

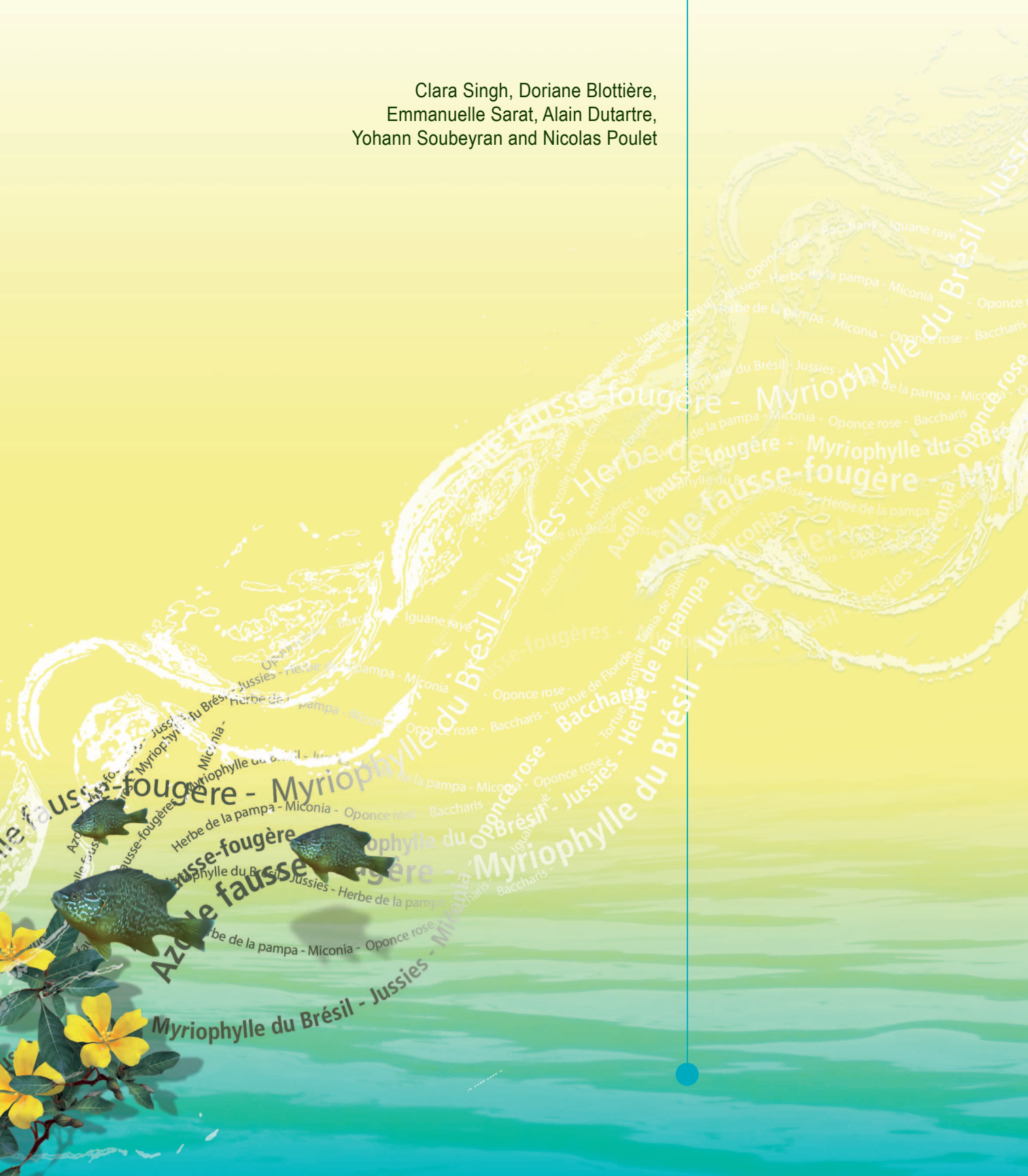
Invasive alien species

Practical information and management insights


Vol. 4

Management insights (ter)

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Almost 50 people contributed to this fourth volume on invasive alien species in the *Knowledge for action* series. The geographic and professional diversity of those people illustrates the collaboration on IAS management that has been growing over the years.

The list is however simply the tip of the “human iceberg” comprising a much greater number of people already engaged in sharing information and ideas on the damage caused by invasive alien species and on how to approach their management. More generally speaking, these participants all contribute to our understanding of our relationship as a species with nature as we progress in assessing the impacts of our activities.

With that in mind and in addition to the persons listed in the Acknowledgements at the end of this volume, we wish to extend our sincere thanks and acknowledgement to the many people not mentioned, whose questions, requests, opinions, comments, disagreements and criticism all contribute to our innumerable discussions and assist us in collectively building up an IAS community that is of vital importance in drawing the attention of society to the importance of the issues involved in biological invasions and the responsibilities that we humans must assume in this field.



Editors' preface

The introduction and development of invasive alien species (IAS) are acknowledged as one of the main causes of biodiversity loss worldwide. Consequently, the Convention on biological diversity decided to include this issue as a specific objective of the 2011-2020 strategic plan that the ratifying States, including France, committed to achieving by 2020. In October 2014, a new EU regulation on the prevention and management of the introduction and spread of invasive alien species became applicable in all the Member States. In France, the national IAS strategy was published in 2017 and now provides a framework to mobilise all the concerned stakeholders and meet the international objectives.

France is obviously confronted with the same problems and there are numerous examples of invasions by alien species in both continental France and the overseas territories. Islands are particularly vulnerable to the problems caused by IAS. Depending on the specific situation, these species enter into competition with native species, modify the functioning of natural habitats and the services provided by ecosystems, affect economic activities and can even undermine human health. The issue has become one of the main concerns of managers of natural areas and of decision-makers in a large number of local governments. IAS are increasingly the topic of statements and reports in the media, and consequently citizens have begun to take note.

Over the past 20 years, a growing number of actors in areas spanning highly diverse administrative and geographic scales have entered the fray in an attempt to prevent and overcome the difficulties created by invasive alien species. Specific needs rapidly became apparent in terms of coordinating work, organising monitoring, assessing the impacts, establishing research programmes, defining strategies and producing effective results.

It is in the above context that the IAS Resource Centre, co-managed by the IUCN French Committee and OFB, works to assist all the concerned participants in their efforts to counter biological invasions. The centre's Science-advice and Technical Network (REST) comprises approximately 100 representatives of various actors (managers of natural areas, researchers, non-profits, public agencies, State services and local governments). The centre works essentially with professionals and biodiversity managers in an effort to improve the effectiveness of projects to prevent and manage biological invasions and to support ad hoc national policies, notably the national IAS strategy.

To address overseas issues, the centre calls on the Overseas IAS Network (formerly the Overseas IAS Initiative) managed by the IUCN French Committee since 2005. Similar to REST, the network enables productive discussions and the sharing of data between the overseas actors in the IAS field. The centre and the network work together closely to achieve the shared objectives and to meet the increasing needs of the actors in the overseas territories.

One of the main expressed needs of IAS managers is the availability of management methods and techniques. Rather than offering "solutions" that are generally not applicable to most local situations, it was decided from the start to compile project management reports drafted in close collaboration with the managers of each IAS project. These reports have the advantage of being highly practical and of proposing, if not solutions, at least actionable ideas to be tested as well as the contact information of the project managers.

This approach, launched in 2012, has already produced a large number of project management reports that, though they represent only a fraction of the work and projects undertaken throughout France, provide useful information on the relative importance of the species managed, of the techniques used and of the regions active in setting up IAS projects.

To improve the visibility of the overseas territories, which have significant experience in the IAS field that has been insufficiently publicised, the approach was extended to include the overseas territories in 2017, in conjunction with the Overseas IAS Network. IAS have significant ecological consequences in continental France, however they are an even greater cause of biodiversity loss in the overseas territories which are made up of many islands whose evolution far from the continents has resulted in unique and fragile ecosystems representing almost 80% of biodiversity in France as a whole. The resulting management reports, almost a dozen in number, represent a valuable instrument for the territories that are confronted with the need to take action quickly given their vulnerability.

Similar to volumes 1 and 2 published in 2015 and volume 3 published in 2018 in the **Knowledge for action** series, this fourth volume is the product of the work by the IAS Resource Centre and the Overseas IAS Network. It would not exist without the contributions and the involvement of many managers of natural areas, whose knowledge and know-how are thus made available to a wide audience. The objectives of this volume are to encourage new initiatives in IAS management, provide a general framework of information and present a wide array of practical examples to assist managers and decision-makers in their respective efforts to improve IAS management. We hope that this volume will contribute to raising awareness of the issues involved in managing invasive alien species in both continental France and in the overseas territories.

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Abstract

Invasive alien species (IAS) and their impacts represent a growing concern for the managers of natural areas. In both continental France and the overseas territories, a large number of people and organisations have taken action to limit the damage. Recent public policies launched on both the EU and national levels facilitate the work, however significant new knowledge is needed before any real progress can be made in both continental France and the overseas territories.

This is because numerous and diverse species of fauna and flora from an array of freshwater, terrestrial and marine ecosystems are involved in the biological invasions and it is necessary to share experience and knowledge in order to improve the methods and techniques currently used.

In the field, which species are managers attempting to address? Which techniques are used, where and how, and what are the objectives and the results achieved? What new initiatives have been launched?

These four volumes in the **Knowledge for action** series clearly present the situation and propose a scientifically based approach, with information on the specific factors of each situation, including the site, the targeted species and the relevant technical and financial data.

Vol. 1 Practical information

The first volume presents the current situation concerning invasive alien species in aquatic environments in continental France.

Six chapters provide a detailed outline on:

- current scientific knowledge on IAS, including definitions, colonisation processes, impacts and topics for future research;
- current legislation and regulations addressing IAS on the international, European and national levels;
- IAS strategies and action plans, including the main participants and existing projects;
- the general approach to IAS management, i.e. prerequisite knowledge, prevention, monitoring and action taken;
- IAS management, including a presentation on the overall situation for interventions, a panorama of existing techniques, the management of waste and assessments of management work;
- the existing tools available to managers, e.g. coordination of projects, lists of species, databases, platforms for information exchange and collections of feedback from management projects.

Vol. 2 - 3 and 4 Management insights

These three volumes are a collection of fact sheets on invasive alien species and reports on management projects carried out in continental France, the French overseas territories and Europe.

The management of 49 species (fauna and flora) is examined in 111 management reports drafted in direct collaboration with the concerned managers. The second volume, published in 2015, contains 51 reports, the third volume 35 and the fourth volume fills out the collection with a further 25 reports.

The fact sheet for each species includes descriptive information on species identification, biology and ecology.

The management reports include:

- the organisation managing the project;
- a description of the project site with maps;
- the problems on the site and the issues at hand;
- the intervention techniques, e.g. the selected method, each operational step, schedules, technical constraints;
- project results and budget;
- the outlook at the end of each project;
- efforts to promote the project and its results;
- available documentation and the contact person for more information.



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Introduction

The overall objective of these successive volumes is to provide managers with a source of information that can help them in improving their management techniques for plant and animal IAS in their area.

The first volume presents a general outline of the available knowledge on IAS in aquatic environments in continental France (scientific data, regulations, management strategies and techniques). The second, third and fourth volumes present an illustrated panorama of management techniques for various IAS, discuss issues and outline processes for setting up management work. The transformation of the Biological Invasions in Aquatic Environments work group (IBMA) into a resource centre specifically addressing IAS issues led to a widening of the scope to include terrestrial, marine and overseas environments (Box 1). Consequently, the range of topics covered by the project management reports progressively shifted to include more types of environments and territories. That is why this fourth volume presents reports on terrestrial environments as well and, thanks to the Overseas IAS Network (Box 2), a more balanced approach including IAS management projects in both continental France and the overseas territories.

Box 1



The Invasive Alien Species Resource Centre

To assist all participants in managing biological invasions, the IUCN French Committee and OFB have operated since 2018 the IAS Resource Centre, the successor to the Biological Invasions in Aquatic Environments work group (IBMA) that launched its activities in 2008. The centre works to improve the effectiveness of projects to prevent and manage biological invasions and to support ad hoc national policies, notably the national IAS strategy. The centre reaches out primarily to professionals and biodiversity managers, and focusses on both plant and animal species in marine, freshwater and terrestrial ecosystems in continental France as well as the overseas territories.

To that end, it attempts to:

- contribute to the steadily expanding proficiency and capabilities of actors;
- produce, implement and disseminate knowledge and know-how;
- develop collective training for actors and a common approach concerning objectives in terms of knowledge and management.

The Science-advice and Technical Network (REST), a central component of the IAS Resource Centre, comprises approximately 100 members representing various IAS stakeholders (managers of natural areas, researchers, non-profits, State services, public agencies, etc.). For the overseas territories, the IAS Resource Centre counts on the Overseas IAS Network (formerly the Overseas IAS Initiative) (Box 2).

The Overseas Invasive Alien Species Network

French overseas territories, located in or along all three oceans under different latitudes, are home to exceptional biodiversity. A majority are islands and their evolution far from the continents resulted in the emergence of a large number of endemic species that are, consequently, highly vulnerable to biological invasions. Given the seriousness of these threats, the IUCN French Committee in 2005 launched an initiative to mobilise all French overseas territories in confronting the problem. With 15 years of experience in IAS management, in 2020 the initiative became the Overseas IAS Network, the obvious partner of the IAS Resource Centre for overseas IAS issues. In order to assist IAS stakeholders in the overseas territories, the Overseas IAS Network:

- provides support in disseminating knowledge and raising awareness concerning biological invasions;
- acts as a knowledge centre to improve anticipation, prevention and to enhance the effectiveness of management operations;
- works to federate efforts against biological invasions throughout the overseas territories and in each region.

The network comprises almost 100 experts and go-to persons. Together, the network and REST cover all French territories (continental and overseas) worldwide and can bring to bear a full range of knowledge to meet the shared objectives of the network and the IAS Resource Centre.

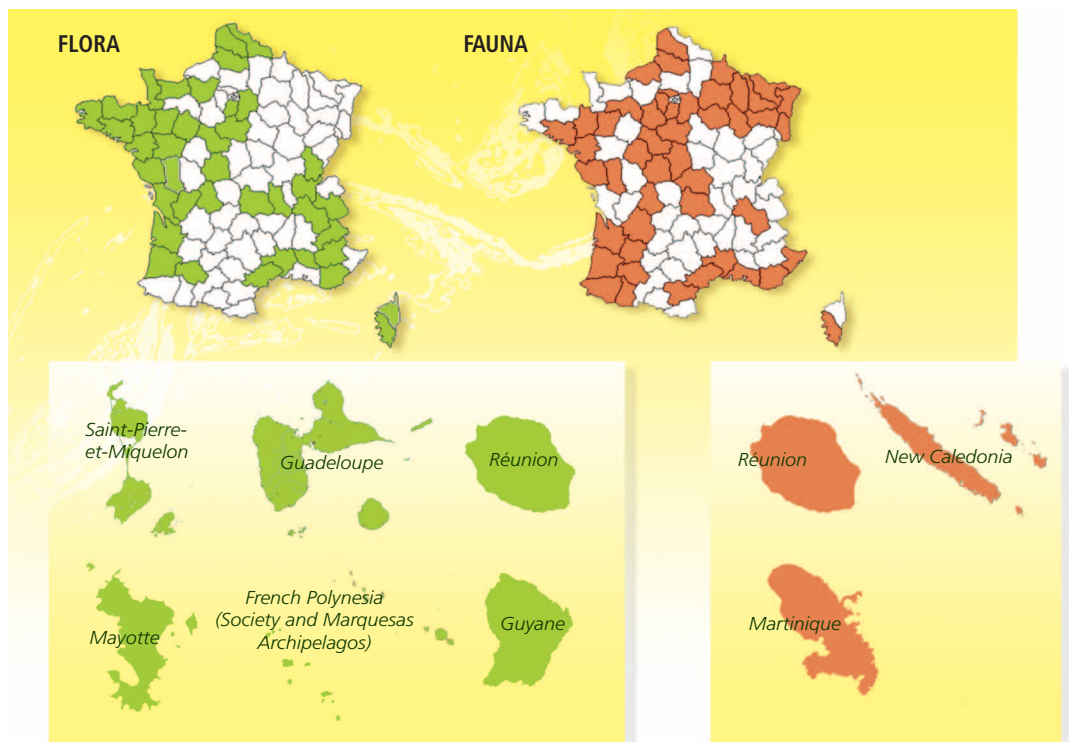
These three volumes are the product of a collaborative approach that mobilised over 150 managers of natural areas in continental France, the overseas territories and in neighbouring countries. A total of 49 different species and 111 management projects are presented. Several examples of management for a given species may be presented if the types of sites and situations differ significantly.

The objective was to collect and disseminate a wide set of management reports, the purpose being not to suggest “one size fits all” solutions that often disappoint, but rather to assist managers in understanding their particular problem and in identifying the methods and techniques best suited to the local management needs.

Table 1 Numerical data on the management reports presented in volumes 2, 3 and 4.

	Volume 2		Volume 3		Volume 4	
	Flora	Fauna	Flora	Fauna	Flora	Fauna
Species	13	13	14 (including 8 new species)	7 (including 4 new species)	16 (including 9 new species)	4 (including 3 new species)
Management projects	27	24	27	8	20	5
Countries	6	6	4	2	1	1
Departments in continental France	24	44	19	7	13	1
French overseas territories	/	/	2	1	4	2
Organisations involved	30	28	30	10	26	5
Contributors	30	33	32	12	32	12

Figure 1



French departments and overseas territories involved in the management projects.

Organisation of the presented management projects

Managers are confronted with the disturbances caused by particular species in their area and generally adopt an approach focussing on the species rather than on the type of environment. The management projects presented in detail in the following pages adopt the same approach.

To facilitate their study, the management projects concerning plant species are grouped according to the types of plants listed below.

Aquatic plants

- hydrophytes
- amphibious plants

Terrestrial plants

- herbaceous plants
- cacti
- trees and shrubs

Similarly, the management projects concerning animal species are grouped according to the following types of animals:

- invertebrates;
- reptiles;
- fish;
- birds;
- amphibians;
- mammals.

In addition, a brief, illustrated “species fact sheet” precedes the management examples for the species in question and provides a succinct presentation comprising:

- species taxonomy;
- a description (morphology, distinctive characteristics, etc.);
- species biology and ecology (types of habitat, living and reproductive conditions, etc.);
- documentation.

Wherever possible and depending on the available information, each management report is divided into an identical set of sections:

- a brief description of the management organisation with contact information;
- geographic location and description of the area concerned by the management project;
- detailed information on each intervention:
 - initial causes (disturbances and issues related to the presence of the species);
 - objectives;
 - practical details (methods employed, results including the quantities eliminated, animals captured, use of waste);
- technical results and costs;
- promotion of the project (articles, etc.);
- the outlook at the end of each project;
- any applicable regulations (for fauna);
- sources of information, links, other contacts.

All the management reports contained in the three volumes may also be downloaded (PDF format) from the IAS Resource Centre site (<http://especes-exotiques-envahissantes.fr/>) and from the OFB technical portal (<https://professionnels.ofb.fr/en/node/1527>). The overseas management reports may also be downloaded from the Overseas IAS Network site (<https://especes-envahissantes-outramer.fr>).

Box 3

Aquatic, semi-aquatic and terrestrial plant species

The plant species discussed in the management projects are divided into different categories.

Aquatic plants

Hydrophytes

“Plant whose entire vegetative structure is located in a water body or on its surface. A hydrophyte may float on the surface and, in the fall, release buds (hibernacles) that spend the winter lying on the bottom of the water body. A hydrophyte may also have roots in the soil beneath the water body. Generally speaking, the reproductive organs of hydrophytes spend the winter below the water surface.” Hydrophytes necessarily grow in an aquatic environment and their entire vegetative structure develops in water¹.

Helophytes

“Plant whose vegetative and reproductive components rise into the air, but whose roots lie in water-permeated soil. During the winter, helophytes consist solely of their stalk rooted in the soil”¹.

Amphibious plants

“Plant capable of living both on land and in water.”¹ These plants can withstand major variations in water levels.

Terrestrial plants

Herbaceous plants

Plants whose stalk and branches are not woody. Their substance remains tender.

Cacti

Plants with fleshy, green stalks filled with more or less viscous liquid (hence the name succulents) and whose leaves take the form of spines.

Trees and shrubs

Plants whose stalk and branches are woody, i.e. consist of wood or are similar to wood. Shrubs are shorter than trees. A tree is at least seven metres tall.

1. Fare A., Dutartre A. and Rebillard A., 2001. *The main aquatic plants in south-west France. Adour-Garonne Water Agency, 189 pp. (In French)*

Benefits derived from the management reports and the overall project

■ The origins of the project

The project to collect management reports was started by IBMA in 2013 following an open call for contributions. The objective was to assist managers in designing projects and to enable them to develop their own methods tailored to local situation, consequently the reports had to include the knowledge and know-how of the people working in the field. This practical knowledge on managing IAS was wide ranging and difficult to collect in a systematic manner, which meant that it often remained unused unless it was presented during special meetings addressing practical aspects, meetings that have become less rare in the past few years.

■ Availability and use of the knowledge gained by managers

This approach, based on regular contacts (meetings, forums) between network members from all types of organisations (local governments, non-profits, managers, etc.) and the drafting of detailed management reports with the people in the field, resulted in the establishment of a wide-based network and in better use and awareness of the knowledge that had been scattered geographically and difficult to detect. These shared experiences now cover the needs that have been clearly identified on the international level and constitute a useful source of operational information for managers. The collected reports, constantly growing in number over time, represent an indispensable source of precise data on management projects that can be widely disseminated.

■ Improvements in collecting management data and information

In drafting the management reports, the managers of natural areas, in conjunction with the coordinating team at the IAS Resource Centre, are in a position to clearly identify the information that previously was not systematically gathered during projects, for example certain quantitative data, cost data, subsequent monitoring work and the local constraints imposed by the actual conditions in the field. That data is, however, indispensable in precisely assessing project characteristics, in justifying management work to funding entities and in better defining objectives and adapting management techniques. The organised management of this data is also the means to preserve the information on IAS interventions for the future, thus ensuring the consistency of work and reducing any losses in skills and know-how that may occur when people change jobs or retire.

■ Improvements in methods and techniques

The frequent sharing of information and data is also a means of identifying missing links and potential improvements in management practices and in the technical and scientific information required in carrying out the management work. The changes made over time in this systematic collection of project data resulted in improved techniques, in developing management plans better adapted to the local context and in pooling numerous data points that can subsequently be analysed more effectively to produce more relevant results. The identification of obstacles frequently encountered by several managers serves as an encouragement to put more thought during planning processes into aspects previously considered secondary, but that are nonetheless integral parts of a project, e.g. communication efforts prior to starting actual work and the management of the waste produced by the work.

■ An increased commitment to sharing information

Regional initiatives to reinforce the sharing of information are increasingly frequent, thus confirming the interest in and value of the process. Increasing numbers of management reports are available on various platforms and the IAS Resource Centre is attempting to coordinate with the different networks in order to select and centralise, among locally drafted documents and received proposals for publication, the reports providing the greatest value on the national level. For example, management work done on emergent species or on species for which little information has been made available, notably animal species, is considered of particular interest. Similarly, regions that have not yet shared their know-how, e.g. the overseas territories, also receive special attention.

■ Reinforced networking of stakeholders

These collections of management reports are a clear encouragement to establish contacts between managers, particularly when large distances are involved, for example between the French overseas territories, but the species and issues involved are the same. The inclusion of the overseas territories in this project is the occasion to establish contacts between overseas and continental participants who have, to date, not cooperated enough on IAS issues and whose discussions will enhance the overall process. What is more, to enhance and facilitate contacts on IAS issues with neighbouring countries, continental and overseas actors can use the English translations of the management reports in their work on the international level.

Figure 2



The sharing of information in the Science-advice and Technical Network (REST) and the Overseas IAS Network, and the drafting of management reports make available the knowledge gained by stakeholders in the field and improve the data-collection system for IAS management.

a, b © E. Sarat, IUCN French Committee