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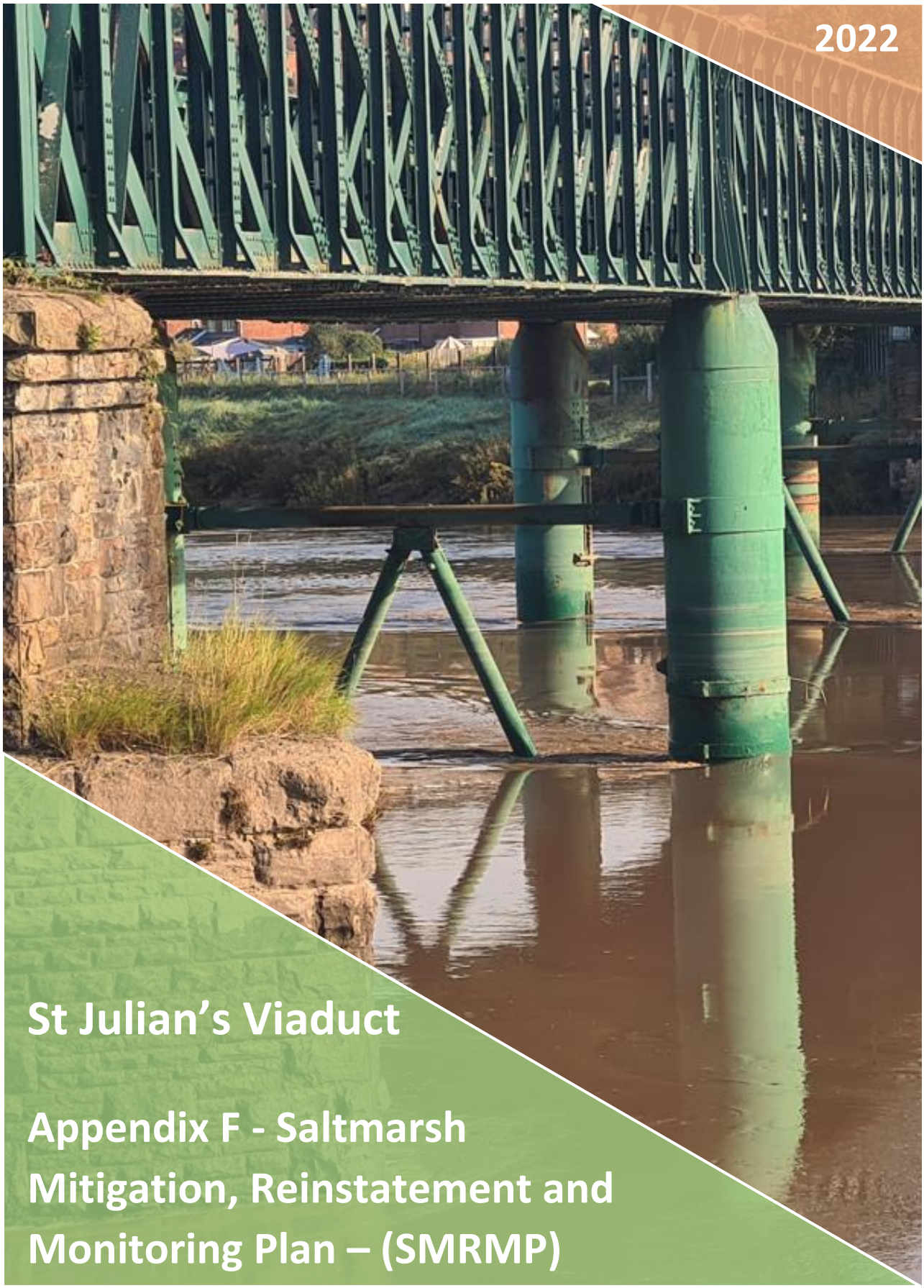

St Julian's Viaduct

Appendix F - Saltmarsh Mitigation, Reinstatement and Monitoring Plan – (SMRMP)

EcoVigour Integrated Environmental Management

NetworkRail

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DOCUMENT INFORMATION			
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1. INTRODUCTION

1.1 OVERVIEW

1.1.1 This Saltmarsh Mitigation, Reinstatement and Monitoring Plan (SMRMP) is a supporting document of the Water Framework Direction (WFD) and Habitat Regulations Assessment (HRA), for the scheduled Scour Protection Works below Saint Julian's Rail Viaduct, Marine License Application.

1.1.2 Saltmarsh is a priority habitat is due its multi-faceted function in the wider environment. It provides flood and coastal defence functions, supports ecosystems of conservation importance, as well as its role in pollution control, waste disposal and the maintenance of water quality.

1.1.3 It supports various vegetation types, large numbers of both rare and abundant invertebrates. While also providing foraging and roosting habitat for migrant, over-wintering and breeding birds.

1.1.4 In relation to the Usk SAC, Saltmarsh is not an Annex I – Habitat feature, however it is a priority habitat within the Natural Resources (NRW) Wales Water Frame Work Directive (WFD) management strategies, in order to achieve favorable/good quality statuses.

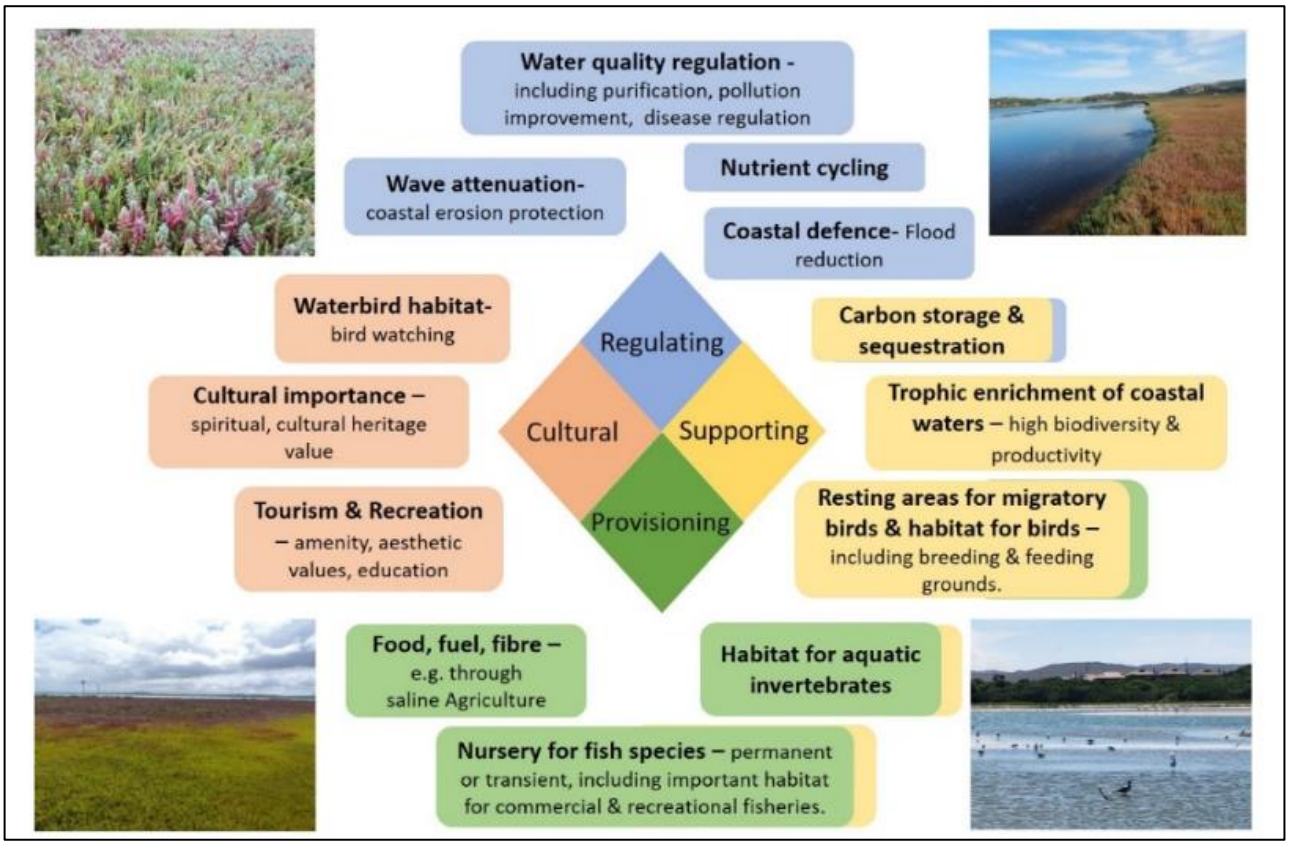

Figure 1: Ecosystem services provided by salt marsh habitat (Janine B. Adams et al 2021).

1.1.5 The objective of this SMRMP is to outline the actions required to ensure that the construction of scour remedial measures is minimised, with the temporary impacts to the adjacent saltmarsh quantified and account for.

1.1.6 The document outlines the provision of pre and post-construction monitoring conditions, which will form part of the Marine Licence agreements.

1.2 PROJECT BACKGROUND

1.2.1 The site is located north of the M4 Corridor, spanning the river Usk, North to South, with the town of Caerleon further north inland.

1.2.2 St Julian's is an 8-span viaduct carrying two lines of the HNL1 over the River Usk. Four spans (spans 2 to 5) are of metallic construction which are supported by three cast iron piers whilst the remaining spans (spans 1 and 6-8) are of masonry arch construction. The structure is on a slight skew to the watercourse with the overall span being 120m and an average width of 8.5m

Figure 2: St Julian's Viaduct (Southern Shore – receding tide).

1.2.3 It is proposed to install a double layer of 600mm (d50) rock armour to Piers 1, 5, 6 and 7. The proposed rock armour is to be pitched at varying gradients on both banks to limit excavation whilst ensuring that the foundations of the elements are not undermined and extending approximately 5m both upstream and downstream of the structure.

1.2.4 The instillation of the rock armour and necessary access into the watercourse/estuarine boundary, will necessitate the management of saltmarsh within these essential works boundaries on the Northern and Southern shore below the structure.

2. Baseline Habitat & Scope of Works in relation to Saltmarsh

1.2.5 This section outlines the current known baseline of saltmarsh habitat below the structure within the working footprint as of January 2022.

2.1 Northern Shore

2.1.1 Habitats present – EUNIS A2.3 Littoral mud & A2.5 Coastal saltmarsh.

2.1.2 Intertidal mud JNCC Code H1.1 & Scattered saltmarsh plants H2.4

2.1.3 The northern access is to the eastern side of the viaduct via improved grassland leading to the structure and River Usk. The vast majority of habitat within the works footprint is soft intertidal mud.

2.1.4 A sparse cover of Scattered saltmarsh plants (Sea Purslane) is present to the upper marsh bordering the grassland extending approximately 1metre towards LW west and east of the arch. 1-2 isolated plants are present beneath the arch. Sea couch grass is present around the uppermost arch.

2.1.5 The saltmarsh is accessible to livestock (cattle). A narrow strip of saltmarsh (Scattered plants) extends both east and west of the viaduct.

Figure 3: Saltmarsh extent to northern access

Figure 4: Saltmarsh to north-east

Figure 5: Sparse plant cover beneath arch

Figure 6: Scattered-sea purslane and couch grass west side of arch

2.2 SOUTHERN SHORE

2.2.1 Habitats present – EUNIS A2.3 Littoral mud & A2.5 Coastal saltmarsh saline reedbeds

2.2.2 Intertidal mud JNCC Code H1.1 & Scattered saltmarsh plants H2.4

2.2.3 The southern access (to the west side of the viaduct) is via an existing footpath and dense bramble scrub. A reedbed (dominated by common reed) is located between the scrub to the upper stretches of the mudflats extending to the west along the riverbank.

2.2.4 A sparse cover of immature sea purslane plants were noted (approx. area less than 1m2) within the works footprint. Reedbeds (approx 5m wide) extend west of the viaduct towards the M4 road bridge.

2.2.5 Sparse scattered saltmarsh plants are present on the upper marsh to the east of the arch (Sea Purslane and couch grass) with the middle and lower reaches being comprised of mudflats. The saltmarsh covers a small area within the works footprint and gives way to tall ruderal vegetation and scrub to the immediate east in the wider habitat.

2.2.6 The saltmarsh has been trampled and is subject to regular disturbance from walkers/dogwalkers and other recreational users. No saltmarsh is present beneath the arches.

Figure 7: Saltmarsh to southern side

2.3 SCOPE OF IMPACT

2.3.1 The map overlay below highlights the habitat types and volumes within the projected works footprint related to scour works. Please note, this drawing does not include the access roads from the north or south which will situated with a mixture of poor-semi improved grassland and scrub habitat away from the riverbank.

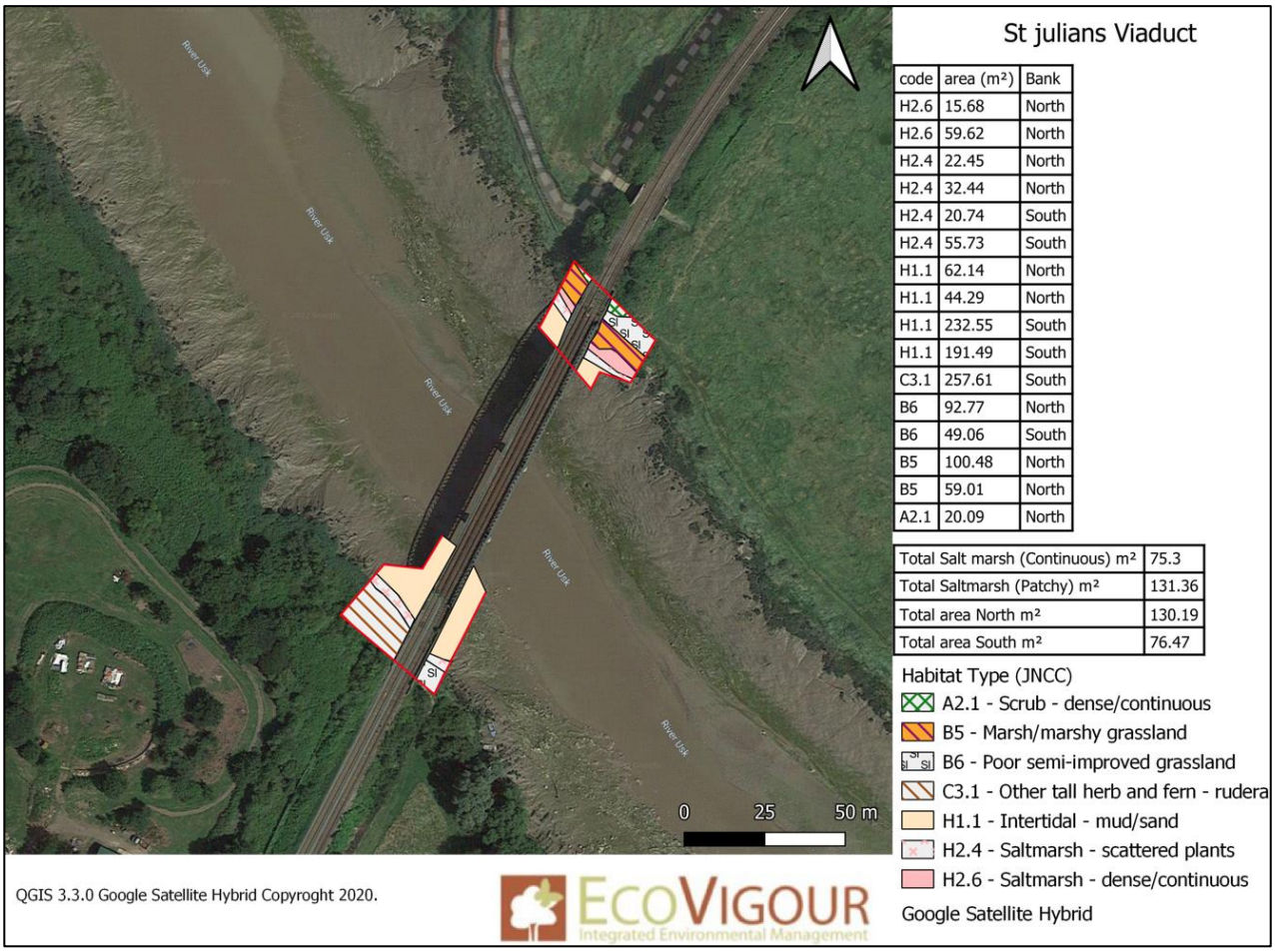

Figure 8: Habitat Map and Volumes.

2.3.2 Using GIS and ground based assessments during the Preliminary Ecological Appraisal stage, it has been estimated that approx.. 75m2 of H2.6 – Saltmarsh dense/continuous and approx. 131m2 of H2.4 Saltmarsh scattered plants will be impacted by the proposed scour protection works.

2.3.3 The assessment informs the initial baseline of habitat which will inform updated baseline surveys of each bank closer to date of construction, as to achieve the most representative sample of habitat which will require reinstatement and follow up monitoring post construction.

2.3.4 The following section outlines the proposed actions to be undertaken as part of the management plan.

3. Pre-Construction Baseline Surveys

2.3.5 A baseline survey on the condition of the saltmarsh will be conducted prior to construction to determine the expected post-construction regeneration of the saltmarsh and any changes in species abundance and diversity that may occur due to the disturbance.

2.3.6 The outline of the baseline survey in proposed below:

- Surveys will be undertaken ahead of the works on each specific bank. As the works are scheduled to occur incrementally, this split approach is the most representative way to ascertain the condition of the indicial banks ahead of works.
- The survey will record an estimated percentage cover of each plant species. .
- Aerial photography from open sources of the saltmarsh will be used as part of the pre-construction surveys to update GIS habitat maps.

4. During Construction Methodology

2.3.7 It was initially proposed to protect the salt marsh features by initially, lining the edge of the watercourse with geotextile membrane and laying material above, to form the haul road. The rational for this, was that this would retain the saltmarsh profile and seed load.

2.3.8 However, under further scrutiny it was concluded that this approach is undesirable. This is due to the likelihood of machine movement up and down the slope would ultimately compress and begin to wear this specific location between shore have temporary haul road. Additionally, it is likely that important portions of the upper layer of saltmarsh would be removed during reinstatement, as excavating the temporary stone for the haul road may lead to further damage to the buried portion of saltmarsh.

2.3.9 Consequently, it has been decided to temporarily translocate the margin saltmarsh to allow for temporary reprofiling of the bank for the haul road. The translocated salt marsh will be retained and maintained with river water being pumped to maintain moisture and required salinity using small submersible pumps.

Figure 9: CocoBN used to stabilise embankment.

2.3.10 During removal of the haul road/ramp the marsh will be placed back to it's original position and secured in place using erosion control matting such as CocoBN or similar. The matting will be secured using wooden pegs to ensure the saltmarsh margin successful re-seat in its original position.

5. Post-construction Monitoring and Reinstatement

4.1 Monitoring

4.1.1 Surveys will follow the same procedure as stated in the baseline survey. This procedure has been designed to allow appropriate comparison and analysis between the different surveys. An initial post-completion monitoring survey will be undertaken following reinstatement of soil to ground level.

4.1.2 Surveys will be undertaken on a 3 month basis for 1 year following installation. If after the first year the reinstatement has not yet reached a satisfactory condition, further surveys will be commissioned.

4.1.3 In addition, aerial photography (e.g. from drones) of the saltmarsh will be undertaken as part of the post-construction surveys.

4.1.4 Monitoring reports will be produced at the end of each year. These will report on the progress of saltmarsh recolonisation in terms of overall coverage and species composition by comparison of the monitoring surveys relative to the baseline/ pre-construction surveys.

6. Reinstatement

5.1.1 Two options could be considered for reinstatement of the saltmarsh following scour protection installation. Whilst the monitoring is required in order to determine which measure is brought forward, both options give certainty that the saltmarsh will recover to its baseline condition.

- Primary Approach - Natural recolonisation/regeneration where tides naturally disperse seeds and propagules throughout the marsh, allowing pioneer species to take advantage of any newly exposed patches within the saltmarsh, while the original patches of saltmarsh become secure along the riverbank once again.

- Secondary Approach - Replanting via the replacement of the removed turf by seeding or artificial transplantation.

5.1.2 The advice of Natural Resources Wales will be sought on the success of the saltmarsh recovery on receipt of each monitoring report and it will be asked to advise as necessary if it considers that natural recolonisation is unsuccessful.

5.1.3 To provide management certainty, after 1 year, regeneration vegetation less than 60%, subject to any potential natural variation, will trigger the consideration for the need supplement the natural regeneration with seeding material to encourage improved recolonisation of the saltmarsh.

5.1.4 Material for seeding the saltmarsh will be selected from sources agreed with NRW. A subsequent planting method statement would be submitted for approval by NRW.

7. REFERENCES

SALTMARSH RESTORATION HANDBOOK - UK & IRELAND - NOVEMBER 2021 - Editors: Rachel Hudson, Joe Kenworthy, Mike Best

Adams, J.B.; Raw, J.L.; Riddin, T.; Wasserman, J.; Van Niekerk, L. Salt Marsh Restoration for the Provision of Multiple Ecosystem Services. Diversity 2021, 13, 680.