

European Otter Workshop

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Otter Project Alentejo

BEHAVIOURAL ECOLOGY OF THE EURASIAN OTTER (*LUTRA LUTRA*) IN ALENTEJO, SOUTHERN PORTUGAL



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Background:



- Still scant data on behavioural ecology (Ex. space/habitat use in Mediterranean freshwater environments)
- Very few “direct” data on the use of reservoirs, a particularly “controversial” habitat type
(e.g. Macdonald and Mason, 1984; Foster-Turley *et al.*, 1990; Jiménez & Lacomba 1991, Jiménez & Delibes 1990, Ruiz-Olmo *et al.* 1991, 2007; Pedroso *et al.*, 2005)

Main goal:



To study the relationship between otters' space/habitat use and the availability and dispersion of the resources (mainly water) in a Mediterranean environment

SPATIAL ORGANIZATION



Questions:

- 1) Is there any relationship between home range size and availability/dispersion of the resources (water – food)?
- 2) If so, how are they related?
- 3) If not, which are the factors involved?



ex. *Resource Dispersion Hypothesis* (e.g. Macdonald, 1983)

HABITAT USE



Questions:

- Does it vary according to the availability of water?
- Are reservoirs and streams used according to their availability?
- Is there any seasonality?



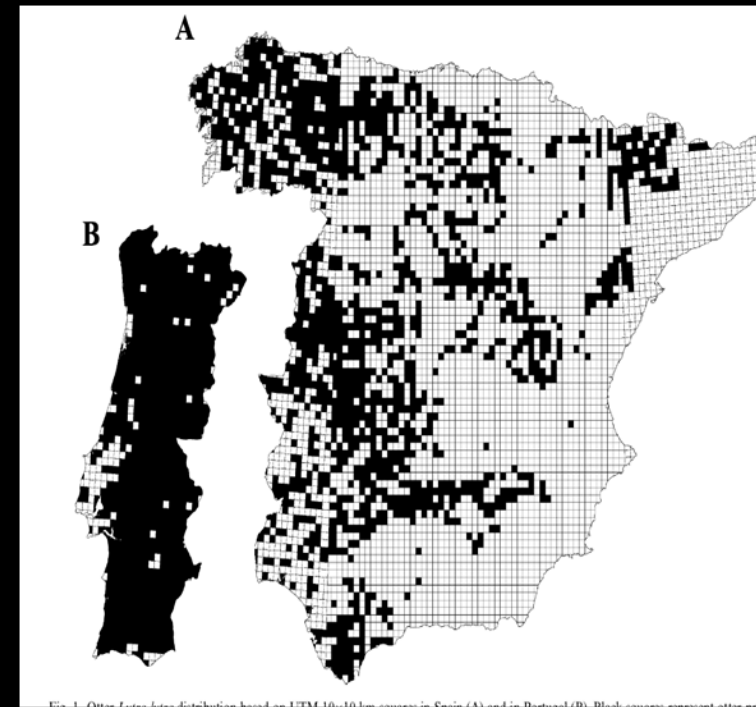
ex.

- 1.The lotic habitat is more frequently used than the lentic.
- 2.The lentic is more used
- 3.They are similarly used
- 4.Their order of selection vary seasonally (ex. Lentic used more during summer?)

Choice of the Study Area:



- One of the areas with the most widespread otter populations in Europe
 - 5 - 24% of the global population (IUCN, 2006).
 - Recently passed from **NT** to **LC**
- Widespread river and reservoir network
- Mediterranean climate with frequent extreme droughts
- Good logistics



Study Area: ~ 180 Km²



Methods: immediate release



Live-trapping, transport to the veterinarian hospital, surgical implantation of the transmitter in the peritoneal cavity and...



The Portuguese Institution for the Conservation of Nature and Biodiversity (ICNB) ethically approved the research program and licensed us to capture otters and implant them with intra-abdominal radio-tags (< 2% of weight).

TRAPPING RESULTS :



- 21 otters caught (7 escapes and 2 recaptures)
- 2.67 Trap-nights per otter (N = 21; Range: 1 – 7), or 9.76 NT including also not successful or abandoned trapping sites
- 7 males
- 5 females
- 2086 Kg Mean Male Weight (N=7)
- 121.67 cm Mean Male length
- 7.19 Kg Mean Female Weight (N=5)
- 111.83 cm Mean Female length
- Mean time between capture and release: X = 279.64 min

Animal/Sex	Age	Weight (Kg)	Length (cm)	Monitoring
F1	Adult	7.50	109.00	16-6-07 – present
M1	Adult	8.34	122.50	27-6-07 – 5-5-08
M2	Adult	9.37	127.00	22-7-07 – 11-3-08
M3	Juvenile	6.80	116.50	29-9-07 – present
F3	Adult	6.06	111.00	5-12-07 – present
F4	Adult	8.00	115.50	20-12-07 - present
M4	Subadult	7.33	119.80	12-5-08 - present
M5	Subadult	7.30	121.05	5-9-08 – present
M6	Juvenile	6.05	109.05	7-9-08 - present

RADIOTRACKING:



TECHNIQUES

- **Triangulation** (White & Garrott, 1990)

- **Homing** (Mech, 1983) → ONLY during the day and with animals in resting



FREQUENCY OF SAMPLING

- 1 location every 36 hours per animal, in an attempt to sample uniformly the hours of the day (until 15-9-08 collected a total of **1062 fixes**)
- Continuous monitoring sessions (Cycles) of 6, 12 or 24 hours (**156 cycles**, for a total of **1451 hours**)

ENVIRONMENTAL DATA:



- **Water availability:** Hydrologic conditions, River width, Water depth, Water quality, distance between successive pools, distance to dams;
- **Prey sampling:** Abundance Index of fish by electrofishing (Zippin, 1958) and of Red Swamp Crayfish (*Procambarus clarkii*, Girard) by nets;

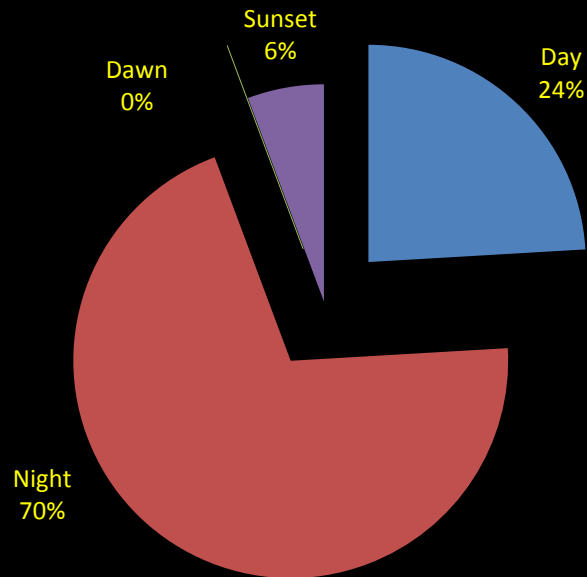


- **Hourly climatic data:** air temperature, precipitation, humidity, wind velocity and direction, solar irradiation.

ACTIVITY RHYTHMS RESULTS:



Percentage of active locations:



Light	Radiolocations
Day	555
Night	415
Dawn	15
Sunset	58
<i>Total</i>	1029

Mainly nocturnal, with only one “temporal” exception (M3)

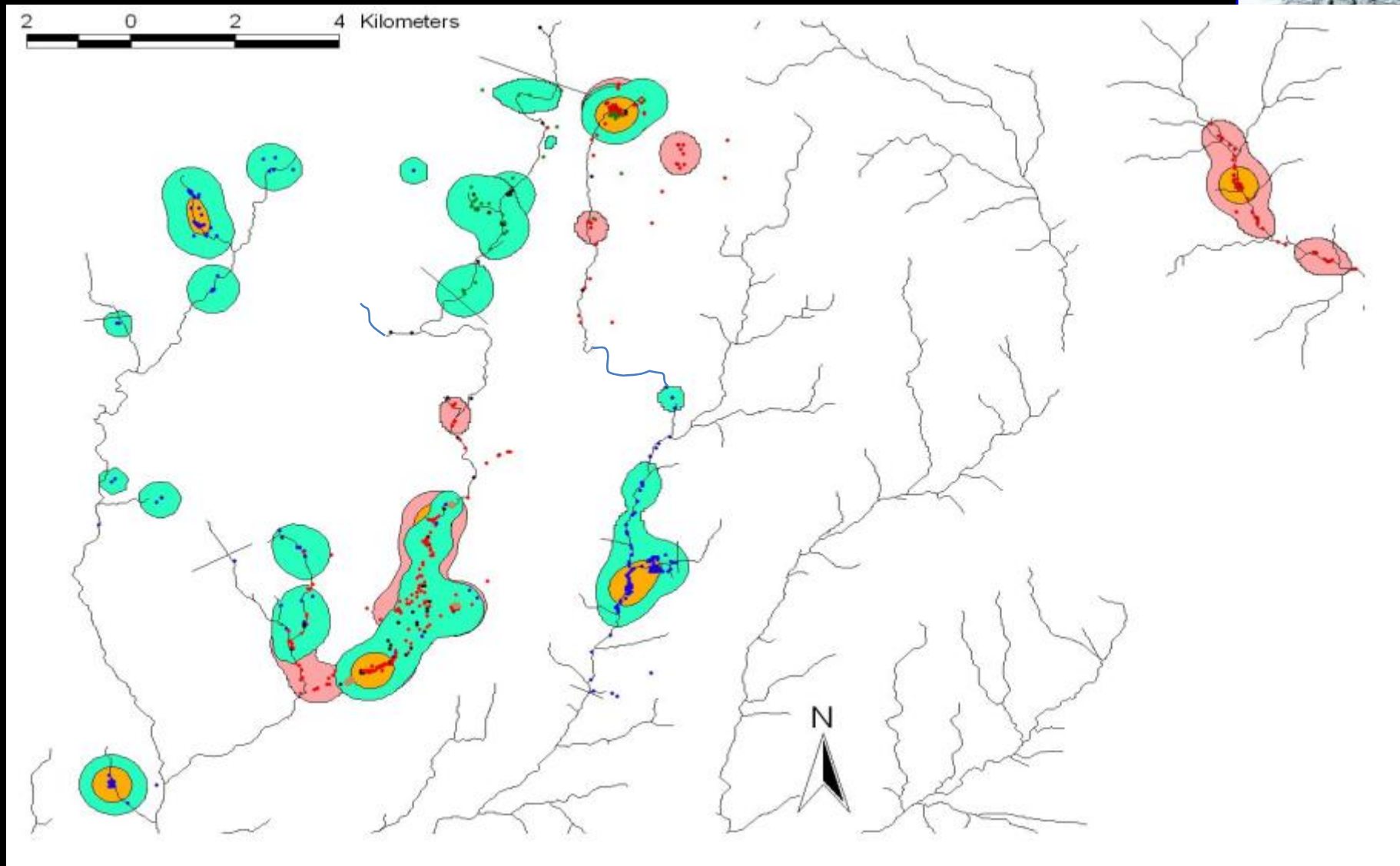


HOME RANGES:

Animal	Estimated age	HR Linear extension (Km)
F1	Ad	18.393
F3	Ad	13.095
F4	Ad	5.807
M1	Ad	9.180
M2	Ad	38.608
M3	Juvenile	38.261 (5.410)
M4	Subad	11.443

Still computing the areas and volumes!

Mean monitoring period needed to reach the asymptote: 62 days



SOCIAL ORGANIZATION:



- No intrasexual overlapping;



Classic mustelid pattern of intrasexual territoriality
(Powell, 1979; Johnson *et al.*, 2000)

- extensive intersexual overlapping, with many times an adult male resting in the same site with two adult females, even when they had cubs

Habitat type use:



200



Vs.



Dry
Reservoirs/Ponds Streams/Rivers Reservoirs/Ponds



Analysing the availability

F1



What is the actual role of the Riparian vegetation ?



When we'll have the definitive pool
of data, how we should interpret
and **divulgate** them?



Where are we going?



We must mark more otters

We also need to improve our prey sampling:
Fish radiotracking?

At the moment we are evaluating the possibility to capture and track otters in the Alqueva's dam, the biggest reservoir in Europe. This will provide us data on a larger dam, and more insight into the controversial issue: if and how do large dams affect otters?



Constraints:

- Time consuming fieldwork and man-power intensive
- Capture success
- Limited budget !



WE THANK:

Fundação Luis de Molina, who partially supports the project, Prof M. Ilheu, for her collaboration and for borrowing electrofishings' equipment, Dr J. Da Costa Reis and Prof J. Potes, the two veterinarians who operated the otters, Dr L. O Néill for the trap-alarms borrowed and Dr Addy de Jongh and the Dutch Otterstation for having provided us with the trap-alarms as sponsorization of the project, Centro de Geofísica de Évora, who kindly furnished climatic data, all the landowners, all the people who helped in the field and the students involved in the project, like Ilaria Campana, Saviana Pansino, Giovanni Manghi, Joao Bernardo, Hugo Zina, Fabrizio Serrentino, Pedro Costa, Henry Travers, Vania Carolina da Silva, Colleen Crotty, Chris Symmes, Ana Vanessa, Sandra Alcobia, Paola Gonçalves, Lara Almeida, Nuno Mezia, Vania Silva, Any Leitao, Rafael, Nelson, Alexandra.

AND YOU FOR THE ATTENTION!



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Otter Portugal Alentejo



○ M3 DISPERSAL



Évora, Portugal

Image © 2008 IGP/DGRF

Image © 2008 DigitalGlobe

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Preliminary data on reproduction



Cubs born all year along:
Spring (N=6), Autumn (N=2), Winter (N=3)

RADIOLOCATION ERROR:



METHOD



- 6 Different operators triangulated transmitters previously hid in different 'ottery' habitat types;
- Comparisons of the 'real' coordinates (GPS) with the estimates (N = 66).

RESULTS



- Mean Error (in m): $\bar{x} = 48.5$; $\sigma = 53.6$; Range: 0 – 341; N = 126
- Mean Error (in °): $\bar{x} = 14.4$; $\sigma = 13.8$; Range: 0 – 93; N = 132.
- Verification of the signal type during diving behaviour

