

## YELLOW-LEGGED GULL *Larus michabellis* IN THE SEČOVLJE SALTPANS (SW SLOVENIA) – ABUNDANCE, AGE DISTRIBUTION AND HABITAT PREFERENCE IN POST-BREEDING PERIOD IN JULY 2003

### Rumenonogi galeb *Larus michabellis* v Sečoveljskih solinah (JZ Slovenija) – številčnost, starostna sestava in izbor habitata v pognezditvenem obdobju v juliju 2003

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A large number of Yellow-legged Gulls, *Larus michabellis*, gather annually after the breeding season in the Sečovlje salt pans, Slovenia. The abundance, habitat choice and age distribution were registered on several occasions by counting the gulls and marking their position on maps. The population reached a maximum of nearly 13,700 individuals on July 19, making it one of the largest in the Mediterranean, after which it decreased to approx. 10,000 on July 30. The majority of the gulls in the area were non-juveniles, i.e. birds in their second calendar year or older, which probably came there to moult. The percentage of juveniles was quite high at the end of the month. Most of the gulls spent the days outside the area, gathering a few hours before sunset to roost in the salt pans. The gulls roosted mainly on firm and dry ground providing clear views.

**Key words:** Yellow-legged Gull, *Larus michabellis*, Sečovlje salt pans, abundance, age distribution, habitat preference

**Ključne besede:** rumenonogi galeb, *Larus michabellis*, Sečoveljske soline, številčnost, starostna sestava, izbor habitata

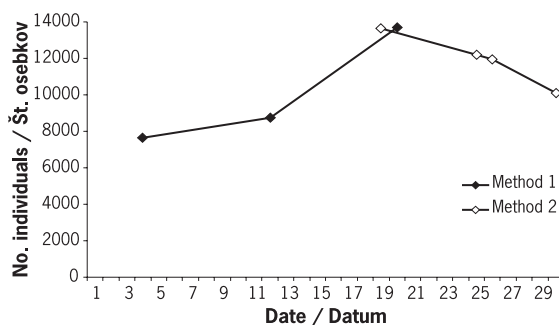
#### 1. Introduction

The population of Yellow-legged Gull, *Larus michabellis*, is distributed throughout the Mediterranean, parts of the Aegean Sea, the Black Sea and in central Europe to about 52°N. It increased substantially during the last century, now numbering 150,000–200,000 pairs (BLOMDAHL *et al.* 2003, CRAMP & SIMMONS 1983, DEL HOYO *et al.* 1996, MALLING OLSEN & LARSSON 2003, MULLARNEY *et al.* 1999, BIRDLIFE INTERNATIONAL 2004). A considerable proportion of the Yellow-legged Gulls stay close to the breeding sites year-round, but the populations in south-western Europe, the Adriatic Sea and the eastern Mediterranean migrate northwards to an increasing extent after the breeding season (BLOMDAHL *et al.* 2003, CRAMP & SIMMONS 1983, DEL HOYO *et al.* 1996, MALLING OLSEN & LARSSON 2003).

Large numbers of Yellow-legged Gulls gather every summer in the Sečovlje salt pans in coastal Slovenia. The few previous studies include counts of the population made every summer from 1983 to 1997 (ŠKORNIK *et al.* 1998). A maximum of 4,000 individuals were counted in August 1996 and 1997 (MAKOVEC *et al.* 1998). RUBINIČ (in POLAK (ed.) 2000) states that the largest number of Yellow-legged Gulls recorded in the entire salt pans area was 15,000, registered in August.

#### 2. Methods

The Sečovlje salt pans are situated by the Slovenian coast in the Bay of Piran in the northernmost part of the Adriatic Sea and cover an area of 738 ha. They consist of two parts: Fontanigge, where commercial salt production was abandoned in the 1960s, and Lera



**Figure 1:** Total abundance of Yellow-legged Gulls *Larus michahellis* on Sečovlje salt pans in July 2003, using methods 1 and 2. Method 1 involved successive sub-area counts (5–7 days) with the median date shown, and method 2 involved counting all sub-areas on one day.

**Slika 1:** Skupna številčnost rumenonogih galebov *Larus michahellis* v Sečovljskih solinah, z uporabo metode 1 in 2. Metoda 1 pomeni zaporedno štetje na podobmočjih (v razmiku 5–7 dni), prikazana je mediana datuma. Metoda 2 pomeni štetje na vseh podobmočjih naenkrat. Prikazani so dnevi v juliju 2003.

(263.5 ha), where salt is still being produced (BELTRAM 1996). This study focuses on Lera, which consists of shallow basins intersected by channels and dikes. The following roosting habitats have been defined: water-filled basins, wet mud in basins, dry mud in basins, low dikes, high dikes without vegetation and high dikes covered with vegetation.

The population was monitored using two methods, both carried out in evenings from 1–30 Jul 2003, using telescope and binoculars. The total number of field days was 20. The area was divided into ten sub-areas and in each one of these the population was monitored on three occasions with a method involving marking the position and activity of the gulls on a made-to-scale map. Water and weather conditions were also recorded. To calculate the abundance of Yellow-legged Gulls in the whole area from this data, the numbers of gulls in the sub areas in one monitoring round (when all areas were monitored over a 5 to 7 day period) were added (referred to as “Total A”). The median date was then chosen as the date for the total number.

On four occasions, the number of individuals in all sub areas was counted during one evening (referred to as “Total B”) and, on 19 Jul all individuals in all sub areas were counted on four occasions during the day. Here, a second monitoring method was used, involving counting the gulls in groups of ten, recording only total numbers in the different sub-areas and thus not their exact position or activity.

The numbers of juvenile individuals (i.e. birds in their first calendar year) in groups of Yellow-legged

Gulls ranging from 48–356 individuals (mean 136) were counted regularly, allowing calculation of the proportion of juveniles, as defined above, and non-juveniles, i.e. birds in their second calendar year or older, in the population.

### 3. Results and discussion

#### 3.1. Abundance

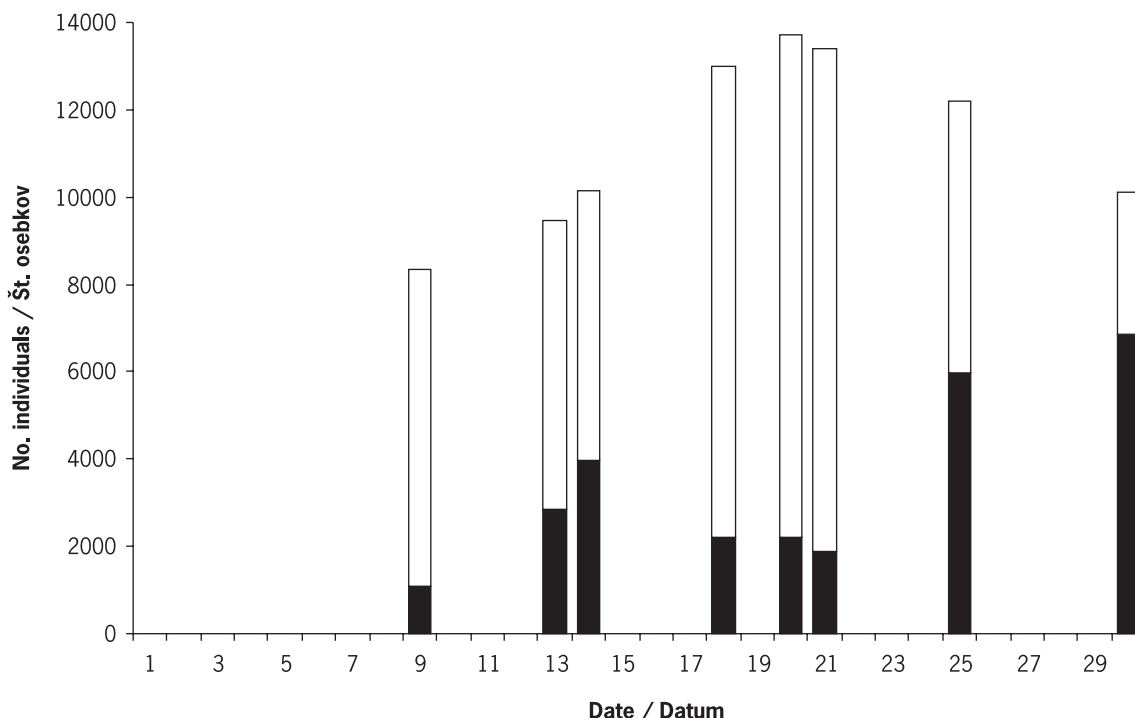
The number of Yellow-legged Gulls roosting in the Sečovlje salt pans increased from about 8,000 in early July to a maximum of nearly 13,700 on 19 Jul (Figure 1). The main cause for the increase was probably the increasing numbers of gulls leaving their breeding grounds after the breeding season, which normally ends in late June or early July (CRAMP & SIMMONS 1983). The number thereafter decreased to about 10,000 on 30 Jul (Figure 1). Access to suitable roosting habitat can probably be excluded as a possible limiting factor to the total abundance. The sum of the highest recorded numbers in the different sub-areas was more than 18,000, i.e. much higher than that recorded in the whole area on 19 Jul. This shows that, even on that occasion, not all possible roosting areas were occupied.

#### 3.2. Age distribution

In early July the Sečovlje salt pans were visited by a large number of non-juvenile Yellow-legged Gulls (Figure 2), probably immature birds or failed breeders (CRAMP & SIMMONS 1983). In mid July the numbers were even higher, probably due to the arrival of adults having finished breeding. The majority of the non-juveniles probably come to the Sečovlje salt pans mainly to moult intensively over a limited period of time. Moulting consumes a lot of energy and the gulls therefore need abundant food resources which they find on nearby refuse dumps. Furthermore, suitable loafing and roosting places are available in the salt pans, making the Sečovlje salt pans a suitable place for moulting. Large numbers of adults gather similarly after the breeding season for moulting in other places in the Mediterranean (e.g. the Ebro delta in Spain) (MALLING OLSEN & LARSSON 2003). At the end of July, approx. 70% of the Yellow-legged Gulls in the Sečovlje salt pans were juveniles.

#### 3.3. Diurnal variation of numbers

On 19 Jul, the number of Yellow-legged Gulls was 2,810 at 8.00 h, decreasing to 1,660 at noon. The



**Figure 2:** Age distribution of the Yellow-legged Gulls *Larus michahellis* on Sečovlje salt pans in July 2003. Black bars denote birds in juvenile plumage and white bars denote non-juvenile birds. Numbers are extrapolated from the count in smaller groups (48–356 individuals, mean 136).

**Slika 2:** Starostna struktura rumenonogih galebov *Larus michahellis* na Sečoveljskih solinah v juliju 2003. Črni stolpci označujejo število juvenilnih osebkov, beli število vseh ostalih starosti. Število je ekstrapolirano iz štetja manjših skupin (48–356 osebkov, povprečje 136).

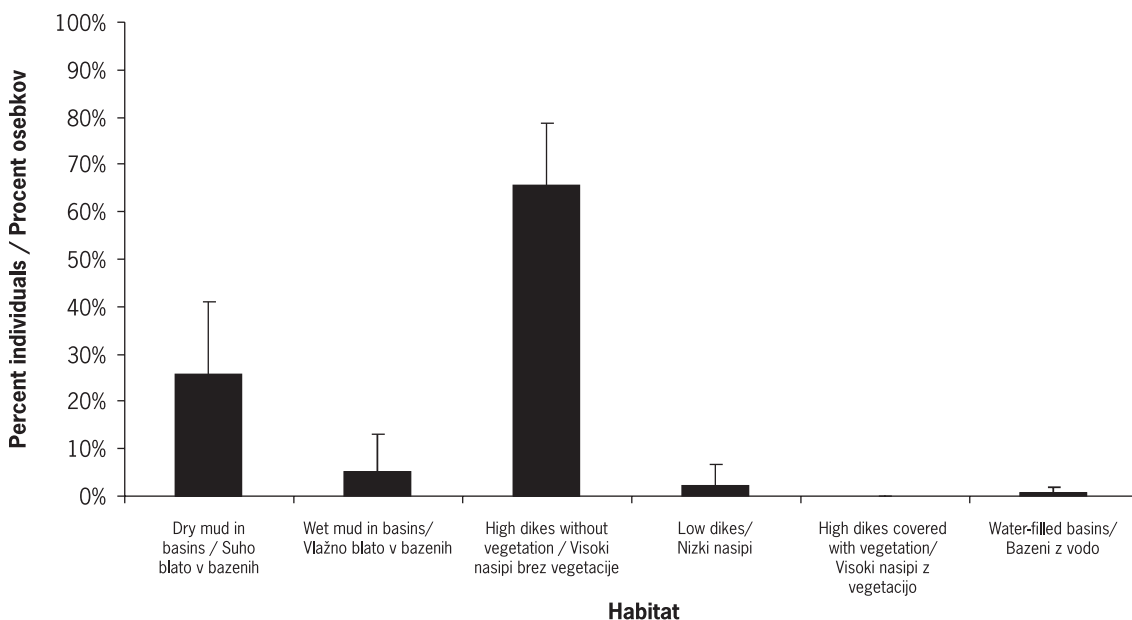
number thereafter increased slowly until 16.00 h and very fast between 16.00 and 20.00 h, when it reached 13,673. The majority of the Yellow-legged Gulls thus spent the day outside the Sečovlje salt pans, leaving the area in the early morning and returning just before sunset.

### 3.4. Habitat preference

High dikes without vegetation constituted the preferred roosting habitat (occupied by an average 66% of the gulls), followed by dry mud in basins (26%), wet mud (5%), low dike (2.4%) and water-filled basin (0.75%) (Figure 3). No gulls roosted on high dikes covered with vegetation. The concentrations on the different habitats (Figure 4) support this distribution. The insignificant number of gulls occupying water-filled basins shows that this is not a frequently used roosting habitat, in keeping with the absence of records that Yellow-legged Gulls normally roost or loaf in water. The individuals that stood in water-filled basins were generally more active than those standing on dikes or

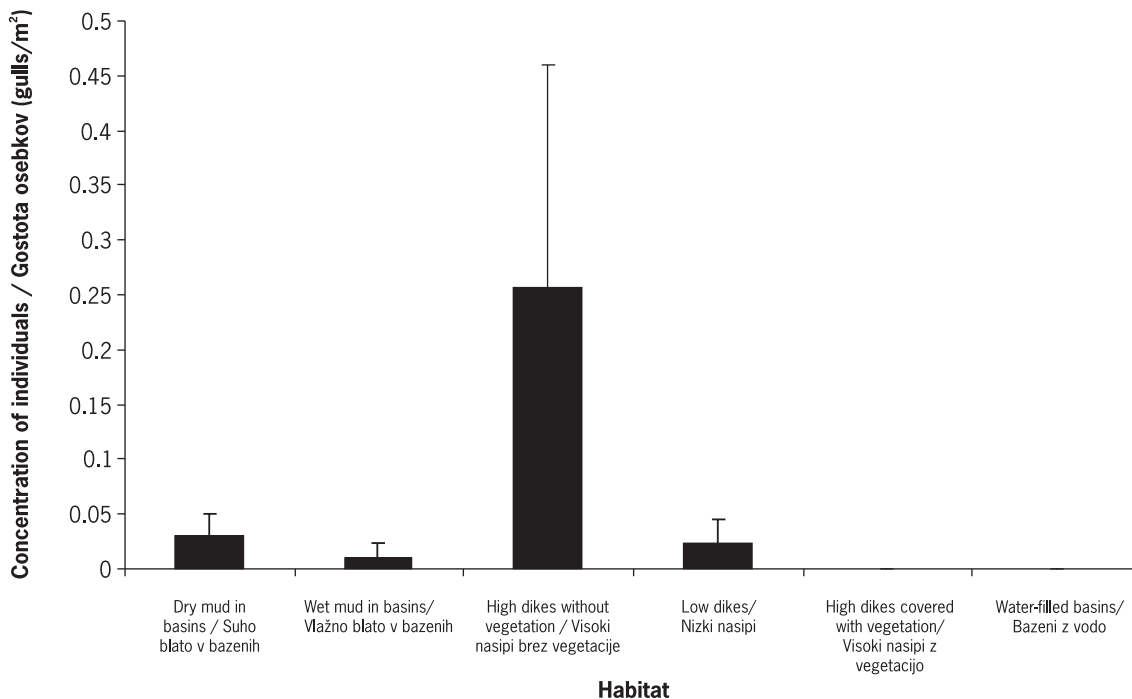
mud in basins and their activity can thus be considered foraging rather than roosting. The latter birds probably moved to another habitat at sunset.

Two factors, apart from disturbance, appear to be important for the Yellow-legged Gulls when choosing a roosting place – the view from the roosting place and its condition (consistency and dampness). The material on which the gulls appear to prefer to roost is dry, solid mud. Earlier studies have shown that the gulls want a good view in order to escape predators (CRAMP & SIMMONS 1983). This conclusion is supported by two observations. One is that the concentration of gull droppings on a broad dike with small hills about 4 dm high was considerably higher on the hilltops than on the surrounding dike. The second is that, in a ditch with dry mud in the bottom, gulls only occupied the sides of the ditch and not the bottom, where the view was very limited. On high dikes without vegetation, both criteria for the view from the roosting place and its condition are met. The fact that no gulls occupied high dikes covered with vegetation highlights the importance of the view. The



**Figure 3:** Average percentages of Yellow-legged Gulls *Larus michahellis* in different habitats in Sečovlje salt pans. Error bars denote standard deviations.

**Slika 3:** Povprečni procent rumenonogih galebov *Larus michahellis* v različnih habitatih v Sečoveljskih solinah. Označena je standardna deviacija.



**Figure 4:** Average concentrations (gulls/m<sup>2</sup>) of Yellow-legged Gulls *Larus michahellis* in different habitats in Sečovlje salt pans. Error bars denote standard deviations.

**Slika 4:** Povprečna gostota (galebov/m<sup>2</sup>) rumenonogih galebov *Larus michahellis* v različnih habitatih v Sečoveljskih solinah. Označena je standardna deviacija.

assumptions can furthermore be corroborated by the fact that the main predation of the gulls in Sečovelje salt pans comes from two terrestrial predators – Red Fox *Vulpinus vulpinus* and Stone Marten *Martes foina*. Higher bare points offer good views to terrestrial predators but, at the same time, gulls' exposure to air predators is minimal, since air predators such as Goshawk *Accipiter gentilis* or Peregrine Falcon *Falco peregrinus* are rare at this site. This does not, however, account for the observation that the concentrations of Yellow-legged Gulls in several cases increased very drastically on low dikes and wet mud in basins, while the concentrations on dry mud in basins and high dikes without vegetation were more constant. This indicates that, when the preferred habitats are fully occupied, the gulls have to occupy less preferred habitats such as wet mud in basins and low dikes. There is some view over possible predators from the bottoms of the basins, where a considerable proportion of the individuals roosted. What differs between dry mud in basins, wet mud in basins and low dikes is the consistency and the dampness, and therefore dry mud, which is dry and solid, is preferred.

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#### 4. Povzetek

V pognezditvenem obdobju se v Sečoveljskih solinah zbere veliko število rumenonogih galebov *Larus michahellis*. Populacijo je avtor spremljal v juliju 2003 z namenom določiti njene parametre glede številčnosti, izbora habitata in starostne sestave. Število rumenonogih galebov je doseglo maksimum 19.7.2003, ko je naštel kar 13,700 osebkov, kar pomeni eno največjih pognezditvenih skupin v Sredozemlju. Po tem datumu je število upadlo na pribl. 10,000 dne 30.7.2003. Večina osebkov ni bila mladostnih, procent mladostnih osebkov je narasel le na koncu meseca. Večina galebov se je med dnevom zadrževala izven solin, kjer so se zbrali pred sončnim zahodom z namenom prenočevanja. Galebi so prenočevali v glavnem na trdnih in suhih tleh z jasnim razgledom.

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