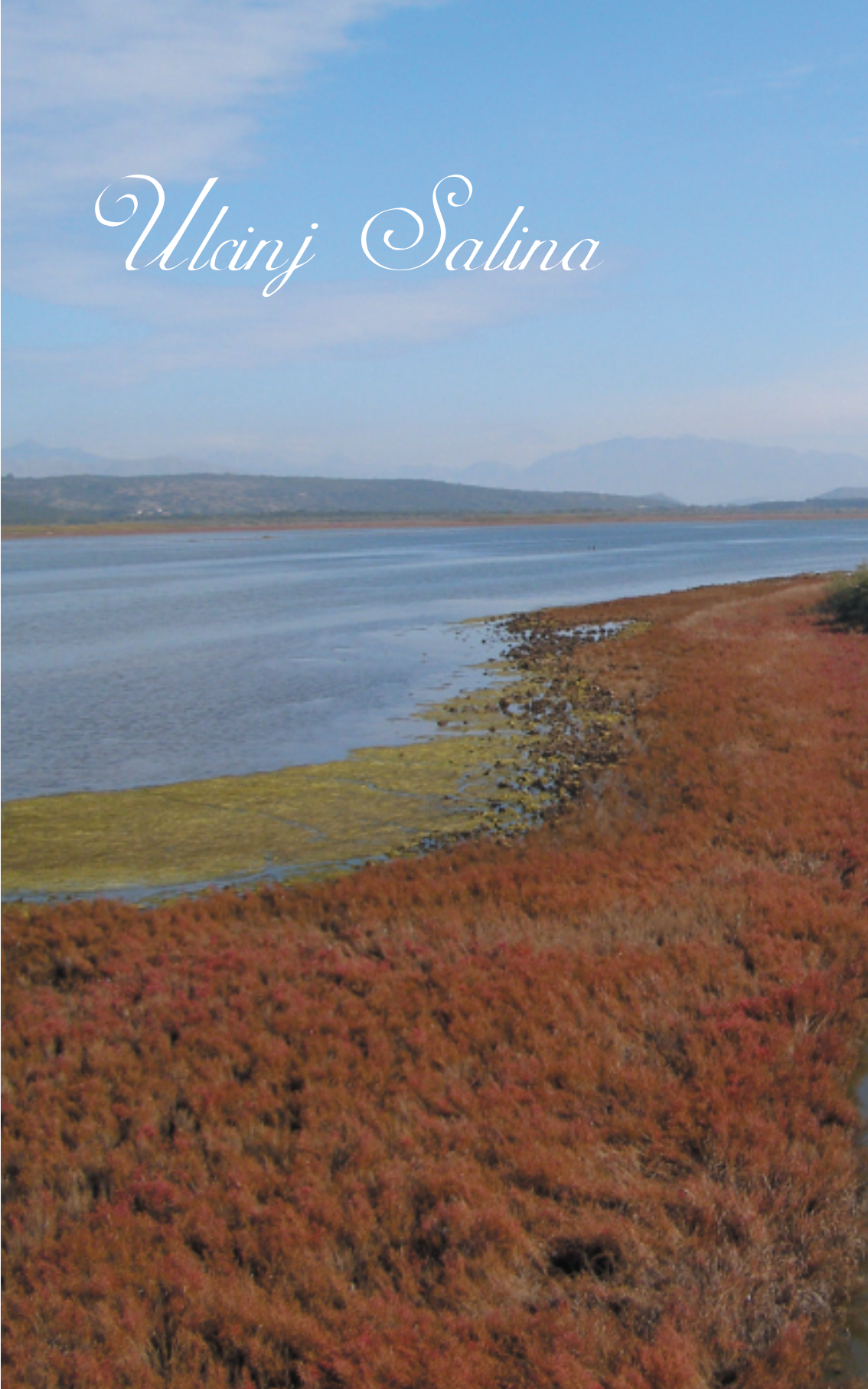

Ulcinj Salina

GEOGRAPHICAL POSITION

Ulcinj Salina is located in the southernmost part of Montenegro and covers approx. 14.5 km² of salty basins. It is built in the region with the largest number of clear sky days and the most sunshine on the Adriatic - 2,567 hours - and the largest number of tropical days in ex-Yugoslavia. Hence, this is an ideal place for a Salina, i.e., a saltpan, which in this case bases its salt production exclusively on evaporation. The Salina is 1 km from Ulcinj town and the same distance from the border with Albania. There used to be the Zogajsko blato, 'Zogaj mudflats' ("zog" meaning "bird" in Albanian) in the area of the present Salina, a wetland with brackish water, which began to be significantly influenced by anthropogenic infrastructural intervention in the late 1830s.

Today it is an artificial, human-managed system where the rhythm of filling and emptying the basins with sea water, the water level and salinity are all predetermined. Hydro-regulation of the Zogaj mudflats began in 1913, when the Port Milena drainage channel was dug. The oldest saltpans were built in the period 1926-1934. Until the middle of the 20th century, the Salina was gradually upgraded. At the beginning of the 1980s it was extended by 60 percent and today covers approx. 1,492 ha. Thus, the Ulcinj Salina was created from the sea and represents a "cultural lagoon". The saltpan basins are surrounded by channels that drain the nearby swamps and depressions, taking the water into the Port Milena channel and thereafter into the sea.

The saltpans are separated from the sea by the Brijeg od mora and Velika plaža beach, and from the Bojana river by channels and dikes against floods. They are an important part of the Lake Skadar and Bojana River watershed system. The area covers 1,000 km². The area of the saltpans under shallow salt water is 1,383 ha (92.2%). Dikes, dividers and channels take up 109 ha (7.8%). The Ulcinj Salina is among the most important bird areas on the Adriatic. These important areas include: Velika plaža, Ada Bojana, the Šasko and Skadar Lake and Velipoja in Albania. The Ulcinj Salina is one of the largest and newest saltpans in the Mediterranean.

POLOžAJ

Ulcinjska solana se nalazi na krajnjem jugu Crne Gore i zauzima oko 14.5 km² slanih bazena. Izgradeña je u regionu sa najvećim brojem vedrih dana, najvećom insolacijom na Jadranu - 2567 sunčanih sati i najvećim brojem tropskih dana u bivšoj Jugoslaviji. Dakle, idealno mjesto za solanu koja je proizvodnju soli zasnovala isključivo na evaporaciji. Solana je 1 km vazdušne linije udaljena od grada Ulcinja i isto toliko od granice sa Albanijom. Nekada je na prostoru današnje solane bilo Zogajsko blato ("zog" na albanskom znači "ptica"), močvara sa bočatnom vodom, koja je počela da poprima antropogeni infrastrukturni oblik krajem tridesetih godina pretprošlog vijeka.

Danas je ona vještački, od strane čovjeka dirigovani ekosistem, gdje je unaprijed određen termin punjenja bazena morskom vodom, nivo vode u njima i njen salinitet. Početak hidroregulacije Zogajskog blata vezan je za 1913. godinu, kada je iskopan drenažni kanal Port Milena. Najstariji solanski bazeni su građeni od 1926-1934. godine. Do polovine 20. vijeka Solana je postepeno dograđivana, ali je na površini dobila početkom 80 -tih kada je pročirena za 60 odsto ukupne teritorije, te danas ima 1,492 ha. Solana je, dakle, uzeta od mora i predstavlja "kulturnu lagunu". Ona je okružena kanalom koji drenira okolne močvare/knete, ne dozvoljavajući da se njihova voda miješa sa solanskom. Kanali odvode vodu u kanal Port Milena, a zatim u more.

Solana je od Jadrana odvojena Brijegom od mora i Velikom plažom a od Bojane kanalom i nasipima protiv poplava. Ona je važan dio sistema sliva Skadarskog jezera i rijeke Bojane, slivnog područja koje zahvata 1,000 km². Površina u Solani pod plitkom slanom vodom iznosi 1,383 ha (92.2%), nasipi, pregrade i kanali zauzimaju 109 ha (7.8%). Solana je u "sendviču" najznačajnijih ornitoloških lokaliteta na Jadranu, pa i šire: to su područja od međunarodnog značaja za boravak ptica Velika plaža, Ada Bojana, Šasko i Skadarsko jezero te Velipoja u Albaniji. Ulcinjska solana je jedna od deset najvećih i jedna od najmlađih solana na Mediteranu.

HOW TO ARRIVE

By car:
from Podgorica 85 km
from Budva 68 km
from Skadar (Albania) via Sukobin 40 km

Ulcinj salina - Ulcinjska solana

E	19°18'5,71"	Površina / Area	1492 ha
N	41°55'25,14"	Dubina / Max depth	0,80 m

KAKO DOĆI

AUTOM:
iz pravca Podgorice 85 km
iz pravca Budve 68 km
iz pravca Skadra (Albanija) via Sukobin 40 km

MORE INFORMATION - VIŠE INFORMACIJA

http://www.birdwatchingmn.org

History of ornithology

The earliest ornithological records, from the end of the 19th century, show that this part of the Balkan Peninsula has long been of interest to ornithologists. The founder of Montenegrin ornithology, Ludwig von Fürer, spent three months in 1893 in the area of Ulcinj and recorded 39 nesting pairs of pelicans. He describes the Zogaj mudflats and their exceptional ornithological assets and does not forget to mention the hospitality of the local people. Ever since then, Ulcinj has "hosted" a number of ornithologists. Some of them left rich documentation on birds, and 250 species have been registered.

Because of their direct vicinity to the sea, the Bojana River, Lake Šasko, Velipoja in Albania and Lake Skadar, are interesting for ornithology and science in general. As it was created by the conversion of a swamp, the birds did not have to change their coordinates while migrating. The Ulcinj Salina has been on their route for a long time now. It has only changed its form and function.

WHY IN ULCINJ?

In the early 20th century, the Government of the Kingdom of Yugoslavia ordered the exploration of the territory with the aim of finding the optimal location for construction of a saltpan. Assessments from Ankaran (in today's Slovenia) to Ulcinj were performed by *Guido Grisogono* and *Ante Koludrović*. After six years of work, they selected the Zogaj mudflats, the place where the present Ulcinj Salina is located. The territory of the Zogaj mudflats swamp was significantly reduced, and today only fragments remain.

Istorija ornitologije

Da je ovaj dio Balkanskog poluostrva bio interesantan za ornitologe, pokazuju i prve ornitološke zabilješke s kraja 19. vijeka. Utemeljivač crnogorske ornitologije Ludwig von Fürer 1893. godine boravio je tri mjeseca na području Ulcinja i između ostalog, zabilježio 39 gnjezdećih parova pelikana. On opisuje močvaru Zogajsko blato i njeno veliko ornitološko bogatstvo, a ne zaboravlja da piše i o gostoprimnosti lokalnih ljudi. Od tada do današnjih dana, Ulcinj je "ugostio" veliki broj ornitologa, od kojih su neki ostavili bogatu građu o pticama, gdje ih je je registrovano oko 250 vrsta.

Neposredna blizina mora, Bojane, Šaskog jezera, Velipoje u Albaniji, pa i Skadarskog jezera, čine ovu "kulturnu lagunu"interesantnom za ornitologiju i nauku uopšte. Kako je nastala kultivisanjem močvare, ptice nijesu morale da mijenjaju svoje koordinate tokom selidbe. Ona na njihovom putu odavno postoji, samo je mijenjala oblik i funkciju.

ZAŠTO BAš U ULCINJU?

Vlada Kraljevine Jugoslavije je početkom 20. vijeka naložila istraživanja sa ciljem pronalaska najoptimalnijeg mjesta za izgradnju solane na njenoj teritoriji. Istraživanja od Ankarana (danas Slovenija) do Ulcinja proveli su *Guido Grisogono* i *Ante Koludrović*. Nakon šest godina rada, odlučili su se za Zogajsko blato, mjesto na kojem se danas nalazi Ulcinjska solana. Izgradnjom solane, površina močvare Zogajsko blato znatno je umanjena i danas se nalazi samo u malim fragmentima.

SALT PRODUCTION

The Ulcinj Salina is filled with sea water. At the beginning of April, strong pumps (3,000 l/sec) start drawing water and sea organisms in all their development stages. The water is pumped into shallow basins with an average depth of 20-30 cm. The water, which still has the same salinity as sea water, is transferred from basin to basin mainly by gravitation. From its entry to the saltpans until crystallisation, the water travels several dozen kilometres, and under the influence of the sun and strong winds it evaporates. From the initial 3.8 g/l of salt, it reaches 235 g/l of salt at the end of production (i.e. in the crystallisation basins).

After this, the salt production basins remain dry and are prepared for the next season. One third of the Salina is always under water. Those basins are not included in the production process, which thus enables the proliferation of life in the waters of this lagoon. The saltpan has a production capacity of 30,000 tones of salt annually. Salt is made of plain sea water, sun and wind. It is collected manually and is of high quality. The Ulcinj Salina is the best example of the synergy of economic production and nature protection in ecological Montenegro.

MEDICINAL MUD, SALT AND TOURISM

The anaerobic conditions of the mud in the Ulcinj Salina basins has created large stocks of medicinal mud. Preliminary assessments have shown its high quality, primarily for the healing of arthritis and skin diseases. Together with sea salt, produced by wind and sun from the pure sea water and unpolluted air that blows in summer from the sea and in winter from unpopulated and clean mountains, it makes Ulcinj Salina a heaven for the development of eco- and medicinal tourism. Tourists are welcomed at the Info Centre of the Salina Museum at the entrance to Ulcinj Salina. There are viewpoints, towers and paths 3.9 and 17.6 km long, from which numerous bird flocks can be seen. It is the best example of connecting economic production and nature protection in Montenegro and an excellent opportunity for nature watching in vivo.

PROIZVODNJA SOLI

Solana se puni vodom iz mora. Jake pumpe (3000 l/sec) početkom aprila počinju iz mora izvlačiti vodu i morske organizme u svim njihovim stadijumima razvića. Voda se preliva po plitkim bazenima prosječne dubine 20-30 cm. Voda koja je po salinitetu ravna morskoj, prevodi se iz bazena u bazen uglavnom gravitacijom. Od ulaza u Solanu do njene kristalizacije, pređe više desetina kilometara i pod uticajem jakog sunca i uvijek umjerenog do jakog vjetra isparava. Od početnih 3.8 g/l soli, na kraju proizvodnje tj. u kristalizacionim bazenima, voda dostigne koncentraciju iznad 235 g/l soli.

Nakon proizvodnje soli, bezeni ostanu suvi i pripremaju se za narednu godinu. 1/3 Solane je uvijek pod vodom i ti bazeni nijesu uključeni u proizvodni proces, čime se omogućava konstantno bujanje života u vodama ove lagune. Solana je projektovana za proizvodnju 30.000 tona soli godišnje. So je pravljena od čiste morske vode, sunca i vjetra. Sakuplja se ručno i visokog je kvaliteta. Solana je najbolji primjer spoja priveredne proizvodnje i zaštite prirode u ekološkoj Crnoj Gori.

LJEKOVITO BLATO, SO I TURIZAM

Anaerobni uslovi u mulju solanskih bazena stvorili su velike zalihe ljekovitog blata. Preliminarna istraživanja ukazala su na njegov visoki kvalitet, u prvom redu za liječenje artiritisa i bolesti kože. Ako se to spoji sa morskom solju koju proizvode vjetar i sunce od čiste morske vode, te nezagađenim vazduhom koji ljeti duva sa mora a zimi sa nenaseljenih i čistih planina, Solana je uistinu raj za razvoj eko i zdravstvenog turizma. Turiste na ulazu u Solanu čeka Info centar sa Muzejom solane, osmatračnice, kule i staze od 3.9 i 17.6 km sa kojih puca odličan pogled na brojna jata ptica. Ona je najbolji primjer povezivanja privredne proizvodnje i zaštite prirode u Crnoj Gori i odlična prilika posmatranja prirode in vivo.

Nature protection

The first law for the protection of Ulcinj Salina was enacted in 1984, when all hunting was banned by a decision of the Workers Council. Several years later, Ulcinj Salina became the first Important Bird Area (IBA) in Montenegro and afterwards became an Emerald site under the Bern Convention. Ulcinj Salina will soon be listed on the Ramsar List of Wetlands of International Importance, primarily as a bird site. It is the first private nature park in Montenegro.

NATURAL CHARACTERISTIC - FLORA AND VEGETATION

The vegetation around Ulcinj Salina does not vary significantly from the vegetation described in the chapter on Tivat Salina, but the habitats are much larger. Currently, 114 plant species have been described. Besides open fields of halophytes (60 ha), there are more than 8 ha of *Phragmites* reedbeds. *Tamarisks* and other woody species cover 13 ha of dikes. One basin in Ulcinj Salina is not active and represents a real museum of halophyte and wetland vegetation.

The dikes are no less interesting: meadows of orchids in the spring, mostly *Ophrys bertolonii* and *Orchis laxiflora*, give way to xenomorphic vegetation during the hot summer days. Halophyte communities are very interesting due to their acclimatisation to rather severe physiological conditions of brackish soil and water. *Salicornia*

Zaštita prirode

Prvi akt o zaštiti Solane donešen je 1984. godine, kada se odlukom Radničkog savjeta zabranjuje svaki lov. Nekoliko godina kasnije, Solana postaje prvo Područje od međunarodnog značaja za boravak ptica u Crnoj Gori, a zatim i Emerald stanište Bernske konvencije. Solana će se uskoro naći i na Ramsarskoj listi močvara od medunarodnog značaja, prvenstveno kao stanište ptica. Ona je prvi privatni park prirode u Crnoj Gori.

PRIRODNE KARAKTERISTIKE - FLORA I VEGETACIJA

Sastav vegetacije na Solani ne razlikuje se bitno od one opisane u poglavlju za Tivatska solila, ali su staništa znatno prostranija. Do sada je na solanskim bazenima opisano 114 biljnih vrsta. Pored prostranih livada halofita (60 ha), na Solani se nalaze velika polja pod trskom *Phragmites*, više od 8 ha. *Tamariks* i ostale drvenaste vrste pokrivaju 13 ha nasipa. Jedan bazen solane nije aktivan i predstavlja pravi muzej halofita i močvarne vegetacije.

Ni nasipi nijesu ništa manje interesantni: livade orhideja tokom proljeća, najčešće *Ophrys bertolonii* i *Orchis laxiflora*, smjenjuje kseromorfna vegetacija tokom paklenih ljetnjih dana. Zajednice halofita solana su vrlo interesantne jer su prilagožene životu u veoma teškim fizioločkim uslovima zaslanjenosti podloge,

herbacea is the dominant species in the *Salicornietum herbaceae* association, together with *Sueda maritima*, *Limonium angustifolium* and *Atriplex portulacoides*. The presence of *Salsola soda* and *Atriplex prostrate* is also important. In addition, the *Arthrocnemetum fruticosi* association is also sometimes recorded.

Vegetation growing in the sludge of Ulcinj Salina is mostly present in channels where the water and ground salinity is much lower. This vegetation changes with the seasons, and starts with *Narcissus tarzetta* and *Romulea bulbocodium*. Later, these give way to *Avena barbata*, *Phragmites communis*, *Carex sp*., *Tripholium nigricens* and others. Reeds are present in channels and the group of basins where the salinity of the water is the same or twice as salty as the sea water.

They are rather aggressive and have expanded more and more over the years. *Tamarix africana*, *Juncus acutus* and *Juncus maritimus* grow adjacent to the reeds. *Beta vulgaris ssp. maritime* is a species which in Montenegro lives only in Ulcinj Salina. Ruderal vegetation is dominant on dikes as an indicator of human presence; grass cutting and continuous grazing.

Habitats - Staništa	Palearctic Habitat Classification Palearkti_ka klasifikacija staništa
Mediterranean and thermo Altanthic salt meadows	15.5
Mediterranean salt steppes	15.8
Mediterranean xeric grasslands	34.53

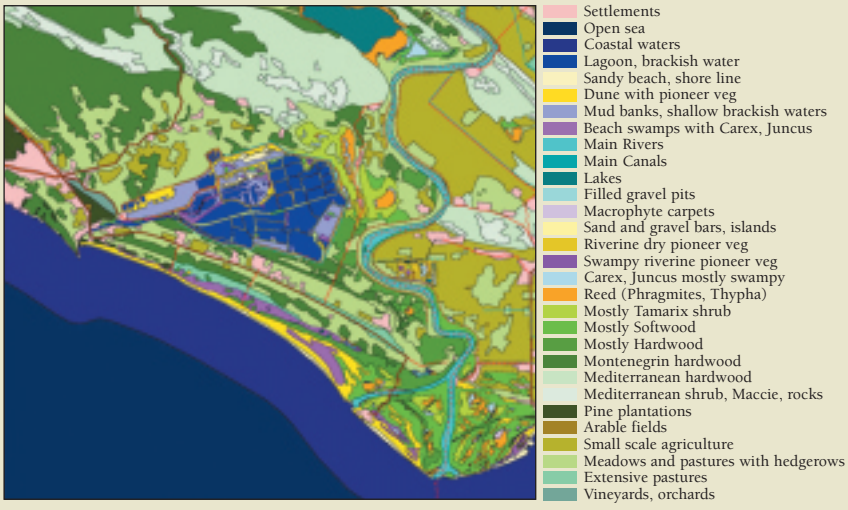
Group / Grupa	Number of species / Broj vrsta
Fish / Ribe	23
Amphibians / Vodozemci	12
Reptiles / Gmizavci	28
Birds / Ptice	241
Mammals / Sisari	33

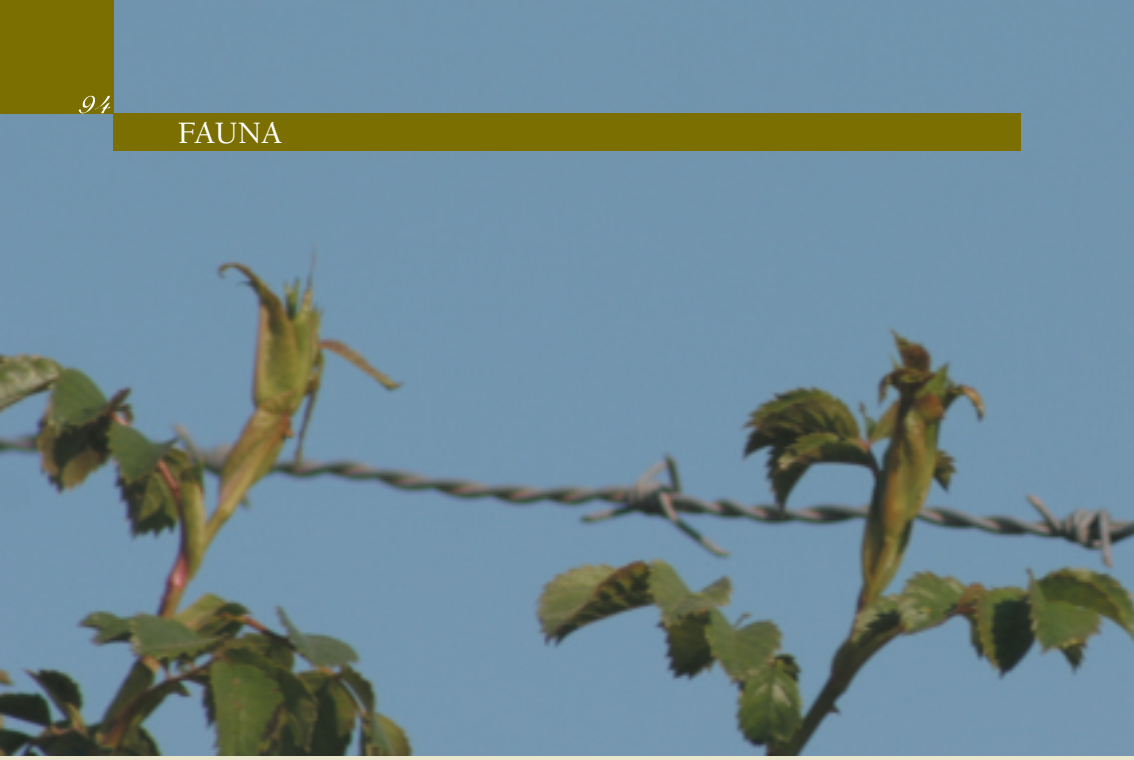
samim tim i vode. Solnjača, *Salicornia herbacea* je dominantna vrsta u zajednici *Salicornietum herbaceae* koju tvori sa *Sueda maritima*, *Limonium angustifolium* i *Atriplex portulacoides*. Značajno je i prisustvo Salsola soda i *Atriplex prostrata*. Uz ovu zajednicu, u jako zaslanjenoj zoni može se registrovati i zajednica *Arthrocnemetum fruticosi*.

Vegetacija koja raste na solanskom mulju najprisutnija je u kanalima solane gdje je salinitet vode i podloge znatno niži. Ova vegetacija se mijenja tokom godišnjih doba a počinje sa *Narcissus tarzetta* i *Romulea bulbocodium*. Kasnije ih smjenjuju *Avena barbata*, *Phragmites communis*, *Carex sp.*, *Tripholium nigricens* i dr.

Trska je prisutna u kanalima i skupini bazena gdje je voda ili jedanaka ili duplo slanija od morske. Prilično je agresivna i širi se iz godine u godinu sve više. Uz trsku rastu *Tamarix africana*, *Juncus acutus* i *Juncus maritimus*. *Beta vulgaris ssp. maritime* je vrsta koja u Crnoj Gori živi jedino na Ulcinjskoj solani. Na nasipima je dominantna ruderalna vegetacija kao indikator prisustva čovjeka, košenja trave i stalne ispaše.

HABITAT CLASSIFICATION





AMPHIBIANS AND REPTILES

12 species of amphibians and 28 species of reptiles survive in the hot summer conditions of Ulcinj Salina. Amphibians barely survive in the salty or fresh water channels, where they are an easy catch for numerous birds. The surrounding brackish swamps are thus an ideal habitat for them. At the opposite extreme, reptiles have their empire in Ulcinj Salina: numerous birds make their nests and hatch their eggs along the dikes.

Along with numerous insects these make ideal food for the reptiles - unless they are eaten by birds themselves. It is possible to hide in the high grass and the numerous stone walls or cavities in the dikes. The largest number of species of both groups registered in the dikes of Ulcinj Salina are vulnerable, endangered or critically endangered species according to IUCN standards.

BIRDS

If we were seeking the most exclusive habitat for birdwatching in the Adriatic, the Balkans or even the whole Mediterranean, Ulcinj Salina would definitely be at the top of the list. Currently 241 bird species have been registered in this “cultural lagoon”, which is 50% of the total bird species registered in Europe. In the wider region, there are habitats where the number of registered birds is even higher, but what makes Ulcinj Salina special is the quality of species and their number. The number of birds using the Ulcinj Salina basins for breeding, wintering or resting

Carduelis carduelis

VODOZEMCI I GMIZAVCI

12 vrsta vodozemaca i 28 vrsta gmizavaca opstaju u paklenim ljetnjim uslovima na Solani. Vodozemci teško izdržavaju u slanoj vodi ili u slatkovodnim solanskim kanalima, gdje su lak plijen brojnim pticama. Zato su okolne brakične močvare za njih idealno stanište.

Za razliku od njih, gmizavci na Solani imaju svoje carstvo: veliki broj ptica, njihova jaja i ptići koji se pile na nasipima, te brojni insekti su njihova idealna hrana, ukoliko i same ne budu pojedene od ptica. Mogućnost za njihovo sakrivanje postoji u visokoj travi i brojnim podzidama ili rupama na nasipima. Najveći broj vrsta iz obje grupe a koje se registruju na solanskim nasipima su ranjive, ugrožene ili kritižno ugrožene prema standardima IUCN.

PTICE

Ako bismo na prostorima Jadrana, Balkana pa i čitavog Mediterana tražili najekskluzivnije stanište za posmatranje ptica, onda bi Ulcinjska solana ušla u najjuži izbor. Do sada je na ovoj „kulturnoj laguni“ registrovano 241 vrsta ptica, što je oko 50% ukupnog broja vrsta ptica registrovanih u Evropi. U regionu pa i šire postoje staništa gdje je broj registrovanih vrsta znatno veći, ali ono što Solanu odvaja od svih ostalih je kvalitet vrsta i njihova brojnost. Brojno stanje gotovo 15 vrsta koje solanske bazene koriste za gniježđenje, zimovanje ili stanicu za odmor prilikom jesenje ili

during spring or autumn migration exceeds the threshold of 1% of the total global bird population. Amazingly, an area of 15 km² hosts 3% of the total global population of the Dalmatian Pelican (*Pelecanus crispus*), 3% of the global population of the Black Tailed Godwit (*Limosa limosa*), and the same percentage of the Spotted Redshank (*Tringa erythropus*)! 55 bird species breed in the Ulcinj Salina. Almost half of the registered breeding pairs of aquatic birds in the whole region breed here. 70 of the registered bird species in this area are of special protection interest on the level of the European Union and are included in Annex I of the Birds Directive.

Results of the IWC winter bird census, which has been performed since 1999 in Ulcinj Salina, shows the presence of 20,000 birds every year, regardless of whether the basins are empty or full of water. Outside the production season, the dikes are subject to erosion as a result of waves; therefore the water is pumped out . In some dry winters, this makes the birds concentrate on a few basins and the scenes are exceptional to behold.

However, the most beautiful season in Ulcinj Salina is spring: early migration brings large and dense flocks of ducks: the Garganey (*Anas querquedula*) comes in the largest numbers, up to 1200 birds per hour. It is very tired from the flight over the Adriatic and lands on this rich breading place to renew its energy before continuing its journey north. Its relative the Teal (*Anas crecca*) is also exhausted from the long flight. It joins the flocks of Pintail (*Anas acuta*) and Wigeon (*Anas penelope*) which have spent the winter in Ulcinj Salina and survived the bullets of local hunters.

Thousands of Waders also come, very tired. Their flocks are smaller but that does not reduce interest in their protection: most of them have unfavourable protection status and their number is declining faster than other groups of birds, primarily due to loss of habitat. Tens of thousands of swallows use Ulcinj Salina as a resting place on their trip back from Africa: the tamarisk trees are small for these lively birds and thus they land and rest on dikes. It sometimes happens that the whole dike becomes black from the Barn Swallow (*Hirundo rustica*) and House Martin (*Delichon urbica*). The Whinchat (*Saxicola rubetra*), Yellow Wagtail (*Motacila flava*), Flycatcher (*Muscicapa striata*) and Meadow Pipit (*Anthus pratensis*) come in flocks of 10,000 birds a day! In spring, Ulcinj Salina is a transitory station for more than 40,000 migrating birds a day.

Exceptional conditions in spring soon give way to the heat of summer. The struggle to raise the nestlings and later on, their preparations for migrating to warmer wintering places continue. The situation is highly dynamic. In autumn, the majority of our nesting birds are getting ready for the journey south, while tired birds from Siberia and Northern Europe will enjoy the Mediterranean winter, rainy but with few frosts, although they will also need to survive tempestuous cold winds from the surrounding mountains.

proljećne seobe prelazi prag od 1% ukupne svjetske populacije. Zamislite da se na 15 km^2 nalazi 3% ukupne svjetske populacije pelikana *Pelecanus crispus* ili 3% svjetske populacije muljače *Limosa limosa* ili isto toliki procenat crvenonoge sprutke *Tringa erythropus*!! Na Solani gnijezdi 55 vrsta ptica. Skoro polovina od ukupnog broja gnjezdećih parova vodenih ptica u cijelom regionu gnijezdi na Solani. 70 vrsta registrovanih na ovom području od posebnog je interesa za zaštitu na nivou Evropske Unije i nalazi se na Aneksu I Ptičje direktive.

Rezultati zimskog cenzusa ptica koji se na Solani provodi od 1999. godine ukazuju na prisustvo oko 20.000 ptica svake godine, bez obzira da li su bazeni ispunjeni vodom ili ne. Van sezone proizvodnje soli, voda nije poželjna u bazenima zbog erozije nasipa usljed djelovanja talasa i ona se ispumpava iz Solane. Pojedinih sušnih zima to koncentriše ptice na samo nekoliko bazena i prizori su izuzetni.

Ipak, najljepše je proljeće na Solani: rana seoba donosi velika i gusta jata pataka: martovka, *Anas querquedula* dolazi u najvećem broju, čak i do 1200 jedinki na sat. Slijeće umorna sa leta preko Jadrana da bi na ovom bogatom hranilištu obnovila energiju za dalji put ka sjeveru. Njena srodnica krdža, *Anas crecca*, takođe je iscrpljena od višesatnog leta. Pridružuje se jatima šiljkana *Anas acuta* i zviždarke *Anas penelope* koje su na Solani provele zimu i izbjegle olovna zrna lokalnih krivolovaca.

Na hiljade šljukarica takođe dolaze umorne. Njihova jata su manja ali to ne umanjuje interes za njihovu zaštitu: većina njih je sa nepovoljnim statusom zaštite i brojnost im opada brže nego drugim grupama ptica, prvenstveno zbog gubitka staništa. Na desetine hiljada lasta koriste Solanu kao odmorište tokom povratka iz Afrike: drveće tamariksa je malo za ove živahne ptice, pa one slijeću i odmaraju na nasipima. Desi se da se cijeli nasip zacrni od seoske *Hirundo rustica* i gradske laste *Delichon urbica*. Travarka, *Saxicola rubetra*, žuta pliska, *Motacila flava*, muharica *Muscicapa striata* i livadska trepteljka *Anthus pratensis* dolaze u jatima sa 10.000 jedinki dnevno!

Solana je tokom proljeća prolazna stanica za više od 40.000 selica dnevno. Izvanredne uslove tokom proljeća ubrzo zamjenjuju paklene vrućine ljeti, borba za podizanje mladunaca i, kasnije, njihove pripreme za odlazak na toplija zimovališta. Dinamika je prisutna svuda u zraku. S jeseni, većina se naših gnjezdarica sprema na put ka jugu a umorne ptice iz Sibira i sa sjevera Evrope uživače tokom zime u mediteranskoj kišnoj zimi sa malo mrazova, ali i preživljavati orkanske i hladne vjetrove sa okolnih planina.

MOST IMPORTANT FAUNA IN TERMS OF AMPHIBIANS, REPTILES AND BIRDS
NAJZNAČAJNIJI PREDSTAVNICI FAUNE VODOZEMACA, GMIZAVACA I PTICA

Amphibians	*Bombina variegata*
Vodozemci	*Bufo viridis*
	Rana temporaria
Reptiles	*Algyroides nigropunctatus*
Gmizavci	*Elaphe longissima*
	Elaphe quatuorelineata
	Elaphe situla
	Hemidactylus turcicus
	Lacerta oxycephala
	Lacerta trilineata
	Lacerta viridis
	Podarcis melisellensis
	Podarcis muralis
	Testudo hermanni
	Vipera amodytes
Birds	*Acrocephalus scirpaceus*
Ptice	*Botaurus stellaris*
(breeding)	*Carduelis cannabina*
(gnjezdarice)	*Charadrius alexandrinus*
	Charadrius dubius
	Galerida cristata
	Glareola pratincola
	Haematopus ostralegus
	Himantopus himantopus
	Hirundo daurica
	Larus cachinnans
	Larus genei
	Recurvirostra avosseta
	Sterna albifrons
	Sterna hirundo
	Tadorna tadorna
	Tringa totanus
(wintering)	*Anas acuta*
(zimovalice)	*Anas penelope*
	Ardea cinerea
	Calidris alpina
	Egretta alba
	Pelecanus crispus
	Phalacrocorax pygmeus

(migrating)	*Anas querquedula*
(migranti)	*Limosa limosa*
	Philomachus pugnax

Glareola pratincola

RED LIST

Regarding the IUCN Red List of endangered species, Ulcinj Salina is a residence for one bird species - the Slender-billed Curlew (*Numenius tenuirostris*), which is critically endangered - CR C2a(ii); D; the endangered Skadar frog (*Rana shqiperica*) - EN B1ab(iii), and 3 vulnerable bird species: the Dalmatian Pelican (*Pelecanus crispus*) - VU A2ce+3ce; the Lesser White-fronted Goose (*Anser erythropus*) - VU A2bcd+3bcd; the Spotted Eagle (*Aquila clanga*) - VU C1.

MOST NUMEROUS BREEDING BIRDS IN ULCINJ SALINA IN 2005 - 2007
NAJBROJNIJE GNJEZDARICE ULCINJSKE SOLANE SA PROSJEČNIM BROJEM PAROVA 2005 - 2007

	(average n° of pairs)
Burchinus oedicnemus	4 - 16
Charadrius alexandrinus	30 - 50
Glareola pratincola	100 - 120
Himantopus himantopus	40 - 130
Sterna albifrons	80 - 150
Sterna hirundo	50 - 80

SPECIES IN ULCINJ SALINA WHICH, WHEN WINTERING, MIGRATING OR NESTING, EXCEED 1 % OF THE GLOBAL POPULATION / POJEDINE VRSTE NA ULCINJSKOJ SOLANI ČIJA BROJNOST NA ZIMOVANJU, SEOBI ILI GNIJEŽĐENJU PRELAZI 1% SVJETSKE POPULACIJE

Species	WPE3	WPE4
Calidris alpina	1%	1%
Charadrius alexandrinus	1%	0,5%
Egretta alba	1%	1%
Egretta garzetta	1,5%	1%
Glareola pratincola	1%	1%
Himantopus himantopus	1%	1%
Limosa limosa	3%	3%
Numenius tenuirostris	1%	1%
Pelecanus crispus	1%	2%
Phalacrocorax pygmeus	1%	0,5%
Platalea leucorodia	1%	1%
Pluvialis squatarola	1%	1%
Tadorna tadorna	1%	1%
Tringa erythropus	1,5%	3%
Ttringa stagnatilis	1,5%	2%

CRVENA LISTA

U vezi sa IUCN Crvenom listom ugroženih vrsta, Solana Ulcinj je boravište jednoj vrsti ptice - maloj carskog šljuki koja je kritično ugrožena *Numenius tenuirostris* - CR C2a(ii); D; ugroženoj skadarskoj žabi žabi *Rana shqiperica* - EN B1ab(iii) i 3 ranjive vrste ptica *Pelecanus crispus* - VU A2ce+3ce ; *Anser erythropus* - VU A2bcd+3bcd ; *Aquila clanga* - VU C1

Tadorna tadorna

BLACK WINGED STILT - VLASTELICA (*Himantopus himantopus*)

The Black Winged Stilt is a bird that lives at very high altitudes. Saltpans and shallow wetlands are its habitats. In Montenegro, it nests only in Ulcinj Salina, with a hundred pairs every year. It has one nest with 2-3 eggs. The nest is cone-shaped and raised above the water surface. Careless water management of saltpan basins can cause flooding of the nests, eggs and nestlings. This bird eats insects found in sludge. It belongs to Annex I of the EU Birds Directive.

Ptica za koju se komotno može reći da živi na visokoj nozi. Njena su staništa solane i plitke močvare. U Crnoj Gori gnijezdi samo na Ulcinjskoj solani sa oko stotinak parova svake godine. Ima jedno leglo, 2-3 jaja. Gnijezdo je kupasto i uzdignuto iznad površine vode. Nesmotreno upravljanje vodom u bazenima solane može uzrokovati potapanje gnijezda, jaja i mladih. Hrani se insektima koje pronalazi u mulju. Nalazi se na Aneksu I Ptičje direktive EU.

DUNLIN - CRNOGRUDA SPRUTKA (*Calidris alpina*)

The Dunlin is grey in winter and in summer has a dark spot on its belly. This very lively bird runs on sludgy ground looking for food. It nests on the ground in the northern continents. It is frequent in Ulcinj Salina, where several thousand of them winter. It can even be found in summer.

Zimi siva, ljeti sa tamnom pjegom na trbuhu. Jako živahna, trči po muljevitoj podlozi tražeći hranu. Uvijek u jatima. Gnijezdi na tlu na sjeveru kontinenta. Na Ulcinjskoj solani, gdje zimuje nekoliko hiljada jedinki, česta i ljeti.

DALMATIAN PELICAN - PELIKAN (*Pelecanus crispus*)

The Dalmatian Pelican is one of the most famous and rarest birds in Montenegro. It can be recognized by its long beak and has a throat that serves as a bag for keeping fish. This endangered and rare nesting bird of Lake Skadar regularly resides in Ulcinj Salina after nesting and during winter. Ulcinj Salina is its most important residence in the whole region for resting, feeding and resting. Rings placed on this bird show that a hundred wintering pelicans come from Greece and Albania to Ulcinj Salina. It nests on islands of peat, reeds and other dead lake plants. It makes one nest with 1-3 eggs and likes to eat fish. The Dalmatian Pelican is a globally endangered species and belongs to Annex I of the EU Birds Directive.

Jedna od najpoznatijih i najrjeđih ptica u Crnoj Gori. Prepoznaje se po dugačkom kljunu sa gušom koja služi za držanje ribe. Ugrožena i malobrojna gnjezdarica Skadarskog jezera, poslije gniježđenja i tokom zime redovno se javlja na Ulcinjskoj solani. Solana je njihovo najznačajnije stanište za odmor, ishranu i skitnju u cijelom regionu. Očitavanje prstenova ukazuje da stotinak zimujućih pelikana na solani dolazi iz Grčke i Albanije. Gnijezdi se na ostrvcima treseta, trske i drugog mrtvog jezerskog bilja, jedno leglo sa 1-3 jaja. Hrani se ribom.Globalno ugrožena vrsta. Nalazi se na Aneksu I Ptičje direktive EU.

COMMON TERN - čIGRA (*Sterna hirundo*)

This bird is the size of a pigeon. Its body and tail are white with grey and it has grey wings. In summer it has a black cap on its head and the tail is significantly forked. This bird breeds in Ulcinj Salina making one to two nests with 3 eggs. It breeds on the ground of slightly rising dikes. The nests are covered by the residues of snails and shells. It is a bird of passage, wintering around the South Pole. It eats small fish and insects as it dives from the air. The Common Tern is listed in Annex I of the EU Birds Directive.

Ptica veličine goluba. Tijelo i rep su bijeli, krila siva, ljeti na glavi crna kapica, rep upadljivo račvast. Gnjezdarica solane, jedno do dva legla sa 3 jajeta. Gnijezdi kolonijalno na blago uzdignutim nasipima a gnijezdo je pokriveno ostacima puževa i školjki. Selica je koja zimuje oko Južnog pola. Hrani se sitnom ribom i insektima, obrušavanjem iz vazduha. Nalazi se na Aneksu I Ptičje direktive EU.

PYGMY CORMORANT - FENDAK (*Phalacrocorax pygmeus*)

This is the smallest cormorant, half the size of the Great Cormorant (*Phalacrocorax carbo*). It has a short neck and is dark in colour with light spots on its body. It nests in colonies on the shores of the Bojana River and Lake Skadar in bushes and trees along the water. When nesting it makes one nest with 3-7 eggs. It mainly eats small fish and occasionally eats crustaceans and molluscs. Ulcinj Salina is its most important feeding place on the Adriatic coast. It is a globally endangered species and is listed in Annex I of the EU Birds Directive

Naš najmanji kormoran, upola manji od vranca *P. carbo*. Kratkog vrata, tamne boje sa svijetlim sitnim pjegama po tijelu. Gnjezdarica obala rijeke Bojane i Skadarskog jezera. Gnijezdi se u kolonijama na grmlju i drveću uz vodu, jedno leglo sa 3-7 jaja. Hrani se uglavnom manjim ribama, rjeđe rakovima i mekušcima. Solana je njegovo najznačajnije hranilište na jadranskoj obali. Globalno ugrožena vrsta. Nalazi se na Aneksu I Ptičje direktive EU.

Anguilla anguilla

Ulcinj Salina is a closed system; thus, there is no way that fish from the surrounding channels can get into the basins. Their presence is possible only if they can cross the dikes between basins, which is only possible for eel, or if they come directly from the sea by pumping: the powerful pumps filling the basins with sea water usually pump in eggs, larvae, or the progeny of sea organisms. All longer organisms are chopped up by the pumps' propellers. This occurs in April, when the production process starts, with the pumping of hundreds of thousands of cubic metres of sea water. Animals brought in by the pumps develop in the basins till June, when the water rapidly starts heating and the oxygen in the water falls. Some species, such as eel, dig into the sludge and wait for the first favourable situation for further development, while others perish or remain on the surface of the water where they become an easy catch for thousands of birds. Depending on the water salinity in some basins, 23 fish species have been recorded so far.

In basins where the salinity is the same as the sea water, which cover a large part of the saltpans, the following economically important fish species are recorded: various species of mullet (*Mugilidae: Liza ramada, Liza saliens, Liza aurata, Chelon labrosus, Mugil cephalus*), eel (*Anguillidae: Anguilla anguilla*), European seabass (*Moronidae: Dicentrarchus labrax*), and *Atherinidae* and *Cyprinodontidae*. These species are dominant by abundance. It is likely that the sea water pumped into the basins contains other coastal fish species. As salinity increases (beyond 100 ‰) in basins and channels, only eels and killifish (*Aphanius fasciatus*) can be found. With further increases in salinity, only killifish (*Aphanius fasciatus*) remain. For a short time they can survive salinity over 250 ‰. Thus, they may also be found in basins where crystallisation of salt begins.

RIBE

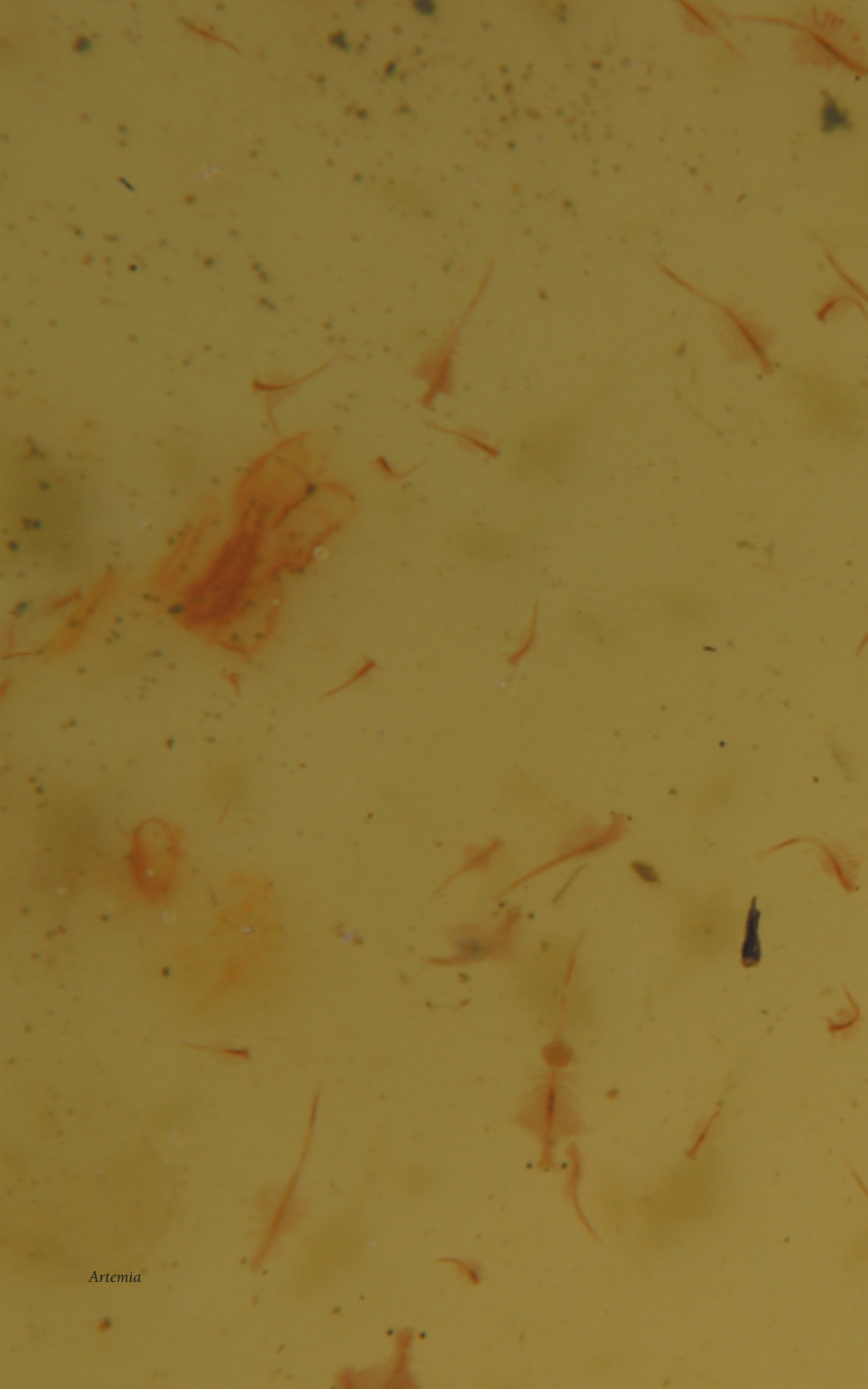
Solana je zatvoren sistem i ne postoji mogućnost da ribe iz okolnih kanala uplivaju u solanske bazene. Njihovo prisustvo moguće je ako pređu nasipe bazena, što može jedino jegulja, ili da dođu direktno iz mora upumpavanjem: jake pumpe koje napajaju Solanu vodom iz mora upumpavaju uglavnom jaja, larve ili mlađ morskih organizama. Svaki malo duži organizam biva iskomadan propelama pumpi. Ovo se dešava u aprilu, kada počinje proces proizvodnje i kada počinje upumpavanje na stotine hiljada kubika morske vode. Pumpama unešene životinje razvijaju se u bazenima sve do juna mjeseca, kada voda počinje naglo da se zagrijava a kiseonika u vodi biva sve manje. Neke se vrste, kao što je jegulja, zakopavaju u muljevito dno i čekaju prvu povoljnu priliku za dalji razvoj, a druge ugibaju ili na samoj površini vode, pokušavajući da uzmu vazduh, postaju lak plijen hiljadama ptica.

Zavisno od saliniteta vode u pojedinim bazenima, u Solani je do sada registrovano 23 vrste riba. U bazenima čiji je salinitet jednak morskom i koji zauzimaju najveću površinu Solane registruju se ekonomski značajne vrste skakavica ili cipola (*Mugilidae: Liza ramada, Liza saliens, Liza aurata*, *Chelon labrosus*, *Mugil cephalus)*, jegulje (*Anguillidae: Anguilla anguilla*), brancini (*Moronidae: Dicentrarchus labrax*), te *Atherinidae* i *Cyprinodontidae*. One dominiraju po brojnosti. Sasvim je vjerovatno da se prilikom ubacivanja morske vode u solanske bazene može naći još po neka priobalna morska vrsta riba. Sa povećanjem saliniteta (preko 100‰), u bazenima i kanalima se uglavnom srijeću samo cipoli, jegulja i solinarka *Aphanius fasciatus*. Sa daljim povećavanjem saliniteta, od riba ostaje samo solinarka *Aphanius fasciatus*, koji kraće vrijeme može da podnese i salinitete preko 250 ‰. Dakle, ona se može naći i u bazenima u kojima već dolazi do kristalizacije soli.

CRUSTACEAN - BRINE SHRIMP - SALAMURSKI RAČIĆ *(Artemia sp.)*

Brine Shrimp are recorded in 500 natural and artificial salt lakes in the world. Although they survive in very salty water, they do not exist everywhere, primarily due to the fact that they cannot spread over the sea since they have no defence mechanisms against predators. Thanks to several types of haemoglobin, they survive in waters of all salinities. Brine Shrimp are used in food and the pharmaceutical industry. Research confirmed that in 1999 there were more than 24 tonnes of this shrimp.

Salamurski račić je registrovan na oko 500 prirodnih ili vještačkih slanih jezera na svijetu. Iako izdržava u jako slanoj vodi, nema ga svugdje, prvenstveno zbog činjenice da se njegov areal ne može širiti morem obzirom da nema nikakvih odbrambenih mehanizama protiv predatora. Zahvaljujući postojanju više vrsta hemoglobina, on može opstati u vodama svih saliniteta. Salamurski račić se koristi u prehrambenoj i farmaceutskoj industriji. Istraživanjima je utvrđeno da je na Solani 1999. godini bilo nešto više od 24 tone ovog račića.



Artemia

MAMMALS

The whole Ulcinj area is unique, not just because of birds but also due to the large number of other animal species. The presence of otters, foxes, rabbits and jackals using Ulcinj Salina as their habitat shows its high value. Otters, which are nearly extinct from other habitats in Montenegro, are a distinct feature. Ulcinj Salina is one of the most important feeding places for bats on the Montenegrin coast.

INSECTS

So far this group has not been seriously explored in Ulcinj Salina, but large fluctuations of insectivore birds have been recorded. Some insects, such as *Oecanthus pellucens*, *Pteronemobius heydenii*, *Xya cf. variegata*, *Anacridium aegyptiacum* and *Locusta migratoria* are often present on dikes. Butterflies (*Lepidoptera*) are numerous in summer. Dragonflies (*Odonata*) are mainly found near channels or halophyte vegetation. However, keeping in mind the large areas under water, dikes and large vegetation cover, great diversity of ground and water insects is expected.

Aeshna cyanea

Calopterih virgo

SISARI

Cijelo ulcinjsko primorje jedinstveno je ne samo po pticama, već i po velikom broju predstavnika drugih životinjskih grupa. Prisustvo vidre, lisice, zeca i šakala koji Solanu koriste kao svoje stanište, pokazuje njenu visoku vrijednost. Posebnost je vidra, koja je pred nestajanjem na ostalim vodenim staništima u Crnoj Gori. Solana je jedno od najznačajnijih hranilišta slijepih miševa na crnogorskoj obali.

INSEKTI

Do sada ova grupa na Solani nije ozbiljnije istraživana ali su primijećene velike fluktuacije broja insektivornih ptica. Neki od njih kao *Oecanthus pellucens*, *Pteronemobius heydenii*, *Xya cf. variegata*, *Anacridium aegyptiacum* i *Locusta migratoria* su značajno prisutni na nasipima. Tokom ljeta, brojni su i leptiri (*Lepidoptera*). Vili konjici (*Odonata*) uglavnom su vezani za kanale ili halofitnu vegetaciju. Ipak, računajući na velike površine pod vodom i nasipima i veliku vegetacionu pokrovnost, za o čekivati je veliki diverzitet kopnene i vodene faune insekata.

Sympethrum meridionale

Somatochlora metalica