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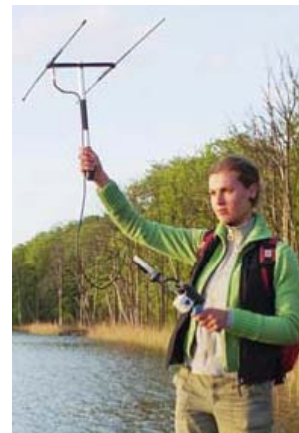
# From litter tree to dispersal –

Insights into the social development  
of raccoon families (*Procyon lotor* L.)  
obtained by VHF telemetry in  
northeastern Germany



# The „Project Raccoon“ in Germany

- Three-year ranging wildlife research study
- Basic data about the population ecology of raccoons in the German lowlands (national park „Müritz“):
  - Spatial and social behaviour, habitat analysis (VHF-Telemetry)
  - Population structure & size (Cameratraps, Pathology, Capture-Mark-Recapture)
  - Genetic relatedness and paternity tests
  - Feeding ecology (scat analysis)





## Research status „Raccoon families“

- Only **one** study on free-ranging raccoon families (SCHNEIDER et al. 1971):
  - Gradual decrease of joint traveling until autumn, but increased den sharing during winter again
  - Final dissolution of families in early spring (mating season)

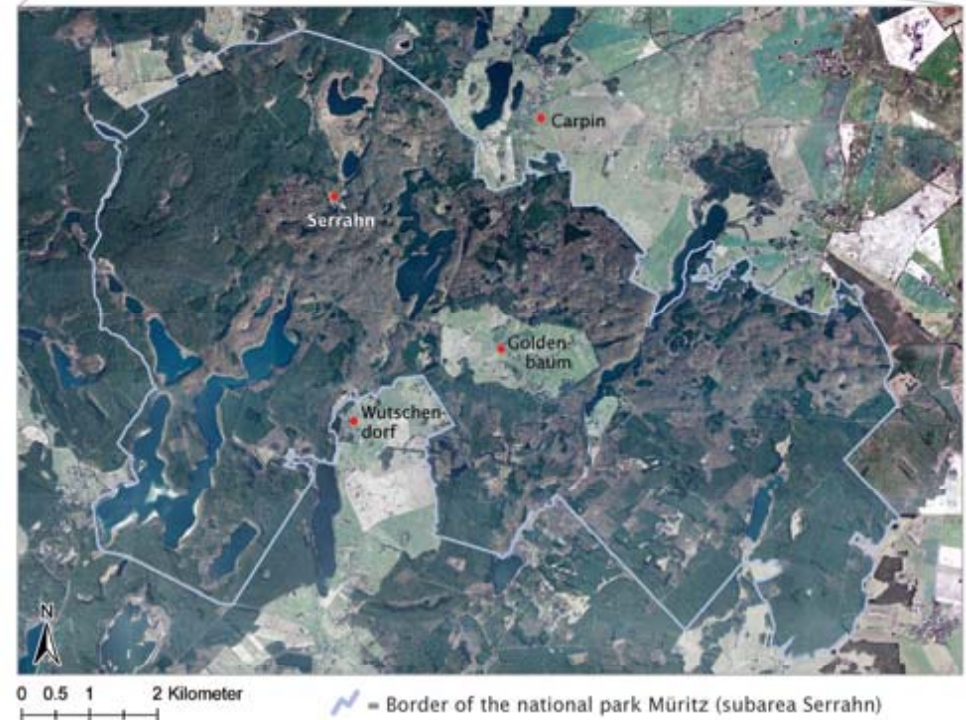
Our investigations focused on:

- Temporal aspects
  - Usage of litter trees
  - Joint traveling to dissolution of family units
  - Dispersal
- Spatial aspects
  - Distances within family units
  - Overlap and size of home ranges
  - Denning behaviour
- Differences betw. adults & juveniles



## Study Area – National Park Müritz

- Located in the northeast German lowlands:
  - 120 km north of Berlin
  - National park „Müritz“, subarea Serrahn
  - 3500 ha
- Dominated by
  - a variety of waterbodies,
  - primeval beech forests (nom. UNESCO Natural Heritage)
  - 65% forest, 19% farmland, 15% water, 1% civilisation
- Temperate climate



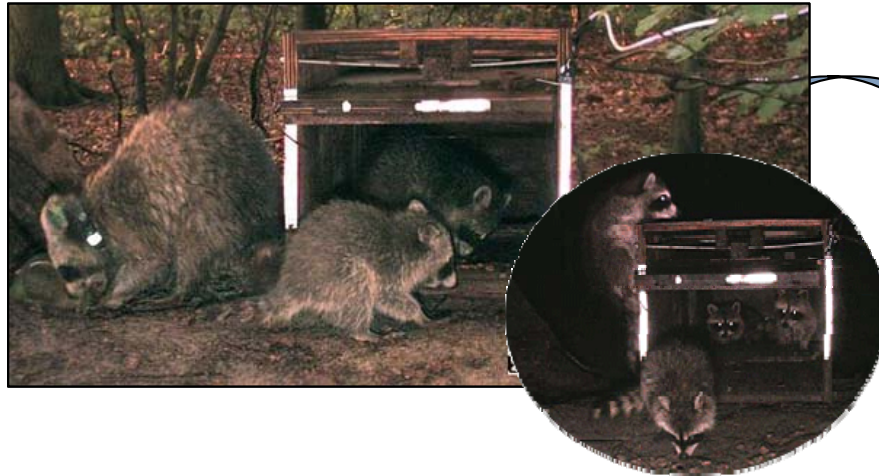


# Study Area – Bogs and mature forests





# Tracking raccoon families



Min. weight: 2000 g!  
Age: ~ 12 weeks



Special,  
expanding  
collars

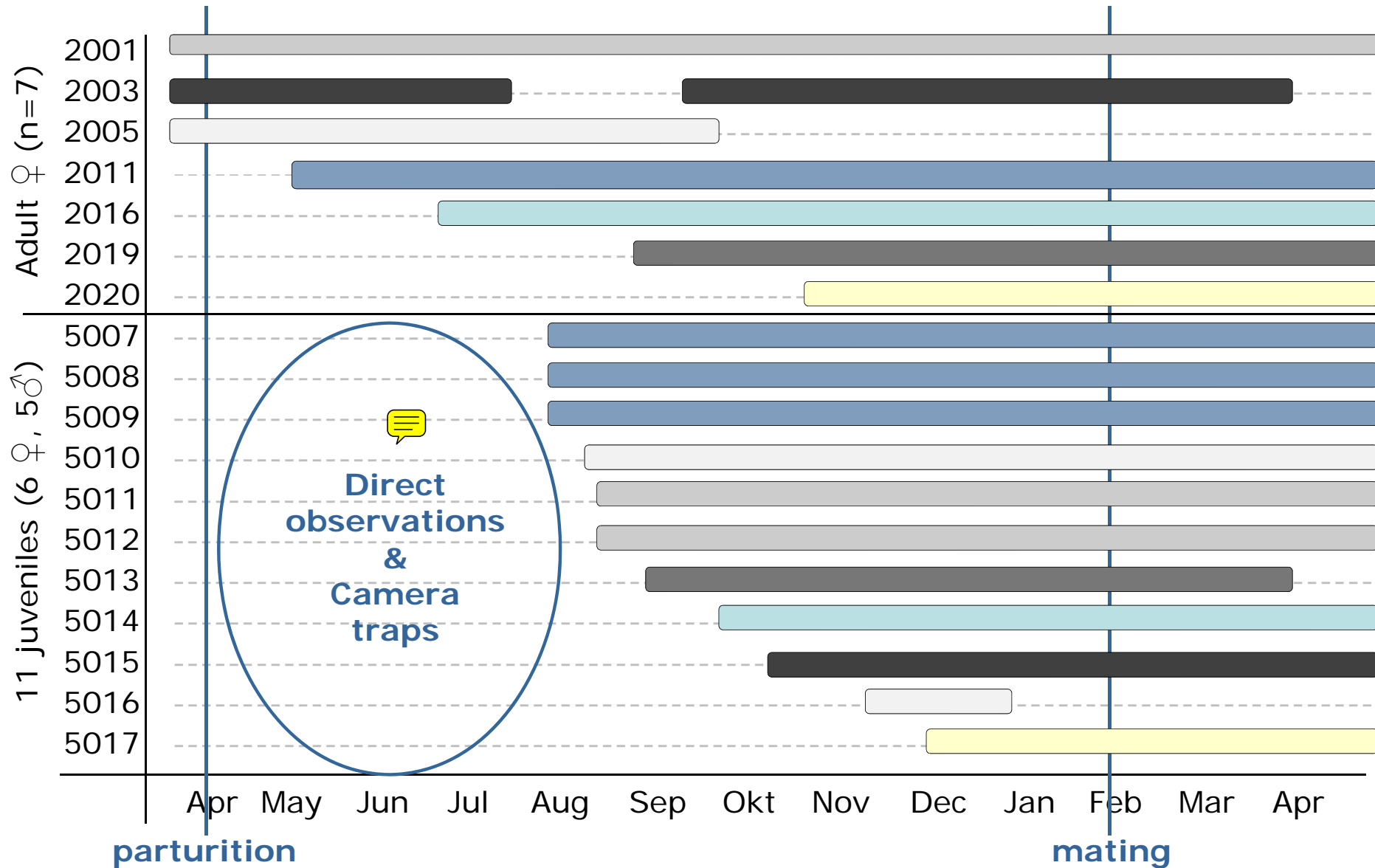
## VHF-Telemetry:

- Once at daytime via „Homing“
- Twice at night per Triangulation



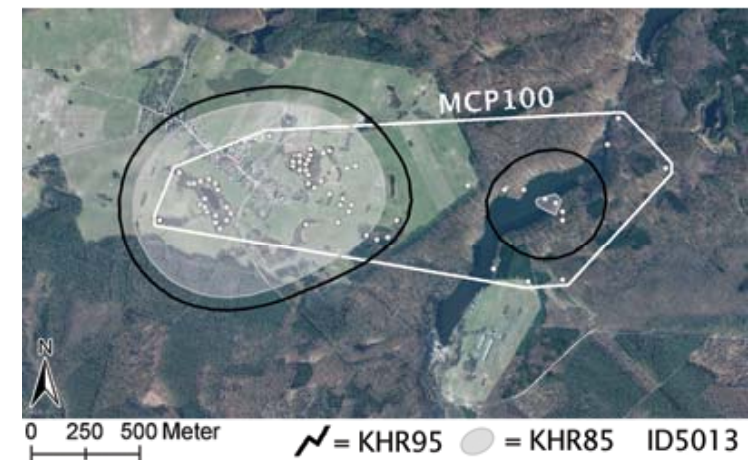
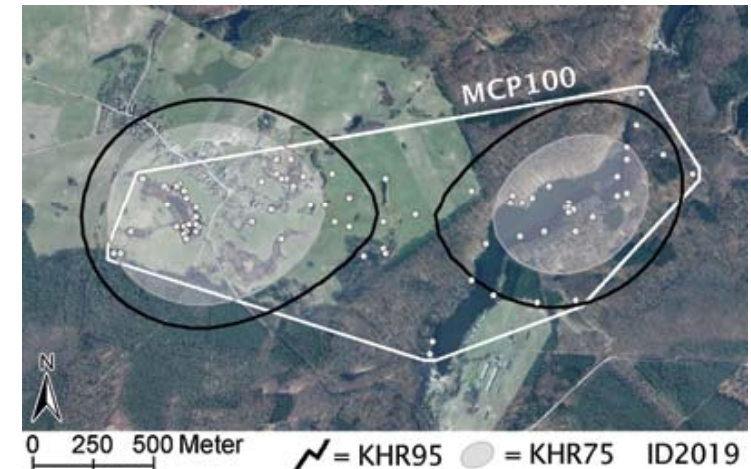


## Studied raccoons



# Home range analysis

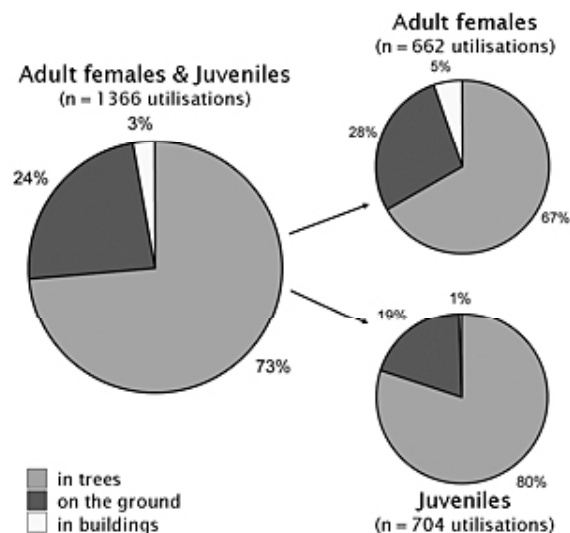
- Kernel home ranges 95% (KHR95) out of **6602** localisations
- Av. annual home range sizes:
  - Adult females: **203 ha**  
(n=15; min. 92 ha, max. 580 ha, SD. 144 ha)
  - Juveniles: **195 ha**  
(n=12; min. 43 ha, max. 634 ha, SD. 180 ha)
  - No significant difference (t-test:  $p=0,7$ )
- Extensive overlap of home ranges within the family units:
  - Juvenile home ranges overlapped to **75%** (min. 29%, max. 91%, SD 25%) with their maternal area
- During litter phase: No influence on maternal spatial behaviour





## Denning behaviour

- Litter trees were used for av. 59 days (min. 46, max. 67)
- Successional litter tree** up to 15 days
  - Observed for the first time for three families
  - Possible reasons:
    - Increased agility of cubs,
    - Hygienical reasons,
    - Continuing protection for cubs
- Daily change of den sites → 11<sup>th</sup> week



- No differences betw. ad/juv in usage of den site categories (see left), but ...
- Number of familiar den sites differed:
  - Ad. ♀ used av. **35** varying den sites
  - Juv. used av. **24** varying den sites

} p=0,004
- Juveniles used higher den sites in trees:
  - Ad. ♀ slept in **14m** height
  - Juv. slept in **17m** height

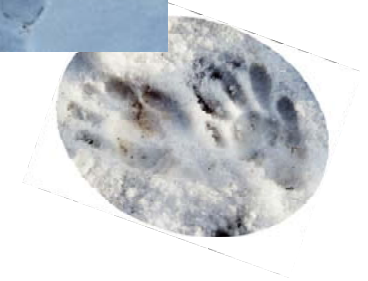


# Daytime resting sites in trees





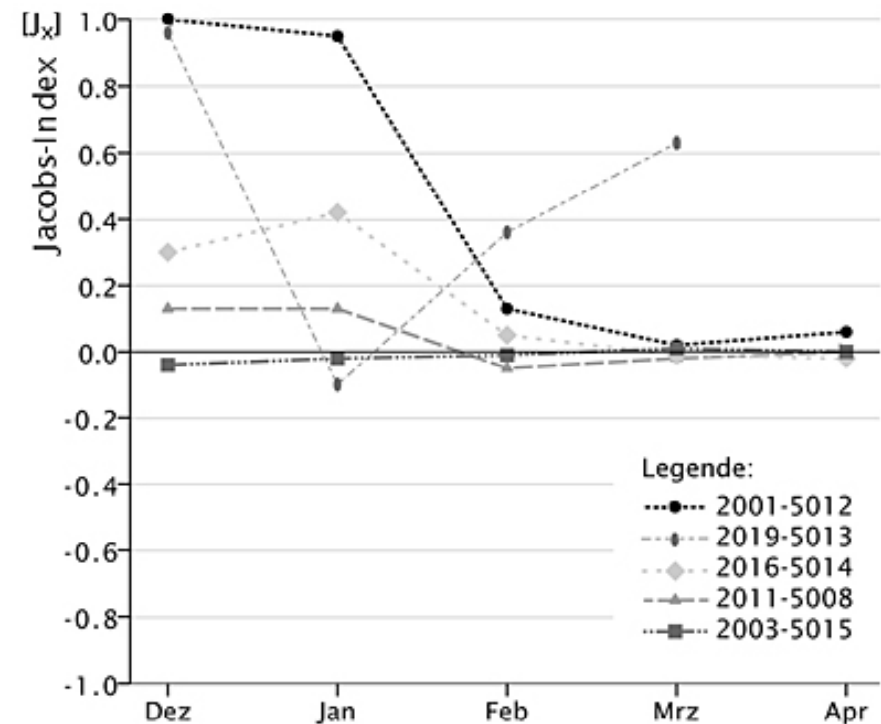
# Daytime resting sites „on the ground“





## Dynamic interactions in raccoon families

- Until 5<sup>th</sup> month cubs accompanied their mother (<100m distance)
- First independent movements at the age of 7 month; excursions and denning solitary
- Investigated social bonds via **Jacobs-Index** (expected vs. observed distances between familial dyads)
- Individual interactions in autumn
- Considerable decrease of interactions during mating season (February)
- Behavioural changes due to hormonal status → aggressiveness and defense of daytime resting sites
- Exception 2019-5013: strong bonds until the mother frequented her next litter tree (April)





## Dispersal of juvenile raccoons

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- Only males dispersed; females used maternal area (matrilinearity)
- Period of dispersal (observed for 4 male juvenile raccoons):
  - ID 5007: **October 2007**  
Several day, wide-ranging excursions  
New home range ~2km north (still under telemetric control today)
  - ID 5013: **April 2008**  
dispersed towards north; tracing not possible
  - ID 5009: **Mai 2008**  
Traced over 70 km towards southeast (MICHLER)
  - ID 5010: **Mai 2008**, tracing not possible (MICHLER)
- Dispersal with sexual maturity or dissolution of familial bonds





## Summary & Conclusions

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- Juvenile raccoons used home ranges within their natal area
- Juvenile raccoons used less den sites and preferred established and higher daytime resting sites
- → → **Development of juvenile raccoons is not completed after their first year of life**
- Social interactions within family units
  - Very individual development with possible influences of mother's age and sexual constitution of litter, but
  - → **Long-lasting social bonds between mother and cubs as well as between siblings are possible and they could last until the next parturition phase**





**Thank you**  
for your interest!

This study and the IUGB attendance was kindly supported by:

Dr. Gustav-Bauckloh-Stiftung, Dortmund



Gesellschaft der Freunde  
der Ruhr-Universität Bochum e.V.



Förderverein  
Mürz-Nationalpark e.V.

