

Why are we monitoring?

Tony Gent & Rob Ward

Amphibian & Reptile Conservation Trust, UK

Reptile & Amphibian Conservation Europe



amphibian and reptile
conservation



SURVEY: methods

Amphibians

- Visual
- Night survey: torches
- Bottle trapping
- Netting
- Egg searching/ spawn count
- Acoustic
- eDNA
- Terrestrial survey
- Habitat Suitability Indices



Reptiles

- Visual survey
- Refuges/ artificial cover objects
- Signs: sloughs/egg burrows
- Habitat quality measures

Intensive studies : radio-tracking, pitfall traps/ drift fences

Also new approaches: camera traps, drone photography, environmental data sets (e.g. Land Cover Map (UK))/ remote sensing (e.g. LiDAR, photogrammetry, etc), thermal cameras

Workshop

- What we're doing (or want to do)
- Why are we doing it?
- Are the methods used, and the data we collect, fit for purpose?
- What can we do to increase their value?

..... devise some key messages around monitoring

Herpetofauna monitors & surveyors

Gentleman Naturalist



- Personal interest
- Education
- Site 'defence'



Citizen Scientist

Academic researcher



Volunteer/
Enthusiast

- Scientific study
- Specific questions



- Varying skill levels
- Develop interest
- Contribute to conservation

Professional ecologist



- Environmental Assessment
- Species inventories



Land Manager

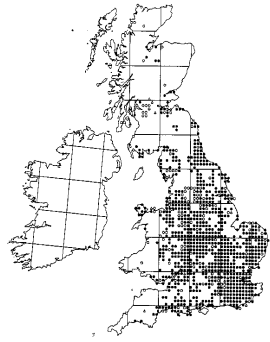
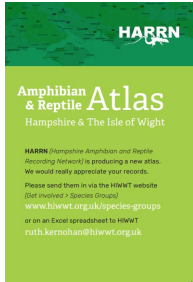
- Site inventory
- Know where things are
- Evaluation of habitat management

- Reporting
- Compliance
- Regulation

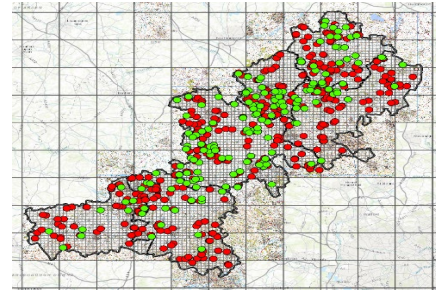


Government/
Statutory Official

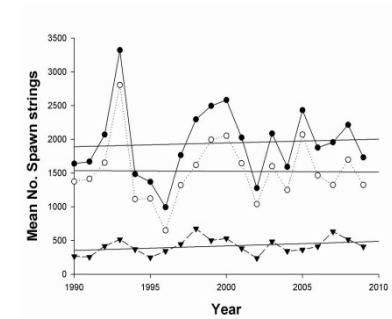
Data uses



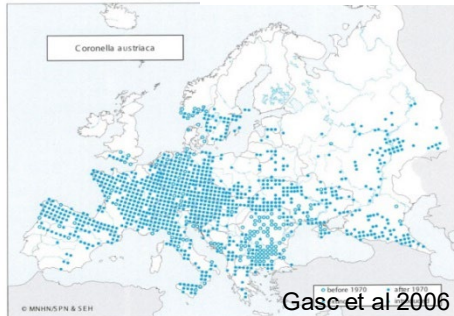
- Atlases
 - Local
 - National
 - European



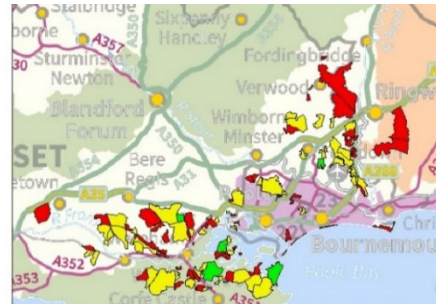
- Presence/absence mapping



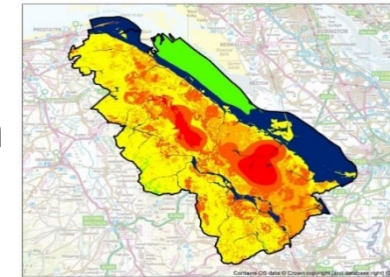
- Population/abundance trends



- Detailed location maps
- Environmental assessments



- Site condition assessments

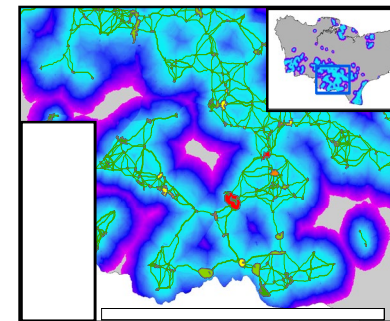


- Modelling distribution/habitat suitability



2009 (2006 assessment)					
Country	Range km²	Population (trend)	Habitat km²	Future prospects	Overall
Germany	66,622 =	201¹ declining	29194	poor	Inadequate U1
Denmark	13,500 X	N/A unknown	11675 X	unknown	unknown
France	33,790	N/A declining	N/A	poor	Inadequate U2
UK	8,850 =	580² stable	35 =	good	Inadequate U1*
Netherlands	10,800 =	1-6 million³ increasing	785 =	good	Inadequate U1

- National status reporting (e.g. Article 17)

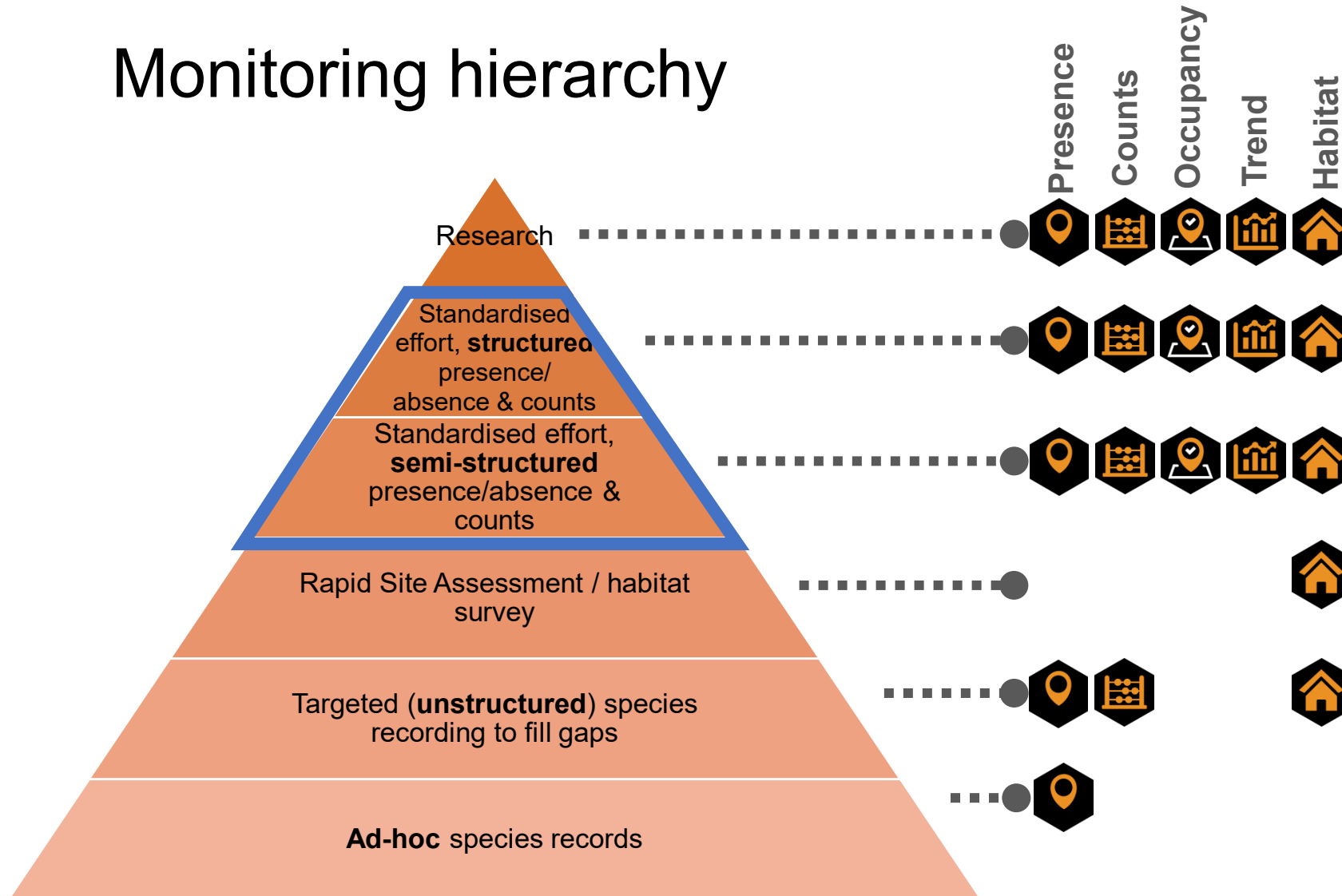


- Connectivity analyses

Different approaches

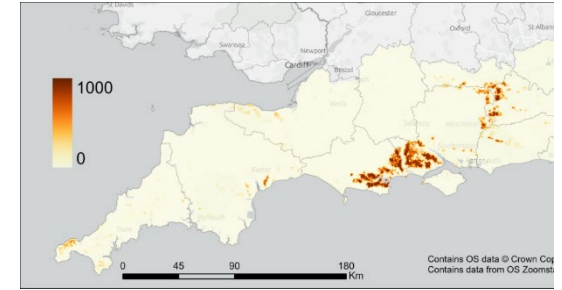
Survey type	Survey projects / data capture
Ad-hoc – incidental records. (<i>Casual survey</i>)	Enquiries line, iRecord, Record Pool, Survey123. May include Garden Dragon Watch.
Unstructured – open and flexible, but with clear objectives. Repeats not essential.	Targeted ‘distribution’ surveys, e.g. to look for species within a site without the constraint of a route or set protocol. Garden Dragon Watch sits roughly here.
Semi-structured – self-selection of sites is allowed, but survey requires repeat visits following a set protocol. Variation / bias accounted for by analytical techniques.	 Understand the observation process
Structured – Preselected locations based on stratified random sampling (or similar). Survey requires repeat visits following a set protocol. Variation / bias (mostly) controlled by protocol and site stratification.	

Monitoring hierarchy



Frequent scenarios

- National level status assessments (Article 17/ Population trends)
 - Article 17
 - Range
 - Population
 - Habitat Prospects
 - Current values vs Favourable Reference values
 - Population trends
 - 'Abundance' measures/ index
- Demonstrating project outcomes
 - Comparing End state vs Initial condition
 - What does success look like?
 - What can you measure
- Understanding distributions
 - E.g. Simple 'inventory' or identifying sensitive/ important areas
 - Presence only, presence/ absence or some indication of relative abundance/ significant?
 - Will a map suffice



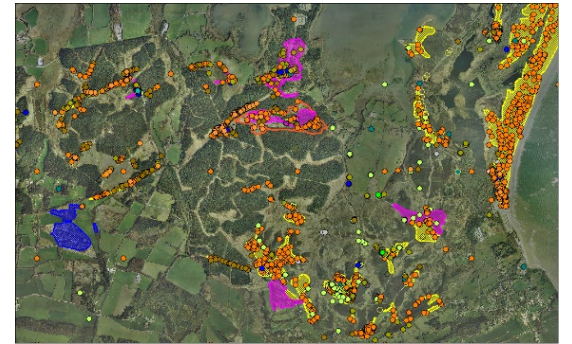
Possible short-comings

- Resources
 - Not enough people – to collect data/ manage the programme over time
 - Not appropriately skilled
- Data sufficiency
 - Too few records
 - Unrepresentative data set (date/ locations, etc)
- Data quality
 - Data unreliable/ wrong: reliance on poorly skilled surveyors
 - Data incomplete
- Wrong type of data
 - Data collected do not allow the desired analyses
 - Wrong type of analyses?



Survey design

- What are we trying to show?
- What does success look like?
- What analyses are needed?
- What metrics/ outputs are needed?
 - What measures best describe the points you wish
 - Will a map suffice ... and at what resolution?



Considerations



- What information do you need to collect about the species?
- What information do you need to collect about habitats?
- What information do you need to collect about 'prospect' (i.e. threats, pressure, measures)?
- Do we need to compromise....

Can we improve or add value?

- Survey design
 - Design local surveys to contribute to national surveys?
 - Design national analyses to maximise value of locally collected data?
 - Improved verification processes – how?
- New technologies and techniques
 - What new techniques are/ will be available to improve data collection, analysis and communication? AI? Environmental DNA?
 - Remote sensing – what is, and how do we collect, the right data to help amphibian & reptile conservation?
 - Do we need more research to improve this?

Can we improve or add value?

- Who should be responsible
 - What are the roles of Governments/ EU, academic institutions, NGOs, volunteers and Citizen Science?
 - What collaborations are needed/ desirable?
 - Who should pay?
 - Who should manage/ 'own' the data?
- What are the big asks and main messages?

Reptile & Amphibian Conservation
Europe

Amphibian & Reptile Conservation

744 Christchurch Road

Bournemouth BH7 6BZ

UK

+44 1202 391319.

enquiries@arc-trust.org

[www. arc-trust.org](http://www.arc-trust.org)

<https://race-europe.org/>



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