

# Habitats in the National Park Seewinkel and Bird Diversity

Anna Sommer, Daniel Stieringer, Marielle Schleifer, Sarah Seeleitner, Vera Foisner

University of Salzburg

**Keywords:** birds, core and protection zone, lake Neusiedl, Nationalpark Seewinkel

**Introduction:** The Nationalpark Neusiedlersee – Seewinkel is the only steppe-national park in Austria with Austria's largest lake Neusiedl and the second largest connected reed belt in Europe (178km<sup>2</sup>) (Herzig & Dokulil, 2001, Löffler 2012). The vast meadows and pastures, salt ponds and reedbeds are habitat to about 340 bird species. This important bird area is a hotspot of migrating birds (Nemeth *et al.*, 2003). The national park contains areas with varying grade of protection. The nature zone with the strongest protection, followed by the preservation zone and the landscape preservation zone (Int 1).

Research questions:

- i) Do core and protection zones differ in species richness and diversity?
- ii) Are there mostly habitat generalists or specialists?

The data were sampled during a field course from 25. to 27. April 2019 in the National Park Lake Neusiedl, Seewinkel in Austria. The observation took place before midday and in the afternoon at ten sampling sites, composed of four core and six protection zones. The sites were always observed from a public observation tower and the area was a quadrant (with a length of approximately 150m). Birds were counted for 30 minutes and allocated to their habitat locality. For identifying the bird species, we used binoculars and a spotting scope, as well as identification keys. The statistical analysis was performed with R (v. 3.5.3). The alpha diversity and the diversity of composition of the sampling sites referring to the habitats were calculated with the Shannon Index and the beta diversity of the bird community? was computed as a NMDS.

**Results:** In total 52 bird species were identified (7 of them just to family level and 2 species could not be identified). The statistical analysis showed no significant difference in diversity? Abundance? Community composition? between the two observed zones, there are variations in the species and habitat distribution. Some species, like *Sturnus vulgaris* showed a higher standard deviation in their distribution because of the different number of individuals counted per sampling site. *Anser anser* was seen in 4 of the 5 observed habitats and occurs mostly in water and salty areas. Some species were only seen once but in a high abundance, like *Passer montanus* in the core zone and show therefore no deviation. While others, like *Sturnus vulgaris* were seen regularly but with lower abundance (figure 1). The habitat distribution showed that there are habitat generalists and specialists. For example, *Anas platyrhynchos*, *Netta rufina* and *Tadorna tadorna*. In total 4 core zones and 6 protection zones were observed, which may be the

reason why there were more species in the protection zone. Most of the observed individuals were just flying over the observation sites. There was a high difference in the Shannon index of the species distribution of the different habitats. Site 1 for example had the least number of habitats (N=2). Site 4 and 10 had the same number of habitats (N=5) and therefore a similar Shannon index. The Shannon index for the two zones is almost the same and showed that there was no difference between them. Although the sample size was too small to show a significance, one could see a trend that other factors like wind or cloudiness influenced the abundance.

**Discussion:** Analyses showed that there is no significant faunal dissimilarity between the zones. The most dominant species at all sampling sites was *Anser anser*. Looking at some other high abundant species, a more complex impression arises. Species like *Vanellus vanellus*, *Sturnus vulgaris* or *Corvus corone cornix* do also seem quite abundant in the observed area.

Looking at the results, one gets the impression that the “Protected Landscape Approach” can be a quite successful way to ensure the protection of local biodiversity in the National Park Seewinkel (Brown *et al.*, 2005). Not only do the hemerophilic species occur in a relatively abundant manner, but also species that have high demands concerning their ecology and their habitat. Recent studies show, that the status of *Vanellus vanellus* and other species prevalent in Annex 1 of the birds’ directive is increasing in the national park after quite a long period of decline. Long term monitoring shows a strong decline in migratory as well as sedentary bird species (Dvorak *et al.*, 2016; Dvorak *et al.*, 2017). Results of the long-term bird monitoring in the Lake Neusiedl area clearly showed that nearly a third of species monitored (12 out of 39) showed a decline in numbers (Dvorak *et al.*, 2016). These are mostly habitat specialists and species showing large scale declines Europe- or worldwide. On the other hand, short term trends since 2001 are mostly positive. A more detailed analysis suggests that some of these recovering species have benefitted from management plans (Dvorak *et al.*, 2016; Probst *et al.*, 2011). Our short time sectorwise monitoring acknowledges these recent improvements and despite having little data and having spent little time in the field one can get the impression of a diverse biocenosis. Having identified some quite rare species (Annex 1 of the birds’ directive; Donald *et al.*, 2007) in such a short time, shows that National Park Seewinkel is a highly diverse region, a very important bird area and can still be seen as a hotspot of migratory birds. Especially rare limikole species, which have high demands on their habitat like *Tringa totanus*, *Tringa glareola* as well as other *Scolopacidae* show that the parks policy, respectively the level of disturbance may be suitable for improving biodiversity inside the national park and that human intrusion, in a regulated manner, and biodiversity do not exclude one another. It seems like having a core zone and a protection zone can be a rather practical way to ensure both, hemerophobic as well as hemerophilic species diversity. To further investigate those assumptions, to specify and analyse abundances of those two ethologically separating aspects of specific bird species ecology, ongoing sampling on

the species level in both of the zones is advised.

### References:

Brown, J., Mitchell, N. J., & Beresford, M. (Eds.). (2005). The protected landscape approach: Linking nature, culture and community. IUCN.

Donald, P. F., Sanderson, F. J., Burfield, I. J., Bierman, S. M., Gregory, R. D., & Waliczky, Z. (2007). International conservation policy delivers benefits for birds in Europe. *Science*, 317(5839), 810-813.

Dvorak, M., Bieringer, G., Grüll, A., & Karner-Ranner, E. (2017). Long term-monitoring of birds reveals drastic changes in the bird communities at the national park Neusiedler See–Seewinkel.

Dvorak, M. et al. (2016). Bestand, Verbreitung und Bestandsentwicklung gefährdeter und ökologisch bedeutender Vogelarten im Nationalpark Neusiedler See-Seewinkel; 2001 bis 2015.

Herzig, A., & Dokulil, M. (2001). Neusiedler See–ein Steppensee in Europa. *Ökologie und Schutz von Seen. Facultas UTB, Wien*, 401-415.

Löffler, H. (Ed.). (2012). *Neusiedlersee: the limnology of a shallow lake in central Europe* (Vol. 37). Springer Science & Business Media.

Nemeth, E. et al. (2003). Interaction between fish and colonial wading birds within reed beds of Lake Neusiedl, Austria. *Interaction between fish and birds: implications for management*. (Ed. IG Cowx). *Fishing News books, Blackwell Science, Oxford*, 139-150.

Probst, R., & Gaborik, A. (2011, November). Action Plan for the conservation of the White-tailed Sea Eagle (*Haliaeetus albicilla*) along the Danube. In *Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention)*. *Nature and Environment* (Vol. 163).

Svensson, L., Grant, J.G., Mullarney, K., Zetterström, D. (1999): *Der neue Kosmos Vogelführer*. Albert Bonniers Förlag, Stockholm

Internet:

Int 1: <http://www.nationalpark-neusiedlersee-seewinkel.at/nationalpark.html>, received 2.5.2019

Int 2: <http://www.nationalpark-neusiedlersee-seewinkel.at/der-kiebitz.html>, received 1.5.2019

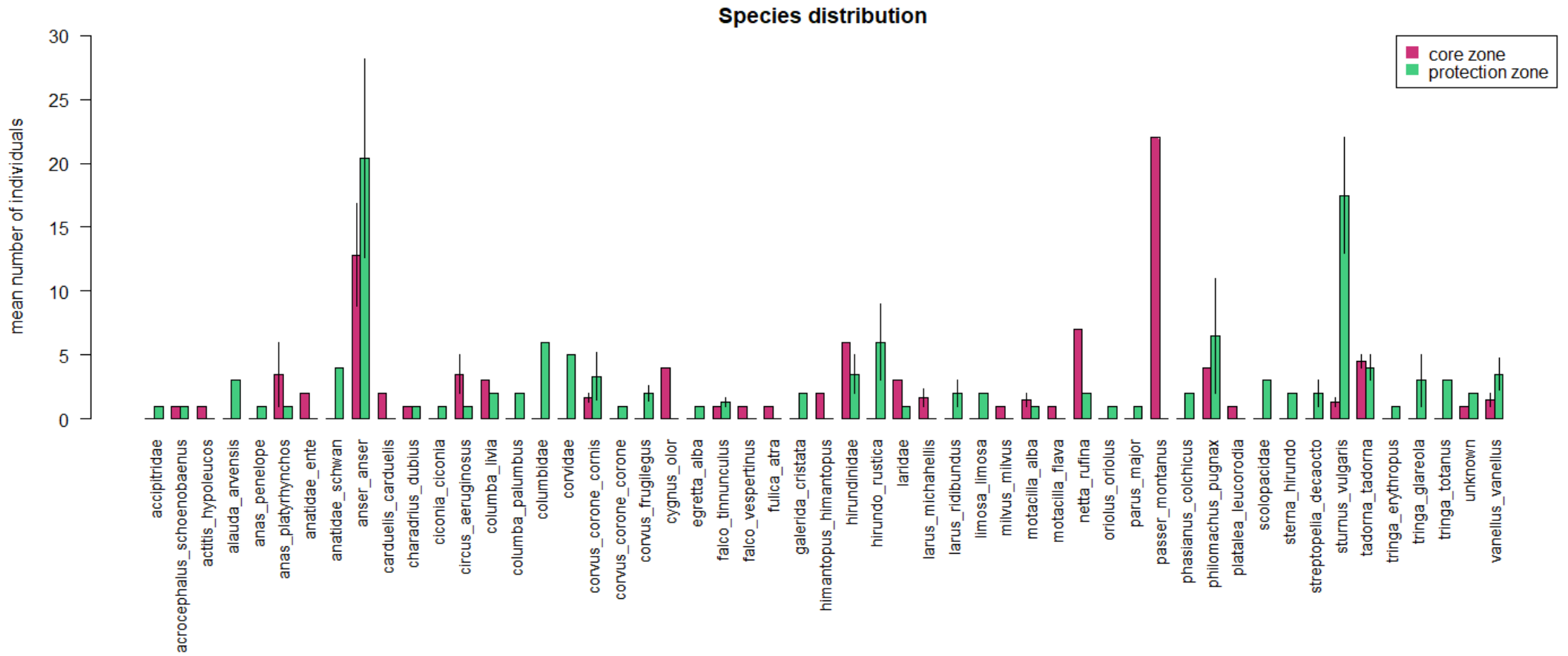


Figure 1: Mean number of the 54 species observed in the two different zones (core & protection).