# Akrotiri Marsh Grazing Capacity Study

**John Badley, Senior Sites Manager**
**RSPB Frampton Marsh & Freiston Shore**

Πτηνολογικός Σύνδεσμος Κύπρου
BirdLife Cyprus

Akrotiri Environmental Education Centre
Κέντρο Περιβαλλοντικής Εκπαίδευσης Ακρωτηρίου

rspb giving nature a home

# Akrotiri Marsh Grazing Capacity Study

**This document has been produced as part of the project "*Akrotiri Marsh Restoration: a flagship wetland in the Cyprus SBAs*"**
**(April 2015 – March 2017) funded by the Darwin Initiative through UK Government funding (Darwin Plus, the Overseas Territories Environment and Climate Fund).**

www.akrotirimarsh.org

# Akrotiri Marsh Grazing Capacity Study

The aim of this document is to establish an appropriate livestock grazing regime at Akrotiri Marsh to help improve conditions for the key target species associated with the wet grassland habitat, specifically breeding black-winged stilt and spur-winged lapwing.

In order to improve conditions for breeding waders the area of reed needs to be reduced and the area of grassland increased, in particular a much larger area of wet or partially flooded grassland needs to be created to provide feeding and nesting opportunities for these species. The grassland sward should be generally short (no more than 5-10cm average height during April), but with a diverse range of plants including the rarer species such as grey club-rush *Scirpus tabernaemontani.*

Livestock grazing is a key management tool in the conversion of reed to wet grassland and the sustainable management of the Marsh. In order to calculate an appropriate livestock grazing density (number of grazing animals) a number of factors need to be examined. These are outlined below and taken into consideration for the recommended grazing densities under the final section 'Recommendations'.

**Vegetation type**

Very little information is available on the species of grass present at Akrotiri Marsh. It is assumed they will be similar to species or in characteristics to those found elsewhere in wet grassland habitats, both tolerating and benefitting from a wet soil conditions and periodic inundation.

**Rare plants**

Some nationally rare plants occur at Akrotiri Marsh. Each has its own specific habitat preferences and all are likely to benefit from at least some extensive grazing. However, an area containing sensitive species has been excluded from the grazed area. Here habitat management with periodic manual cutting using brushcutters will help keep conditions favourable and stop them being out competed by reed growth. These plants may also be affected by bramble encroachment. This could in part be due to lower than normal water levels during the past two years (2015 and 2016) to facilitate the engineering works. The bramble may need to be removed manually (or perhaps by grazing with goats) but as wet conditions have been reinstated bramble encroachment may be limited in future.

Grey club-rush *Scirpus tabernaemontani* which is an unusual plant in Cyprus grows in the wet zone areas between the reed and wet grassland. This may be affected by heavy grazing and is also a plant which is popular with basket weavers. Although the extensive grazing and pushing back of the reed edge should create more favourable conditions for this species in the longer term these plants will need to be monitored to ensure they do not adversely suffer due to the higher/extensive grazing

pressure. If this is considered to be the case then they could be fenced off with electric fencing for part or all of the season. Consideration could also be given to translocating the seeds from the *Scirpus* to other suitable areas on the Marsh as they become available to reduce the potential for disturbance to nesting waders (currently a key location for the plant is adjacent to the wader scrape) by basked weaver and to ensure a more viable population.

**Insect communities**

These will be associated with the diversity of habitat conditions and plant species on site. As with plant diversity a very heavily grazed sward could lead to a reduction in insect diversity, however, without reasonably high grazing pressure it will be difficult to expand the area of grassland. Excluding livestock form certain areas or rotational grazing may alleviate potential impacts.

**Soils**

The soils at Akrotiri Marsh are generally peaty in the north and central areas and sandy towards the west and south. Peaty soils are better for wetland sward grass growth due to retaining moisture and having more organic matter. The soils in the areas of existing grassland are suitable for the wetland grass sward and the soils in the central areas, currently dominated by reeds would be suitable to convert to a grassland sward. It will be less likely a suitable grass sward could be achieved in the west and south of the site due to the presence of sandy soils which will dry out and not retain sufficient water for the sward to establish.

**Water levels**

Water level management is important to ensure optimal habitat conditions for both ecological targets and grazing. The higher winter levels should be retained into spring to benefit breeding ferruginous ducks and provide suitable areas for breeding and passage waterbirds including black-winged stilts and spur-winged lapwings. At present there is little suitable habitat for breeding waders (other than the wader scrape, which due to the provision of islands surrounded by sufficiently deep open water should be suitable) but as the reedbed is pushed back over time larger seasonally flooded areas of grassland would be expected. This area of habitat recreation is a key objective of the project. Water levels can be allowed to gradually and naturally drop in spring and through the summer before being recharged again in winter. Good water level management is important for grazing livestock because if the levels are too high it could restrict grazing availability and access for livestock to graze the lower areas of marsh. The lower areas of marsh are where we want to encourage livestock to graze to facilitate the transition from reedbed to wet grassland. Water level management is covered in more detail in the Water Level Management Plan.

**Salinity**

Salinity will significantly affect the growth and composition of grasses as many species are not particularly salt tolerant, with high salinity levels radically altering the vegetation community. Salt tolerant plants are generally palatable to livestock and a saline dominated plant community could be suitable for many passage and breeding waterbird species (eg as is present at Oroklini Marsh) but this is not a habitat type we would prefer at Akrotiri Marsh given the history of the site, the rare species of plants, amphibians and invertebrates that are not salt tolerant and the scarcity of freshwater wetlands in Cyprus. Although there is quite a strong saline influence at the southern end of Aktrotiri Marsh the northern part of the site, which is regularly spring fed and where this work is focussed, does not have a significant saline influence, therefore we do not consider this to be a factor we need to take into account.

**Weather (rainfall, temperature and sunshine) and water availability**

Climatic conditions at Akrotiri are typified by high temperatures, high levels of sunshine and generally low rainfall. The summer is particularly hot with temperatures frequently reaching $40^0$ Celsius.

Grass will grow when the temperature is consistently above $6^0$C. In Cyprus we consider this would be from late-February to early December. Therefore the grazing season is extended compared with more northerly European latitudes.

However, the very warm or hot weather conditions associated with a general lack of rainfall might normally be considered detrimental to grass growth, potentially severely so (eg. 'drought conditions'). These conditions might be expected to more than offset the potentially beneficial conditions outlined in the paragraph above and this is the case in much of Cyprus where grass growth is severely restricted. But because Akrotiri Marsh sits in a natural topographical basin and benefits from a regular spring-fed water supply these barriers to grass growth are not significant and this creates ideal conditions for wetland plants.

We have seen how reeds grow extremely vigorously and tall, to 8m plus in some areas at Akrotiri Marsh. Grass has a similar growing cycle to reed and although not as significant, grass growth is also vigorous leading to Akrotiri Marsh developing a lush grass sward where it has not been out competed by reeds.

**Pollutants**

We have assumed there are no significant pollutants to take account of in this study.

**Non-livestock grazing pressure**

Unlike many wetland sites the grazing pressure from other animals (eg wildfowl) is negligible. There are very few ducks or geese using Akrotiri Marsh (which can be significant grazers of wet grasslands). Even assuming numbers will increase due to the habitat works it is unlikely given the peak counts in the recent Cyprus bird reports reviewed (2013 & 2014) that geese or ducks will be present in sufficient numbers to be considered in the grazing assessment.

**Type of livestock**

In order to calculate recommended grazing densities on wetland sites 'Livestock unit coefficients' are often used. These vary depending on the source, but for the purposes of this study we use the Eurostat Livestock Unit (LSU) calculations. Animals of relevance to Akrotiri Marsh include; bull 1.0 LSU, cow over 2 years old 0.8 LSU. Calves 1-2 years old 0.7 LSU and if under 1 year old 0.4 LSU. Horses and donkeys are similarly categorised. However, because the traditional Akrotiri cattle breed is noticeably smaller than UK cattle (upon which the criteria are based) and since smaller animals will require less food (grass) it is suggested lowering the LSU cattle values for all age classes by 0.2 LSU. Therefore the livestock at Akrotiri will be treated as follows;

- Bull 0.7 LSU
- Cow 2+ years old 0.6 LSU
- Cow 1-2 years old 0.5 LSU
- Calf <1 year old 0.2 LSU
- Horse/donkey 2+ years old 0.8 LSU
- Horse/donkey 1-2 years old 0.7 LSU
- Horse/donkey <1 year old 0.4 LSU

Normally cattle are preferred for grazing wet grassland habitats. The current composition of livestock favours cattle. At Akrotiri Marsh having a variety of livestock could be advantageous because horses may be good at eating reed and donkeys are also known for eating tough vegetation in comparison to cattle, so having some horses and donkeys might aid the conversion of reed to grassland habitat. Sheep are not recommended because they tend to create a rather uniform short sward that does not create diverse habitat conditions for wildlife (the perimeter fencing is also not suitable for sheep).

**Supplementary feeding**

With an expected lack of growth during mid-December to late-February at Akrotiri Marsh it will be necessary for graziers to either remove their livestock to find alternative grazing or to provide supplementary feeding on site for the animals. The availability of reed will not offset the lack of grass during the winter because the reeds will become woody and unpalatable during winter.

**Reed clearance/cutting**

From early August until late February (i.e. not during the bird breeding season) some mechanical cutting or other removal of reeds in certain areas would be highly desirable to help facilitate the conversion of reed to wet grassland habitat as mechanical cutting will be more effective and will deliver a quicker transition than grazing alone. It is important for these areas to be grazed as soon as the reed starts to regrow to prevent it quickly reverting to a reedbed and aid the transition to a grassland. Water level control will also be important as if the reeds are removed and the area is flooded it may not prevent livestock from accessing these areas. This should be considered as a management tool to create more wet grassland habitat.

**Nest trampling**

There is a risk of livestock trampling ground nesting bird nests. In some habitats and for some species this can be a problem (eg saltmarsh nesting redshanks and colonial island nesting species such as gulls, terns and avocets). To reduce this risk livestock should be prevented from accessing the wader scrape during late February to June through the use of an electric fence. After this date the fence should be removed to encourage cattle to graze the scrape, including the islands to manage vegetation growth. For any birds nesting away from the grazing exclosure around the wader scrape including black-winged stilts and spur-winged lapwing plus other species (wagtails etc) there is a greater risk of nest trampling. This can only be reduced by further electric fencing, tethering cattle or reduced grazing densities. Since extensive cattle grazing is important to ensure good quality wet grassland habitat condition and a conversion of reed to wet grassland only further electric fencing and stocking densities measures are considered appropriate. In the short-term it is unlikely there will be many ground nesting birds at Akrotiri Marsh outside of the wader scrape due to the extent and quality of habitat. According to Google Earth around 17.5ha of grazing land is available (date unknown) and as of March 2017 there were a total of 99 animals. This is an overall grazing density of 5.7 Livestock per hectare.

*The Wet Grassland Guide* includes a calculator for nest trampling rates by grazing livestock on wet grassland habitat. The most closely related species assessed in the guide; black-tailed godwit and northern lapwing would theoretically experience nest trampling rates of around 83% and 62% respectively at current (March 2017) grazing density. At Akrotiri Marsh it might be expected spur-winged lapwing could be similar to northern lapwing and black-winged stilt more similar to black-tailed godwit. Irrespective of the species, these trampling rates would be unsustainably high. However, we are currently in a situation where we need to increase the area of non-reed habitat and with no breeding waders at present the risks of trampling are somewhat academic. Waders are less likely to attempt to nest in areas with very high cattle grazing density. Once a larger area of suitable habitat for ground nesting waders has been created decisions will have to be made for livestock management during subsequent breeding bird seasons (late February to June) to ensure suitable conditions are created. Management options include lowering overall grazing densities, lowering densities in some areas (i.e. rotational grazing) or excluding livestock from some areas (possibly through the use of seasonal electric fencing).

**Livestock management**

As there are a number of graziers and some at least will want to keep their livestock separated, but with the community wishing not to have internal permanent fencing the use of temporary electric fencing needs to be considered. It is up to the graziers to negotiate their own grazing parcels, but close liaison with the graziers will be necessary to ensure conservation objectives are being achieved. The wader scrape will need to be fenced off during late February to June to prevent accidental trampling of nests (the cattle are likely to walk out onto the islands). Due to budget constraints a complete perimeter fence could not be installed as part of the DLUS034 project therefore graziers will have to be aware that livestock may be able to escape Akrotiri Marsh if they get through or around the reedbed. This can be addressed with electric fencing provision. In the longer term consideration should be given to complete the perimeter fencing to ensure extensive grazing with livestock can be effectively delivered.

**Extra water from dam**

Fresh water availability is crucial for the success of Akrotiri Marsh. In certain conditions such as drought or if the spring water flows are insufficient to maintain desired water levels it may be necessary to increase the flow of fresh water into Akrotiri Marsh by supplemental water from the dam. See Water Level Management Plan.

**Recommendations**

Typical grazing densities for lowland wet grasslands in the UK are in the range of a maximum 0.5 – 0.9 LSU/ha. Given the factors outlined under 'Soils', 'Salinity' and 'Weather...' we consider this should be higher at Akrotiri Marsh, where a range of 1.0-1.75 LSU/ha might be appropriate. The current grazing density (March 2017) at is 49.05 LSU in 17.5ha or 2.80 LSU/ha. However, as suggested under 'Nest Trampling' additional grazing is available in the form of reeds adjacent to the 17.5ha wet grassland habitat which contribute to a lower effective pressure on the grassland habitat. As the Akrotiri Marsh Project seeks to reduce the area of reed and increase the area of grassland higher livestock densities are required to encourage the animals to ingress into the reedbed and transition the reed habitat into grassland habitat. Therefore it is considered desirable for the first five years to have a livestock grazing density in the range 1.75-3.00 LSU/ha (as calculated over the 17.5ha existing grassland). Grazing levels should be reviewed annually and recalculated to take into account any increase in the 17.5ha grazed area/wet grassland. The grazing pressure will need to be brought back in the longer term to 1.0-1.75 LSU/ha when the wet grassland area has been increased to the desired area to bring the grazing back into equilibrium so the reedbed area does not continue to be reduced . An aspirational target for wet grassland habitat could be 50-60ha (of the total ca. 118ha Akrotiri Marsh total area – as measured on Google Maps between the road, southern perimeter ditch, eucalyptus wood to the east and farmland to the west), retaining 15ha of saltmarsh and 43-53ha of reedbed. To illustrate the number of animals required once the desired habitat areas have been achieved based on 60ha grassland this would equate to 100-175 cows aged 2 years or older (using the grazing density range 1.0-1.75 LSU/ha).

At these short and longer-term target grazing density levels nest trampling remains a significant issue and so efforts will need to be made to provide areas of suitable habitat where densities are lowered to a maximum of 0.9 LSU/ha. This could be achieved over the whole site if some animals are removed during the nesting season (late February to June) or if this is not possible then the most likely areas for breeding waders (the wetter areas) should be temporarily fenced off from livestock. The wader scrape which has been created specifically for breeding waders should also be ungrazed between late February and June.

The introduction of extensive grazing, leading to a more diverse, less reed dominated habitat will provide enhanced opportunities for plants and invertebrates in the longer term, but in the short-term rare plant and insect species will also need to be monitored (for at least five years) to ensure the communities and rarer species are not adversely affected by the higher levels of grazing required break up and transition reed into other habitats. Short-term mitigation to alleviate potential problems could include the provision of temporary electric fencing around important populations and rotational grazing.

As outlined earlier monitoring will be crucial to inform the grazing densities and to ensure the breeding waders, rare plants and insects benefit from the changed grazing regime. A management plan is also in preparation for the site. This should include monitoring and an annual review comparing grazing levels, key breeding bird numbers, rare plant and invertebrate data to inform management.