

# Creating and managing dune slacks



### THIS HABITAT MANAGEMENT SHEET COVERS THE FOLLOWING INFORMATION:

- The importance of dune slacks
- The species the work will benefit
- Which approach to use
- Guidance on planning your slack
- Step-by-step guide
- Examples of slacks created in a sand dune system

Dune slacks are depressions in the dune system that have formed because of wind erosion down to the water table. The level of water varies depending on rainfall and fluctuations in the water table, typically rising between autumn and spring, before falling again throughout the summer months and often drying by the end of summer.

On certain dune systems, dune slacks are breeding sites for the extremely rare Natterjack Toad; in spring, adults gather in pools and spawn is laid in shallow water. Slacks are also very important for many specialist species of vascular plants and bryophytes such as Petalwort and Sea Bryum.

Without the correct set of natural conditions or effective management, dune slacks may quickly succumb to over-vegetation, eventually resulting in scrubby woodland. Unfortunately, this successional change is taking place faster than new slacks can form - therefore intervention is needed to preserve this important habitat in its early-successional stage.

### When to create, rejuvenate or manage?

Knowing which approach to adopt is key to not only saving time and money, but also managing a site in the best way for the species concerned.

Mowing dune slacks in late-summer / autumn once dry, limits plant regrowth the following year, ensuring flooded slacks remain open (no emergent vegetation). Employing a grazing regime over winter maintains a short sward throughout the surrounding terrestrial habitat and can create some bare ground, perfect for Natterjack Toads, bryophytes and semi-aquatic plants.

Rejuvenation (scraping out) is required to clear excessive levels of emergent vegetation and scrub which reduces the area of open water. It will also combat the establishment of rank grasses and scrub which could dominate the surrounding terrestrial habitat and threaten connectivity to other pools. Urgent attention is required when species of

particular concern are being predated upon or out-competed by more dominant species of flora and fauna.

Create new pools to improve connectivity through the dune system and to increase the potential range of certain species.

Slacks may be created using machinery or by hand, where a sensitive approach is sometimes required.

### Before you start

**Timing:** Early-autumn is the ideal time to create and rejuvenate ponds. At this time of year, the ground is not too wet and the breeding season for amphibians and invertebrates will have ended.

**Planning:** Always obtain the landowner's permission to carry out the work. Be aware of possible restrictions on designated sites such as a nature reserve or SSSI; seek consent where required. Carefully survey the existing habitat, taking note of potential hibernation sites for Natterjack Toads and Great Crested Newts. Carry out a pond survey for signs of amphibians. Check for any archaeological interest (even if not a listed site).

**Positioning:** Plan where to locate slacks; historical maps, aerial imagery and Light Detection and Ranging (LIDAR) imagery are useful tools for positioning potential pools. Look for natural depressions where the water table may be near the surface. Use dip wells to measure the depth to the water table and take readings throughout the year. Slacks should be close to an existing network of breeding pools where terrestrial habitat is suitable and well-managed. New Natterjack Toad breeding pools should be situated close to potential hibernation sites; Natterjacks favour southerly facing dune slopes with a mixture of bare sand, and tussocky vegetation. Select areas that will not be shaded by tall trees or buildings and, as slacks can be a long term feature, do plan for shading by future tree growth. Consider how the site is used and managed, make sure that new pools will not block access points or cause problems with the present habitat management.

**Size and depth:** There is no defined size and slacks should be designed to fit the local landscape. Slacks should ideally be wide and shallow enough so that the pond margins are gently sloping and pools dry out in late-summer most years. This creates a large "draw-down zone" which may be colonised by mosses, liverworts and semi-aquatic plants. Small or narrow slacks must be significantly shallow to avoid

overly-steep sides. If possible, creating a number of pools of differing depths is preferred to allow for annual fluctuations in water levels.

**Shape:** Despite preference being given to kidney-shaped slacks, those which fit into the landscape will save time and money when being created. Try to avoid long, narrow slacks as these tend to be deeper and/or steep sided.

### Creating and rejuvenating slacks

1. Before excavation can begin, clear any scrub or trees from the immediate and surrounding area. See the 'Managing scrub on a sand dune system – habitat management guide'.

2. Mark-out the extent of the planned pool. Remove all surface vegetation, roots and top soil from within this area to expose bare sand beneath. This organic matter may be buried nearby, ideally in northerly facing dune slopes at a depth of at least 2m, if using machinery. Otherwise, deposit spoil away from the slack area to create an artificial dune ridge. The deposited material will be covered with fresh sand later.

3. Natterjack Toad breeding pools should be no more than 1m deep in March/April. Using the height of the water table gathered from dip-well measurements, continue to dig down to the required depth. Put the fresh sand to one side for use later. If the work is being carried out in autumn / early-winter, the slack bottom may be dry but water levels should rise with rainfall. In elevated areas where the water table is too far beneath the surface, using an impermeable membrane to line the pond will be required to catch and retain rainwater. The membrane should be covered with fresh sand.



*Following the removal of scrub, turf is being stripped to expose bare sand beneath ready for excavation.*



*A good example of a recently dug dune slack. Note the gently sloping sides.*

4. Use the fresh sand to cover the organic material that was either buried or shaped into a dune ridge. When burying with fresh sand, consider the direction of prevailing winds and the consequences of potential wind-blown sand.

5. **Enhancement:** create sand patches on the slopes of surrounding dune ridges to provide potential hibernation sites. Mow, graze or turf-strip the surrounding terrestrial habitat to improve connectivity across site and provide foraging opportunities.

### Managing dune slacks

**Grazing:** Natural grazers, such as rabbits, maintain a short sward with little need for management. However, rabbit numbers have declined drastically and there are few other widespread, natural grazers. To replicate this, a seasonal grazing regime may be implemented using a mixture of sheep and cattle. Sheep create an even, short sward and are effective at grazing and causing light disturbance on slopes. Cattle cause greater levels of disturbance and graze unevenly, creating varied vegetation structure which can be important for biodiversity. Livestock will avoid woody vegetation, preferring younger and more tender foliage. Woody vegetation should therefore be removed using other methods to prevent encroachment throughout the slack. Livestock may be kept on-site all year, but pools should be fenced off to minimise disturbance in spring / summer.

**Mowing:** To supplement grazing, or when grazing isn't an option, annual mowing of dune slacks in late-summer /

early-autumn will keep vegetation short and prevent encroachment of scrub and invasive species. Only mow after flowers have gone to seed and remove all arisings to prevent a build-up of organic matter and soil enrichment.

**Scrub management:** It is important to halt the invasion of scrub as soon as possible; otherwise, it can be just a matter of years before management becomes a costly and time consuming exercise. Scrub should be removed by either digging or cutting followed by herbicide treatment. See the 'Managing scrub on a sand dune system – habitat management guide' for further guidance. This should not be needed if an effective mowing/grazing regime is in place.



*A recently created dune slack. Sections of the dune behind have been scraped to create bare sand.*



*Annual mowing of a dune slack taking place in the autumn © Pete Gahan, Natural England*

**Example 1: Slack creation, National Trust Formby.**

The sand dunes around Formby once held a number of Natterjack Toad breeding pools, but coastal erosion and the natural roll-back of the dunes has buried these pools leaving a 2.5km stretch of sand dunes devoid of any dune slacks. This meant that Natterjacks to the north and south were becoming isolated from one another. Two pools were created at the halfway point where there was good terrestrial habitat and plenty of potential hibernation sites. One pool was created in an active blow-out, excavated to the water table and beyond to a total depth of around 1m. The other pool was ~4m above the water table and any attempt to reach it would mean the pool was too steep sided. Therefore, a large bowl was scraped out and an impermeable membrane covered with fresh sand was used to line the pool to catch and retain rainwater.



**Example 2: Slack rejuvenation. Cabin Hill National Nature Reserve.**

A Natterjack breeding pool was created in the frontal sand dunes during a previous project in 2005. The pool was located in a narrow steep sided dune valley, which resulted in the pool being too deep and having too steeper sides for breeding Natterjacks. To improve it, a mechanical excavator re-profiled the surrounding dune slopes to widen the slack area creating a large pool with gently sloping margins. Sand excavated from the surrounding dune slopes was used to infill the pond to reduce the water depth.



**Example 3: Slack management. Cabin Hill National Nature Reserve.**

The rear section of Cabin Hill National Nature Reserve is managed through a combination of scrub removal, mowing and grazing. In late-summer / early-autumn, recently-dried dune slacks are mown, reducing the height of low growing vegetation such as creeping willow, grasses and small saplings. The cuttings are raked and removed from site. A combination of staff, volunteers and contractors clear tall scrub such as birch and willow throughout the winter. These activities are supplemented by a grazing regime of 60 sheep, maintaining a short sward throughout the slack area and surrounding terrestrial habitat.

