

“La gestione di specie e habitat per riqualificare i sistemi insulari “
“Management of species and habitats for the restoration of island ecosystems”
Portoferraio, 10 - 12 dicembre 2019 / 10 - 12 December 2019

CAPRA DI MONTECRISTO: GESTIONE DI UN UNGULATO PROBLEMATICO, MA DI RILEVANTE VALORE SCIENTIFICO/CULTURALE

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Università di Torino

WHAT, IF ANY, IS THE MONTECRISTO GOAT?

.....a matter of name...

Capra hircus or *Capra aegagrus* or *Capra aegagrus hircus*?

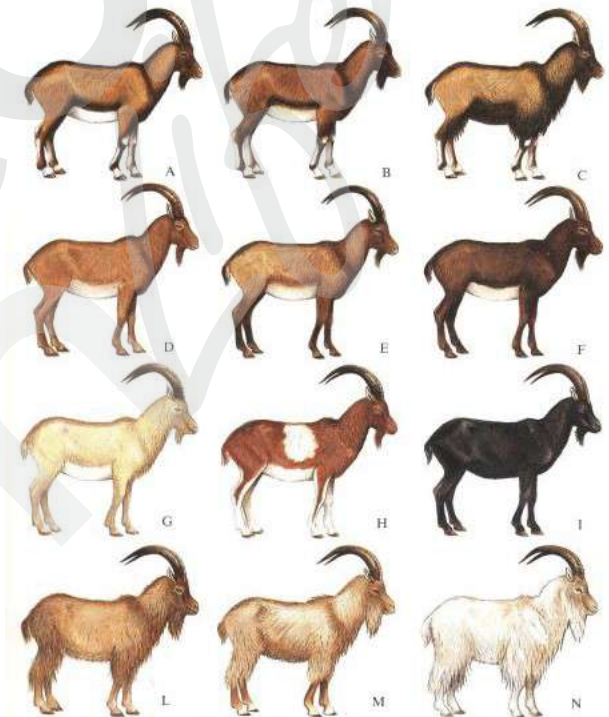


Fig. 9 - Vari tipi di manto individuati nella popolazione di Capra dell'Isola di Montecristo: tipo «Agrimi» (A-B), tipo «Pictus» (C), tipo «Montecristo» chiaro e scuro (D-E-F), tipo «bianco crema» (G), tipo «pezzato» (H), tipo «nero» (I), mantelli invernali (L-M-N).

Habitat Directive Annexes II & IV

National level:

- Environmental Ministry Decree 19 January 2015 - listed as «parautoctona»
- IUCN Italian red list: NA

Strasbourg, 4 January 2018
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T-PVS/DE (2018) 3

CONVENTION ON THE CONSERVATION OF EUROPEAN WILDLIFE
AND NATURAL HABITATS

Standing Committee

38th meeting
Strasbourg, 27-30 November 2018

Group of Specialists on the European Diploma for
Protected Areas
21-22 February 2018
Strasbourg, Palais de l'Europe, Room 8

The only goat population in Italy that lives in the wild since ancient times.

5. maintain the island's goat population at its current level and take steps to protect the other components of the ecosystem which are under particular threat from the goat population;

WHAT HAS BEEN DONE SO FAR

- From 1975 to 1997; (2006): population control through shooting
- From 2003: annual population monitoring



Eradicazione di componenti
florofaunistiche aliene invasive
e tutela di habitat
nell'Arcipelago Toscano

- ✧ Protection during rat eradication
- ✧ Post release individual monitoring
- ✧ Genetic investigation
- ✧ Population monitoring
- ✧ Ex situ conservation



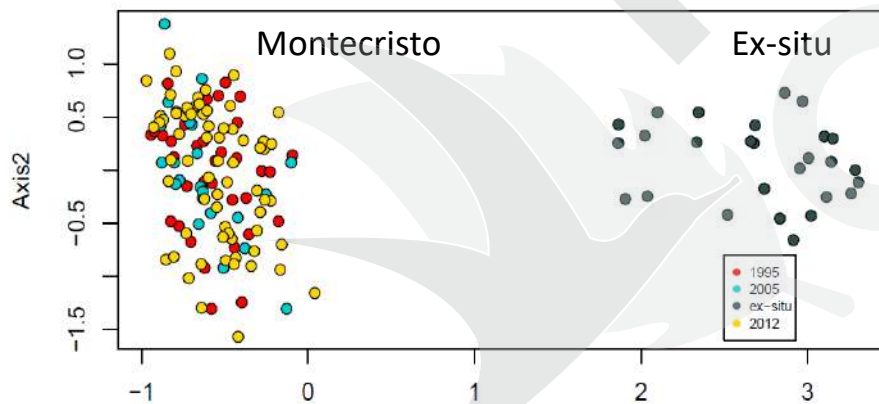
- ✧ Population monitoring
- ✧ Ex situ conservation



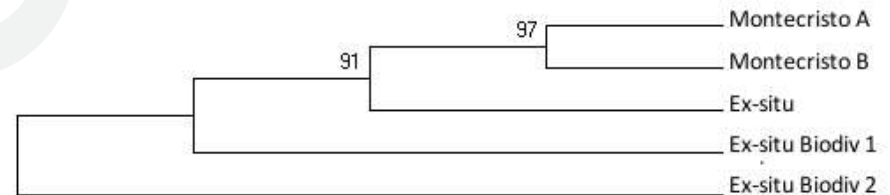
Island conservation in
Tuscany, restoring habitat
not only for birds
www.restoconlife.eu
info@restoconlife.eu

WHAT DO WE KNOW?

- Hardy-Weinberg equilibrium
- No recent bottleneck (1995-2012)
- DNAmT haplotypes A & B (73% and 27%) unique to the population (1953-2012)
- Ex-situ nucleus (ante 2010) are something else

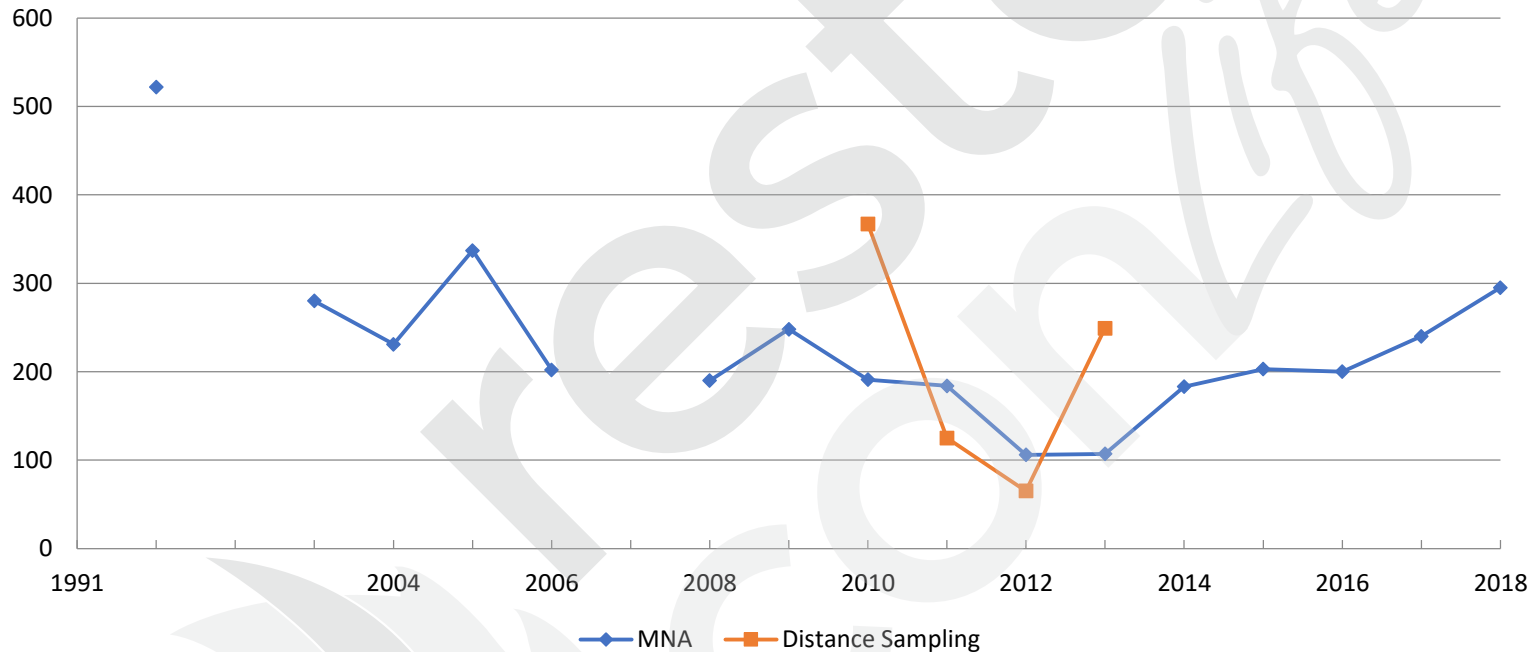


(Verardi *et al.* 2006; Palladini *et al.* 2013)



WHAT DO WE KNOW?

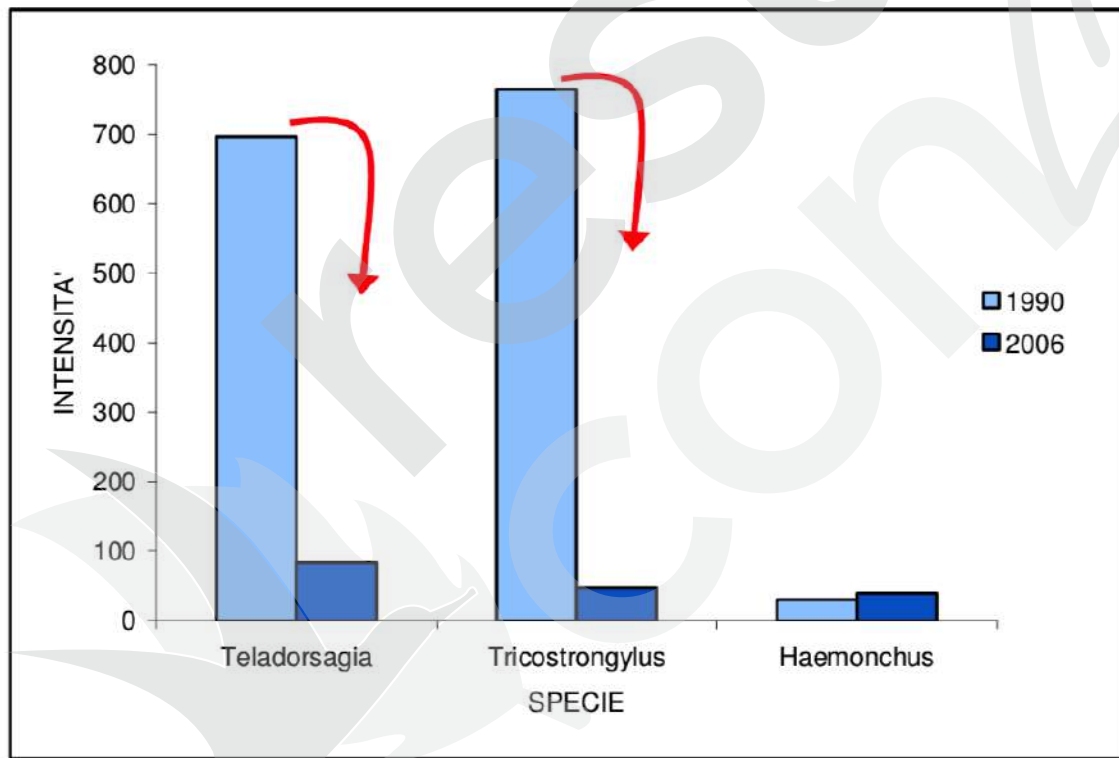
- Population trend: direct counts and Distance sampling



Anno	Km	n° gruppi	Encounter rate	N° medio animali/gruppo	ds
2010	12,58	91	7,23	2,21	0,78
2011	20,18	99	4,91	2,15	0,68
2012	13,23	33	2,49	1,56	1,44
2013	20,61	103	5,00	1,82	0,57
2014	17,40	138	7,93	2,10	1,61
2015	14,00	101	7,21	2,91	2,45
2016	17,40	207	11,90	1,87	1,72
2017	16,19	217	13,41	1,87	1,34

WHAT DO WE KNOW?

- Parasite (gastrointestinal strongili) population



$N_{2006}=19$

$N_{1990}=40$

(E. Armaroli & V. Guberti 2006)

WHAT DO WE KNOW?

HEALTH CONDITION EVALUATIONS - dott.ssa Zanet (Università di Torino)

Contextually with goats captures, to every individual:

- General objective examination
- Biological sample collection (blood, faeces, conjunctival samples)

Vector-borne diseases → research of the pathogen DNA by PCR analysis

Leishmania infantum : NEGATIVE



Borrelia burgdorferi s.l.: NEGATIVE

Anaplasma spp.: NEGATIVE

Ehrlichia spp.: NEGATIVE

Babesia spp.: POSITIVE → n=1 yearling female



WHAT DO WE KNOW?

Direct transmission diseases → research of the pathogen DNA by PCR analysis

Toxoplasma gondii: NEGATIVE

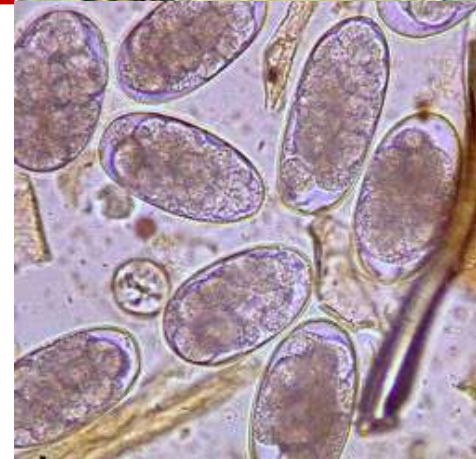
Neospora caninum: NEGATIVE

Mycoplasma conjunctivae: NEGATIVE

Gastro – intestinal parasites → copromicroscopic analysis

Gastro-intestinal strongyles present in every individual
(UPG media=23, min=5, max=40)

Eimeria genus coccidia (OPG=10) in n=1 adult female

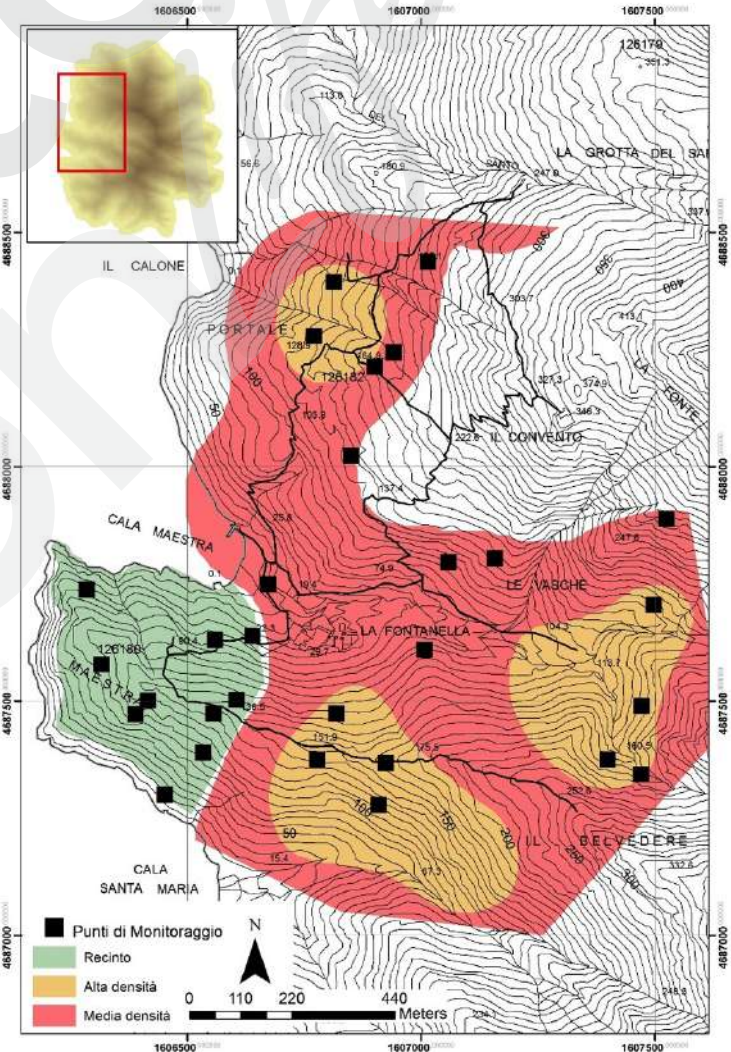


WHAT DO WE KNOW?

- ✓ Transect sampling in areas with different frequentation by goats (from distance sampling data);
- ✓ 10 meters transects;
- ✓ Surveys repeated in 2016, 2017 and 2018.

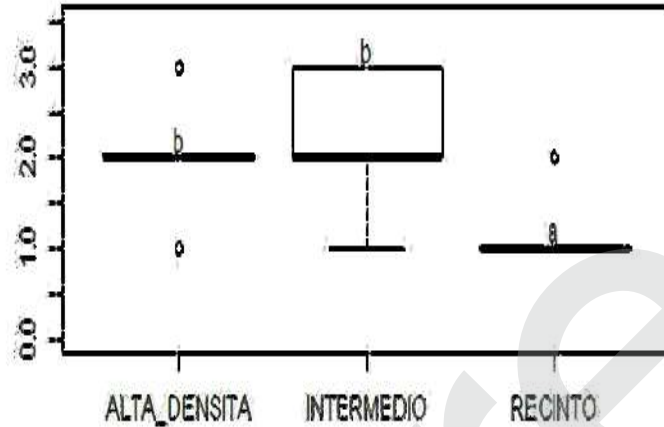
Evaluation of:

- **Soil erosion (1-3 scale)**
- **Mean soil depth (10 measures)**
- **Proportion of browsed individuals**
- **Mean browsed individuals /total (1-3 scale)**
- ***Pellet group* presence**

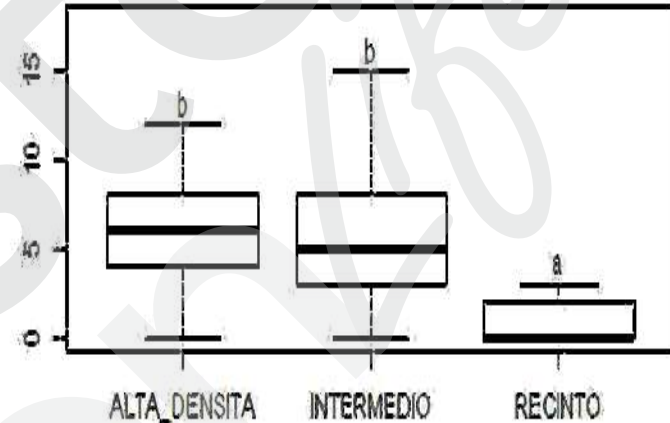


WHAT DO WE KNOW?

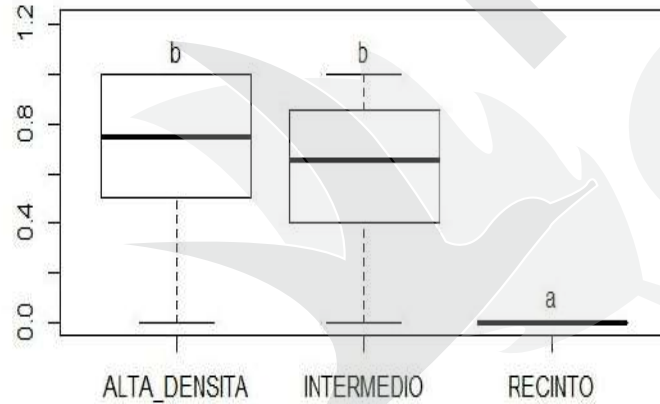
Soil erosion



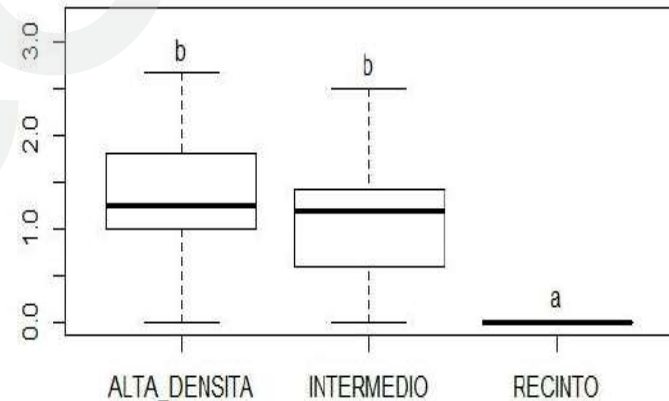
Pellet group presence



Browsed individuals proportion / total



Mean browsed individuals / total

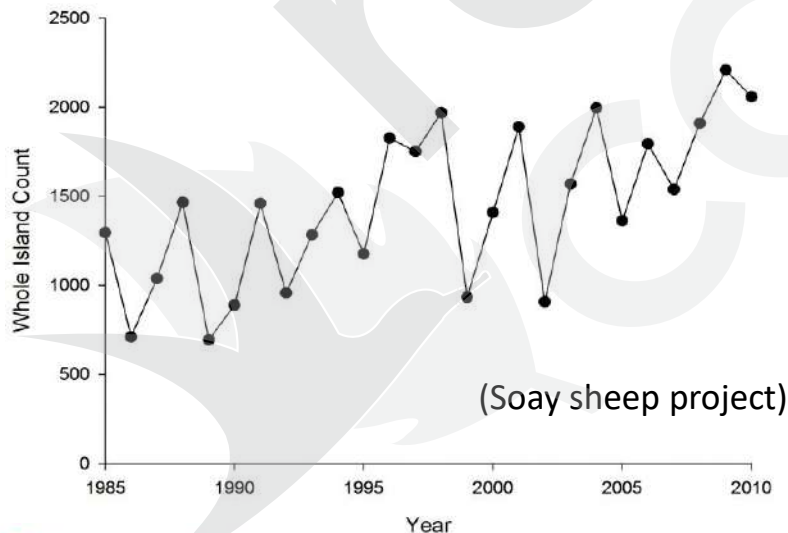


WHAT DO WE KNOW?

From the theory...

«Population data and theoretical models argue that large mammalian herbivore rarely attain numerical stability»

- Density dependent variations
- Effect of environmental stochasticity (important risk of population decline size-independent)



***Ungulate
population on
island: instability!***



WHAT'S NEXT?

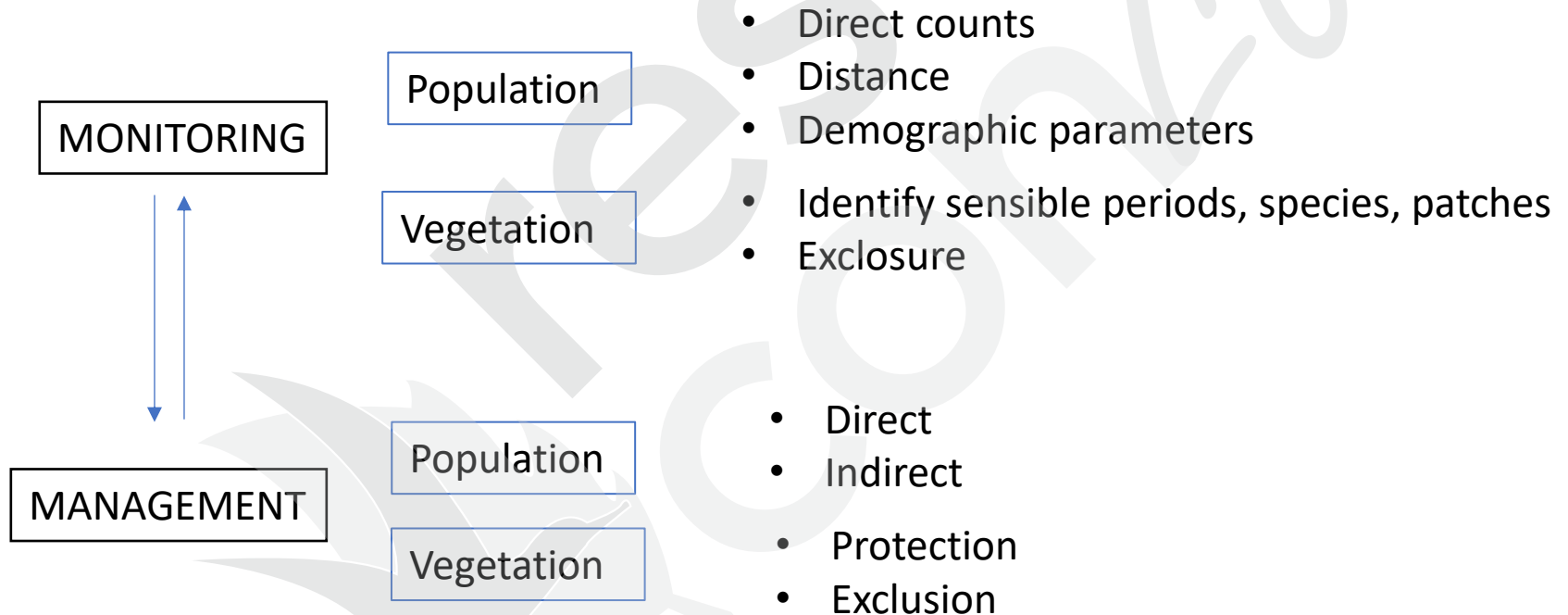
CONSERVATION AND MANAGEMENT PLAN

- Montecristo goat is the only goat population in Italy that lives in the wild since ancient times.
 - Founded by individuals very close to wild ancestors.
 - High conservation value from historical/cultural perspective (IUCN Caprine Specialist Group) => Natural Reserve (1971)
 - Goat population conservation must be pursued on Montecristo island, keeping ex situ (ex situ emergency stocks)
- Guarantee the conservation of both the ecosystem and the goat population;
- **The plan must be based upon evidences rather than opinions**

WHAT'S NEXT?



CONSERVATION AND MANAGEMENT PLAN



MANAGEMENT OPTIONS

- NATURAL EVOLUTION OF THE POPULATION
- POPULATION CONTROL (localized/diffuse)
 - Control through shooting
 - Control through captures and translocations
 - Fertility control



**...KEEPING IN MIND THAT:
the magic number doesn't exist!**

- IMPACT MANAGEMENT
 - Protection throughout exclusion/deterrent system

.....Warnings!

When you start, you must go on



Island conservation in
Tuscany, restoring habitat
not only for birds
www.restoconlife.eu
info@restoconlife.eu