredients, including bacterial meals, plant-based proteins, algae, and yeast.

There are many hypotheses describing the interactions involved in biological invasions, but it is largely unknown whether they are backed up by empirical evidence. This book fills that gap by developing a tool for assessing research hypotheses and applying it to twelve invasion hypotheses, using the hierarchy-of-hypotheses (HoH) approach, and mapping the connections between theory and evidence. In Part 1, an overview chapter of invasion biology is followed by an introduction to the HoH approach and short chapters by science theorists and philosophers who comment on the approach. Part 2 outlines the invasion hypotheses and their interrelationships. These include biotic resistance and island susceptibility hypotheses, disturbance hypothesis, invasional meltdown hypothesis, enemy release hypothesis, evolution of increased competitive ability and shifting defence hypotheses, tens rule, phenotypic plasticity hypothesis, Darwin's naturalization and limiting similarity hypotheses and the propagule pressure hypothesis. Part 3 provides a synthesis and suggests future directions for invasion research.

Seasonal quantitative sampling in two common coastal habitats was used to investigate habitat use of different life-stages. Sandy areas were found to be highly important for the early life stages of *L. sceleratus*. In contrast, *Posidonia oceanica* habitats were mainly preferred by larger (> 29 cm) reproductive adults with a maximum recorded size of 64 cm. *Lagocephalus sceleratus* was found to be an invertebrate and fish feeder while size classification revealed a tendency for an ontogenetic diet shift with increased size to a molluscivore feeding. The ontogenetic diet shift is most probably attributed to a shift in habitat use with increasing size. During early life stages *L. sceleratus* inhabited sandy bottoms where it fed on various invertebrates, including the genus *Nassarius* and *Dentaliidae*. The predominant molluscan species found in the diet of larger (> 20 cm) *L. sceleratus* individuals was *Sepia officinalis* while predation of *Octopus vulgaris* was less successful. *Sepia officinalis* and *O. vulgaris* are of economic interest in the area and the impact of *L. sceleratus* on local stocks of these species is discussed. Societal impacts were also evident in the area due to increased public attention concerning the lethal effects of the toxic *L. sceleratus*, if consumed. Seasonal variations in the

condition of *L. sceleratus* did not show any significance and the high conditional values together with information on high numbers caught during samplings, signifies its ability to become an important member of the coastal fish community. Combined ecological, economical and social effects clearly classify *L. sceleratus* a pest in the area

This open access book describes the serious threat of invasive species to native ecosystems. Invasive species have caused and will continue to cause enormous ecological and economic damage with ever increasing world trade. This multi-disciplinary book, written by over 100 national experts, presents the latest research on a wide range of natural science and social science fields that explore the ecology, impacts, and practical tools for management of invasive species. It covers species of all taxonomic groups from insects and pathogens, to plants, vertebrates, and aquatic organisms that impact a diversity of habitats in forests, rangelands and grasslands of the United States. It is well-illustrated, provides summaries of the most important invasive species and issues impacting all regions of the country, and includes a comprehensive primary reference list for each topic. This scientific synthesis provides the cultural, economic, scientific and social context for addressing environmental challenges posed by invasive species and will be a valuable resource for scholars, policy makers, natural resource managers and practitioners.

The invasive species problem will become increasingly important in the years to come. Trade, travel and tourism are rapidly globalized, and border controls are reduced. This affects natural ecosystems in which aggressive invaders may have disastrous effects. `New' diseases affect human, animal and crop health. The Convention on Biological Diversity presents national authorities with a tall order in coping with this problem. For the first time in one volume, this book presents both ecological, biological and epidemiological aspects of invasive species, as well as the problem of disease organisms for agriculture and human health. The book constitutes a comprehensive background to the global strategy for managing invasive alien species which now is being developed by SCOPE and UNEP. The book is well suited for management staff in various environmental, economic and social sectors. It is essential for university and college teachers, researchers in ecology, natural resources management, and social sciences, as well as M.Sc. and Ph.D. students.

Jedes Jahr breiten sich invasive gebietsfremde Arten in neue Ökosysteme aus. Die von den Eindringlingen verursachten Auswirkungen können sich in kürzester Zeit bemerkbar machen und verheerend sein. Das Thema der invasiven gebietsfremden Arten ist umfassend, komplex und auf verschiedenen Ebenen von globaler Bedeutung. Verschärft wird es durch die Globalisierung der Weltwirtschaft und den zunehmenden Handel, durch den die natürlichen Barrieren für den Transfer von Arten durchbrochen werden. Invasive gebietsfremde Arten bedrohen die weltweite Nahrungsmittelversorgung, die Qualität und Verfügbarkeit von Trinkwasser sowie die Stromproduktion und -versorgung. Zusammen mit den zusätzlichen Risiken durch den globalen Klimawandel ist die weltweite Homogenisierung von Pflanzen, Tieren und Mikroben ein wesentlicher Faktor für den sich verschlechternden Gesundheitszustand der Ökosysteme und die nachlassenden Ökosystemdienstleistungen überall auf der Welt. Um dieser Entwicklung entgegenzuwirken, besteht die dringende Notwendigkeit einer einheitlichen Ausrichtung von Regierungen, Kulturen und Programmen und einer besseren grenzüberschreitenden Koordination. Nur so lassen sich die vielfältigen Bedrohungen durch invasive gebietsfremde Arten für die Umwelt, die Wirtschaft und die Gesundheit von Pflanzen und Tieren sowie insbesondere die menschliche Gesundheit effektiv bekämpfen. Dieses vierbändige Werk ist das erste, das einen

umfassenden Satz nützlicher Materialien zu den zentralen Themen bereitstellt, um die gesamte globale Bedrohung durch invasive gebietsfremde Arten sowie die vielfältigen Probleme in verschiedenen Teilen der Welt deutlich zu machen, und es enthält Material, in dem potenziell replizierbare Lösungen zur Überwindung dieser Bedrohungen aufgezeigt werden. Das Werk betont die Bedrohung durch invasive gebietsfremde Arten auch im Sinne eines globalen ?Aufrufs zum Handeln?. Invasive Arten kennen keine Grenzen. Daher hoffen wir, dass wir durch die Zusammenstellung von Material, das unterschiedliche wissenschaftliche und gesellschaftliche Standpunkte aus aller Welt berücksichtigt, sowie durch die Vermittlung von Erkenntnissen und Beispielen zu einer Vielzahl damit zusammenhängender Themen das globale Bewusstsein stärken und einheitliche nationale Reaktionen auf die Bedrohung durch invasive gebietsfremde Arten fördern können. Invasive non-native species are a major threat to global biodiversity. Often introduced accidentally through international travel or trade, they invade and colonize new habitats, often with devastating consequences for the local flora and fauna. Their environmental impacts can range from damage to resource production (e.g. agriculture and forestry) and infrastructure (e.g. buildings, road and water supply), to human health. They consequently can have major economic impacts. It is a priority to prevent their introduction and spread, as well as to control them. Freshwater ecosystems are particularly at risk from invasions and are landscape corridors that facilitate the spread of invasives. This book reviews the current state of knowledge of the most notable global invasive freshwater species or groups, based on their severity of economic impact, geographic distribution outside of their native range, extent of research, and recognition of the ecological severity of the impact of the species by the IUCN. As well as some of the very well-known species, the book also covers some invasives that are emerging as serious threats. Examples covered include a range of aquatic and riparian plants, insects, molluscs, crustacea, fish, amphibians, reptiles and mammals, as well as some major pathogens of aquatic organisms. The book also includes overview chapters synthesizing the ecological impact of invasive species in fresh water and summarizing practical implications for the management of rivers and other freshwater habitats. The use of alien species is a proven means to increase production and value from aquatic ecosystems. In the Mekong/Lanchang basin, alien species such as tilapia (*Oreochromis* spp.) play an important role in providing cheap and readily available protein to rural and poor sectors. However, alien species are now recognized as one of the most significant threats to aquatic biodiversity. Several steps are necessary for effective use and control of alien species, but one of the most important was identified to be following codes of practice similar to that developed by the International Council for the Exploration of the Sea.--Publisher's description.

Invertebrates exhibit a wide range of diversity in body plan, physiology, behaviour, adaptation and preferences for habitat and food. Their relationship with the environment is unique and multidimensional. This book is organized into two sections containing chapters on the frontier areas of research in ecophysiology and management-related problems of various invertebrates. Topics covered include hibernation physiology; the amelioration potential of drug and parasitic host response of molluscs; the genetics and biology of hydrocorals; and current trends of management, aquaculture, and harvesting of ecologically and economically important molluscs and sponges. This book is an enriched edition of invertebrate zoology and is a useful source of information for researchers and students in various disciplines. In recent years, a paradigm shift in research on invertebrates has occurred under the backdrop of climate change and environmental contamination. This important shift in the research is well reflected in this book.

This book - Biodiversity Enrichment in a Diverse World - considered biodiversity (plants, animals, fungi, and microbes) from three different angles: genetics, species, and ecosystems. The relationships between them are complex and it looks at these aspects from different angles and also various interventions at different levels. The scientific approach of the book demonstrates that the three levels are closely inter-

connected and action is therefore needed to conserve and protect the systems if the benefits provided to human life will continue to be available. However, conservation of the biological diversity is essentially an umbrella term for traditional species, relationship to human health, ecosystem conservation and the need to manage the human use of the species and ecosystems in a sustainable way.

This book is the first attempt to provide an overall picture of aquatic species invasions in Europe. Its geographical scope stretches from Irish waters in the west to the Volga River and the Caspian Sea in the east, and from the Mediterranean Sea in the south up to the Arctic coast of Europe. Not all parts of the continent could be covered equally, as in some countries species invasions are not yet studied. The book represents the array of all major European aquatic systems in the broadest geographical and ecological scope possible, from fully saline seas, semi-enclosed brackish water bodies and coastal lagoons to freshwater lakes, major river systems and waterways. The key objectives include the present status and impacts on economy and environment caused by non-native aquatic species in European waters. Altogether more than 100 scientists from 24 countries have joined together to synthesize the available information on bio-invasions.

This book examines what will happen to global invasive species, including plants, animals and pathogens with current and expected man-made climate change. The effects on distribution, success, spread and impact of invasive species are considered for a series of case studies from a number of countries. This book will be of great value to researchers, policymakers and industry in responding to changing management needs.

The world is in the midst of an ecological explosion with devastating implications. Thousands of species of microbes, plants, and animals are being introduced, both deliberately and inadvertently, to new land areas, seas, and freshwaters. In many regions, these new colonists are running wild, disrupting the dynamics of ecosystems, pushing native species toward extinction, and causing billions of dollars in direct economic damages. *Alien Species in North America and Hawaii* provides a comprehensive overview of the invasive species phenomenon, examining the threats posed and the damage that has already been done to ecosystems across North America and Hawaii. George W. Cox considers both the biological theory underlying invasions and the potential and actual effects on ecosystems and human activities. His book offers a framework for understanding the problem and provides a detailed examination of species and regions. Specific chapters examine: North American invaders and their threats how exotic species are dispersed to new regions how physical and biotic features influence the establishment and spread of invasives patterns of exotic invasions, with separate chapters covering each of the ten most seriously invaded regions and ecosystems patterns of invasiveness exhibited by major groups of exotics the theory of invasive capability of alien species and the resistance of communities to invasion theoretical aspects of ecosystem impacts of invaders and the evolutionary interaction of invaders and natives management and public policy issues *Alien Species in North America and Hawaii* offers for the first time an assessment and synthesis of the problem of invasive species in North American and Hawaiian ecosystems. Scientists, conservation professionals, policymakers, and anyone involved with the study and control of invasive species will find the book an essential guide and reference to one of the most serious and widespread threats to global biodiversity.

The spread of invasive alien species (IAS) is creating complex and far-reaching challenges that threaten both the natural biological riches of the earth and the well being of its citizens. While the problem is global, the nature and severity of the impacts on society,

economic life, health, and natural heritage are distributed unevenly across nations and regions. Thus, some aspects of the problem require solutions tailored to the specific values, needs, and priorities of nations while others call for consolidated action by the larger world community. Preventing the international movement of invasive alien species and coordinating a timely and effective response to invasions will require cooperation and collaboration among governments, economic sectors, non-governmental organisations, and international treaty organisations. This strategy highlights the dimensions of the problem and outlines a framework for mounting a global-scale response. While both the problem and the scale of the solution may appear dauntingly complex, the issue presents an unparalleled opportunity to respond with actions that link preservation of biodiversity with protection of the health and livelihood of the world's human populations.

Biological invasions by alien (non-native) species are widely recognized as a significant component of human-caused global environmental change and the second most important cause of biodiversity decline. Alien species threaten many European ecosystems and have serious environmental, economic and health impacts. The DAISIE (Delivering Alien Invasive Species Inventories for Europe) project has now brought together all available information on alien species in Europe (terrestrial, aquatic and marine) and from all taxa (fungi, plants, animals). Thus for the first time, an overview and assessment of biological invasions in the Pan-European region is finally possible. The Handbook of Alien Species in Europe summarises the major findings of this groundbreaking research and addresses the invasion trends, pathways, and both economic as well as ecological impact for eight major taxonomic groups. Approximately 11.000 alien species recorded in Europe are listed, and fact sheets for 100 of the most invasive alien species are included, each with a distribution map and colour illustration. The book is complemented by a regularly updated internet database providing free additional information. With its highly interdisciplinary approach, DAISIE and its Handbook will be the basis for future scientific investigations as well as management and control of alien invasive species in Europe.

Introduction of alien species constitutes worldwide one of the major threats to biodiversity, particularly in freshwater ecosystems. In France, the number of alien aquatic plant and animal species has increased exponentially over time in freshwater ecosystems and shows no sign of decreasing. For fish only, more than 40 alien species have been either voluntary or involuntary introduced in the past decades. About two-thirds are still present today and at least 26 are naturalized. As in many European countries, the fish introduction history in France switched from voluntary introduction in the nineteenth century (aquaculture, sport fishing, and management of ecosystems) to unintentional but human-aided introductions (aquarium trade and global ship transport). The negative impacts of alien species on native species and ecosystems are most often unknown in France and needs further studies to develop a functional policy on alien species introductions and the protection of aquatic ecosystems integrity. The information gathered allow discussing the possible reasons explaining whether an alien species is able or not to establish sustainable populations in France and thereafter became invasive, such as gobies recently arrived.

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