

Dynamic Dunescapes Dune Management Case Study Template

Sand dune system	Sefton Coast
Case Study Subject	Invasive Species (<i>Rosa rugosa</i>) Removal
The Management Intervention	

Site background information

Stretching for around 20km between Liverpool and Southport, the Sefton Coast is the largest sand dune system in England. The environment here supports significant numbers of different dune-specialised species, so it's recognised as one of the most important dune habitats in North-west Europe and is a designated Site of Special Scientific Interest (SSSI) and Special Area of Conservation (SAC). Our work on the Sefton Coast covers over 4,500 hectares of sand dunes, beach and tidal mud flats, and some areas of dune heath and woodland.

Japanese Rose *Rosa rugosa* is a plant species native to coastal habitats in Eastern Asia. First introduced to the UK around 150-200 years ago as an ornamental plant, it later escaped from gardens and flourished across our own dune habitats. Its thick bushes produce attractive pink flowers, and its seeds are eaten by birds which help it to spread. Once established, growth is fast, leading to its expansion over large areas of dune habitats. This smothers native plant growth, significantly reducing biodiversity by creating dense thickets that shade out open dune habitats.

It's difficult to completely remove – it can regrow from just a root fragment left in bare sand. It can also spread at a rate of around 20% per year.

What was the issue/change you hoped to make? (Ecological, physical, user behaviour, mix)

R. rugosa is considered one of the most widespread invasive species threatening dune habitats in north-west Europe with at least twelve EU LIFE Nature projects addressing its control on coastal habitats between 2005 and 2020.

A volunteer survey across the Sefton Coast in 2014 identified around 500 patches, totalling 5.7 Ha of *R. rugosa* in our dune system and given its ability to spread rapidly, its extent would have increased by the start of Dynamic Dunescapes in 2020. There was significant concern that if we did not intervene soon to reduce the spread of this invasive species, it would dominate large areas of the Sefton Coast, with serious consequences for our protected dune flora and fauna.

What was the suggested intervention?

The main removal methods are using a 'dig and bury' mechanical technique to dig up the *R. rugosa* patches and bury it deep enough to prevent regrowth. Herbicide treatment is also a recognised intervention technique.

What did you do?

We collated the data from the original volunteer survey to create a GIS map of the *R. rugosa* patches. The *R. rugosa* was spread across multiple SSSI units owned by different organisations. We undertook a series of field visits across the sites with each landowner. We recorded whether the patch was still present and what intervention method to use. The preference was to use the 'dig and bury' method however, the *R. rugosa* was growing in places where this method would not be

possible such as within the 'rubble beach' at Hightown Dunes. In these cases, herbicide treatment was the chosen option.

We found a large proportion of the patches had merged, often creating one long continuous patch. We also found Japanese Knotweed *Reynoutria japonica* mixed in with the *R. rugosa* in several places. Also, a previous project had already tried to tackle around 1.6 Ha of *R. rugosa* on one of the SSSI units.

How did you do it?

As the *R. rugosa* was spread across different SSSI units, we worked in partnership with all the landowners to agree a programme of works.

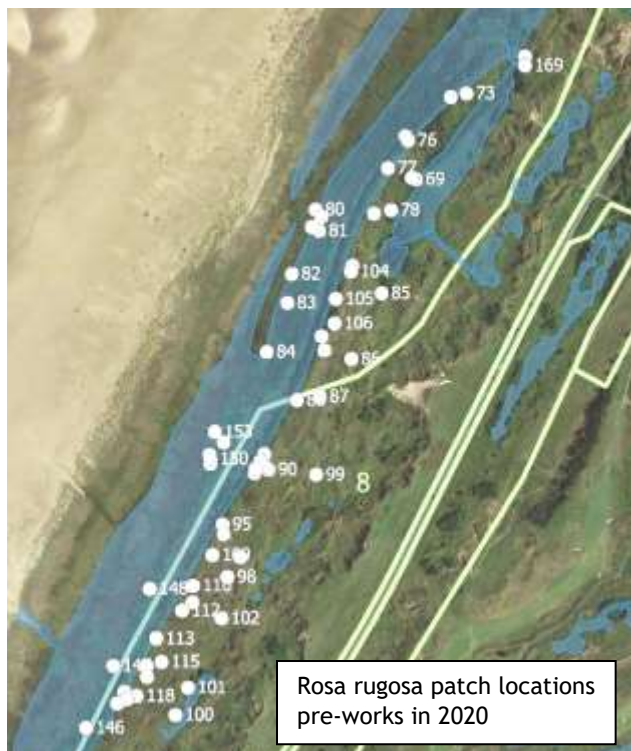
A specialist herbicide contractor was brought in to complete a three-year treatment programme (2021 to 2023) on the *R. rugosa* patches we could not feasibly dig and bury. A selective herbicide (active ingredient 'triclopyr') was used which targets the shrub only, leaving other dune flora intact. This is not permitted for use near water so where patches were near dune slacks, glyphosate-based herbicide was used under an Environment Agency permit. Our contractor also treated the Japanese Knotweed (with glyphosate).

Two treatment visits per year were carried out across all the patches, totalling around 2.5 Ha. The treatment was only applied during suitable weather, avoiding wet and windy conditions and nesting bird checks were carried out by the contractor before spraying commenced. The *R. rugosa* was treated during the summer months as the treatment is most effective when the plant is in full leaf. The Japanese Knotweed (JK) was treated in September to October as the treatment works better when this species is beginning to die back for autumn/winter.

Contractors were also brought in to carry out the mechanical removal and burial of around 3.3 Ha of *R. rugosa* using two 12/13t excavators. Prior to works starting, a UXO toolbox talk was carried by a UXO consultant, as on parts of the Sefton Coast, a UXO desk study had identified a medium risk of encountering unexploded ordnance.

The *R. rugosa* patches were marked out with bright pink flags on sticks at least one metre beyond the patch edge to help the excavator drivers see the extent to remove. The *R. rugosa* was then dug up with as much root removed as possible. The resulting material was then buried at least 2m deep and capped with the sand excavated from the burial hole. These works were carried out between November 2022 and February 2023 outside nesting bird season and to minimise disturbance to protected species. The contractor also provided a banksman to supervise the works.

Following completion of the dig/bury works, either from missed fragments or disturbed seed bank, *R. rugosa* regrowth across the resulting sand patches during the summer was spot treated with herbicide.



Rosa rugosa patch locations
pre-works in 2020



Google Earth image July 2023 - post
dig/bury works

How was the site / intervention monitored?

Natural England staff and the individual landowners regularly visited the sites when the contractors were operating. Photographs were taken before, during and after the works to monitor and record the changes made. Patches were re-visited throughout the herbicide treatment programme to review effectiveness and post-dig/bury to monitor regrowth.

What modifications, if any, did you make to your initial plan and why?

The original project plan assumed that all the patches across the Sefton Coast could be dug and buried which upon review, was not the case, therefore alternative interventions i.e., herbicide required consideration.

Additional areas of *R. rugosa* and JK were identified throughout the project which we were able to treat within the project budget. We were also able to fund the first year of treatment of *R. rugosa* and JK on the Ribble Estuary SSSI to the immediate north of the project area, which will help prevent re-establishment onto the Sefton Coast SSSI/SAC.

On the advice of our herbicide contractor, we also carried out some winter works on JK at Queen's Jubilee Nature Trail after the first year's treatment. Well-established JK was on an embankment comprising mostly made-up ground (rubble etc) meaning we could not use dig/bury. To further weaken the plant, using a mini excavator, the contractor broke up the established crowns in situ and covered them with a small amount of available sandy soil. The following autumn/winter, there was

very little regrowth of JK where we had carried out this work, greatly reducing the amount of herbicide required over the treatment programme.

Highlight any issues/obstacles & how you overcame them?

The Covid situation, and some internal procurement issues, made completing some of this work very challenging. We had to delay the start of the herbicide programme until 2021 due to the restrictions at the time but this still allowed us to complete the desired three treatment years. The dig/bury works had to be delayed twice until 2022 and it would have been best completed over two winter seasons rather than just the one. The rapidly rising water table during the works also made burying material to 2m difficult at times.

A large amount of litter was exposed when we were excavating the *R. rugosa* in an area known as the 'beach cleanings tip'. This was where decades ago, material cleaned off the beach, mostly plastic, was dumped in the dunes. The landowner's Community Engagement Officer swiftly organised a series of litter picks, initially using their own ranger team to deal with the larger items, and then with the public which generated a lot of positive feedback and much reminiscing on the 1970s/80s food packaging unearthed!

How much did the intervention cost?

Herbicide treatment: £42k

Dig/bury: £107k

What else went well?

The dig and bury works have created large areas of bare sand which, in our overly-fixed dune system, will provide much needed habitats for our specialist dune species such as the sand lizard, natterjack toad and the northern dune tiger beetle.

The herbicide treatment programme has left patches of dead *R. rugosa* stems which we haven't removed, primarily due to the time and resources this would take. However, these thickets of dead stems have proved popular with rabbits at Queen's Jubilee Nature Trail with burrows observed beneath several patches after the works were completed. These stems clearly provide the right amount of cover, enough for rabbits to feel safe from predators but not too dense that they can't see what's above and around them. Rabbits are an essential grazer within the dune system and an increase in their numbers would be of great benefit to this site.

Engagement Measures

How were the public and others engaged?

As the works were across multiple sites within different landowners, we co-ordinated our messaging in partnership. Social media posts were shared on Dynamic Dunescape's social media channels prior to any works commencing and these were then shared by our partners.

Posters were created and displayed on all the sites before and during the work periods so that visitors could find out both what was happening and why this intervention was important to the health of the Sefton Coast. The posters were also tailored to each site and landowner.

Where work was taking place close to residential properties, we also undertook letter drops to inform the local community when, how and why the works were taking place.

Responses to any enquiries received were also often co-ordinated between the partners to ensure consistent messaging across the project.

Is the intervention working?

Please describe how. What has changed?

Aerial imagery shows the extent of the *R. rugosa* removal and the extensive amount of bare sand created which will be fantastic for our native dune flora and fauna to re-colonise. Already marram grass is stretching out across the patches.

It is unlikely we will be able to eradicate this species completely, particularly given its use in local gardens, but removing such a large amount of *R. rugosa* on the Sefton Coast will make any ongoing management much easier for landowners to build into their maintenance programmes.

The sites will still need monitoring over the coming months and years to treat the inevitable regrowth. There are also new patches being discovered which will also need to be targeted.

A repeat of a survey like the original volunteer survey would be a good way to keep track of this invasive species in future.

Photo 1: Early partnership meeting pre-Covid in October 2019 amongst the *Rosa rugosa* at Hightown Dunes



Photo 2: *Rosa rugosa* in the 'rubble beach' at Hightown and Crosby in 2019



Photo 3: Typical *Rosa rugosa* patch in the fixed dunes (Phil Smith)



Photo 4: 'Beach cleanings tip' area in 2014 – mix of *Rosa rugosa* and Japanese Knotweed (Phil Smith)



Photo 5: Contractors at work digging and burying *Rosa rugosa* (Phil Smith)



Photo 6: *Rosa rugosa* patch on right after first treatment at Queen's Jubilee in 2021 – Japanese Knotweed on left



Photo 7: Same area as Photo 6 after Japanese Knotweed crown work in January 2022



Photo 8: Same area as Photo 7 in May 2022. Very little JK regrowth after the crown work, the bare sand has been invaded by evening primrose. Some *Rosa rugosa* regrowth on right before second year of treatment.



Photo 9: Rabbit burrow beneath dead *Rosa rugosa* stems



Photo 10: Extensive area of bare sand created post-*Rosa rugosa* removal adjacent to a road and houses



Photo 11: 'Beach cleanings tip' area post dig and bury works



Photo 12: Rosa rugosa dig and bury works adjacent to a ditch and footpaths

