



# African clawed frog

(*Xenopus laevis*)

## Managing the African clawed frog in the Argentonnay area

### Bressuire urban area (Agglo2b)

- This management project was carried out from 2011 to 2013 by the Argentonnay intermunicipal association (CCA). Following the local-government reform, the CCA was folded into the Bressuire urban area (Agglo2b) on 1 January 2014.
- One of the responsibilities assumed by Agglo2b concerns the protection and development of the environment and of living conditions:

- restoration, maintenance and preservation of rivers, management of the Argenton valley Natura 2000 site;
- management of invasive species with an action plan against the African clawed frog initiated in 2011.

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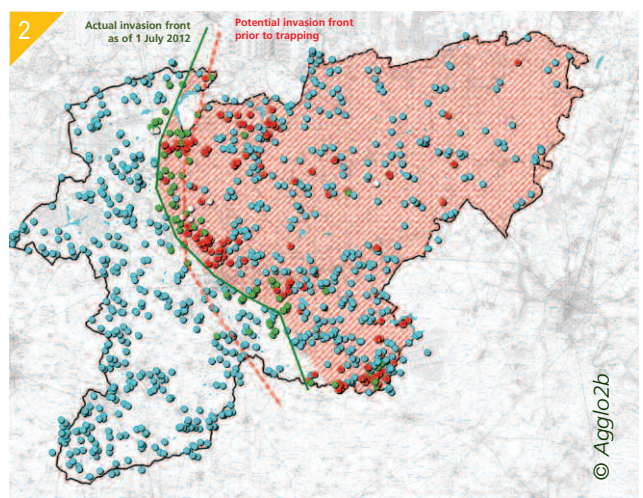
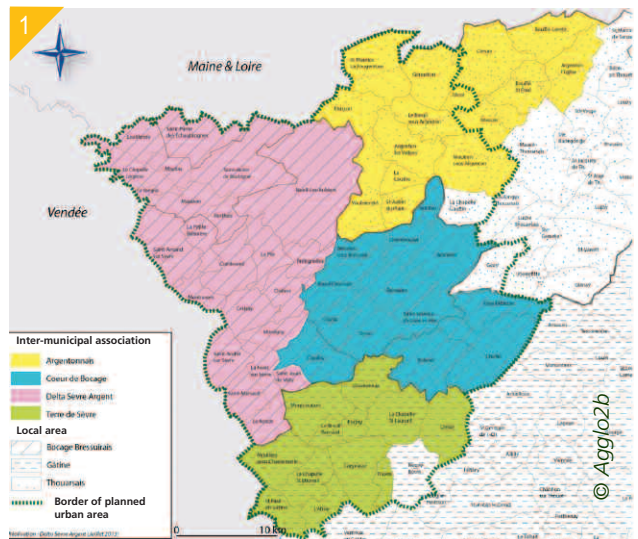
### Intervention site

#### ■ The Argentonnay area

- This area is crossed by the Argenton River which flows through several types of territory, ranging from bocage landscapes to plains. Fauna and flora are particularly rich and diversified, including the European otter.
- The main economic activity is farming. The crops in the plains give way to meadows in the bocage areas where hedgerows still exist and there are pools in virtually each plot of land, for the greater benefit of amphibians.
- The area colonised by the African clawed frog covers a surface area of between 102 and 139 square kilometres in 26 towns, including 11 in the Maine-et-Loire department and 15 in the Deux-Sèvres department (2012 estimates).

#### ■ Distribution of the African clawed frog

- First reports of African clawed frogs were made following the discovery of a few colonies in the Argentonnay area in 1998. The unintentional introduction occurred in the 1980s when the animals escaped from a breeding centre run by the National scientific research centre (CNRS) in the town of Bouillé-Saint-Paul.
- In 2012, traps were set in 201 water bodies and African clawed frogs were caught in 113.



1. The Bressuire urban area.  
2. Invasion front of the African clawed frog in 2012

## Disturbances and issues involved

### ■ Impacts on native species

- Predation on amphibian eggs, notably those of the marbled newt (56% of plant stalks had at least one newt egg in water bodies without African clawed frogs compared to only 9% in water bodies where the African clawed frog was present).
- On the basis of stomach contents, the frogs consume the larvae and adults of amphibians, as well as fish, insects and molluscs.
- Species richness has dropped in colonised areas over the past few years from 3.2 species in areas without African clawed frogs to 1.8 in those with.

### ■ Impacts on ecosystems

- The frogs interfere in food webs and in species successions.

### ■ Impacts on animal health

- The species is suspected of transmitting diseases to native amphibians (salmonellosis, sparganosis and especially chytridiomycosis for which the species is a healthy carrier)

## Interventions

- Two studies, conducted from 2003 to 2008 by environmental-protection associations with support from the Deux-Sèvres departmental council and the Loire-Bretagne water agency, determined the distribution and rate of advance of African clawed frogs in the Argentonay area and their impact on the native species. A number of management methods were tested.
- Following the studies, the species was listed as invasive first on the regional level (2009), then on the national level (ministerial decree dated 30 July 2010).

### ■ Tests on different management methods

#### Chemical method

- The resistance of African clawed frog adults and larvae to different concentrations of Rotenone, an organic substance naturally produced by certain tropical plants, was tested. The substance is toxic for many species of poikotherm (cold blooded) animals. The use of Rotenone in aquatic environments was subsequently prohibited in France in 2009.
- Ten frogs were placed in 100-litre containers with different concentrations of Rotenone (300 ppm, 600 ppm and 1 200 ppm):
  - 83% of the frogs died from the 300 ppm concentration after 7 to 9 hours of exposure;
  - 50% of the frogs died from the 1 200 ppm concentration after 90 minutes of exposure;
  - 50% of the larvae died from the 300 ppm concentration after 90 minutes of exposure.
- The use of Rotenone produced useful results, but could lead to the death of other species if it is used in the natural environment.
- The same protocol was used to test the resistance of African clawed frog adults and larvae to quicklime (0.4 grams per litre):
  - no deaths were observed;
  - burns and non-lethal alterations to limbs were nonetheless observed.



3. African clawed frog.



## Mechanised method

■ A standardised trapping technique was employed using hoop nets baited with kibble or liver:

- at least one trap was installed for every 100 square metres of water body;
- the traps were checked every morning for five days;
- the captured African clawed frogs were counted.

■ Seine nets were used on occasion in the water bodies where reproduction was observed (presence of large groups of tadpoles).

■ If the tipping point (a reduction in the number of African clawed frogs caught) was not reached after one week, trapping continued to achieve effective results.

## ■ Local action plan in the Argentonnay area

■ In 2011, the Argentonnay intermunicipal association (CCA) launched an action plan over its entire territory and hired a policy officer to ensure its implementation. The tasks of the policy officer included the points below.

■ Trapping of adults and tadpoles from April to November:

- traps were set in 15 to 20 water bodies per week, starting from the invasion front and heading toward the source;
- the hoop nets were not fully submerged in order to avoid killing non-targeted species;
- the traps were laid on Monday and checked every day until Friday. If frogs were still being trapped toward the end of the week, trapping was continued the next week;

- tadpoles were caught using a seine net (fine mesh, 0.5 x 0.5 cm) and dip nets;
- on private property, direct access was possible thanks to the previous information efforts addressing the owners, who also participated in the trapping work (an agreement was signed with CCA for the provision of the equipment and recommendations);
- captured frogs were put to death by freezing and then transferred to the rendering service.

■ Monitoring of native amphibians in parallel with trapping:

- night-time visits to count amphibians using searchlights;
- counting of amphibians accidentally caught in the traps;
- a monitoring sheet (environment, species) for each water body was used in conjunction with a geographic information system.

■ Provision of information year round to the population:

- on different topics, e.g. African clawed frogs and other invasive species, native amphibians, aquatic environments, food chains, etc.;
- to different groups, e.g. school classes, elected officials, owners of water bodies.

■ Monitoring the impacts of the action plan:

- visits to previously trapped water bodies, one week, month and year later;
- monitoring over several years of other amphibian species before and after trapping;
- assessment of captures to determine any changes in the distribution of African clawed frogs.



4. 5. 6. Preparation and installation of hoop nets for African clawed frogs.



## Results and costs

### ■ Results

*Table of the main results.*

Water bodies trapped	295
Water bodies with proven presence of the species	174
Water bodies seine netted	24
Frogs captured	
Adults	15 792
Juveniles (< 4 cm nose to cloaca)	1 948
Tadpoles	62 174
Number of owners met	≈ 100
Owners participating in trapping	23
Informational meetings held	42
Total number of people informed	> 1 000

### ■ Costs

■ Total cost of management operations from June 2011 to June 2013 = 64 300 euros, including:

- 49 250 euros for payroll costs (policy officer);
- 8 300 euros for personnel costs (vehicle, clothes, etc.);
- 4 000 euros for equipment (hoop nets, seine nets, dip nets, etc.);
- 2 000 euros for informational material;
- 360 euros for storage material;
- 390 euros for mapping of data.

*Sources of funding for the management plan.*

Source of funding	%
Poitou-Charentes regional council	20
Deux-Sèvres departmental council	40
CCA (internal funding)	40

## Outlook

- Expand the action plan to neighbouring areas (Thouarsais, Saint-Varentais, southern section of the Maine-et-Loire department) to ensure the effectiveness of trapping over the long term.
- Inform a maximum number of persons (land owners, farmers, the public, etc.) to create an area-wide surveillance network for early detection of sites colonised by the African clawed frog.
- Use the environmental-DNA technique to detect the presence of the species (in conjunction with the standard method in the field).
- Study the long-term impacts, the foreseeable final distribution, the most heavily used dispersal channels, behavioural traits of assistance in capturing the species, the most critical developmental stages, etc.



7. Captured African clawed frogs.  
8. A presentation to a school class.



## Information on the project

- A brochure presenting the African clawed frog and the action plan was published.
- A sequence on the issue was aired on 7 June 2011 on a regional television news show.
- Information has been provided on local and national radio shows.
- Articles have been published in the press.
- A poster presents the species, its origin, distribution and impacts.
- Half-day field sessions were organised by ONCFS on the African clawed frog in 2012 and 2013, during a continuing-education course on invasive alien vertebrates in the Loire basin.
- The results of the action plan were presented during symposia and workshops, and notably the Meetings on invasive alien species in the Loire basin, held on 29 and 30 October 2013 in Tours.

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9. A brochure on African clawed frogs

### For more information

- The initial version of this document was first published in:  
Sarat E. (coord.) 2012. Vertébrés exotiques envahissants du bassin de la Loire (hors poissons) : connaissances et expériences de gestion. Office national de la chasse et de la faune sauvage, Plan Loire Grandeur Nature, 128 pp.