

# Adriatic Marbled Bush-Cricket (*Zeuneriana marmorata*)

## A National Action Plan for Italy 2016-2022

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## INTRODUCTION

Wetlands belong to the most highly threatened habitat types on our planet. In Europe, many wetlands have been destroyed or degraded by human activities, including drainage, agricultural land use, industrialization, regulation and damming of river courses, pollution, eutrophication, invasions of non-native species and other actions. In northern Italy, many wetlands have disappeared and been replaced by intensive croplands or industrial areas, leading to a drastic decline of many wetland species.

The Adriatic Marbled Bush-Cricket, *Zeuneriana marmorata* (Fieber, 1853), is a rare bush-cricket species, which is found in a few wetlands in north-eastern Italy (Friuli Venezia Giulia) and Slovenia. It has a loud and highly characteristic song, which creates a unique acoustic atmosphere in the very few places where it still exists. The species occurs in coastal reed beds (Fig. 1), where it is only found where the reed vegetation is not too dense and the water not too saline. Only four populations of this species still exist with an estimated total of 3,000-5,000 adult individuals per year (a very small number for an insect species). The entire remaining habitat of this species has a size of 0.57 km<sup>2</sup> (57 ha) with only ca. 16 ha being left in Italy. *Z. marmorata* is quite sedentary and sensitive to habitat destruction.



Figure 1: Habitat of *Zeuneriana marmorata* in the Marano Lagoon © Francesca Tami



The destruction and fragmentation of habitats has led to extinction of most Italian populations of the species, especially in the area of the Venice lagoons (Fig. 2). For several decades, *Z. marmorata* was presumed to be extinct, until it was rediscovered in a small wetland at Lisert near Monfalcone (Kleukers *et al.* 1997). The species has meanwhile also been discovered in the marshes south of Ljubljana (Slovenia) as well as in three other coastal wetlands in Friuli Venezia Giulia.

Considering the history of land use, it is very likely that *Z. marmorata* was formerly more widespread in the North Adriatic coastal region of Italy. Currently, it is confined to three small areas of coastal reed beds: Lisert (Monfalcone), the mouth of Isonzo river and the Marano Lagoon. The species faces at least two severe threats. The population in Lisert has dramatically declined as a consequence of industrial development. It is also affected by changes in water level and subsequent encroachment of shrubs and trees. The coastal populations in the Marano Lagoon and at the mouth of Isonzo river are threatened by sea level rise. Subsequently, the species is listed as Endangered on the IUCN Red List of Threatened species (Kleukers *et al.* 2015).

If the remaining habitats in Italy are not immediately preserved, the Adriatic Marbled Bush-Cricket will probably disappear from the area. Therefore, a conservation strategy for the species has been developed in cooperation with the major stakeholders.

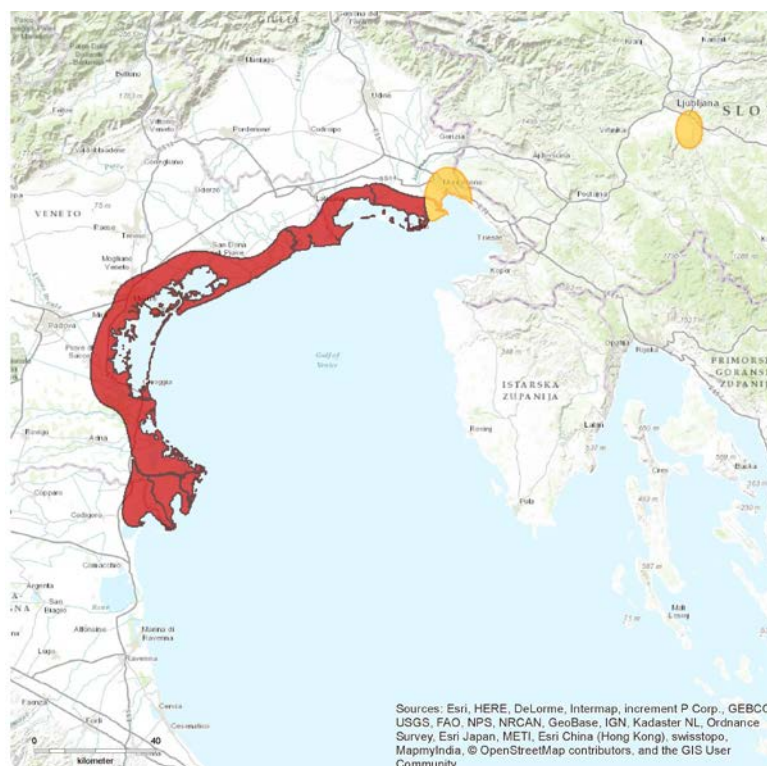


Figure 2: Map of the distribution of *Z. marmorata* (orange: remaining distribution; red: former distribution – now extinct); note that the population in the Marano Lagoon was discovered after the map was created. Source: Kleukers *et al.* (2015).

# STATUS REVIEW

## Species description

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### *Systematics / Taxonomy*

The Adriatic Marbled Bush-cricket, *Zeuneriana marmorata* (Fieber, 1853) is a bush-cricket that belongs to the family Tettigoniidae, subfamily Tettigoniinae. It is reported from a few locations in the north-east of Italy and Slovenia. The genus *Zeuneriana* is found in southern Europe and contains four species: in addition to *Z. marmorata*, *Z. amplipennis* is found from Serbia to Romania, *Z. abbreviata* in southwestern France and northern Spain and *Z. burriana* in northern Spain. The two eastern species are closely affiliated with wetland habitats. The genetic relationships of the species have not been studied and particularly the status of *Z. amplipennis* and *Z. marmorata* needs to be clarified.

### *Biology & Ecology*

*Zeuneriana marmorata* is a medium-sized grasshopper (length: ♂ 16-20 mm, ♀ 17-21 mm), with a rather squat shape (Massa *et al.* 2012). Its basic colour is black or blackish-brown while the tegmina are dark brown in colour and are widely spread, almost reaching the apex of the abdomen in the male, while they are slightly shorter in the female (Figs. 3-4). The male cerci are widened at the base and have a robust curved tooth facing the inner side. The female ovipositor is 8-9 mm long, is slightly upturned and laterally flattened. The nymphs are blackish-brown, with the upper part of the pronotum and the back being of a lighter brown.



Figure 3: *Z. marmorata* male © Francesca Tami



Figure 4: *Z. marmorata* female © Silvano Candotto



Figure 5: Eggs of *Z. marmorata* deposited in the stems of grasses and herbs. © Stanislav Gomboc



Figure 6: *Z. marmorata* nymph  
© Francesca Tami

The species is very elusive and difficult to observe. The specimens tend to be amongst dense vegetation. Males are easier to find than females as they sometimes climb up the tall stalks from which they sing, dropping or jumping down at the slightest sign of threat. The males emit a powerful song by rubbing the tegmina (forewings) together. This song is audible up to a distance of more than 30 metres. As the males sing during the main season, bioacoustic monitoring of the species is feasible.

The species is not able to fly and the impression is that they are not very mobile – similar to other related taxa, but further research on the mobility of *Z. marmorata* is needed. The males appear to exhibit territorial behaviour.

The species has one generation per year and hibernates during the egg stage like most of European Orthoptera species. The eggs are laid inside the stems of herbaceous plants (Fig. 5). No information on the average number of eggs laid, development length and their micro-climatic requirements exist. In Italy, nymphs of the species (the intermediate instars) were observed on 5 June 2016, so it is assumed that the eggs hatch in May. Adults have been seen or heard from the second half of June onwards (20 June 2014, 24 June 2016). The number of singing males decreases after the end of July; a few single specimens can be found until the beginning of September. Local variation in phenology (and in the peak of highest density) has been observed in the appearance of adults depending on the habitat. In thick reeds the adults appear later than those in areas of more open vegetation and drier areas. In Slovenia, the adult season starts a little later and adults may be found until end of September.

The species feeds on leaves of *Phragmites australis* s.l. and, in the past, adults have been fed in captivity with grasses and forbs. In Slovenia some nymphs were reared in an insectarium and fed with salad (*Lactuca sativa*), oat flakes or other seeds, raisins and, in small quantities,

dried insects. They also ate leaves of *Rubus idaeus*, which were placed in the insectarium as canopy. Probably, like other Tettigoniidae the species is omnivorous, feeding predominantly on vegetation consisting of grasses and other plants. Bush-crickets in general are not confined in their diet to particular plant species or narrow groups of plants.

*Z. marmorata* lives in moist habitats close to water courses with a vegetation in which sedges (*Carex* sp.), rushes (*Juncus* sp.) and / or *Phragmites australis* predominate. The sites at which its presence is currently known are periodically submerged by water although the species does not live in areas that are flooded for long periods during the growing season. It can tolerate a slight salinity and both the site at the mouth of the River Isonzo and at the Marano Lagoon are flooded, including inundation by salt or brackish water.

Two other rare Orthoptera species partly co-occur with *Z. marmorata* or in similar habitats: *Roeseliana brunneri* and *Chrysochraon dispar giganteus*.

## Function and values

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The Adriatic Marbled Bush-cricket has not received much attention from the public so far. Given the small range of the species, its known locations along the Adriatic coastal region can be seen as a Key Biodiversity Area for this species. The species main ecological role is primary consumer. It is likely to be prey to other arthropods and vertebrates and might possibly also be a predator of small insects. These aspects are however not studied in detail.

More important is the role of *Z. marmorata* as a bioindicator of habitat quality of the marshland as it is very sensitive to changes in habitat quality. It may also have value as a symbol species of threatened wetland habitats. Although it is difficult to observe, it is easily identifiable through its song.

## Historical account

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The type locality of the species is not exactly known, because Fieber (1853) described it on the basis of findings of the generic origin "Illyrien". Between 1816 and 1849 the Kingdom of Illyria was a State of the Austrian empire with its capital in Ljubljana, which included a very large area, from 1820 incorporating Carinthia, Carniola - part of today's Slovenia - Gorizia and Gradisca, Trieste and Istria, today part of Slovenia and Croatia.

Historical sites (specimens collected from the second half of the 1800s up to the 1940s) include the mouth of the Adige, Chioggia (at present in Veneto), Aquileia, Terzo d'Aquileia, Bistrigna - near Monfalcone - and Monfalcone (at present in Friuli Venezia Giulia) (Brunner von Wattenwyl, 1882; Giordani Soika, 1949; Kleukers *et al.*, 1997; Marcuzzi *et al.*, 1971; Fig. 7). Probably the historical range in Italy included the low plain and the coastal zone, at least between the mouth of the Timavo and the mouth of the Adige.



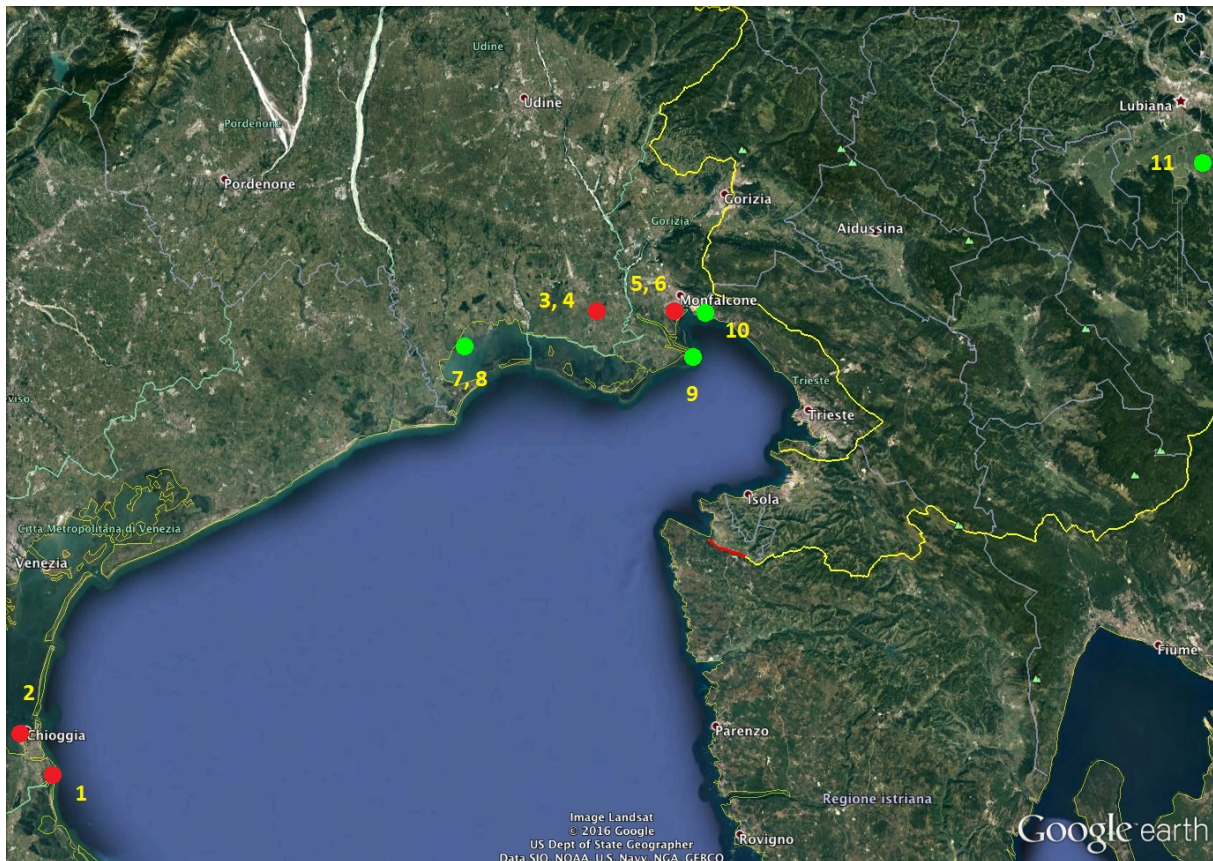


Figure 7: Present (green) and extinct (red) sites of *Z. marmorata* (1. Mouth of Adige River; 2. Chioggia; 3. Aquileia; 4. Terzo d'Aquileia; 5. Monfalcone; 6. Bistrigna; 7. Cormor River – Muzzanella (Marano Lagoon); 8. Delta of Stella River (Marano Lagoon); 9. Mouth of Isonzo River; 10. Lisert and mouth of Timavo River, 11. Ljubljansko Barje in Slovenia).

### *Causes of the reduction of the historical distribution:*

Reclamation (mainly between the two world wars and until the 1950s, but at the Lisert site more recently), with major changes in hydrology and the destruction of wetland habitats, which have been converted to cropland.

Intensive agriculture has also led to the transformation of wet meadows (potentially suitable for *Z. marmorata*) to arable land (e.g. in the low Friuli plain).

Social changes. A loss of interest in the agricultural use of wetlands has led to the abandonment of residual wet meadows that have subsequently developed into thick reed beds, which are probably less or unsuited to *Z. marmorata*. At one time the reed beds and wet grasslands were cut for production of litter with reeds also being used to make “*grisiolo*” (used with plaster to create false ceilings in homes) and “*grasio*” (long barrages used to fish with creels), and the seedheads of reeds used to make brooms. The fact that the wet meadows were mown is also evidenced by the following place names in the delta of the River Stella: Prò

della Cunata and Prò della Cuna Dolse (“Prò” = meadow). These wet meadows near the mouth of the River Stella have not been mown for decades.

Use of pesticides / insecticides in agriculture and against malaria (DDT). It is likely that insecticides have caused the disappearance of the species in areas where potentially suitable habitat still exists. Heavy use of insecticides occurred after the second world war for controlling mosquitos and eradicating malaria.

Industrialization of the Lisert area (since the 1970s) and consequent destruction of habitats. Massive expansions of the industrial area in the south-east of Monfalcone has occurred during the last 50 years and continues.

Fire. In the past there have been fires both in Lisert and in Lagoon of Marano.

## **Current distribution and demography**

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In the past the species was assumed to be extinct, until it was rediscovered near Monfalcone (Lisert) in 1996 (Kleukers *et al.* 1997). Meanwhile, three populations have been documented in Italy in the Friuli Venezia Giulia Region (Lisert and Timavo near Monfalcone, the mouth of the Isonzo River and the Lagoon of Marano). One population has been discovered in Ljubljansko Barje (Slovenia) in 2004 (Gomboc & Šegula, 2005; Kleukers *et al.*, 2015).

### *Current distribution in Italy*

#### 1) Lisert and Timavo (Fig. 8)

##### *Lisert Springs (Municipality of Monfalcone)*

The population was discovered in 1996 by Kleukers and Fontana (Kleukers *et al.* 1997). The site is in the Municipality of Monfalcone, between the State Road, the Moschenizza canal and the Tavoloni canal. It is separated by a gravel track and a railway overpass and the southern part is crossed by a railway siding. In some databases it has been named as “San Giovanni al Timavo (Trieste)”, as the nearest village is San Giovanni al Timavo (located in another Municipality, Duino Aurisina). The location of Lisert could correspond to the historic one of “Monfalcone”. The area inhabited by *Z. marmorata* has a vegetation consisting mostly of *Juncus* sp. and *Phragmites australis* s.l. and undergoes occasional flooding. The wet meadow and reed bed area is surrounded by scrubland. The species is not evenly distributed in the area. Most of the population is found in the eastern part of the site (Fig. 9).



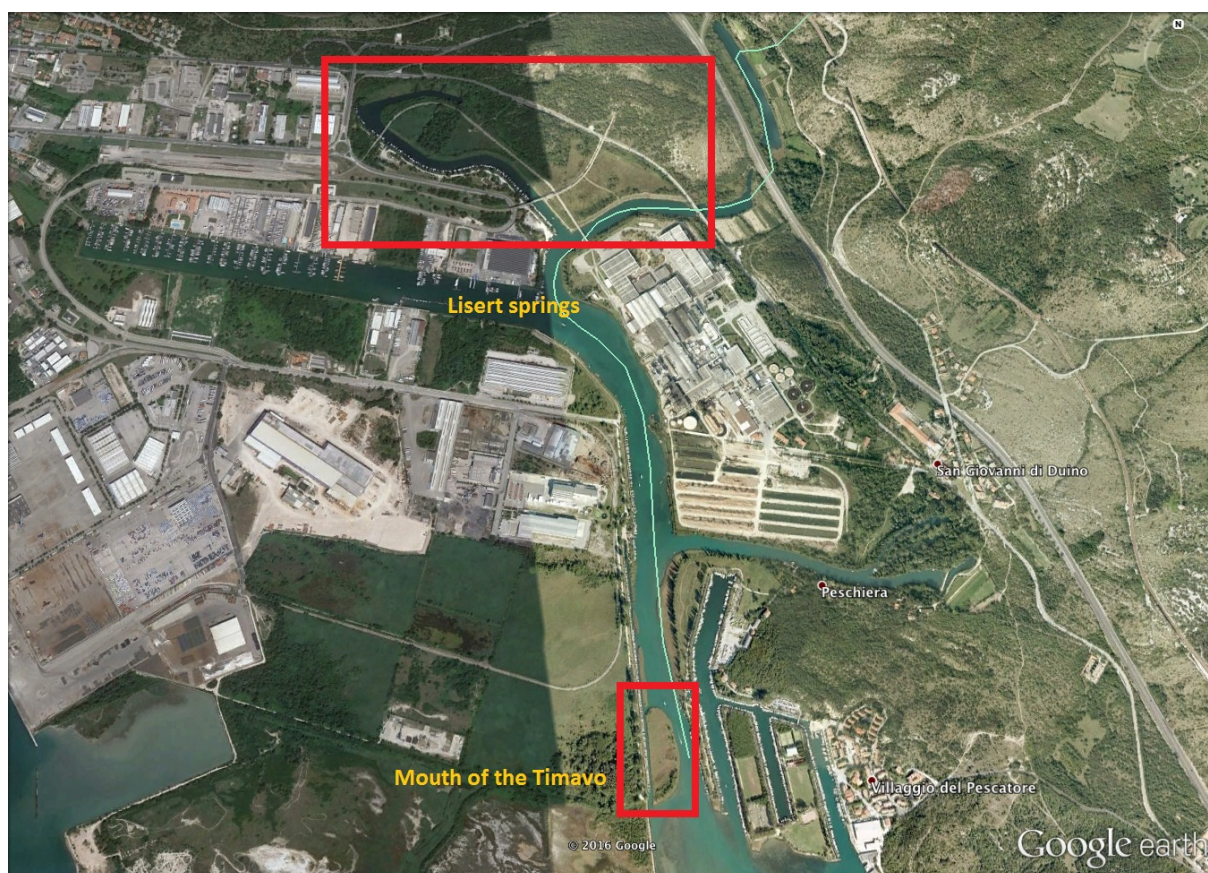


Figure 8: Situation of the two locations with *Z. marmorata* near Monfalcone (Lisert springs and mouth of Timavo).



Figure 9: Main occupied habitats of *Z. marmorata* in the Lisert area. Map Yannick Fanin.

*Z. marmorata* was found in the following habitats:

- Wet (from brackish to freshwater) grassland (*Schoenus nigricans* or *Juncus maritimus*) with *Phragmites australis* proliferations. *Phragmites* from sparse to almost thick patches. Areas rarely flooded in summer.  
The grassland located east of the viaduct is apparently more suitable for the species area. In this area there is a high density of *Z. marmorata*, but this decreases in areas with scrub and in the northern, drier portion. *Phragmites australis* under 1.8 m in height.
- *Phragmites australis* reed beds with clearings of the wet grassland of *Schoenus nigricans* or *Juncus maritimus*.  
The species is present in reeds to the north-west of the railway bridge. The stems are up to 2-2.5 m high and there is a good density of *Z. marmorata* which decreases in the vicinity of the areas occupied by shrubs and trees. This area is rapidly undergoing scrub encroachment. In the reed beds on the central and western part of the site the species is present but does not appear evenly distributed. It is possible that some areas are flooded for a very long periods and are thus not suitable for *Z. marmorata*.
- Reed beds of *Cladium mariscus* (great fen-sedge) with *Phragmites australis*, regularly freshwater flooded habitat at the springs “Le Fontanelle.” The site was not visited, but several males were heard singing from the opposite bank.
- Meadows (with *Phragmites* proliferations) on artificial embankments.  
The grassland along the banks of the Tavoloni and Moschenizza Canals. The outer part of the embankment hosts wet meadows. Several specimens of *Z. marmorata* were identified among the reeds along the bank of Tavoloni Canals whilst along the Moschenizza only isolated individuals were heard.

There remains a residual current activity in this area with mechanical cutting along the Moschenizza and Tavoloni canals (on behalf of the local drainage board) and the mowing of a piece of damp grass between the viaduct and Moschenizza canal, perhaps not every year.

The area has undergone changes over the last 20 years, in particular with regard to the vegetation structure. Compared to the 1990s the wet grassland area suitable for the species has declined, in part because in the southern portion a railway siding has been constructed, but especially as a part of the grassland has been progressively encroached by scrub and trees. This succession is due to the abandonment of wetlands, which are partly no longer mown, and the fact that the area is at least partially drained as a result of several recent human interventions (the construction of the railway sidings and a methane pipeline). It has also been degraded by the planting of tree species (*Fraxinus angustifolia* / *oxycarpa*, *Alnus glutinosa*) following the construction of the railway. In a few years this process will lead to the formation of true carr-type woodland.





Figure 10: Habitat of *Zeuneriana marmorata* in the Lisert Springs © Francesca Tami

*Mouth of the Timavo (Municipalities Monfalcone / Duino-Aurisina)*

Between 2006 and 2008 a small population was also identified on a small island at the mouth of the Timavo River occupied by a reed bed (Tami *et al.* 2011). In June 2016 some males were heard singing here.

2) Mouth of the Isonzo River (Municipalities of Grado and Staranzano; Regional Nature Reserve Foce dell'Isonzo) (Fig. 11)

In June 2014 a population was found south of Fossalon di Grado near the village of Punta Sdobba, at the mouth of the river Isonzo (right bank, locality "Caneo", Grado). In August 2016 the species was found in reed beds along the left bank of Isonzo too (near Punta Spigolo, Staranzano) (Fanin *et al.* 2016).

Here the species lives both in reed beds and wet meadows with a prevalence of *Phragmites australis* and / or *Juncus* sp. The area is also periodically submerged by brackish water too.

On the right bank the most suitable habitat for *Z. marmorata* appears to be the grassland located immediately south of the Isonzo River, where *Juncus* sp. forms a thick layer close to the ground and is accompanied by *Phragmites*, generally less than 2 m in height. *Z. marmorata* seems rare or absent in the rush bed with sparse growth of *Phragmites* 1-1.5 metres in height,

perhaps as a result of higher salinity. The species also lives along the edge of thick reed beds, along paths, and in areas in which *Phragmites* is decidedly dominant.

On the left side the density of the species appears very high in reedbeds (with or without *Juncus gerardi* on the ground).

It is not easy to establish precisely the area occupied by the species, because it is difficult to walk in the reeds as a result of the presence of flooded areas.



Figure 11: Situation of the location with *Z. marmorata* at the mouth of Isonzo River (Lisert springs and mouth of Timavo).

A list of habitat of *Z. marmorata* at the mouth of the Isonzo:

- Flooded to dry (depending upon the tides), open brackish reed beds of *Phragmites australis* with organic litter on the ground (common reed stalks, driftwood, etc.)
- Open brackish reed beds with or without wet carpets of *Juncus gerardi* on the ground
- Brackish rush vegetation (*Juncus acutus* or *J. maritimi*) with sparse *Phragmites australis* canes
- Edge of thick *Phragmites* reed beds along rivermouth banks



Figure 12: Occupied habitats of *Z. marmorata* at the mouth of Isonzo river. Map Yannick Fanin.

### 3) Lagoon of Marano (Fig. 13)

In July 2016, the species was found in two areas of the Lagoon of Marano (Fanin *et al.* 2016). Three major subpopulations were found together with isolated singing males. The density of the species in this area (at least at the sites so far identified) is apparently lower than that observed at the mouth of the Isonzo and Lisert. The sites of the Lagoon of Marano can only be reached by boat, and at some of these it is not possible to land and / or is very difficult to walk, because of the presence of flooded areas and the at times very dense vegetation.

#### *Cormor-Muzzanella (Municipality of Marano Lagunare)*

The first area is located along the Cormor River, on the islet at the confluence of the Cormor and the Muzzanella. On the main site, located along the Rio Muzzanella, the vegetation consists mostly of *Carex* sp. and *Phragmites australis*. It was not possible to land at this site but at least ten males were heard singing.

A group of a few single males (4 individuals) was found in another location (Bassut) on the same island, along paths near a hunting seat. The vegetation consists mainly of *Carex* sp. and reeds.





Figure 13: Situation of the locations with *Z. marmorata* in the Lagoon of Marano (1. Rio Muzzanella, 2. Cormor River – Bassut, 3,4 Delta of the Stella – Prò de la Cuna Dorse, 5. Delta of the Stella – Barena Malfatta).

*Mouth of the River Stella (Municipality of Marano Lagunare; the regional natural reserve Foci dello Stella)*

A population of at least 10-20 singing males was found in the northern part of the Barena Malfatta. Here the dominant vegetation is *Phragmites australis* (Less than 1.80 m in height) and *Juncus* sp. The area is also periodically submerged by brackish water.

The second is located on the *Prò dela Cuna Dorse* islet, occupied by wet grassland dominated by *Phragmites australis*. Singing males were heard from the boat in the southern portion and in the east of the islet (about 20 specimens).

Isolated singing males were heard at two other sites along the River Stella.

*Demographic analysis*

Population surveys were carried out in 2016 (singing males counted along transects 10 m wide). The measured densities are equal to 156 singing males per ha in an area at Lisert (date of surveys: 12 and 19 July) and 163 singing males pro ha in an area at Isonzo-Punta Sdobba (date of surveys: 22 and 26 July). However we know that the density is not uniform; in other areas it appears lower, in others it appears higher.



Based on these investigations and field observations, we can provide a first rough estimate of the number of males in song:

- Lisert Springs: 300-500
- Isonzo Rivermouth, Punta Spigolo: at least 400
- Isonzo Rivermouth, Punta Sdobba: at least 400

Extent of principal areas occupied from *Z. marmorata* at Lisert and Isonzo:

- Lisert Springs: ca 3,5 ha
- Isonzo Rivermouth, Punta Spigolo: ca 5 ha
- Isonzo Rivermouth, Punta Sdobba: > 2,5 ha

## Habitat and resource assessment

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The species is closely related to wetland habitats (wet meadows, reed beds of *Phragmites australis*) periodically inundated by water. However, it does not inhabit areas flooded for long periods (at least during the growing season). It is not tied to a particular type of plant association, but probably to certain microclimatic conditions (temperature, humidity) and vegetation structure. It tolerates at least mild salinity (at the mouths of the Timavo, Isonzo and Stella rivers).

For this species the following quote fits very well: “many threatened species now exist in the most marginal parts of their former range, because humans have usurped the best areas; in effect, they are living in what could be termed the best of the worst areas” (IUCN, 2008). For example, one hypothesis is that areas with low salinity were originally marginal in the species distribution as they are not optimal for the species but are now very important for the conservation of *Z. marmorata*, because half of the sites where it is still present, are at least partly flooded by sea or lagoon waters. The formerly suitable habitat in the plains has largely been transformed into non-suitable habitats, such as cropland.

## Threat analysis

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### *Direct threats*

Industrialization and infrastructural development. Large parts of the habitats in Lisert have been destroyed as a consequence of conversion of wetlands into industrial areas. This process might continue and threaten the remaining habitat of the species.

Intensive agricultural land use. In the past, many wetlands in the region have been converted into cropland. While the process of habitat conversion has stopped, only a small part of original areas of wetlands remains.

Encroachment of shrubs and trees. The construction of dykes and embankments as well as drainage and abandonment have degraded the habitat quality in the Lisert area. The process of succession is now a problem and bushes have become abundant in large parts of the habitat (with only the eastern part of the grassland being cut occasionally, Fig. 14).

In other sites (Isonzo), the reeds might naturally evolve towards more mature stages that are possibly less favourable for *Z. marmorata*. However, this process is currently little understood.

Previous hydrological changes affect the water level and therefore have had and continue to have an effect on the vegetation at the site of the Lisert Springs (see above).

Grazing. At the Isonzo mouth some habitats are currently grazed by horses. The grazed area is probably less or not suitable for *Z. marmorata*, but the effects of grazing have so far not been studied in detail.

Habitat fragmentation. *Z. marmorata* populations occupy small areas and are isolated. As the species is highly sedentary, it is unlikely to be able to colonize new or existing habitats on its own. It might be possible that specimens and stems of reeds carrying eggs may be transported by water, but this has not yet been studied. At the “Lisert Springs” site, habitat fragmentation has been aggravated by heavy changes to the hydrology (the implementation Tavoloni and Moschenizza canals and the backfilling of part of the natural water bodies) together with the construction of the railway viaduct and the paper-mill railway sidings.

Pesticides. Pesticides represented a major threat in the past. The current use of pesticides in the area and its effects on the species are not known. One threat could be, for example, the use of herbicides along the Tavoloni and Moschenizza canal area of the Lisert Springs (currently flailing is performed).

Fires. Fires are relatively rare in the habitat of *Z. marmorata*, but they may cause serious damage to the populations of the species.

Human disturbance. Collecting does not appear to be a threat to this species, as it is not valued by collectors. The species is protected by Regional regulations.

### *Indirect threats*

Social changes. The loss of interest in the use of marginal areas for agricultural purposes as a consequence of the low economic profitability has contributed to the recent abandonment of the Lisert Springs area over the last 20 years. Generally, the social situation in the region has changed during recent decades and the number of cattle has decreased.

## *Future Threats*

Future construction of infrastructure or changes in land use could be risky, especially in the area of the Lisert Springs, which is not currently subject to any form of protection.

Climate change - increase in sea levels. An increase in episodes of high water and flooding in the medium/long term could lead to an increase in salinity in some areas located at the mouth of the Isonzo and the Marano Lagoon, and could render the sites less suited to *Z. marmorata* which only tolerates slight salinity.



Figure 14: Encroachment of shrubs and trees in the Lisert Springs site © Francesca Tami

## **Conservation & Management**

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*Z. marmorata* has been assessed as Endangered (EN) on the IUCN Red List of Threatened Species (Kleukers *et al.* 2015). The species is protected by the Autonomous Region Friuli Venezia Giulia Regulation (DPR Reg March 20, 2009 n. 074 / Pres.), which prohibits its capture. There are no ongoing specific actions to preserve this species. Some environmental groups have called for the establishment of a regional biotope (a strictly protected area) on the “Sorgenti del Lisert” (“Lisert Springs”) site (Municipality of Monfalcone), which is home to one of the populations of this species, but the process for the establishment has not been completed.

The site of the Lisert Springs is not subject to any form of protection. The other sites fall within protected areas with the island at the mouth of the Timavo located within the Natura2000 network, in the SPA (Special Protection Area) “Karst areas of Venezia Giulia”. The area at the mouth of the Isonzo enjoys more forms of protection, since it is included within the Regional Natural Reserve of the mouth of the Isonzo River and the SPA and SCA (Special Conservation Area) “Isonzo Rivermouth - Isola della Cona”. The populations of the Lagoon of Marano are located within the SPA and SCA “Lagoon of Marano and Grado” while those along the Stella River are also within the River Stella nature reserve.

Agricultural use: Part of the Lisert Springs site has been mown in recent years while the meadows along the banks are cut every year. In the past, clearings were mown (not every year) for hunting common snipe (*Gallinago gallinago*), both in Lisert and in the Lagoon of Marano.

In the Isonzo Reserve, between Isola della Cona and Punta Spigolo, meadow habitats are managed through grazing of Camargue horses and, in the recent past, cattle. In the remaining part of the reserve the habitat is left to natural succession. Horses probably rarely graze in the area where *Z. marmorata* lives.

In Stella reserve the habitat is left to natural succession; only in some areas are reeds cut and used in the construction (roofs and walls) of “*casoni*”, typical fishermen’s huts.



# CONSERVATION STRATEGY PLANNING

## Methodology

### Guidelines

To develop the conservation strategy for the Adriatic Marbled Bush-cricket in Slovenia, the handbook of the IUCN Species Survival Commission (IUCN SSC 2008), strategies from other species and advice from experts were used. Definitions of Vision, Goals, Objectives and Actions were strictly adopted from the IUCN SSC handbook. The way they interact through the conservation strategy planning is shown in Fig. 15.

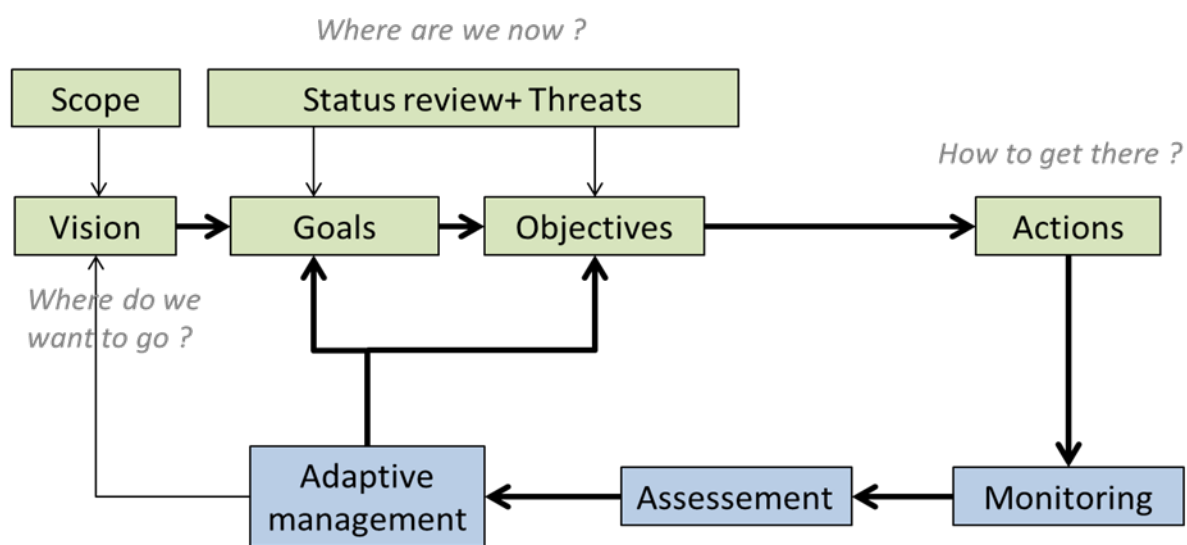


Figure 15: Conservation strategy planning. Adapted from IUCN SSC (2008).

As defined in the handbook, actions must be SMART: specific, measurable, achievable, realistic and time-bound. Targets were included in actions and goals.

### Workshop

To develop a conservation strategy for the Italian populations of the Adriatic Marbled Bush-cricket, the approach of the IUCN Species Survival Commission was used. This requires a review of the species' status and the threats it faces, and development of a Vision for the future, Goals, Objectives and Actions. This was done through a participatory workshop, involving species specialists and planners, ministries and state government agencies, managers, researchers and other stakeholders.

### Participants

These included the Regione Autonoma Friuli Venezia Giulia (*Servizio paesaggio e biodiversità; Servizio foreste e corpo forestale – stazioni forestali*), the Regional Natural Reserve of the mouth of Isonzo and local environmental associations (see Appendix for a detailed list of participants).

## Programme

The workshop ran on 28<sup>th</sup> of September in the information centre of the Riserva Naturale Regionale Foce dell'Isonzo – Staranzano (Gorizia). A preparatory workshop was held on 18<sup>th</sup> September 2016 in Ljubljana (Slovenia) by a core group to prepare a draft vision, goals, objectives and actions that were suggested to the stakeholders, revised and completed two days later. A field trip to the only non-Italian population near Ljubljana was also organised for the core group. On 20<sup>th</sup> September, information on the species (biology, ecology, threats) and on the strategic planning process was presented. The vision, goals, objectives and actions were discussed and modified by stakeholders and a field trip to the habitat at the Isonzo river mouth took place. The workshop programme is given in Appendix I.

## Vision

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**The Italian North Adriatic coastal area will maintain a well-connected network of open wetland habitats, including reeds, marshes and wet meadows, that will be under sustainable conservation management, sustaining large viable populations of *Zeuneriana marmorata* and other associated threatened wetland species.**

The vision was carefully worded to reflect the following points:

- (i) “well connected network of open wetland habitats”: The current area of remaining wetland habitats is rather small and needs to be increased and better connected.
- (ii) “including reeds, marshes and wet meadows”: Particularly open wetland habitats have become scarce in the Region. Encroachment of bushes and trees is a threat to many wetland species.
- (iii) “sustainable conservation management”: Conservation management has just started in many parts of the Region and no management plans exist so far for many protected areas.
- (iv) “sustain large viable populations of *Zeuneriana marmorata*”: Habitat management needs to focus on increasing the population of *Z. marmorata* as the remaining populations are probably too small to be viable.
- (v) “other associated threatened wetland species”: Conservation management needs to be applied in a multi-species context, considering many threatened species of which *Zeuneriana marmorata* is one important flagship.

Abbreviations of major actors:

- SBIC: Riserva Naturale Regionale Foce dell’Isonzo
- ASTORE: Associazione Studi Ornitologici e Ricerche Ecologiche del Friuli Venezia Giulia
- ROGOS: Rogos Società Cooperativa
- MCST: Museo Civico di Storia Naturale di Trieste

## Goals, objectives and actions

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### **Goal 1: Habitat management**

To increase the wetland area of high quality for nature conservation in concordance with other relevant plans and strategies, facilitating population growth and spread of *Zeuneriana marmorata* and other threatened species in the region.

#### **OBJECTIVE 1.1 HABITAT PRESERVATION AND IMPROVEMENT**

To preserve and improve the conditions of wetlands with high nature conservation value, particularly habitats of *Zeuneriana marmorata* and other threatened species.

#### **Actions**

##### *1.1.1 Facilitate the protection of the habitat in the Lisert area as a “Biotope” by 2018*

Remarks: The area has been proposed as a “Biotope” (a strict nature reserve category), but this has not yet been implemented.

Actor: Municipality / Region / Samantha Saffer / Paul Tout

Accountable: Samantha Saffer / Paul Tout

Resources needed: NA

Indicator of success: Lisert wetland is “Biotope”

##### *1.1.2 Identify land owners in Lisert area by end of 2017*

Remarks: To be able to instigate conservation action also without formal designation as a “biotope”.

Actor: Samantha Saffer / Paul Tout

Accountable: Samantha Saffer / Paul Tout

Resources needed: NA

Indicator of success: List of land owners

##### *1.1.3 Explore possibilities to close sluice(s) in the Lisert area to increase water level and facilitate restoration by 2017*

Remarks: Are there other possibilities to raise the water level? How many sluices exist?

Actor: SBIC

Accountable: SBIC

Resources needed: staff time

Indicator of success: Solution presented by 2017 to close sluice(s) by 2020

##### *1.1.4 Monitor shrub development in Lisert area to check if shrub removal has to be done*

Actor: SBIC

Accountable: SBIC

Resources needed: staff time

Indicator of success: yearly short report (or map), first scrub invasion map in 2017



*1.1.5 Prevent the area Spigolo from grazing by putting fences by end of 2017*

Remarks: A first fence will be build in 2017 to prevent grazing in the Isola della Cona (were the species was discovered and abundant). After monitoring in summer 2017, different experimental plots will be fenced in order to assess the impact of grazing pressure.

Actor: SBIC

Accountable: SBIC

Resources needed: staff time, 1,000 € for material

Indicator of success: Fence built

*1.1.6 Ensure the inclusion of Zeuneriana marmorata monitoring in the management plan of the SPA Lagoon of Marano and Grado by 2017*

Actor: Region

Accountable: Region

Resources needed: staff time

Indicator of success: Management plan includes monitoring of *Z. marmorata*

*1.1.7 Explore possibilities to increase the size of existing Natura 2000 site (SPA Karst areas of Venezia Giulia) by 2020*

Actor: Region

Accountable: Region

Resources needed: staff time

Indicator of success: Expansion plan for SPA submitted

**OBJECTIVE 1.2 HABITAT RESTORATION**

To increase the area of open wetland habitats by restoring destroyed or degraded habitats in the region.

**Actions**

*1.2.1 Identify potentially suitable localities for restoration in the region based upon former wetland areas by 2019*

Remarks: Vegetation map exists (Univ. Trieste) -> suitability map may need to be created from this in combination with satellite images and field surveys

Actor: SBIC / Paul Tout

Accountable: SBIC / Paul Tout

Resources needed: staff time, 1,000 € for material

Indicator of success: suitability map provided

### 1.2.2 Experimental restoration of brackish reed beds close to existing populations of *Zeuneriana marmorata* by 2019

Remarks: fence off areas that are currently grazed. How large? -> some planning needed; may also act as corridors to re-connect isolated sites. Possibly a large reed bed restoration project will be started in 2018

Actor: SBIC

Accountable: SBIC

Resources needed: fence / staff time, 20,000 € for embankment restoration in Boschetta area

Indicator of success: Restoration site established; brackish-freshwater habitat re-establishing in place of former salty habitats

## Goal 2: Species support

To increase the population size and area of occupancy of *Zeuneriana marmorata* in the North Adriatic coastal area of Italy, monitor its population trend and develop approaches to protect the species from potentially detrimental effects of climate change.

### OBJECTIVE 2.1 TRANSLOCATION

To explore possibilities to create new populations of *Z. marmorata* by translocating it into potentially suitable habitats that is currently not occupied and might serve as a backup population also facing the threat of climate change.

#### Actions

#### 2.2.1 Explore potentially suitable habitats for translocation by 2020

Remarks: Historical sites as well as un-studied sites.

Use the existing habitat map (Oriolo 2011) as guidance

Actor: Andrea Colla (MCST) / Francesca Tami / Yannick Fanin

Accountable: Andrea Colla (MCST)

Resources needed: staff time

Indicator of success: priority list for potential translocation sites provided

#### 2.2.2 Draft a translocation strategy for the species by 2022

Remarks: Only if suitable habitat has been identified under 2.2.1 and if a sufficient source population is available!

Actor: Andrea Colla (MCST) / Francesca Tami

Accountable: Andrea Colla (MCST)

Resources needed: staff time

Indicator of success: translocation plan provided

## OBJECTIVE 2.3 MONITORING

To monitor the population trends of *Z. marmorata*.

### Actions

#### 2.3.1 Establish a monitoring method for all Italian populations by 2018

Remarks: presence / absence on each site might be sufficient (or just covering the distribution) as many areas are not accessible.

Actor: SBIC / Yannick Fanin

Accountable: SBIC

Resources needed: staff time

Indicator of success: Monitoring in place by 2018.

## Goal 3: Research

To obtain the information necessary to understand the distribution, ecology, population size and trend of the species, the best practice of habitat management as well as the identification of conservation units.

## OBJECTIVE 3.1 DISTRIBUTION & ECOLOGY

To obtain information on the distribution, population size and trends for *Zeuneriana marmorata* and other threatened wetland species along the Adriatic coast from Trieste to Chioggia (Venice).

### Actions

#### 3.1.1 Map the distribution of *Zeuneriana marmorata* (using the habitat suitability map as a basis) by 2018

Remarks: Forestry has boats and access (but needs training). Also check for occurrence at historical sites as well as in Croatia (Paul Tout/Josip Skejo). Also look for *Chrysochraon dispar giganteus* and *Roeseliana brunneri*.

Actor: Francesca Tami / Paolo Fontana / Yannick Fanin

Accountable: Francesca Tami

Resources needed: support of Region needed, staff time

Indicator of success: Report by end of 2020.

#### 3.1.2 Perform a mapping of singing males in Lisert, mouth of Isonzo and Marano in 2017/18.

Remarks: Marano: distribution and index of abundance may be sufficient as it is nearly inaccessible.

Actor: Francesca Tami / Yannick Fanin / Carlo Guzzon

Accountable: Francesca Tami

Resources needed: 5,000 €

Indicator of success: Map provided end of 2018.

### *3.1.3 Study the ecology of Zeuneriana marmorata in the Italian habitats by 2020*

Remarks: Particularly oviposition sites, mobility

Actor: Andrea Colla (MCST) / Yannick Fanin

Accountable: Andrea Colla (MCST)

Resources needed: 3,000 €

Indicator of success: Report on ecology provided

## **OBJECTIVE 3.2 CONSERVATION MANAGEMENT**

To obtain information on the best habitat management method to limit the spread of scrub and reed (in Lisert & Isola della Cona).

### **Actions**

*3.2.1 Conduct an experiment on the best grazing management method to improve the habitat of Zeuneriana marmorata by 2020.*

Remarks: Timing? Develop an experimental design in 2017/18 for Isola della Cona (possibly also Lisert?)

Actor: SBIC / students?

Accountable: SBIC

Resources needed: staff time

Indicator of success: Report by end of 2020.

Monitoring: *Zeuneriana* response

*3.2.2 Study genetic differentiation of Zeuneriana populations from Italy to the Danube delta by 2019.*

Actor: Student / Technicians

Accountable: Trier University

Resources needed: 2,000 €

Indicator of success: Phylogenetic analysis presented

## **Goal 4: Public Awareness**

To build public awareness of the value of wetland ecosystems in the region as well as the rarity and responsibility for the species.

### **OBJECTIVE 4.1 Awareness raising**

To maximize the audience which is aware of the species and its ecosystem as a part of the national heritage whose protection and management are of “global interest”.



## **Actions**

### *4.1.1 Build a sign in Isola della Cona Reserve to inform about the unique species and its habitat by 2018*

Remarks: Outside or in visitors centre ?

Actor: SBIC / Paul Tout

Accountable: SBIC

Resources needed: 500 €

Indicator of success: Sign established

### *4.1.2 Conduct a “Zeuneriana” event evening to inform interested naturalists in summer 2017*

Actor: ROGOS / Paul Tout / Francesca Tami

Accountable: ROGOS

Resources needed: NA

Indicator of success: Event in summer 2017

### *4.1.3 Exhibition in Natural History Museum Trieste (MCST) informing on the importance of invertebrates, including Zeuneriana marmorata by 2018*

Actor: Trieste Museum / Trier University / Francesca Tami

Accountable: Trieste Museum

Resources needed: NA

Indicator of success: *Zeuneriana marmorata* covered in exhibition in Trieste Museum

### *4.1.4 Publish a Newspaper article on the workshop, the species and the importance of its ecosystem by March 2017*

Actor: Matteo de Luca

Accountable: Matteo de Luca

Resources needed: staff time

Indicator of success: Article printed

### *4.1.5 Publish scientific article on outcomes of research by 2020*

Remarks: Possibly also in annual publication of Trieste Museum to inform regional scientists and naturalists

Actor: Trier University / SBIC

Accountable: Trier University

Resources needed: NA

Indicator of success: Article published

*4.1.5 Organize a report in the local TV in 2017*

Actor: Paul Tout

Accountable: Paul Tout

Resources needed: NA

Indicator of success: TV report

*4.1.6 Conduct an evening conference on the species by the local association (ASTORE) in 2017*

Actor: Carlo Guzzon / Francesca Tami / Yannick Fanin

Accountable: Carlo Guzzon

Resources needed: NA

Indicator of success: conference conducted (first event scheduled for 31<sup>st</sup> March 2017)

## Actions' detail sheets

Actions	Who	When	How	Budget (€)	Indicator of success
<b>Goal 1: Habitat management</b>					
<b>OBJECTIVE 1.1 HABITAT PRESERVATION AND IMPROVEMENT</b>					
1.1.1 <i>Facilitate the protection of the habitat in the Lisert area as a "Biotope"</i>	Region, Monfalcone Municipality, S. Saffer, P. Tout	2018		NA	Lisert wetland is "Biotope"
1.1.2 <i>Identify land owners in Lisert area</i>	S. Saffer, P. Tout	End 2017	Land Register, interviews	NA	List of land owners
1.1.3 <i>Explore possibilities to close sluice(s) in the Lisert area to increase water level and facilitate restoration</i>	SBIC	2017	Dialogues with authorities	Staff time	Solution presented by 2017 to close sluice(s) by 2020
1.1.4 <i>Monitor shrub development in Lisert area to check if shrub removal has to be done</i>	SBIC	yearly report	Field surveys	Staff time	Yearly short report (or map), first scrub invasion map in 2017
1.1.5 <i>Prevent the area Spigolo from grazing by putting fences</i>	SBIC	End 2017	Field	Staff time, 1,000 for material	Fence built
1.1.6 <i>Ensure the inclusion of Zeuneriana marmorata monitoring in the management plan of the SPA Lagoon of Marano and Grado</i>	Region	2017		Staff time	Management plan includes monitoring of Z. marmorata
1.1.7 <i>Explore possibilities to increase the size of existing Natura 2000 site (SPA Karst areas of Venezia Giulia)</i>	Region	2020		Staff time	Expansion plan for SPA submitted
<b>OBJECTIVE 1.2 HABITAT RESTORATION</b>					
1.2.1 <i>Identify potentially suitable localities for restoration in the region based upon former wetland areas</i>	SBIC, P. Tout	2019	Bibliography, vegetation map	Staff time, 1,000 € for material	Suitability map provided
1.2.2 <i>Experimental restoration of brackish reed beds close to existing populations of Zeuneriana marmorata</i>	SBIC	2019	large scale restoration project	Staff time, 20,000 € for embankment restoration in Boschetta area	Restoration site established; brackish-freshwater habitat re-established in place of former salty habitats

Actions	Who	When	How	Budget (€)	Indicator of success
<b>Goal 2: Species support</b>					
<b>OBJECTIVE 2.1 TRANSLOCATION</b>					
<i>2.2.1 Explore potentially suitable habitats for translocation</i>	A. Colla (MCST), F. Tami, Y. Fanin	2020	Field surveys, vegetation map	Staff time	Priority list for potential translocation sites provided
<i>2.2.2 Draft a translocation strategy for the species</i>	A. Colla (MCST), F. Tami	2022	To be developed	Staff time	Translocation plan provided
<b>OBJECTIVE 2.3 MONITORING</b>					
<i>2.3.1 Establish a monitoring method for all Italian populations</i>	SBIC, Y. Fanin	2018	Focus on range border	Staff time	Monitoring in place by 2018
<b>Goal 3: Research</b>					
<b>OBJECTIVE 3.1 DISTRIBUTION AND ECOLOGY</b>					
<i>3.1.1 Map the distribution of Zeuneriana marmorata (using the habitat suitability map as a basis)</i>	F. Tami, Y. Fanin, P. Fontana	2018	Field surveys	Staff time	Report by end of 2020
<i>3.1.2 Perform a mapping of singing males in Lisert, mouth of Isonzo and Marano</i>	F. Tami, Y. Fanin, C. Guzzon	2018	Field surveys	5,000 €	Map provided end of 2018
<i>3.1.3 Study the ecology of Zeuneriana marmorata in the Italian habitats</i>	A. Colla (MCST), Y. Fanin	2020	To be developed	3,000 €	Report on ecology provided
<b>OBJECTIVE 3.2 CONSERVATION MANAGEMENT</b>					
<i>3.2.1 Conduct an experiment on the best grazing management method to improve the habitat of Zeuneriana marmorata</i>	SBIC, students	2020	Field experiment	Staff time	Report by end of 2020
<i>3.2.2 Study genetic differentiation of Zeuneriana populations from Italy to the Danube delta</i>	Trier University	2019	Lab study	2,000 €	Phylogenetic analysis presented
<b>Goal 4: Public awareness</b>					
<b>OBJECTIVE 4.1 AWARENESS RAISING</b>					
<i>4.1.1 Build a sign in Isola della Cona Reserve to inform about the unique species and its habitat</i>	SBIC, P. Tout	2018	draft a sign	500 €	Sign established
<i>4.1.2 Conduct a "Zeuneriana" event evening to inform interested naturalists</i>	ROGOS, P. Tout, F. Tami	2017	organize event	NA	Event in Summer 2017
<i>4.1.3 Exhibition in Natural History Museum Trieste (MCST)</i>	MCST	2018	develop exhibition	NA	Exhibition in Trieste Museum



<b>Actions</b>	<b>Who</b>	<b>When</b>	<b>How</b>	<b>Budget (€)</b>	<b>Indicator of success</b>
<i>4.1.4 Publish a Newspaper article on the workshop, the species and the importance of its ecosystem</i>	M. De Luca	March 2017	Write report	Staff time	Article printed
<i>4.1.5 Publish scientific article on outcomes of research</i>	Trier University	2020	Write manuscript	NA	Article published
<i>4.1.6 Organize a report in the local TV</i>	P. Tout	2017	contact TV	NA	TV report
<i>4.1.7 Conduct an evening conference on the species by the local association (ASTORE)</i>	C. Guzzon, F. Tami, Y. Fanin	2017	organize conference	NA	Conference conducted

## REFERENCES

- Brunner von Wattenwyl, C. 1882. Prodomus der europäischen Orthopteren. Leipzig, Engelmann, 466 p.
- Fanin, Y., Tami, F., Guzzon, C., Candotto, S. & Merluzzi, P. 2016. Nuove località di *Zeuneriana marmorata* (Fieber, 1853) (Insecta Orthoptera) in Friuli Venezia Giulia (Italia nord-orientale). Gortania Bot. Zool. 37: 35-41.
- Fieber, F.X., 1853. Synopsis der europäischen Orthopteren mit besonderer Rücksicht auf die in Böhmen vorkommenden Arten. Lotos, 3: 90-104, 115-129, 138-154, 168-176, 184-188, 201-207, 232-238, 252-261.
- Giordani Soika, A., 1949. Studi sulle olocenosi. II. Fattori ecologici e fattori geografici nella distribuzione degli Ortoteri nell'estuario veneto. Mem. Soc. ent. It., Vol. XXVIII: 61-72.
- Gomboc, S., & Šegula, B., 2005. The finding of *Zeuneriana marmorata* (Fieber 1853) in Slovenia (Orthoptera: Tettigoniidae): Slovenian Entomological Society Vol. 13, st. 2: 81-92.
- Kleukers R., Fontana P., Odé B., 1997. *Zeuneriana marmorata* (Fieber): an endemic bushcricket from the coast of the northern Adriatic sea (Insecta Orthoptera: Tettigoniidae): Atti Acc. Rov Agiati, a.247, 1997 ser. VII vol. VII, B: 63-79.
- Kleukers, R., Hochkirch, A. & Buzzetti, M.F., 2015. *Zeuneriana marmorata*. The IUCN Red List of Threatened Species 2015: e.T44712377A70741349.
- IUCN/SSC, 2008. Strategic planning for species conservation: A Handbook. Version 1.0. Gland, Switzerland: IUCN Species Survival Commission. 104 pp.
- Marcuzzi, G., Dalla Venezia, L. & Lorenzoni, A.M., 1971. Appunti ecologico-qualitativi sul popolamento animale di alcuni biotopi litorali dell'Alto Adriatico. Atti Ist. Ven. Sc. Lett. Arti, Cl. Sc. fis. mat. nat., 129: 119-207.
- Massa, B., Fontana, P., Buzzetti, F.M., Kleukers, R. & Odè B., 2012. Orthoptera. Fauna d'Italia vol. XLVIII. Calderini. Ministero dell'Ambiente e della Tutela del Territorio e del Mare.
- Oriolo G., 2011. Carta degli habitat FVG e di interesse comunitario del sito: ZSC it3330005 Foce dell'Isonzo – Isola della Cona; scala 1:10.000. Digital edition 2016
- Tami, F., Tirello, P. & Fontana, P., 2011. Contributo alla conoscenza di alcuni Ortoteroidi (Insecta Blattaria, Mantodea, Orthoptera, Dermaptera) in Friuli Venezia Giulia (Italia nord-orientale). Boll. Mus. St. Nat. Venezia, 62: 19-34.

## Appendix I

Workshop programme Isola della Cona, 20<sup>th</sup> of September 2016 - Italy





RISERVA NATURALE REGIONALE  
FOCE DELL'ISONZO  
ISOLA DELLA CONA

Riserva Naturale Regionale Foce dell'Isonzo  
**SBIC**  
Stazione Biologica Isola della Cona

**20th September 2016**

Isola della Cona Conference room  
Riserva Naturale Regionale Foce dell'Isonzo – Staranzano (GO)

### **Workshop on the conservation of *Zeuneriana marmorata* (Adriatic Marmored Bush-Cricket)**

*Zeuneriana marmorata* (Adriatic Marmored Bush-Cricket) is a rare cricket species linked to wetland habitats, which occurs in few sites of the Italian region Friuli Venezia Giulia (Lisert near Monfalcone; mouth of the Isonzo/Soča River; the Lagoon of Marano) and on Ljubljansko barje near Ljubljana, in Slovenia. The species is protected by the Region Friuli Venezia Giulia regulation (DPR 074/2009); it has been assessed as globally Endangered (EN) on the IUCN (International Union for Conservation of Nature) Red List of Threatened Species. The meeting has the aim of discussing and developing an official conservation strategy for this species and it is promoted by the IUCN SSC Grasshopper Specialist Group, IUCN SSC Invertebrate Conservation Sub-Committee e IUCN SSC Species Conservation Planning Sub-Committee, in collaboration with a parallel conservation initiative in Slovenia.

*Zeuneriana marmorata* (Grillastro marmorato) è una rara cavalletta tipica di zone umide, presente in poche aree del Friuli Venezia Giulia (Lisert presso Monfalcone; foce dell'Isonzo; Laguna di Marano) e in un'area della Slovenia (Ljubljansko barje, presso Lubiana). La specie è protetta dal Regolamento sulla tutela della fauna minore della Regione autonoma Friuli Venezia Giulia (DPR 074/2009); è stata valutata in pericolo di estinzione (EN) dall'Unione internazionale per la protezione della natura (IUCN). L'incontro ha lo scopo di discutere e sviluppare una strategia di conservazione per la specie, promossa da IUCN SSC Grasshopper Specialist Group, IUCN SSC Invertebrate Conservation Sub-Committee e IUCN SSC Species Conservation Planning Sub-Committee, in coordinamento con un'analogha iniziativa per la popolazione in Slovenia.





## Programme

9.00 – Welcome to participants / Benvenuto ai partecipanti  
**M. De Luca & F. Perco** (Cona Island Biological Station/Stazione Biologica Isola della Cona)

9.15 – What is IUCN, SSC (Species Survival Commission) and strategic planning for conservation?

**Axel Hochkirch** (Chair of the IUCN SSC Invertebrate Conservation Sub-Committee, Co-Chair of the IUCN SSC Grasshopper Specialist Group)

9.30 – *Zeuneriana marmorata*: presentation of the species and its status / *Zeuneriana marmorata*: presentazione della specie e del suo status

**Francesca Tami, Stanislav Gomboc, Paul Veenvliet, Yannick Fanin, Silvano Candotto, Carlo Guzzon, Nicolas Janecke, Tamara Rehm Soula, Paul Tout**

10.00 – Local *Zeuneriana marmorata* habitats: a short description / Habitat localmente adatti per *Zeuneriana marmorata*: una breve descrizione

**Pierpaolo Merluzzi** (Cona Island Biological Station)

10.15 – Threats on the species in Italy / Minacce per la specie in Italia

**Francesca Tami, Yannick Fanin, Carlo Guzzon, Pierpaolo Merluzzi, Paul Tout**



RISERVA NATURALE REGIONALE  
**FOCE DELL'ISONZO**  
**ISOLA DELLA CONA**

Riserva Naturale Regionale Foce dell'Isonzo  
**SBIC**  
Stazione Biologica Isola della Cona

**10.30 – Coffee break**

10.50 – Discussing the vision and goals of the Conservation Strategy  
/ Discussione sulla visione e sugli obiettivi a lungo termine di una  
strategia di conservazione

**13.00 – Lunch at the Cona island “Pettiroso – Restaurant”**

14.00 – Discussing the objectives and actions of the Conservation  
Strategy / Discussione sugli obiettivi a breve termine e sulle azioni  
che si possono intraprendere per la conservazione della specie

16.30 – Excursion to the *Zeuneriana marmorata* sites in the  
Isonzo/Soča Nature Reserve -Escursione all'interno della Riserva  
nei siti di *Zeuneriana marmorata*

