IUCN SSC ISG Annual meeting, Dominica, 6-11 November, 2022
https://www.iucn-isg.org/2022-isg-meeting/

Update of implementation
of the
National Action Plan (NAP)
for the
conservation of the Lesser Antillean iguana
in the
French West Indies (FWI)
2018-2022

Nicolas PARANTHOËN (nicolas.paranthoen@onf.fr)
Melvin BÉATRIX (melvin.beatrix@onf.fr)
Alexis GUILLEUX (alexis.guilleux@onf.fr)
Jérôme LABRY (jerome.labry@onf.fr)
Simon MARTIN-PIGEONNIER (simon.martinpigeonnier@gmail.com)
Marina MOUTOU (marina.moutou@onf.fr)
Émy NJOH ELLONG (emy.njoh-ellong@collectivitedemartinique.mq)
Julie PAUWELS (jul.pauwels@hotmail.fr)
Kevin URVOY (kevin.urvoy@ofb.gouv.fr)

Presentation plan

1) The *I. delicatissima* National Action Plan in the FWI

2) Location, habitats, populations

3) Conservation (6 actions)

4) Outreach and communication (3 actions)

5) Monitoring and research (4 actions)

6) Conclusions to ISG partners

1) The *I. delicatissima* National Action Plan in the FWI

MINISTÈRE DE LA TRANSITION ÉCOLOGIQUE
Liberté Égalité Fraternité

What is a National Action Plan in France ?

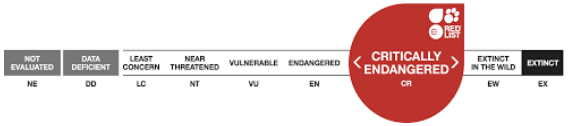
- French government answer to preserve **CR** and **EN** species
- Develop a **realistic** and **holistic** intervention strategy based on the **priorization of identified conservation issues**
- Strategy gathering all the **stakeholders**

PRÉFET DE LA MARTINIQUE
PRÉFET DE LA GUADELOUPE
Direction de l'Environnement, de l'Aménagement et du Logement
Office National des Forêts
OFB Office Français de la Biodiversité
Parc national de la Guadeloupe
cnrs
Gendarmerie nationale
Marine Nationale
Guadeloupe Port Caraïbes
Région Guadeloupe
Collectivité Territoriale de Martinique
Commune de la Désirade
Police Municipale
Réserve Naturelle Nationale de Saint-Martin
Réserve Naturelle Iles de la Petite Terre
Réserve Naturelle La Désirade
Association Le Carouge
Le Gaïac
Réserves Naturelles de Petite Terre et de la Désirade – Association Titè
CARBET des SCIENCES
Sepanmar
Parc naturel régional de la Martinique
Zoo de Martinique Habitation Latouche
Zoo de Guadeloupe Parc des Mamelles
SOS Faune Sauvage
Life4BEST
l'Europe s'engage en Guadeloupe avec le FEDER
Union Européenne
Fonds européen de développement régional
OFB Office Français de la Biodiversité
AFD Agence Française de Développement
ARDOPS Environnement
Nathalie Duporge Biodiversité.Expertise.Pédagogie
Aquasearch Aquatic Science

2) Location, habitats, populations

Context

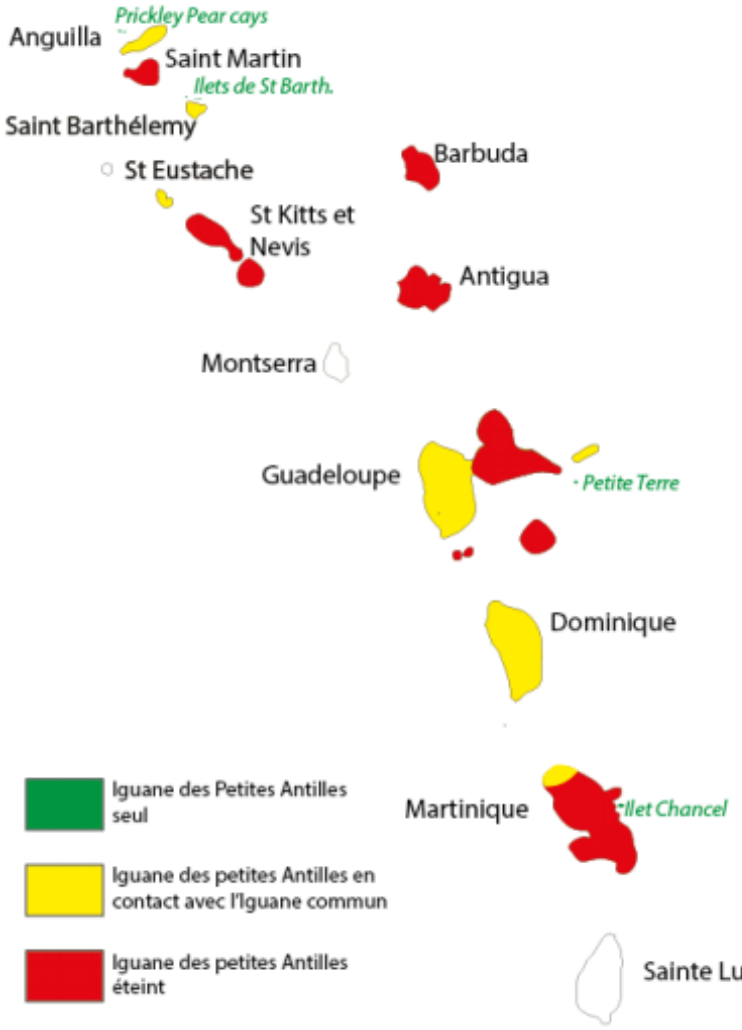
- *I. delicatissima* is **endemic from Lesser Antilles**
- **UICN Redlist**:
  - Vulnerable (VU) in 2006
  - Endangered (EN) in 2010



in 2018

- **Protected in France since 1989**
- **Main threats**:
  - Historically: game and habitat loss
  - Currently: **competition with IAS *I. iguana***

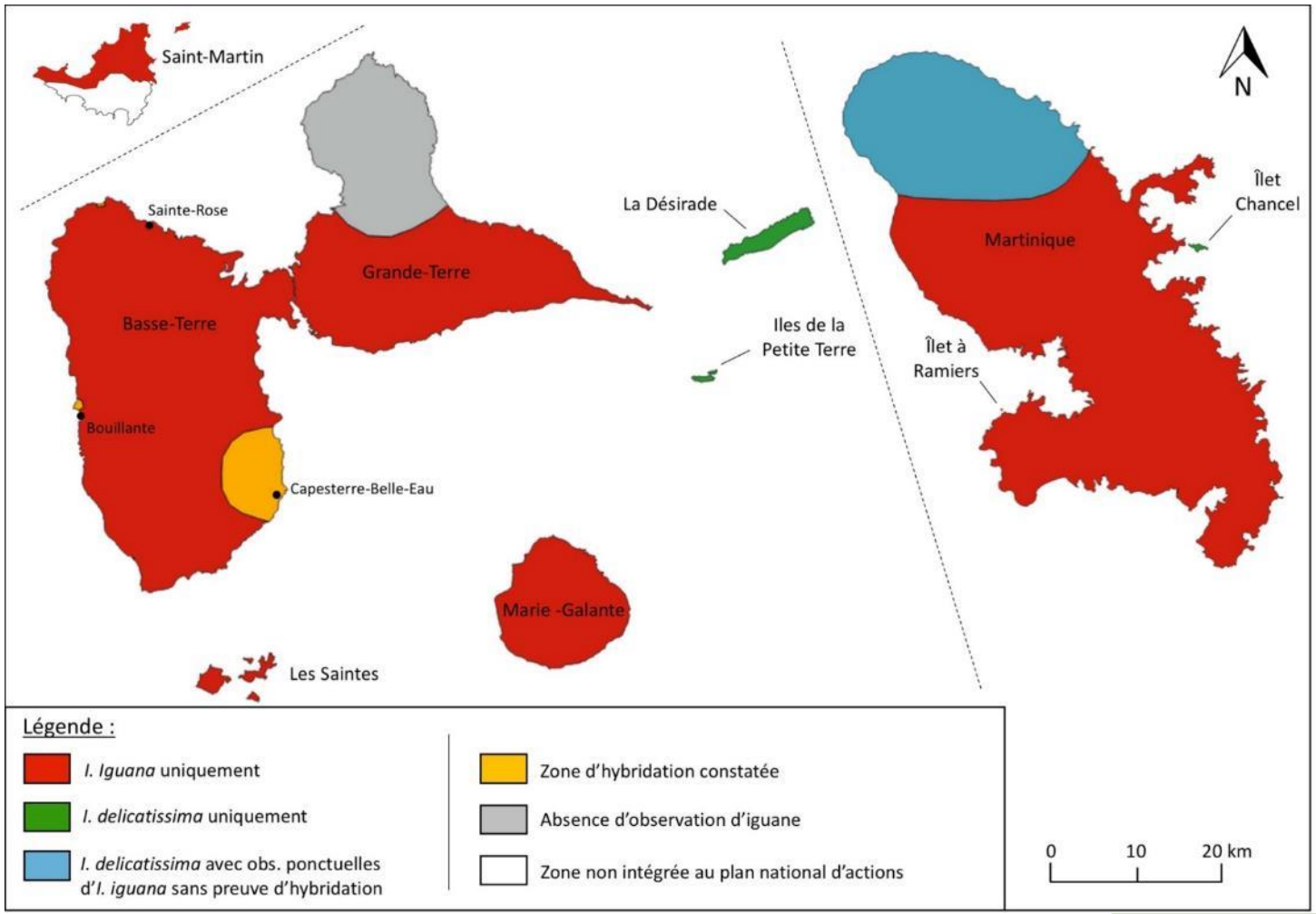
Location



Office National des Forêts
PRÉFET DE LA MARTINIQUE
PRÉFET DE LA GUADELOUPE
Direction de l'Environnement, de l'Aménagement et du Logement

2) Location, habitats, populations

Location in the FWI



Office National des Forêts

RÉSEAU POUR LA CONSERVATION D'IGUANA DELICATISSIMA

3) Conservation (objective #1)

6 actions

- Action #1: **reduce the competition exerted by *I. iguana*** — Priority #1

See presentation « ***Fighting the Spread of the Common Iguana: the French West Indies Case*** »
(DUPORGE N, ANGIN B., BERGER A., KESTEL K.)

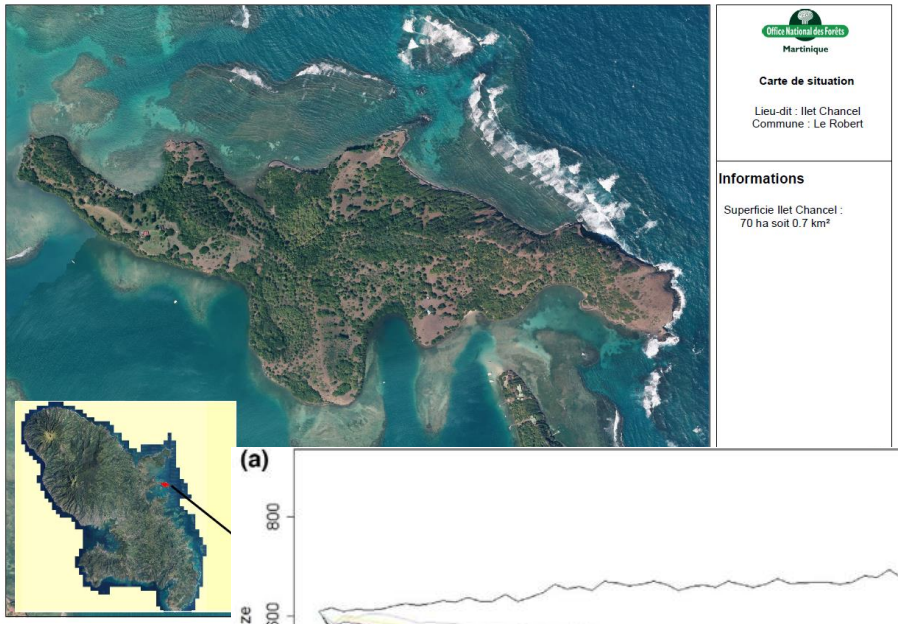
- Action #2: improve the **regulatory tools** available for the protection of the species
- Action #3: create **reflex protocols** for each threat and each population
- Action #4: reduce **unnatural mortality** of the species — Priority #2
- Action #5: conserve **genetic diversity** and **increase the number of populations**
- Action #6: improve the **natural habitat** conservation

Office National des Forêts
PRÉFET DE LA MARTINIQUE
PRÉFET DE LA GUADELOUPE
Direction de l'Environnement, de l'Aménagement et du Logement
RÉSEAU POUR LA CONSERVATION D'IGUANA DELICATISSIMA

3) Conservation (objective #1)

<u>Focus on action #4</u>: reduce unnatural mortality of the species

1. *IAS predation control at LAI nesting sites*
2. *IAS predation removal in other LAI habitats*
3. *Road mortality reduction at Desirade*

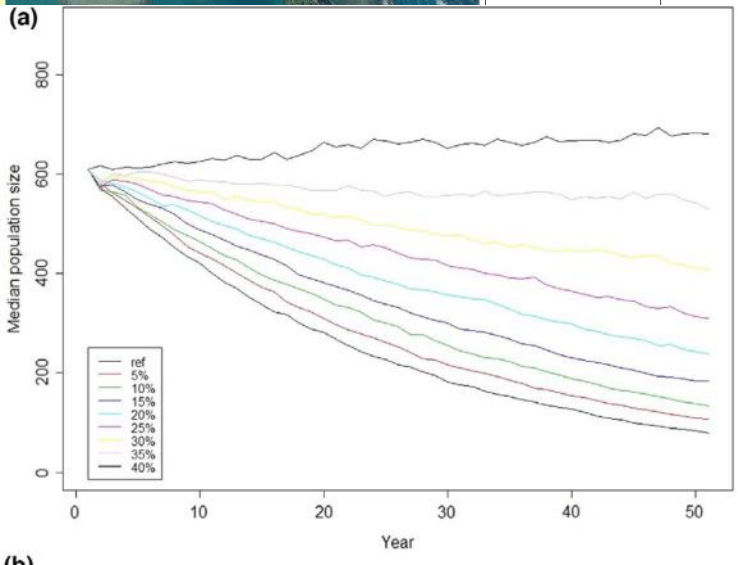


<u>Rodent control at Chancel islet (Martinique)</u>

- Adult LAI pop size estimates (Warret Rodrigues et al., 2021):
  - **928 in 2013 vs. 611 in 2020**
  - **➔ yearly decline of 4% ➔ 80 individuals after 50y !**
  - Population decline **driven by low recruitment rates**

➔ Improve reproductive success and **survival of immature iguanas up to 40%** to stabilize the population trend

➔ Reduce threats targeting the **eggs and immature cohorts**



3) Conservation (objective #1)

Focus on action #4: reduce unnatural mortality of the species

- **96 egg predations** by rats observed through camera trapping in 2021
- **5 eggs transported within 24 hours** in one spot

Bushnell

Office National des Forêts

PRÉFET DE LA MARTINIQUE
Liberté
Égalité
Fraternité

PRÉFET DE LA GUADELOUPE
Liberté
Égalité
Fraternité

Direction de l'Environnement, de l'Aménagement et du Logement

RÉSEAU POUR LA CONSERVATION D'IGUANA DELICATISSIMA

3) Conservation (objective #1)

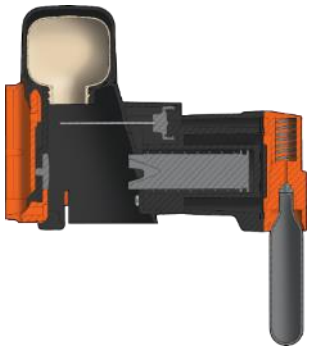
- **<u>From 2018 to 2022</u> : annual rodent control campaigns at Chancel islet (Martinique) mostly using non vulnerable mechanical trapping (monitored with camera traps)**

  - Different kinds of **baited trap cages** (non vulnerable)
  - Vulnerable automatically resettable traps

  (GoodNtaure™ E2A24)

« creel » type

« cage » type



3) Conservation (objective #1)

- **<u>From 2018 to 2022</u> : annual rodent control campaigns at Chancel islet (Martinique) mostly using non vulnerable mechanical trapping (monitored with camera traps)**

Year	Period	Target species	Target location	Lasting	Trap type and number	Results
2018	October	**Primarly mongooses & chickens** Secondarly rats	LAI nesting sites (n=4) & islet owner's house	**5 days**	- **12** rat creels - **4** mongoose cages - **3** chicken cages - **4** handmade traps	**22 rats** 2 cocks & 1 hen 0 mongoose
2019	May-June	**Primarly mongooses & chickens** Secondarly rats	LAI nesting sites (n=4) & islet owner's house	**6 days**	- **10** rat creels - **12** mongoose cages - **3** chicken cages - **4** handmade traps	**19 rats** 2 hens 0 mongoose
2020-2021	September to March	**Rats**	Main LAI nesting sites (n=2)	**6 months**	- **9 Goodnature E2A24** (vulnerable traps)	**9 rats**
2021	March-April	**Rats**	LAI nesting sites (n=4), islet owner's house & 3 other spots	**5 days**	- **82** baited rat cages	**44 rats**
2022	May-June	**Rats**	LAI nesting sites (n=4), islet owner's house & 4 other spots	**42 days**	- **145** baited cages	**104 rats**
						198 rats

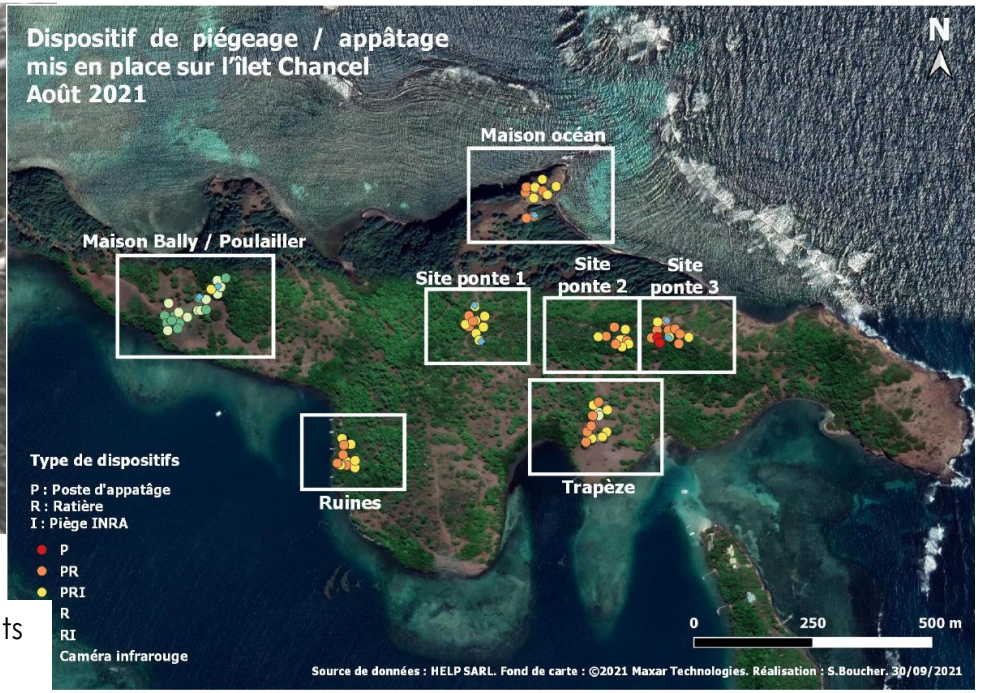
3) Conservation (objective #1)

Focus on action #4: reduce unnatural mortality of the species

3) Conservation (objective #1)

Focus on action #4: reduce unnatural mortality of the species

- **2021: rodent control campaign at Chancel islet (Martinique) using chemical trapping**



: Dispositif de piégeage / appâtage mis en place sur l'îlet Chancel (Source : HELP Sarl, Cartographie : S. her).

➔ **49/60** bait stations eaten

➔ 82 %

➔ between **300 and 600 rats eliminated**

➔ **27 rats** caught within 504 nights

➔ 5,35 %

➔ very low because of hermit crabs

Office National des Forêts

RÉSEAU POUR LA CONSERVATION D'IGUANA DELICATISSIMA

3) Conservation (objective #1)

Focus on action #4: reduce unnatural mortality of the species

- **2023: rodent removal campaign on the whole Chancel islet using chemical trapping**

Year	Period	Target species	Target location	Lasting	Trap type and number	Results
2021	August	Rats	LAI nesting sites (n=4) and islet owner's house	**6 days**	- 84 baited rat cages - 60 Brodifacoum 29 ppm (anticoagulant) baiting stations	- **27 rats** - **600 baits consumed in baiting stations ➔ 300 to 600 rats killed** - **82% of baiting stations consumed**
2023	February 13 to April 28	Rats	**All the Chancel islet (70 ha, 135 ha when considering the topography)**	**7 weeks**	- **2 200** Brodifacoum 29 ppm (anticoagulant) baiting stations - (30 camera traps)	**?**


A


B


C

5) Monitoring and research (objective #3)

4 actions

- Action #1: continue **population monitoring** — Priority #1

*See presentation « **Demography of the Lesser Antillean Iguana throughout its range** »*
(ANGIN B., WARRET RODRIGUES C., BESNARD A.)

- Action #2: study **phylogeny** of the LAI throughout its distribution range — Priority #3
- Action #3: improve knowledge of the species' **ecology and biology** — Priority #2
- Action #4: understand the **interaction mechanisms** between *Iguana delicatissima* and *Iguana iguana* — Priority #3

5) Monitoring and research (objective #3)

Focus on action #2: study phylogeny of the LAI throughout its distribution range

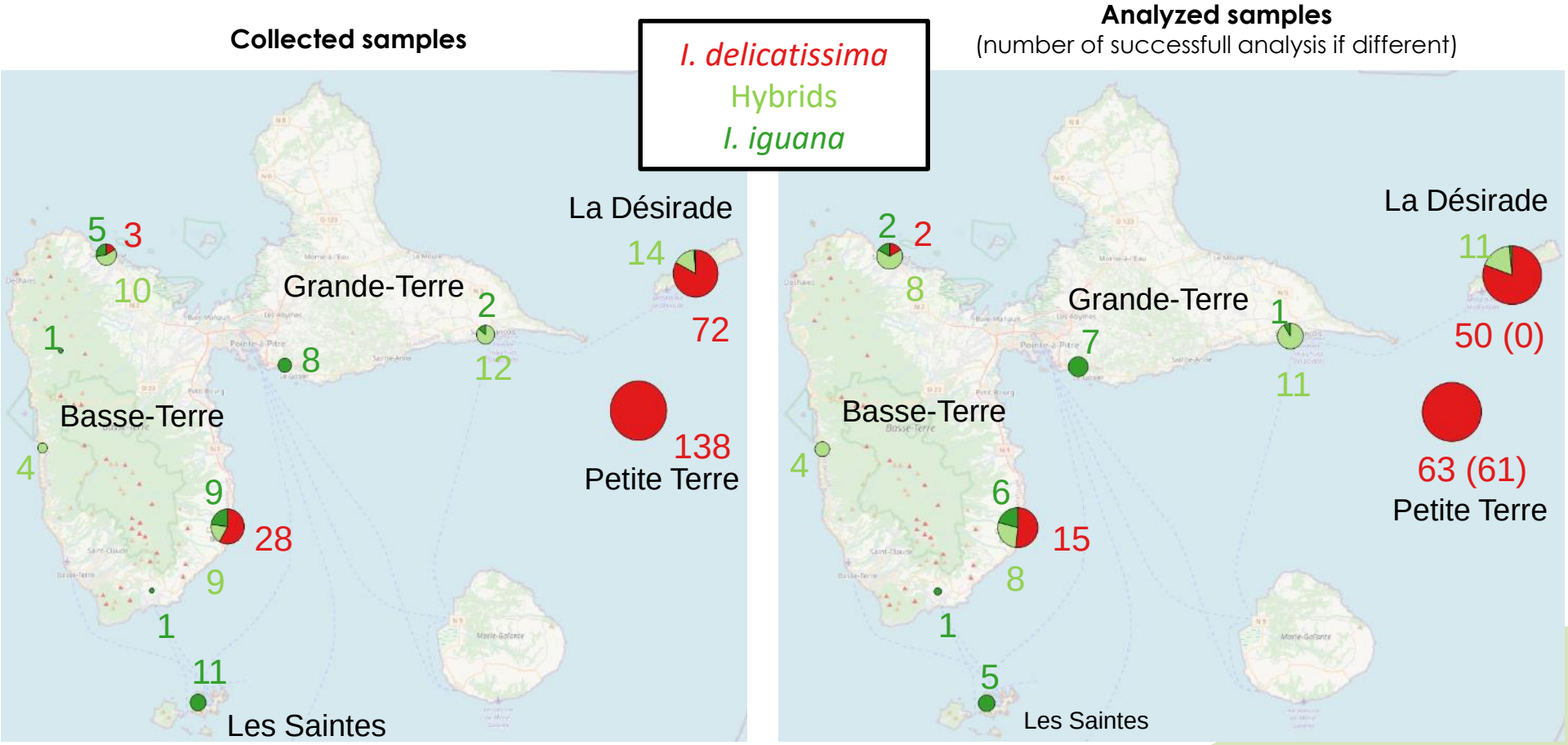
- **2022 objective**: **establish a state of the art of genetic knowledge**:

  - Identify **how many** *iguana sp.* **samples** were collected in the past?
  - Which were the research and/or conservation **objectives**?
  - **Where** are the samples **stored** (if any left)?
  - Were all samples **analyzed or not?**
  - Which **markers were used?**
  - **Which lab** conducted the analysis?
  - Which were the **results?** Were they **published (reports and/or articles)?**
  - If any samples left, are they **still analyzable or not?**

5) Monitoring and research (objective #3)

Focus on action #2: study phylogeny of the LAI

Guadeloupe

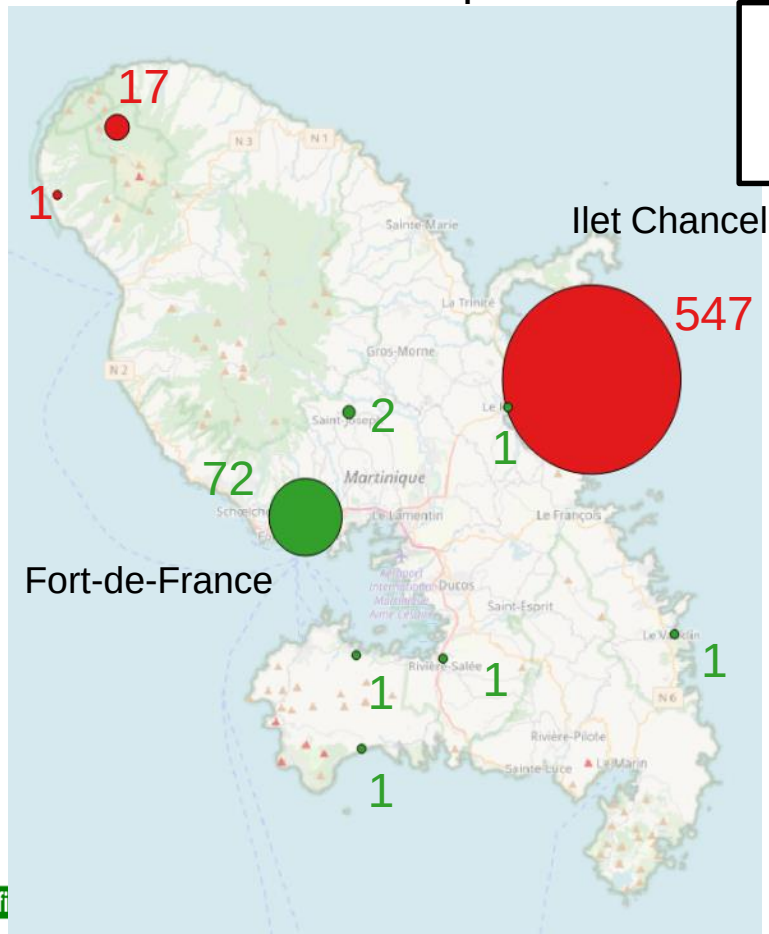


5) Monitoring and research (objective #3)

Focus on action #2: study phylogeny of the LAI

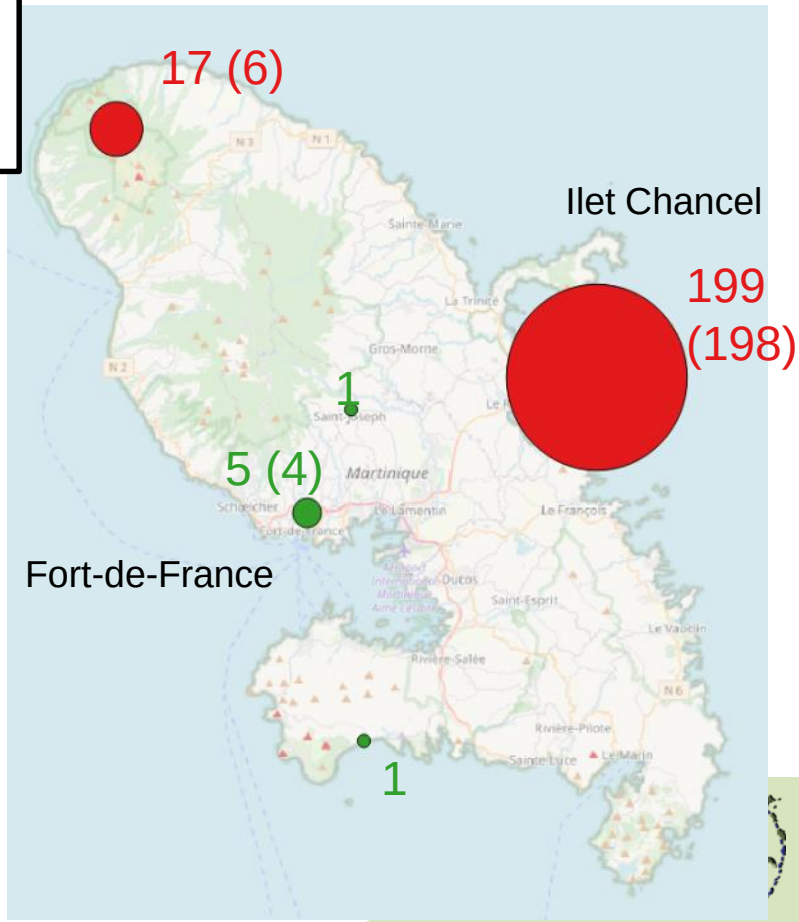
Martinique

Collected samples



I. delicatissima
Hybrids
I. iguana

Analyzed samples
(number of successfull analysis if different)



5) Monitoring and research (objective #3)

Focus on action #2: study phylogeny of the LAI

Genetic analysis of iguana populations in the FWI – (Very) short research history

- **1990s**: Iguana genetic studies **started** ➔ **First proofs of hybridization** between *I. delicatissima* and *I. iguana* (Day & Thorpe, 1996)
- **Between 2007 & 2015**: researchers developed **microsatellites markers** specific to *I. delicatissima* (Valette et al., 2012) which were used to confirm the **hybridization** and work on **populations structure** (Vuillaume et al., 2015)
- **In 2015 & 2019**: **214 samples** analyzed by a private lab but never used for research projects
- **In 2021**: the FWI NAP worked with the MSU (Welch's lab) to study inbreeding in Chancel's LAI pop.

➔ **Over the last 30 years: 1,000 biological samples of iguanas were collected in the FWI but all were not analyzed and/or used for research projects.**

➔ They are **scattered in different private and research labs or administrations**.

5) Monitoring and research (objective #3)

Focus on action #2: study phylogeny of the LAI

Genetic analysis of iguana populations in the FWI

Next steps:

➔ **Take inventory of all samples** collected and trace back **where they are stored**

➔ **Retrieve all the genetic data produced** through the analysis of these samples

Next objectives:

- Identify a **satisfying storage strategy** for biological samples so they are in one place and can be easily available
- **Share the list of biological samples** so that **research team can apply to use them** in projects
- **Share the genetic data produced** this far so they can be used in research projects

Conservation prospects:

- **Phylogeny** of LAI troughout its range ➔ gaps ➔ **new sampling campaigns and analysis?**
- Use genetic data **to calibrate reintroduction / translocation projects** in the West Indies

6) Conclusion to ISG partners

Towards a new Regional *I. delicatissima* action plan…

- **<u>Long-term goals</u> :**
  - **increase the number of sustainable populations**
  - **conserve the genetic diversity**

➔ **Aggregate genetic knowledge** throughout LAI's range (phylogeny, inbreeding, hybridization)

➔ **Fill in gaps in genetic knowledge** throughout LAI's range

➔ **Translocate individuals** from subpopulations submitted to **current or near-future high risk of hybridization**

  ➔ **ex-situ?**

  ➔ **in-situ to safer & suitable areas?**

➔ **Reinforce inbred population (if any)?**

Office National des Forêts

PRÉFET DE LA MARTINIQUE
Liberté
Égalité
Fraternité

PRÉFET DE LA GUADELOUPE
Liberté
Égalité
Fraternité

Direction de l'Environnement, de l'Aménagement et du Logement

RÉSEAU POUR LA CONSERVATION D'IGUANA DELICATISSIMA

iguana specialist group

IUCN SSC ISG Annual meeting, Dominica, 6-11 November, 2022
https://www.iucn-isg.org/2022-isg-meeting/

RÉSEAU
POUR LA CONSERVATION
D'IGUANA DELICATISSIMA

Thank you for your attention!

Office National des Forêts

PRÉFET DE LA MARTINIQUE
Liberté
Égalité
Fraternité

PRÉFET DE LA GUADELOUPE
Liberté
Égalité
Fraternité

Direction de l'Environnement, de l'Aménagement et du L