2018 Updating Vegetated Shingle Survey,

Shingle Street, Suffolk

for

Suffolk Coasts and Heaths AONB

A "Touching the Tide" project

Contents

Executive summary

A survey for the Suffolk Coasts and Heath Area of Outstanding Natural Beauty (AONB) 'Touching the Tide Project' in 2012 showed that the Vegetated Shingle Communities at Shingle Street for their majority conform to the National Vegetation Community (NVC) SD1 *Rumex crispus – Glaucium flavum* shingle (typical community), *Lathyrus japonicus* (sub-community) with *Arrhenatherum elatius – Silene uniflora*- Communities (Abrehart Ecology, 2012).

An updating survey, in June 2018, was carried out to assess the changes in the vegetation communities along the same transects, attempting to ascertain how the survey area at Shingle Street has been impacted by human pressure and current management regimes since 2012.

Since the previous survey in 2012, the area of shingle within the recording area has grown by approximately 2.55 hectares (from approx 13.35 to approx. 15.90 hectares). The previous survey reported an increase of approximately 4 hectares between 2000 and 2012. These time periods show a considerable increase in area of shingle habitat in a relatively short period of time, with an increase of between approximately 0.3 and 0.4 hectares per year.

Using the JNCC Common Standards Monitoring Guidance for Vegetated Coastal Shingle Habitats, the following comments were made on the condition assessment (Natural England, 2011);

"The vegetated shingle features were deemed to be in Unfavourable no change condition due to failing targets on species composition and recreational pressures being unresolved. There has been a significant change in pattern of erosion (in the south) /accretion (in the north) due to natural coastal processes, but also possibly due to the rock revetment placed at East Lane, Bawdsey."

"Several areas devoid of any vegetated substrate within the habitat as a result of anthropogenic activities… Overall area is trampled throughout but bigger plants are growing vigorously, although there is very little lichen type shingle vegetation. Site not reaching its potential"

The Joint Nature conservation Committee (JNCC) guidelines recommend that there should be "no loss of vegetated substrate within the habitat as a result of anthropogenic activities" but, searches of historic aerial online mapping data suggests that there has been little appreciable change in the areas of disturbance since 2000. The 2012 survey report concluded that, due to the substantial accretion described above, there has in fact been a considerable increase in the area of land holding Vegetated Shingle Communities.

The 2018 survey supports this conclusion, showing that the area of shingle has increased in most of the survey area. However, these results should be taken with caution, due to the fact that the vegetated shingle communities upon it remain trampled and consisting mostly of larger and more vigorous plant species. Further up the shingle, grassland communities were more widespread than in previous surveys. Less trample tolerant species such as orache and lichens are lacking and signal an unfavourable condition where diversity and mosaic of specialist vegetated shingle communities is desirable.

The results of this survey should be used to inform future condition assessments for unit 33 of the Alde – Ore Estuary SSSI, as a valuable source of information about how this site and the communities within it have changed during the monitoring period.

1. Background and Objectives

A "Touching the Tide" community based project for the Suffolk Coasts and Heath AONB had been ongoing at Shingle Street since 2012 to assess the condition of the shingle vegetation within an area of unit 33 of the Site of Special Scientific Importance (SSSI). Shingle Street is located on the mainland Suffolk coast. It is opposite the southern end of Orfordness spit, on the west bank of Orford Haven (estuary of the Ore/Alde-Butley estuary). Further background on the project and the physical characteristics of vegetated shingle can be found in the previous survey report (Abrehart Ecology, 2012) This report covers the re-survey of the site in 2018 as part of the Shingle Street community project.

2. Methodology

The survey was undertaken following the methods used during the previous survey (see Abrehart Ecology, 2012).

3. Results

The results below are described using the National Vegetation Classification (NVC), it is one of the key common standards developed for nature conservation agencies. NVC provides a comprehensive classification and description of the plant communities of Britain, each systematically named and arranged and with standardised descriptions for each.

Area 1 – Dominated with sea kale, curled dock, yellow-horned poppy with some sea pea. NVC SD1 *Rumex crispus – Glaucium flavum* shingle (typical community), *Lathyrus japonicus* (sub-community).

This was the main community (see figure 2.2) across the majority of the seaward side of the survey area. This community was abundant where there has been a considerable deposition of new material since 2000 (Google Earth images). This has resulted in SH9a *Crambe maritima - Rumex crispus littoreus* pioneer community being the most significant foreshore community along much of the coast ridge.

Area 2 – Dominated with sea kale, curled dock, yellow-horned poppy with some sea pea but, with a noticeable amount of false-oat grass.
NVC SD1 *Rumex crispus – Glaucium flavum* shingle (typical community), *Lathyrus Japonicus* (sub-community) with *Arrhenatherum elatius – Silene uniflora* – Communities.

This community (see figure 2.2) consisted of the majority of the remaining area of fairly exposed shingle inland of the above community in 3.1. Immediately inland, the SH9a *Crambe maritima - Rumex crispus littoreus* pioneer community is replaced by SH11 *Lathyrus japonicus* pioneer community. Within this section of all the transects this community still contains a considerable proportion of bare shingle with some stronger associates with *Glaucium flavum, Rumex crispus, Arrhenatherum elatius,* creeping thistle -*Cirsium arvense,* prickly sow-thistle -*Sonchus asper,* beaked hawk's-beard - *Crepis vesicaria* and sea campion - *Silene uniflora.*

Area 3 – Dominated with red fescue and fine bent grasses with sheep's sorrel common in the grass with many uncommon species of vetch too with yellow vetch *Vicia lutea* found occasionally..
NVC U1 *Festuca rubra, Agrostis capillaris, Rumex acetosella* grasslands (typical community)

Inland of these pioneer communities (see figure 2.2, 3.1 and 3.2 above) the Shingle Street vegetation around the footpath is composed of *Festuca rubra* grasslands. The most maritime of these is the SH41 community (see below for full description) which is located immediately behind the SD1 communities. It may result from older, inland grassland having being re-exposed to marine influences by increased footfall or by erosion in the past. It also has some bare shingle but is characterised by the constant presence of *Festuca rubra, Arrhenatherum elatius, Silene uniflora,* and *Lathyrus japonicus.* Frequent associates in this assemblage include ribwort plantain - *Plantago lanceolata,* early hair-grass - *Aira praecox, Rumex crispus, Cerastium* spp. and *Vicia* spp., despite the maritime influences, this is a stable

grassland and contains small quantities of bryophytes such as *Hypnum cupressiforme* and *Eurhynchium praelongum*. This community does not occur elsewhere in East Anglia and is primarily northern in distribution.

In the most stable areas of grassland adjacent to the houses more mature Red Fescue *Festuca rubra* grassland occurs. Here, the matrix contains some sand and a more diverse grassland results in an SH40 community (see below for full description). Many of the same species are present as in the SH41 community but *Festuca rubra* is more abundant. There are a range of annual grasses and a wide range of clovers and vetches (including the uncommon suffocating clover -*Trifolium suffocatum* and the rare yellow vetch - *Vicia lutea)* are also locally important within this community.

In a depression to the north of the hamlet is a saline lagoon, (included in part of Transect 14) more silt is present in the shingle matrix to the west of the lagoon and an *Elytrigia atherica – Festuca rubra* nSH36 community is present. Major associates are maritime species including thrift - *Armeria maritima,* sea purslane - *Atriplex portulacoides,* sea plantain - *Plantago maritima* and sea wormwood - *Seriphidium maritimum.* On the shingle ridge to the south of this lagoon the herbs seaside herb-robert - *Geranium robertianum ssp. maritimum* and biting stonecrop - *Sedum acre* are common and there is a bryophyte and lichen component.

The areas of low plant density (leading away from the car parking areas) have always been so, with continued trampling evident from the Google Earth images from 2000.

Invasive Species
Near the Coastguard Cottages and elsewhere within the hamlet red valerian - *Centranthus ruber* occurs in both its red and white forms. It normally invades disturbed locations and has not, so far, spread further. rose campion - *Lychnis coronarium* was found in one area outside a property near to the footpath (TM3675242693). This invasive species can very quickly dominate areas of shingle and as such should be removed before it becomes a dominant feature of the shingle community.

Detailed descriptions of the communities identified within the survey.
SH9a As a separate community that comprises a *Crambe maritima - Rumex crispus littoreus* pioneer community which is depauperate. The major associates illustrate the sandy nature of the shingle, with Marram - *Ammophila arenaria* and *Glaucium flavum* most commonly found in the community. Therefore it seems more appropriate to consider it a sub-community of the more common *Crambe maritima - Solanum dulcamara* community.

SH11 A community which is defined by the dominance of the nationally rare *Lathyrus japonicus*. This represents a shingle pioneer community in which overall cover is usually low and mostly *Lathyrus japonicus*. There are very few associates in this assemblage with *Rumex crispus littoreus, Cirsium arvense, Glaucium flavum* and *Sonchus asper* as the species most commonly found in association with *Lathyrus japonicus*. This community is typical of many southern shingle sites reflecting the distribution of *Lathyrus japonicus*.

SH36 The grass sea couch - *Elymus pycnanthus* is an indicator in another community but here this community comprises a *Festuca rubra - Elymus pycnanthus* assemblage with the maritime herbs *Atriplex portulacoides, Plantago maritima* and *Armeria maritima* as the key associates. However, the dominance of *Festuca rubra* precludes the presence of many associates. This community is clearly typical of shingle sites with a high proportion of fine fraction within the shingle matrix and closely resembles a saltmarsh community. This is reinforced in the occurrence of marsh species such as sea beet - *Beta vulgaris maritima, Seriphidium maritimum* and sea lavender - *Limonium vulgare* as occasional associates in the assemblage. The distribution of this community is largely southern within the UK.

SH40 This major assemblage is characterised by the constant presence of *Festuca rubra, Arrhenatherum elatius, Silene uniflora,* cat's-ear - *Hypochoeris radicata* and little mouse-ear - *Cerastium semidecandrum* in a diverse grassland. Despite the occurrence of the maritime herb *Silene uniflora*, this community appears to represent a mature grassland normally associated with relatively stable locations away from maritime influences, with the lichens *Cladonia crispata* and *C. furcata* found as frequent associates along with *Plantago lanceolata, Rumex acetosella, Hypnum cupressiforme, Aira praecox* and *Tortula ruralis*. This vegetation unit is typical of sites on the south eastern coast, particularly in East Anglia.

SH41 A more maritime, less mature version of the grassland described above where the two communities are divided. In this case, *Arrhenatherum elatius, Festuca rubra, Plantago lanceolata, Silene uniflora and Rumex crispus littoreus* are

the key indicators with a major herb element among the associates. The key associates include *Hypochoeris radicata, Cerastium semidecandrum, Lathyrus japonicus* and *Geranium robertianum*. Clearly this assemblage is closely related to the previous community with many of the same constants and major associates. However, it is the absence of any lichens or bryophytes which distinguishes this community and which may indicate the less mature nature of this unit. This, along with the constant presence of maritime herbs, may indicate that this is an earlier stage in the development of this type of grassland. The distribution of this community is largely northern, although it is also found at one southern area (Orfordness and Shingle Street), which incidentally also supports the previous community. This community is also less rich in species than the former.

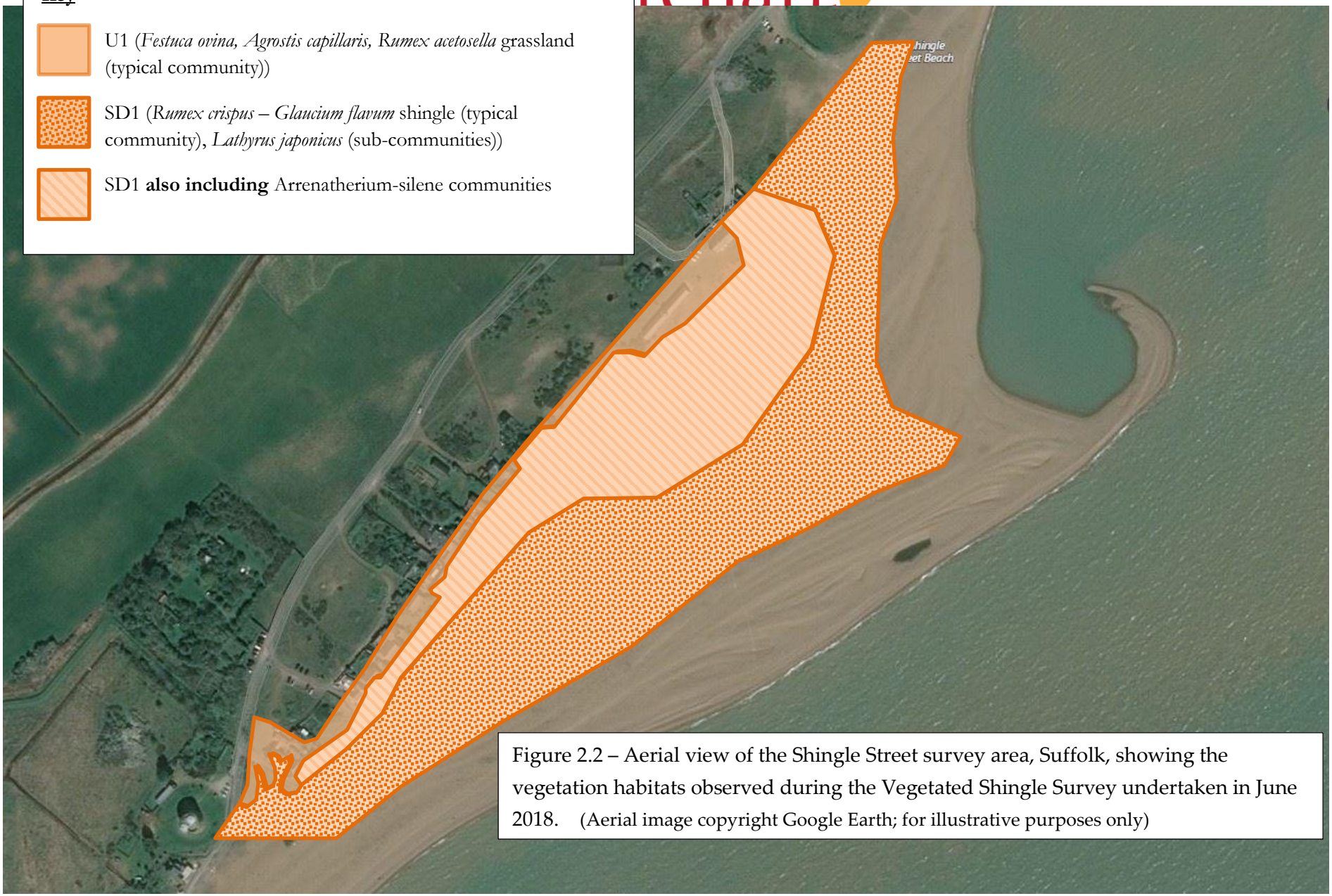

Figure 2.2 – Aerial view of the Shingle Street survey area, Suffolk, showing the vegetation habitats observed during the Vegetated Shingle Survey undertaken in June 2018. (Aerial image copyright Google Earth; for illustrative purposes only)

4. General discussion

Area 1 – *Dominated with sea kale, curled dock, yellow-horned poppy with some sea pea. NVC SD1 Rumex crispus – Glaucium flavum shingle (typical community), Lathyrus japonicus (sub-community).*

Area 1 dominated the vegetation communities found within the survey area (see Figure 2.2), as in 2012. This community contains a number of species resistant to trampling once a certain size is reached, such as sea kale, sea pea and sea beet, which were abundant within this habitat type. However, a healthy and functioning community of this type requires a larger diversity of species than that present throughout much of this habitat type at Shingle Street. For example, less hardy species such as orache were almost absent from this habitat.

Sediment grading was evident within some of the older shingle ridge structures, and these often showed a marked difference in particle size between ridge crests and lows, with the larger particles on the ridges. These variations can have a large impact on beach morphology, stability, hydrology and the development of floral communities. In some sites where there is a greater range of aggregate structure many more shingle species occur on these beaches with a well-mixed shingle matrix. This was not the case at Shingle Street.

Area 2 – *Dominated with sea kale, curled dock, yellow-horned poppy with some sea pea but, with a noticeable amount of False-oat Grass.*
NVC SD1 Rumex crispus – Glaucium flavum shingle (typical community), Lathyrus Japonicus (sub-community) with Arrhenatherum elatius – Silene uniflora – Communities.

This community consisted of the majority of the remaining area of fairly exposed shingle inland of the above community in 3.1. Immediately inland, the SH9a *Crambe maritima - Rumex crispus littoreus* pioneer community is replaced by SH11 *Lathyrus japonicus* pioneer community. Within this section of all the transects this community still contains a considerable proportion of bare shingle with some stronger associates with *Glaucium flavum, Rumex crispus, Arrhenatherum elatius,* creeping thistle -*Cirsium arvense,* prickly sow-thistle -*Sonchus asper,* beaked hawk's-beard - *Crepis vesicaria* and sea campion - *Silene uniflora.*

This area of habitat comprises a larger extent of the survey area than during the 2012 survey. Occurrence of grasses within this habitat type was also considered to have increased. Trampling within this area is lower, possibly due to the presence of adjacent houses and the lack of public car parks very closeby.

Area 3 – Dominated with red fescue and fine bent grasses with sheep's sorrel common in the grass with many uncommon species of vetch too.
NVC U1 *Festuca rubra, Agrostis capillaris, Rumex acetosella* grasslands (typical community)

The area of this grassland community was also noted to have increased in extent, with a less clear separation between Areas 2 and 3. Invasive species such as red valerian were abundant, and species diversity in this area appeared to be the highest within the site.

Limitations of the survey

This survey has some limitations; the whole of the two units of the SSSI were not fully covered during this survey, this would have required another two days to complete. Ideally there should be two surveys carried out each year in order to gain as much useful data as possible to establish if there is any detrimental effect on the site by visitors.

Unfortunately gaps in data entry limit the interpretation and conclusions which can be drawn from individual transects. Despite this, a general picture of species presence and absence along the transect routes has been gained.

Causes for concern and future threats

Pressures at Shingle Street

Natural pressures

The main natural pressure on the site is that of erosion of the foreshore in some areas of the site and large deposition of material in other sections of the site. This is an on-going event at the site as this section of the coast is very dynamic. From year to year the site changes shape considerably with islands appearing offshore for a few years then being eroded soon after. Even in the life of these transient islands shingle communities can develop, although briefly. Some of the natural pressures faced by shingle species include the constant risk of inundation from the sea, its desiccating salt spray, high winds, a frequently shifting substrate, the risk of burial under shingle deposits, wide ranging temperature changes and a lack of fresh water and nutrients. Shingle species have evolved some adaptations to cope with these issues. Sea-kale (*Crambe maritima*) and yellow horned-poppy (*Glaucium flavum*) both have a very long tap root which can grow up to 2 meters. These roots can be driven down through the shingle to allow the plant access to fresh water supplies.

Recently (since 2000) there has been a considerable deposition of material along the length of the site greatly increasing its area, demonstrating the give and take nature of this dynamic habitat.

Human pressures

The man made pressure experienced by shingle habitats at Shingle Street can have as much a damaging effect as natural pressures. Although Shingle Street has only two small car parks the effects of trampling across the site is dramatically demonstrated at either end of the SSSI. Fishermen accessing the shore along the site can leave camping debris and discarded waste from fishing. Access impacts do appear to be concentrated along the two routes from the car parks to the sea, and along the immediate high tide mark. In contrast the lack of litter (and dog mess) in the mature shingle indicates that levels of foot traffic here are relatively low, as does the well preserved nature of the crisp shingle ridges. There was noticeable reduction in the vegetation along the shell line as was visible on the ground and from the aerial images from google earth.

Shingle Surveys

Undertaking surveys is an important part of any site management program; the data gathered can help site managers to effectively monitor changes and recognise positive or negative trends within communities.

Surveys should be carried out twice a year, once at the beginning and once towards the end of the growing season. It is important to repeat surveys on an annual basis, at a fixed location. This will provide a comprehensive and up to date pool of information, making it easier to identify changes.

5. References

This report to be cited as:
Abrehart Ecology Ltd (2018). *reporting project on* Vegetated Shingle communities *at Shingle Street, Suffolk. June 2018*. An ecological survey including floral observations undertaken for the Shingle Street Community by Abrehart Ecology Ltd and the residents of Shingle Street.

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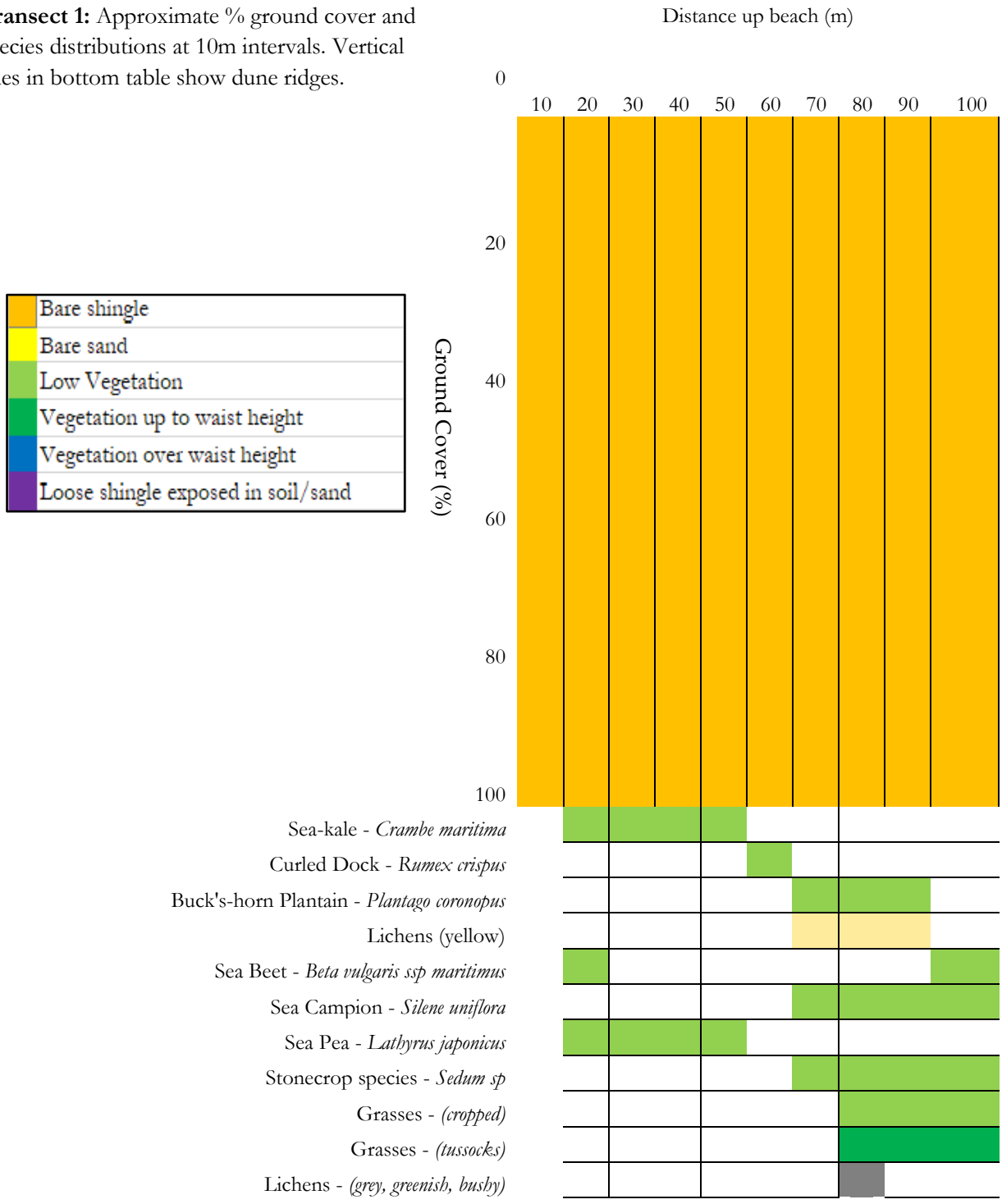
6. Acknowledgements

We would like to thank the owners of the Shingle Street SSSI for their help with recording on the site and to especially to Jeremy Mynott for commissioning the teaching and recording of this site.

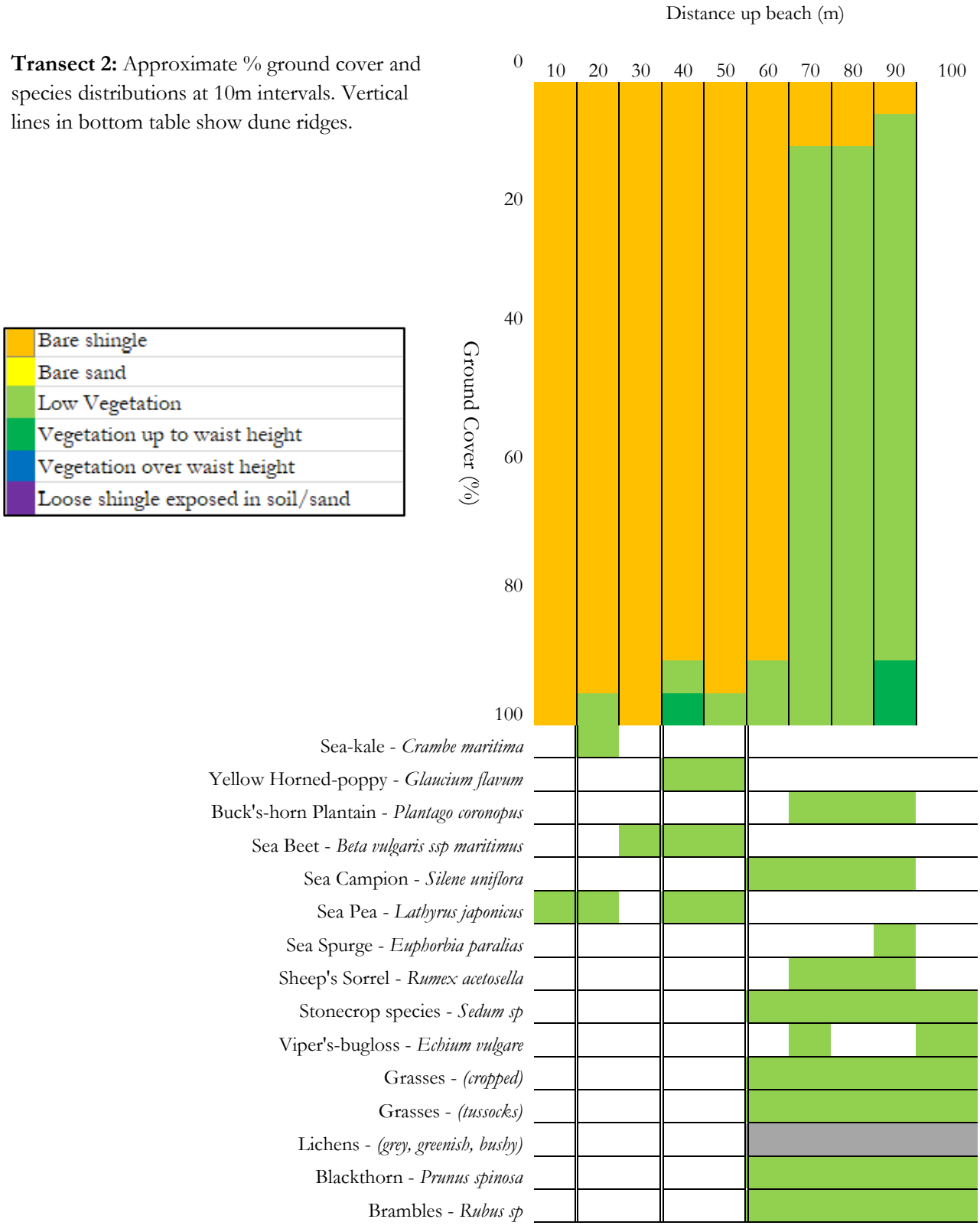
APPENDIX A

Transect data on species of plant recorded, as per survey sheets, during the Shingle Street, Vegetated Shingle Survey June 2018

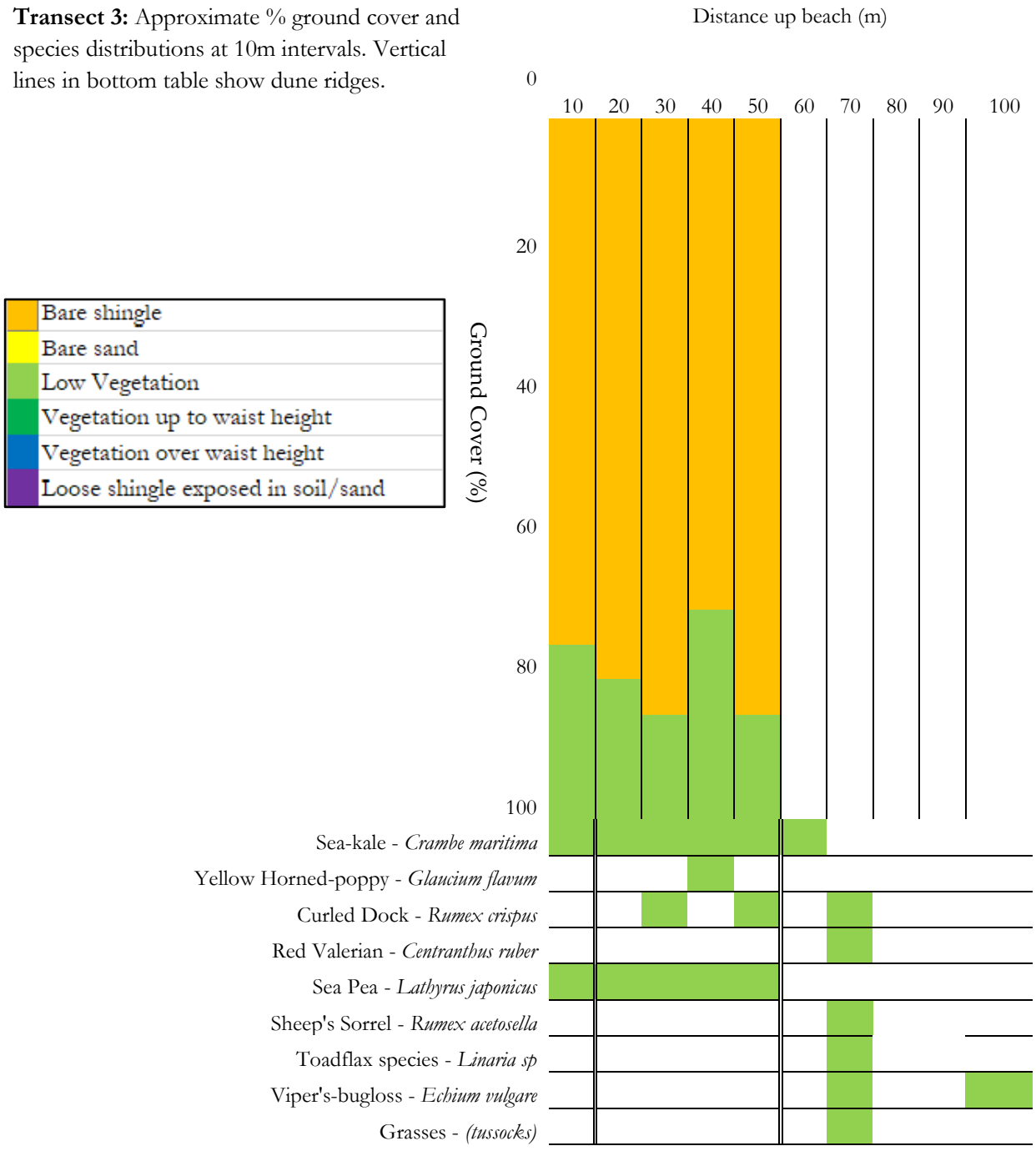
Transect 1: Approximate % ground cover and species distributions at 10m intervals. Vertical lines in bottom table show dune ridges.



Transect 2: Approximate % ground cover and species distributions at 10m intervals. Vertical lines in bottom table show dune ridges.



Transect 3: Approximate % ground cover and species distributions at 10m intervals. Vertical lines in bottom table show dune ridges.



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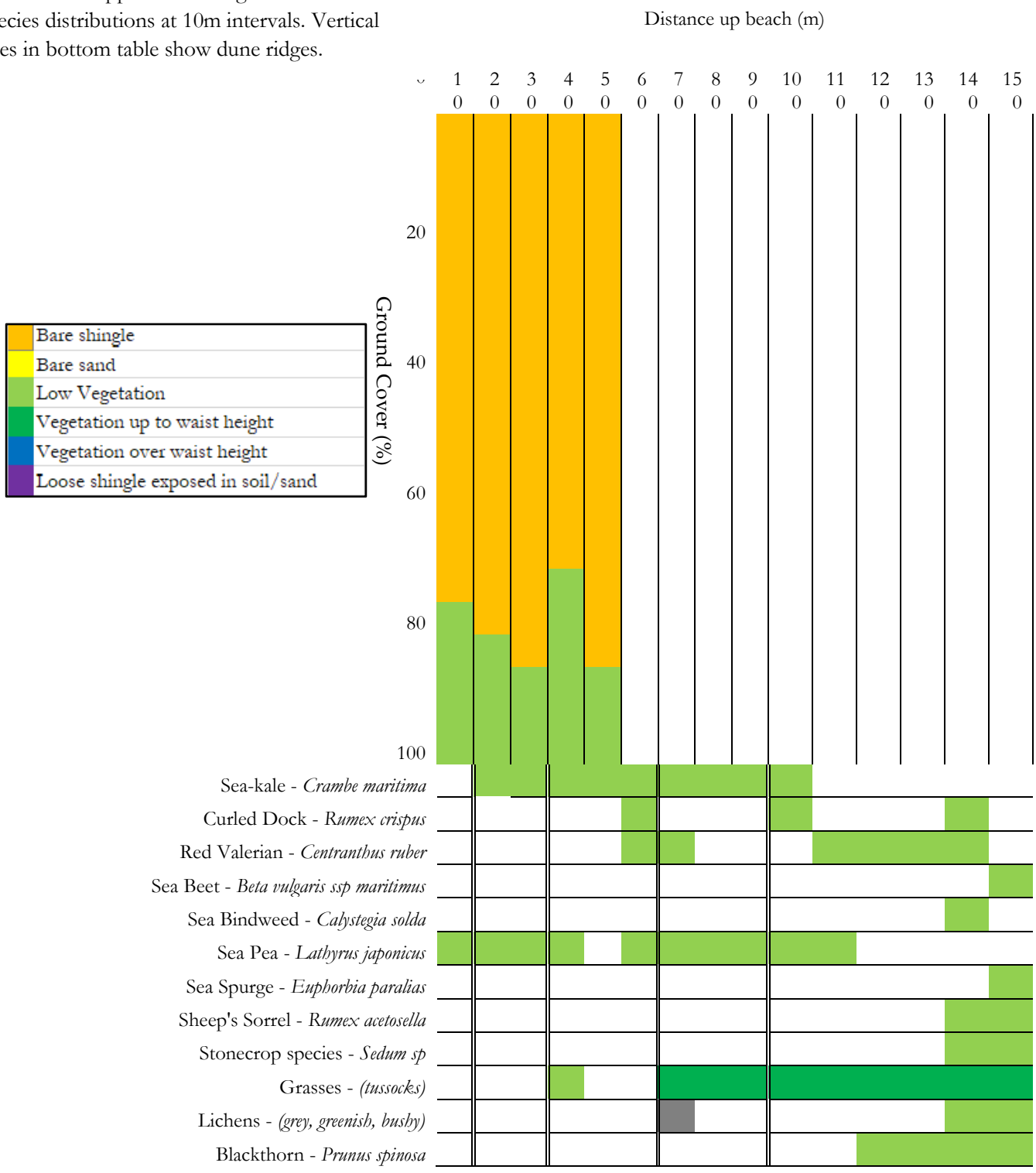

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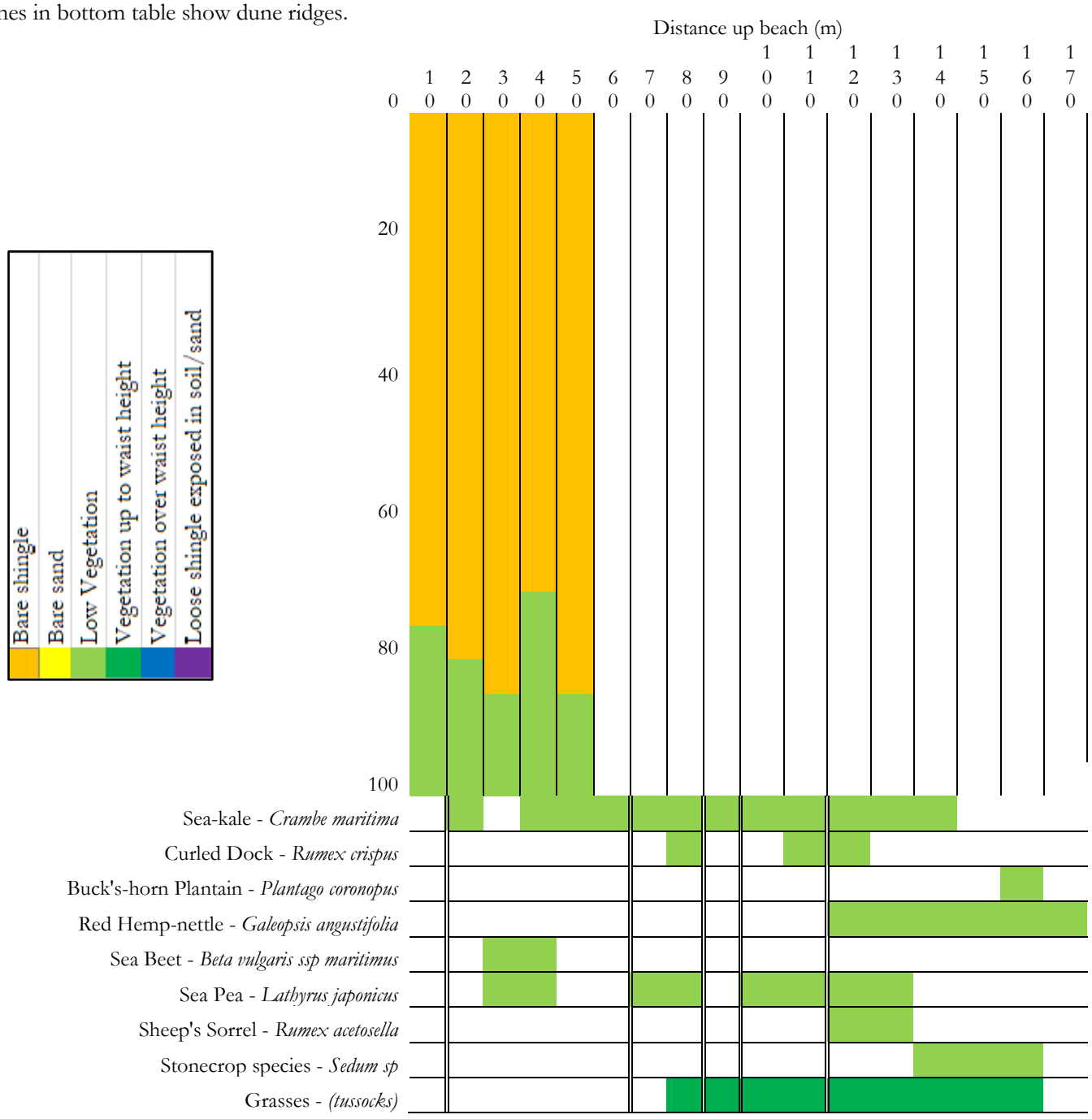
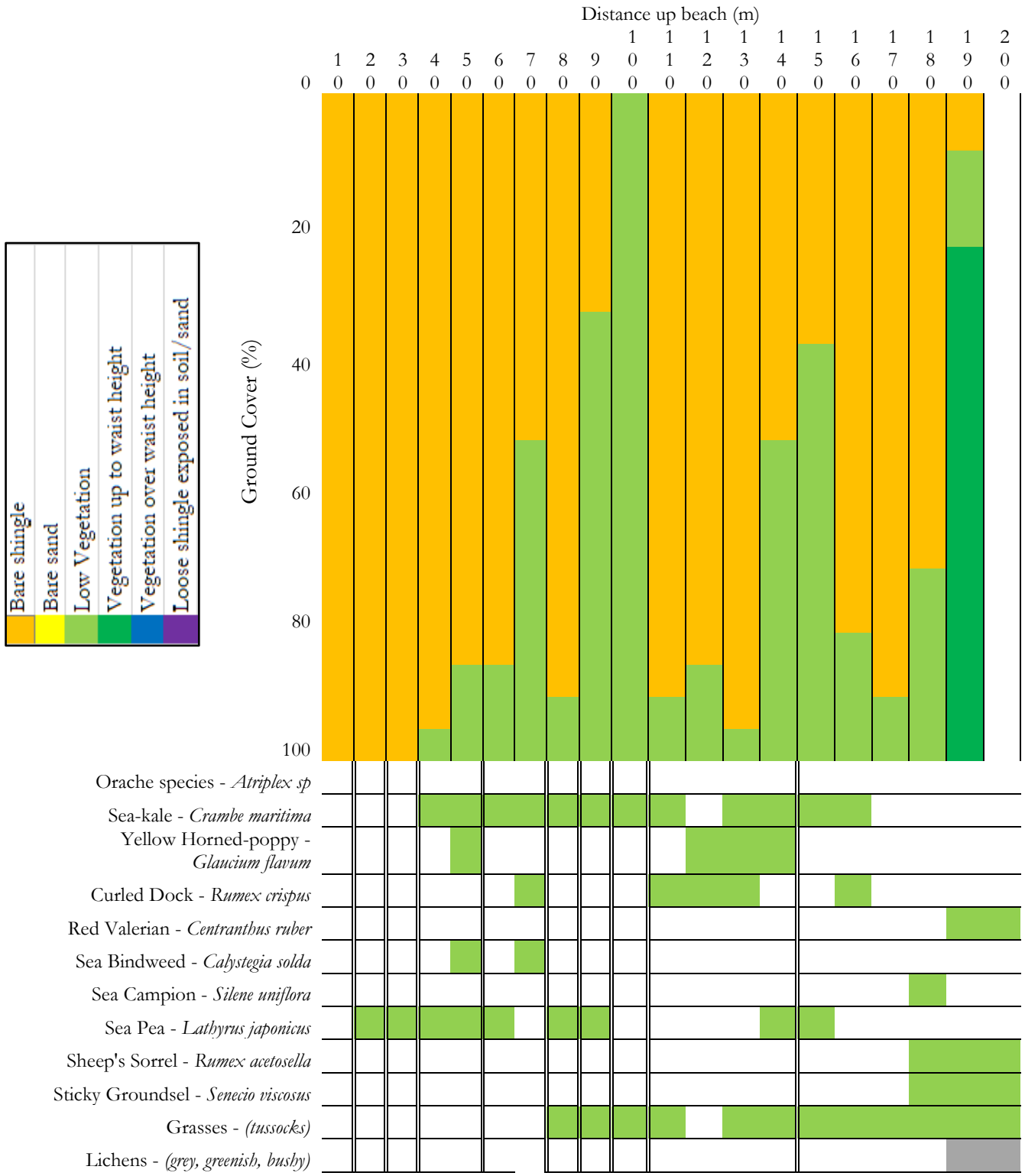
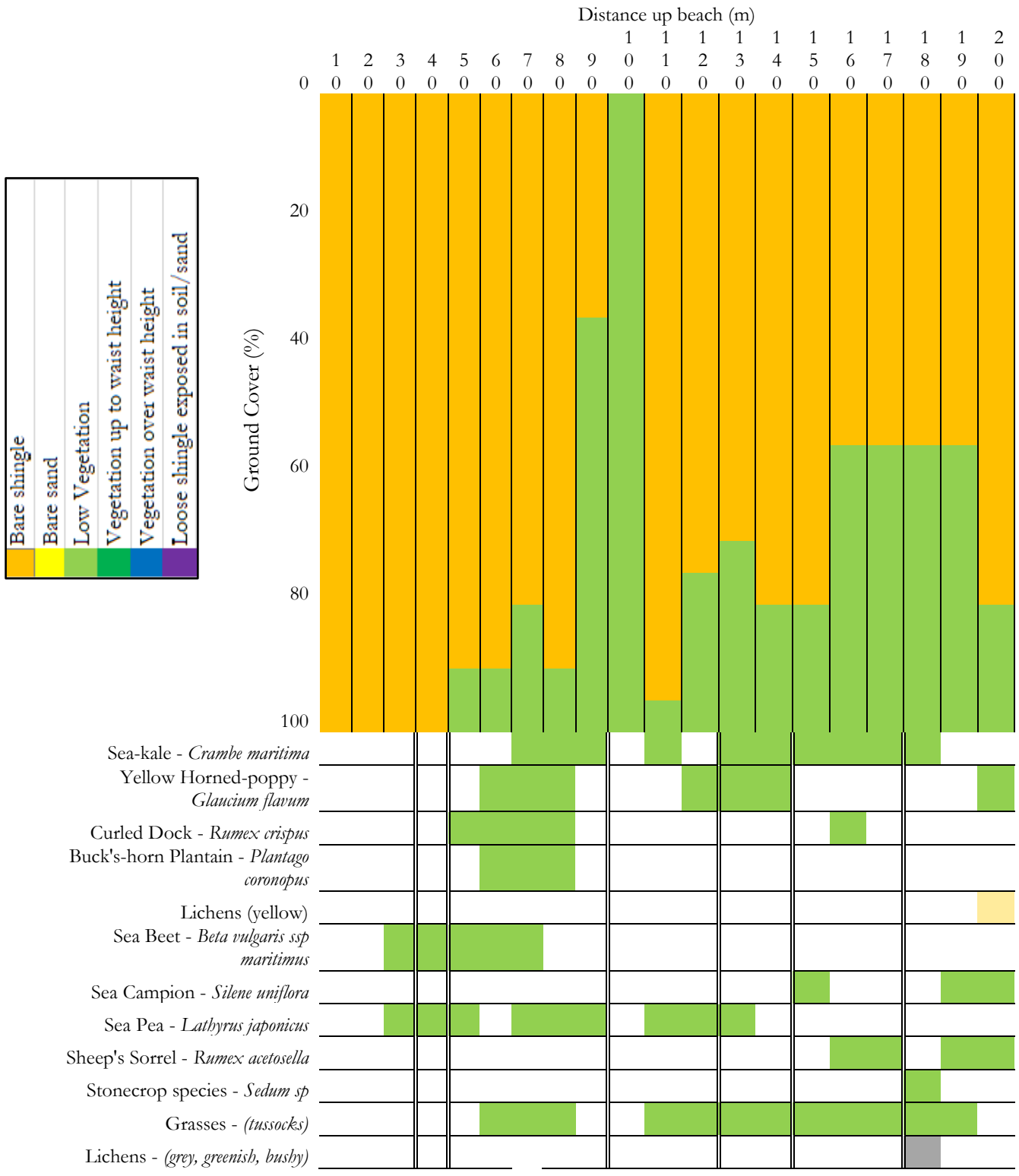
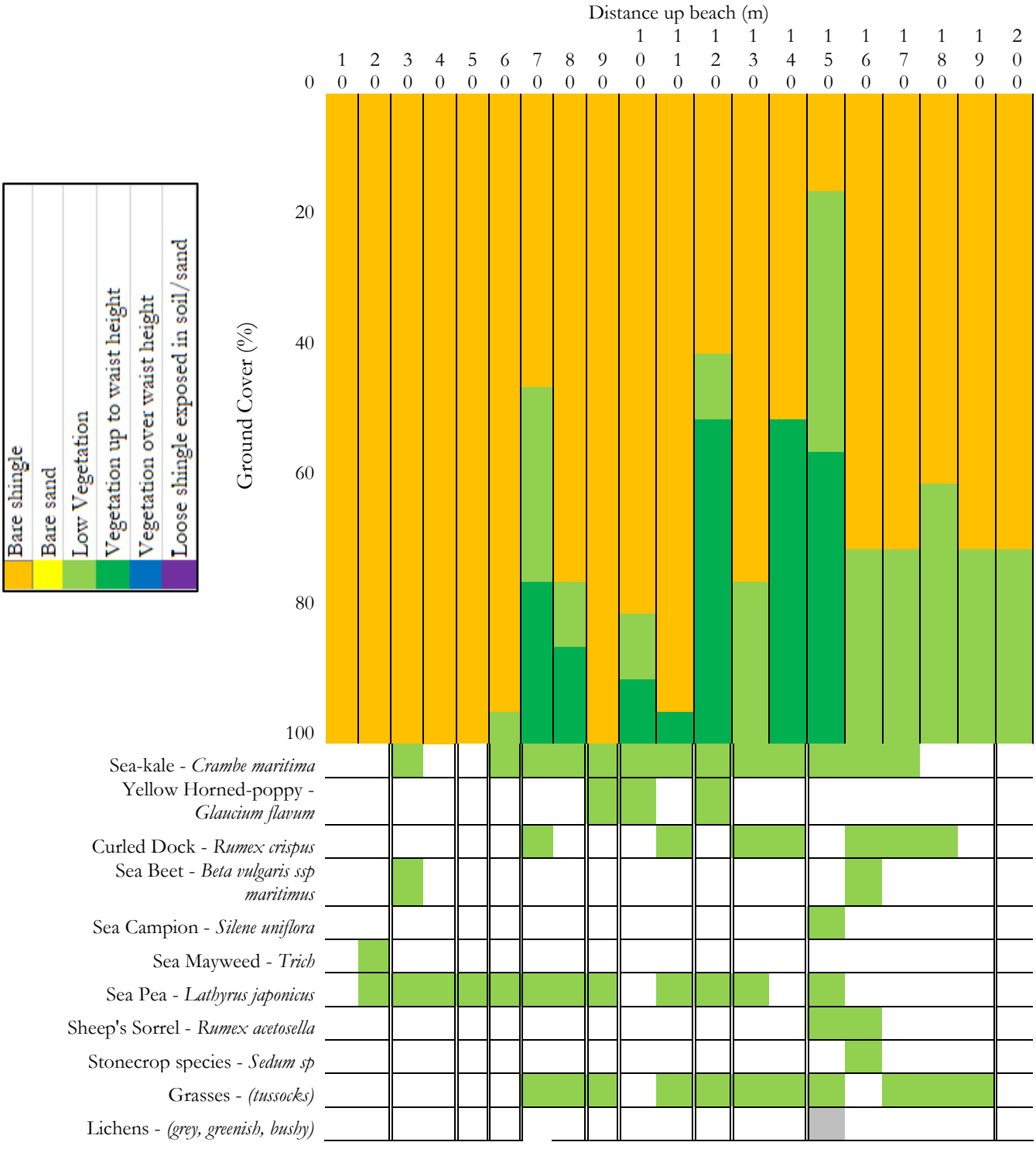



Distance up beach (m)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190
200
Ground Cover (%)
0
20
40
60
80
100
Bare shingle
Bare sand
Low Vegetation
Vegetation up to waist height
Vegetation over waist height
Loose shingle exposed in soil/sand
Orache species - Atriplex sp
Sea-kale - Crambe maritima
Yellow Horned-poppy - Glaucium flavum
Curled Dock - Rumex crispus
Red Valerian - Centranthus ruber
Sea Bindweed - Calystegia solda
Sea Campion - Silene uniflora
Sea Pea - Lathyrus japonicus
Sheep's Sorrel - Rumex acetosella
Sticky Groundsel - Senecio viscosus
Grasses - (tussocks)
Lichens - (grey, greenish, bushy)

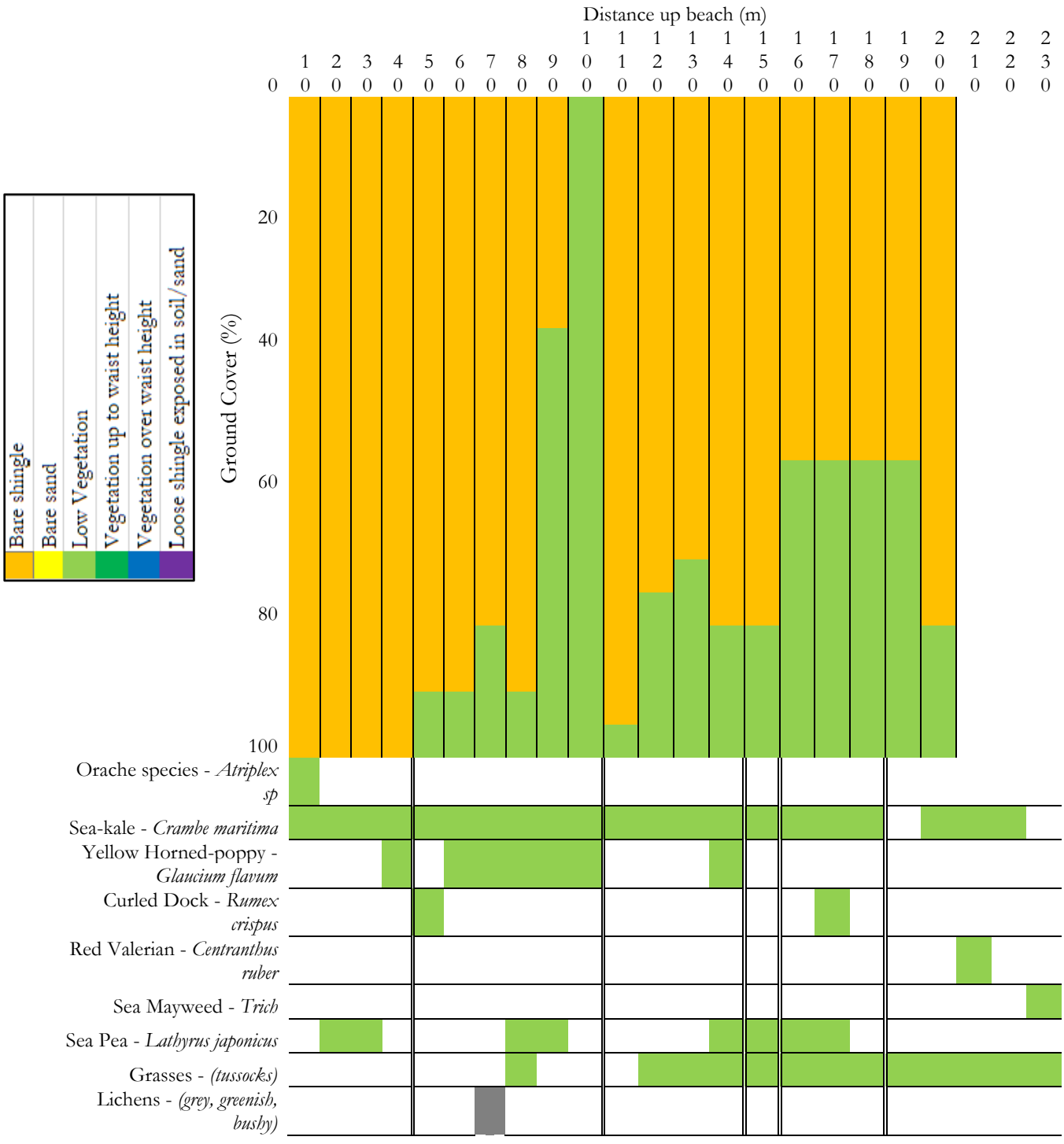
Transect 7: Approximate % ground cover and species distributions at 10m intervals. Vertical lines in bottom table show dune ridges.



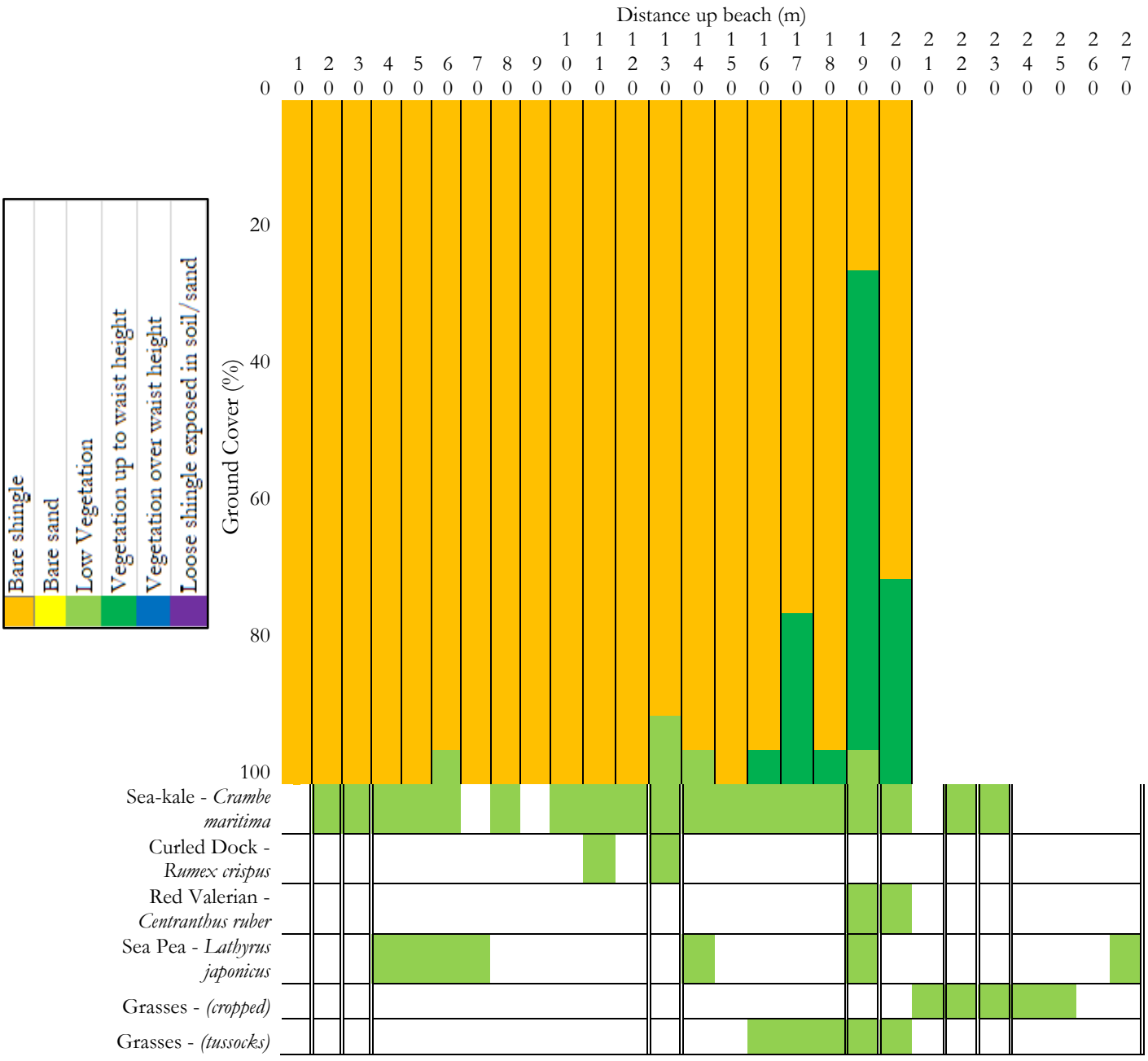
Transect 8: Approximate % ground cover and species distributions at 10m intervals. Vertical lines in bottom table show dune ridges.



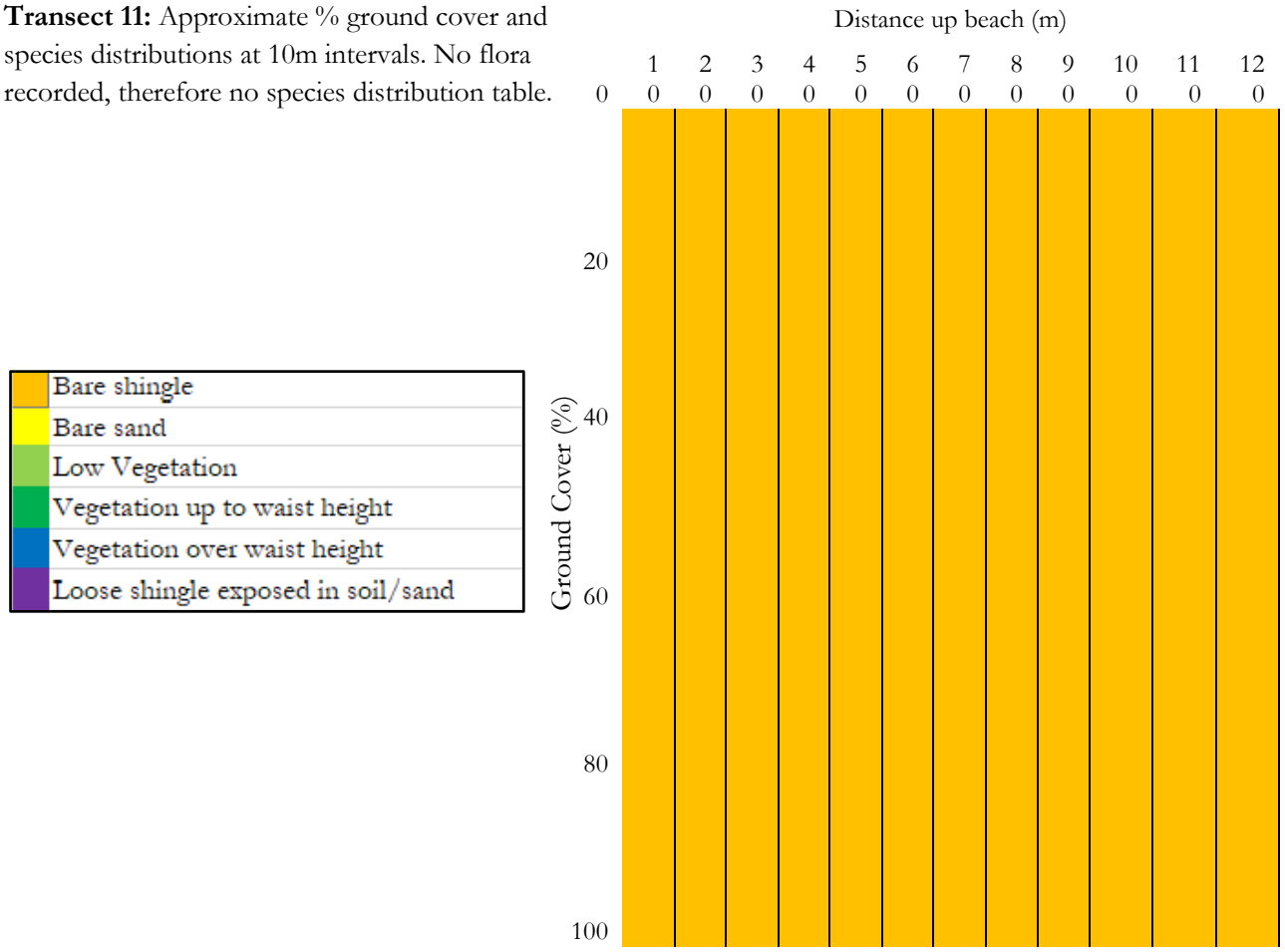
Transect 9: Approximate % ground cover and species distributions at 10m intervals. Vertical lines in bottom table show dune ridges.



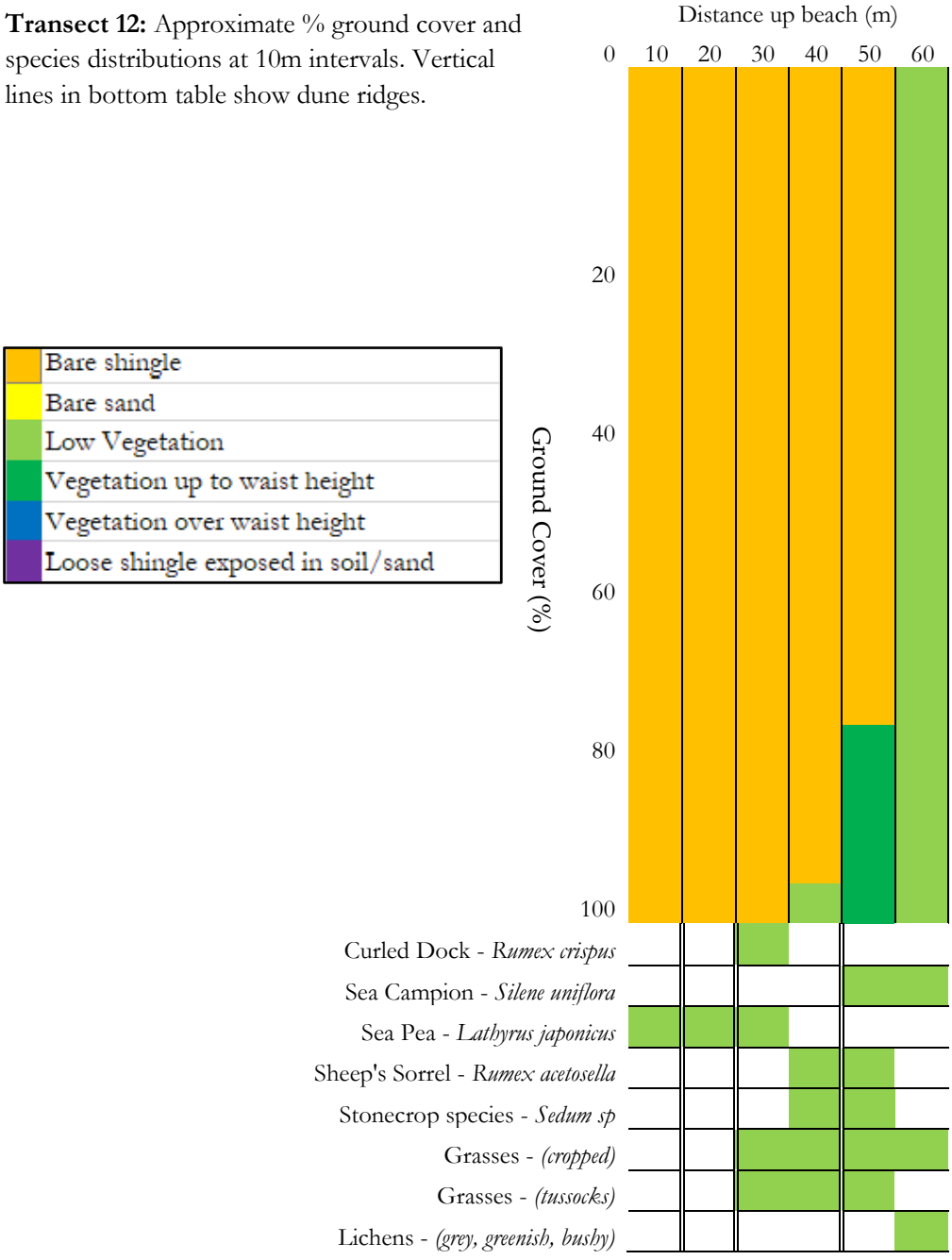
Transect 10: Approximate % ground cover and species distributions at 10m intervals. Vertical lines in bottom table show dune ridges.



Transect 11: Approximate % ground cover and species distributions at 10m intervals. No flora recorded, therefore no species distribution table.



Transect 12: Approximate % ground cover and species distributions at 10m intervals. Vertical lines in bottom table show dune ridges.



Vegetated Shingle Survey at Shingle Street, Suffolk, June 2018 for the Shingle Street community.

Survey carried out by
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