

Interregional Workshop on different eradication and control methods for Invasive Alien Species

Palais Lantivy, Ajaccio, Corsica

60 participants representing the University of Corsica, organizations of the French state, the fishing federation, beekeepers, the federation of divers and various managers of natural areas (forests, coastline ...).

INTRODUCTION

Mr. Julien Paolini, territorial adviser to the Corsican Community, delivers the opening speech of this workshop. He first thanks the project leader, Greece through the National Center for Environment and Sustainable Development (NCESD), especially its director Dr. Varelidis, editor of the 2014 European invasive species regulation. He then thanks the rest of the project partners as well as the local partners.

He reminds that Corsica is a refuge of biodiversity, a hotspot, because of the high rate of endemism on the island. However, this biodiversity is threatened by human activities such as increased trade, overcrowding, pollution and, of course, the introduction of new species.

These invasive alien species (IAS) are the second most important biodiversity loss in the world behind habitat degradation. The introduction of species is an old phenomenon but has accelerated in recent years with the advance of transport, increased trade and climate change. He illustrates his remarks by recalling figures concerning flora. Indeed, today there are almost as many invasive plant species as endemic species. This implies implementing appropriate measures to conserve biodiversity. Awareness, control and fight actions are therefore essential. These actions must be carried out in a coordinated manner between public institutions and their partners.

Today, the legislative and regulatory tools are still perfectible and means must be found to adapt the regulations to the specificities of the regions. This is one of the main challenges of the INVALIS program. INVALIS will assist policymakers to improve IAS management and increase public administrations capacity to effectively implement IAS management policies.

Mr. Paolini gives the floor to Mrs. Marilena Eleftheriou, representative of the NCESD, who presents INVALIS in more detail.

Mrs. Eleftheriou also recalls the danger of invasive alien species. She emphasizes that they occur in all major taxonomic groups and are found in every type of habitat, thus causing a great

threat to local species as well as billions of euros of damage each year. That's why the Interreg Europe program INVALIS was launched. INVALIS brings together 7 partners from 7 countries to share their experiences with invasive species management to improve their environmental policies, by supporting policy measures for the prevention, early detection and control of IAS.

Thus the Ajaccio workshop will allow the various actors present to exchange their experiences on the different methods of monitoring, control and eradication of the IAS they use.

Part one: Presentations and interventions

Presentation 1. Actions carried out by the Environmental Agency of Corsica on IAS issues: the ALIEM project

Mrs. Marie-Cécile Andrei-Ruiz, Environmental Agency of Corsica – Observatory and Conservatory of Insects of Corsica, presents the ALIEM project. It is an Interreg program with nine partners spread over the five regional territories of the Marittimo Program. ALIEM proposes to respond to the problem of invasive species spreading that threaten Mediterranean biodiversity.

The ALIEM project works on 4 axes:

- Creation of a cross-border platform for collecting, exchanging and analyzing IAS data
- Organization and animation of the surveillance network
- Awareness and education
- Implementation of the cross-border observatory and definition of an action plan

With these axes, the project will improve the knowledge on IAS, organize a cross-border information system by sharing initiatives and data to contribute to an alert and education system in order to act effectively to better control threats and contribute to restoration of degraded ecosystems.

Thus the program has made it possible to raise the awareness of more than one million citizens, more than 500 institutions and more than 900 scientists on the issue of IAS through brochures, communication campaign or exhibitions.

Question from Mrs. Véronique Touquet, Agglomeration Community of Ajaccio (CAPA): How were the figures presented obtained?

Mrs. Marie-Cécile Andrei-Ruiz: With various actions such as interventions on the radio, with schools, more specific meetings with key players in the environment. The program has a tool that allows to inform the number of people affected by these interventions and to know the number almost exact.

Presentation 2. What has been done (or still in progress...) on invasive plants in Corsica

Mrs. Hugot, National Botanical Conservatory of Corsica – Environmental Agency of Corsica, presents the various activities of the conservatory. Before that, she describes the geographical characteristics of Corsica and the different stages of vegetation. She recalls that Corsica is a refuge area in which one can find relict species of the last ice age like *Myrtus communis*. She emphasizes the fact that beyond a strong endemism, Corsica presents a large number of rare species (present in less than 3 localities). In view of these specificities, the problematic invasive species is very important in Corsica. In addition, since 1978 there has been an acceleration in the number of introduced alien species.

Based on the work of A. Natali and D. Jeanmonod in 1996 on introduced flora, the Botanical Conservatory was able to launch in 2004 a first program on introduced species consisting of species mapping and social studies. Then the Conservatoire took part in the Mediweeds network and in 2011 recruit an agent who works on the IAS issue. They conduct different studies such as a Comparative analysis of the alien vascular flora of Sardinia and Corsica and germination test for the ALIEM project.

Another achievement of the Conservatory is the creation of a label in 2016: Corsica Grana. This label promotes the use of local plants for ornamentation with locally produced plants to limit the import of exogenous plants.

The Conservatoire also participated in the drafting of various regulatory tools such as the National control plan on *Cortaderia sp.* or the National strategy on invasive species.

No questions were asked.

Presentation 3. Marine Invasive Exotic Species - Example of a surveillance network: The Alien-Corsica Network

Mrs. Emeline Barralon, University of Corsica, after having recalled the definition of an invasive species, presents the issues related to the marine environment, in particular the different vectors of introduction. In the Mediterranean, the main vector of introduction is the passage of species through the Suez Canal. Faced with the increase in the number of marine species introduced along the Corsican coast, in 2015 the Corsican Environment Office launched the Alien-Corse network.

The purpose of the Network is to identify as early as possible any arrival of new species along the coast of Corsica in order to alert the public to the potential threats related to these species, and to implement, if possible, management measures to restrict their negative impact on the environment or on human activities.

The network functions thanks to the reports that the divers make. They complete a descriptive sheet gathering the various necessary informations as well as a photo of the species. Thus

49 brackish and marine water alien species have been reported. The network has made it possible, for example, to monitor the evolution of *Percnon gibbesi* populations along the Corsican coast.

Numerous communication tools have made dive clubs and schools aware of the problem.

Note from Mrs. Anna Occhipinti, Lombardy Foundation for the Environment: It's important to note that *Percnon gibbesi* entered the Mediterranean alone through the Strait of Gibraltar. It is also important to take action against this species although it is not considered invasive with regard to the European regulation.

Question from Mr. François Arrighi, Environmental Agency of Corsica: Mr. Arrighi noted in the intervention the notion of eradication in the marine environment. He asks then if he is known in the world a successful eradication action.

Mrs. Emeline Barralon: There is no case of eradication in the marine domain. The Alien network allows an early detection of new species. This detection allows a rapid response that is more in the order of limiting diffusion than eradication.

Question from Mr. François Arrighi, Environmental Agency of Corsica: Mr. Arrighi asked if an economic valuation of the crab *Percnon gibbesi* was considered because a close species is very popular in Asia.

Mrs. Marie Garrido, Environmental Agency of Corsica: It is not planned to make an economic evaluation because there are not enough individuals.

Mrs. Marie-Cécile Andrei-Ruiz reminds that often to fight against an invasive species is introduced another species. It would be interesting to discuss these aspects introductions of new species which sometimes can make things worse.

Presentation 4. Mode of IAS governance and decision-making in Latvia

Mrs. Evija Andrušķeviča, Nature Conservation Agency in Latvia, recalls that, as a country of the European Union, Latvia is subject to EU Regulation 1143/2014. In this regulation, we find the list of Invasive Alien Species of Union concern. This list contains 49 species of which 18 are found in Latvia.

She presents the different species present in Latvia including *Heracleum sosnowskyi*, the only species on the list of invasive alien plants in Latvia. She specifies the presence of a Regulation Regarding Restricting the Spread of the Invasive Alien Plant Species.

Currently, a complete national regulation is in place for a single species: *Heracleum sosnowskyi*. The process to adjust national regulation to implement provisions set in EU regulation is a slow and long process. EU level approach is abstruse for ordinary people and commercial sector. The quality of distribution data for some invasive species is low and the resources for the implementation of all necessary actions are insufficient. But IAS are one of the priorities for funding of projects by the government, the national regulation prevent conscious release/establishment of non-native species

in the wild and promote eradication of them. Existing legislation can provide lessons and help eradication of invasive species and implementation of regulation such as tax reductions where invasive species have been eradicated or special payment for management practices devoted to eradicate invasive species

As a result, Latvia faces challenges and is already preparing future measures to combat IAS such as the National list of IAS of Latvia, Regulations Regarding Restriction of the Distribution of Invasive Alien Species or Procedures for developing Invasive Alien Species control and eradication plans.

No questions were asked.

Presentation 5. Risk assessment on invasive alien plants

Mr. Yohan Petit, National Botanical Conservatory of Corsica – Environmental Agency of Corsica, after recalling the characteristics of the Corsican flora and the threats caused by the invasive flora, presents the method of elaboration of the lists of invasive exotic plants used in Corsica.

The first step is to identify which taxa are selected. For this, several criteria are studied: whether the plant is exogenous or native, the date of introduction (before or after 1492) and autonomy (naturalized or not escaped). A state of knowledge is done for each taxa.

Once the taxa have been selected, a risk analysis is carried out using three criteria: the abundance-dominance index noted from 0 to 3 with 0 being the absence of the taxon and 3 being a recovery regularly greater than 50%, the frequency of the taxon in Corsica in a Grid of 5*5 km and the invasiveness based on a risk assessment.

This is a solid and objective methodological framework and a support to the Regional Strategy for IAS management. This allows for more targeted and effective actions and creates links with geographically close territories.

Question from Mrs. Véronique Touquet, Agglomeration Community of Ajaccio (CAPA) asks if the list provided by the Conservatory is the same provided by the French Water Agency.

Mr. Yohan Petit points out that, although the Environmental Agency of Corsica participated in the elaboration of the list of the Water Agency, it is not the same list. On the other hand some species are common between the two lists.

Presentation 6. Management of Invasive Alien Species in Extremadura

Mr. Francisco Antonio Hueso Fernandez, Ministry of Environment and Rural Agricultural Policies and Territory - Government of Extremadura, reviews the actions carried out in Extremadura for the management of invasive alien species. The concern about Invasive Alien Species started in

2004, with the appearance of common water hyacinth (*Eichhornia crassipes*) in the Guadiana River. After that the Administration begins to be aware of this issue after the appearance of some studies on invasive species (fish, etc.). As a result, the Life Invasep project begins to be implemented on the ground in 2012, which starts working in the control of alien species in both the Guadiana and Tagus basins. Then the Royal Decree 630/2013 of August 2 of the Spanish catalog of invasive alien species was approved. The region of Extremadura has proposed the creation of a national biological invasion management team, led by the Ministry of the Environment. As a result, an early warning network has been created, interconnected at both the national and regional levels.

So in Extremadura a series of actions has been conducted such as introduction and propagation risk analysis for the zebra mussel (*Derissa polymorpha*), mapping, study of control and elimination by biological methods of Mimosa (*Acacia dealbata*) and Ailanthus (*Ailanthus altissima*), studies on distribution on several species like the American mink (*Neovison vison*) and awareness actions with brochures, itinerant exhibition and social networks.

No questions were asked.

Presentation 7. Monitoring of a potentially IAS vector of human diseases: example of *Aedes albopictus* in Corsica.

Mrs. Hélène Barré-Cardi, Environmental Agency of Corsica – Observatory and Conservatory of Insects of Corsica, presents the monitoring of the *Aedes albopictus* mosquito in Corsica. First of all she details the invasiveness of the species. Indeed, the species is native of the south-east of Asia and lives in bamboos and tree holes. He adapted to artificial breeding sites such as tires. This gave rise to a large global expansion due to passive transportation of the eggs. It is now the most invasive mosquito species. We can find it in natural and urban areas, close to humans. It's a potential vector of numerous pathogens like arboviruses (dengue, chikungunya, zika...).

In Corsica, the first report was made in 2002 but no sign of colonization was found. In 2006, it was shown that the species settled in Northern Corsica and in 2007 in Southern Corsica. A rapid mosquito expansion by passive transport in vehicles leads to an almost total colonization of the island in 2018.

That's why since 2006, a network was set up on the whole island. This network made it possible to follow the evolution of the populations and to note pest-free zones: further away, more at altitude and less populated. This network consists of setting up of ovitraps on the whole island.

To limit the risk of transmission of pathogens, it is necessary to act on the densities of mosquito populations by eliminating breeding sites and by sensitizing individuals. Indeed, it is important to make people aware that they are potential mosquito breeders when areas of stagnant water are present in their flower pots, for example.

The goal of the vector control network is to prevent mosquitoes from biting people and getting infected (operational fight) and to prevent healthy people from getting stung (individual prevention).

No questions were asked.

Presentation 8. Introduction of species, basta !!! Local Observatory of Biodiversity

Mrs. Violette Foubert, CPIE Centre Corse A Rinascita, presents the CPIE. It is an association presenting two main axes of work: the raising of awareness and the education of all to the environment for the sustainable development as well as the support of the territories in the service of public policies of sustainable development projects.

She recalls the characteristics of Corsican fish populations, particularly with the presence of trout (*Salmo trutta*) of Mediterranean and endemic origin. These species are threatened by the introduction of more than 20 fish species for fishing or accidentally. The problem is that these introduced species are common in continental France. There is no specific regulation related to these fishes. There needed to be a way to stop the introduction, to improve the knowledge and to raise the awareness of users, especially fishermen.

This is why the Local Observatory for Biodiversity was created in 2011 with two mains actions: raising awareness and environmental engineering (inventory and data analysis). To do this a website dedicated to data collection has been created, posters and flyers have been distributed and tools for the identification of species have been produced. Thus maps of distributions of these species could be made and allowed to improve the knowledge.

No questions were asked.

Presentation 9. Study and follow-up of the Red Weevil of Palm in Corsica

Mrs. Catherine Gigleux, Fredon Corse (Regional Federation of Defense against Harmful Organisms), is responsible for monitoring the Red Weevil. Fredon is the organization in charge of epidemiosurveillance, prevention and control of animal and plant diseases and certain tasks related to sanitary and phytosanitary controls.

The monitoring network has four roles: inspection of towns, setting up a trapping network, inspection of palm trees in nurseries 4 times a year and palm mapping. The weevil was first reported in 2006 in Porto-Vecchio (south-eastern Corsica) before spreading on almost the entire Corsican coast. The monitoring is carried out thanks to 4 types of traps and 2 types of pheromones. The data collected in these traps are referenced in an application that directly transfers the data to a server. This allows an analysis of the flight cycle and an analysis of the survival of the insect according to the climatic conditions. Protections of palms with biological methods as well as sanitation or destruction if necessary of affected palms are thus achieved.

No questions were asked.

Conclusion of the Part One

At the end of these presentations, it appears that different means are put in place to fight against IAS even if the problem seems to be very recent. In particular, the presence of various effective surveillance networks affecting virtually all environments and involving various parts of the population. Institutions, academics and users are all involved in effective species detection.

Communication and public awareness seem to be an important part of the action taken on IAS. It is indeed through a global awareness that this problem can find answers.

Eradication methods following these detection networks are also in place.

There is also a problem of adaptation of national policies at a local level. Some laws do not seem adapted to the situation of certain regions and cause difficulties or inability to manage invasive species.

That is why the INVALIS program should help to make political decisions in line with regional, national and European concerns.

Part Two: Workshops

Workshop 1: Detection and Monitoring of IAS

First, participants presented their IAS issues including a focus on marine and freshwater species. There was a certain heterogeneity across the different regions represented in the means put in place to address this problem related to IAS, as well as a need to prioritize the species to be monitored. In fact, the lack of material and human resources makes it necessary to make choices, depending on the danger of the species, and the feasibility of the actions to be undertaken.

In particular, the workshop reminded us that many works have called into question the famous Tens Rule (10% of introduced species are established). Indeed, it was found during these different that the success of establishment of introduced species was generally above 40%. This suggests that (i) we should focus our management efforts on reducing the number of introduced species and (ii) that it is important to detect IAS as early as possible, let alone potentially invasive species. It is also important to remember that in a climate change context, species could become acclimated more easily.

One of the alternatives, even if it is not the only one, is to play on early detection (Early Warning and Rapid Response, European Commission, 2011). Detection tools must be proposed as far upstream as possible and the notion of structured network and information gathering are / seem to be the best strategies. Some examples have been cited such as the ALIEM project, the ALIEN Corsica network or partnerships with environmental users such as fishermen in Greece or in the framework of the DACOR project in Corsica.

It was also emphasized the importance of governance and regulation. Politicians have a key role to play in stimulating the implementation of regulatory and decision-making tools (for example: motion and deliberation taken by the Assembly of Corsica on IAS). However, the will to do is not sufficient because it is necessary to have a regulatory framework at different scales: regional, national and international especially European. In particular, lists of species authorized for import, mainly for the terrestrial environment, were mentioned.

Workshop 2: Control and Eradication of IAS

Three points were discussed: regulations, control and eradication, and prevention.

At the level of regulation the participants agree that European regulations are necessary and that the drafting of lists of species at the local level is obligatory. For example in Spain there is only one list to regulate IAS. In some regions, however, species on this list are native and vice versa, especially in the islands. It thus appears the need to build these lists of invasive species in adequacy with a given territory according to the ecology of the environment. The construction of the lists must be based on a risk analysis linked to the European regulations. It also appeared that regulatory tools exist but that they are not necessarily exploited, one must also carry out legal analyzes to bring out all these tools.

The future of these regulated species was then discussed to eventually reach the means of control and eradication. The participants agreed that eradication and total control can only be done at a local level. The possibility of using these invasive species as natural resources, including some crabs or clams, has been discussed. But this may lead to a conflict of interest that may lead to dissemination for production or hunting. Thus we must avoid introducing species for economic reasons so that they do not find themselves in the nature once their interest disappeared. It has also been addressed the problem of communication around the eradication of IAS, especially around animal species. Control should be prioritized according to sites, target species and cost / benefit ratio.

Finally, prevention has been addressed. It was reminded of the need to work on the regulations already in place to make them known to citizens and politicians. It is also necessary to work with the horticultural sector which is a great vector of introduction. Volunteering is not the most effective tool. Work on regulations is essential. Internet marketing is an extremely important point, communication on this level is essential. Finally, LIFE programs can raise the awareness of users such as those in Rome for passengers at the airport.

Conclusion of the Part Two

Following these workshops, it appears that actions are being taken to fight against the introduction of invasive species. But there is also a lack of human and material resources to make the fight more effective.

Early detection has to be the first step in IAS management. Networks involving academics, scientists and users need to be put in place to ensure the finest possible follow-up.

Following this early detection, control and monitoring protocols must be put in place quickly, taking into account the environmental characteristics, the costs and benefits of the actions and the feasibility of the methods.

To achieve these goals, local regulations need to be drafted to enable environmental actors to monitor and control as efficiently as possible.

Guidelines

- Implement monitoring networks involving all the actors of the environment;
- Realize solid and objective methodological framework and control protocols based on ecological, economic analyzes;
- Adapt national policies at a local level;
- Write lists of invasive species specific to regions;
- Work with the horticultural industry and help nurserymen to propose alternative solutions for ornamental plants;
- Do not introduce alien species for commercial or recreational purposes;
- Communicating around the phenomenon: intervention with schools, exhibitions, scientific conferences, information brochures ...
- Carry out a study of the already existing regulations and to fight against the invasive species: sanitary fight, introduction for pet shops ...