

**RSPB
Shorne Marshes & Higham Bight
Management Plan
Extension**

1st April 2024 – 31st March 2025

Author:

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Minor changes during the life of this Plan:

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New projects during the life of this Plan:

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N.B. ANY NEW PROJECTS I.E. THOSE NOT DETAILED IN THIS PLAN, WILL NEED SEPARATE CONSENT FROM RSPB AND RELEVANT STATUTORY AGENCIES

Document owner

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Plan Team

The following people constitute the plan team, the reviewers and the consultees for the content of the plan:

Organisation	Title and Remit	Name	Role
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RSPB	Kent & London Area Reserves Manager	Martin Randall	Reviewer
RSPB	South East Region Ecologist	Viv Booth	Reviewer
RSPB	South East Region Senior Land Agent	Cliff Percival	Reviewer
RSPB	South East Region Communications Manager	Ellie Taylor	Reviewer
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Approvals

This document requires the following final approvals prior to consent for the plan:

Gate	Title and Remit	Name	Issue No.	Date of approval
1	South East Region Reserves Management Team	Marc Fletcher (Chair)	20170926	26/10/2017
2	National Reserves Standards & Audits Group (RSAG)	Bob Elliot (Chair)	20171026	21/11/2017
3	Kent & London Area Reserves Manager	Martin Randall	20171208	21/12/2017
	South East Region Ecologist	Viv Booth	20171208	15/12/2017
	South East Region Senior Land Agent	Cliff Percival	20171208	10/01/2018
	South East Region Communications Manager	Ellie Taylor	20171208	16/01/2018
4	South East Region Reserves Manager	Marc Fletcher	20180622	20/12/2018
	South East Region Director	Nic Scothern	20180622	20/12/2018

Natural England SSSI Consent

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20190204	06/02/2019	28/02/2019	Paul Hyde
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1. THE VISION for the reserve

Over the next 25 years, Shorne Marshes will be firmly cemented as the prime breeding wader reserve within the RSPB South East region's 'wader factory' that is North Kent. We will have completed the final improvements to the lowland wet grassland and reedbed habitats to ensure that every part of the reserve is as productive as it possibly can be for the species that are reliant on these habitats in this part of the UK.

Our management will be consistently delivering a vibrant wetland nature reserve where important populations of key species of conservation concern flourish. Our management will be dynamic and appropriate to the seasons for both resident species and migratory species at the relevant times of the year that profit from Shorne Marshes as a home.

Spring will be alive with the sound of up to 65 pairs of each of *peewitting* lapwing and over 75 pairs of *chipping* redshank. These ambitious numbers for the reserve will be, in no small part, due to the resurgence of these species' populations in the wider countryside. Water voles will continue to thrive in every ditch, European eel will have recovered and be part of a flourishing aquatic ditch environment whilst bearded tit will be heard *pinging* from the reedbeds throughout the year with marsh harrier a regular breeding bird and component of the ecosystem at the reserve.

Summer will be a time for important invertebrates with scarce emerald damselfly continuing to be spotted floating around ephemeral pools associated with sea-club rush and divided sedge whilst new 'emeralds' such as southern and willow will be a part of the assemblage having continued to colonise the UK. Working closely with key partners, our four rare carder bee species, particularly shrill carder bee, will be regular along the seawall as they seek out the nectar from the flowers that we will have ensured are present in sufficient quantities to support these long-tongued bees.

The scrub fields will have been maintained and managed to provide habitat for a small, but important, population of nightingales. However, and more significantly, the population of great crested newts in these fields will continue to be a noteworthy population in the southeast of England whilst the rough grassland element of the habitat will provide a nesting and hibernating resource for our scarce bumblebees.

Again, working with our key partners and using innovative solutions, we will have reversed the erosion of the saltmarsh at Higham Bight and maintained a sufficient area of this sparse habitat along the banks of the estuarine Thames, particularly in light of climate change and sea-level rise predictions. In addition, Higham Bight will continue to provide vital feeding and roosting habitat for a wide range of wader and duck species and continue to make a notable contribution to the habitat required by the vast assemblage of wintering waterfowl that congregates in the Thames Estuary every year. Finally, and the new most ambitious objective for Shorne Marshes, is that we will have surmounted the presently limited use that the reserve has for wintering waterfowl and the site will experience much larger numbers of waders and wildfowl as should be expected for a lowland wet grassland along the North Kent coast.

2. RESERVE MANAGEMENT

2a.1. Rationale for Management of the Reserve for Ecology and Visitors

As stated in the vision, Shorne Marshes is the prime breeding wader reserve within the RSPB South East region's 'wader factory' that is North Kent and the principal reason for RSPB managing this reserve. Furthermore, after much investment and development of the site's ability to be managed effectively, the reserve's delivery for breeding waders is now achieving long-standing expectations. Higham Bight provides the function of much needed habitat for wintering waders and wildfowl – a function that can be erroneously considered secondary to breeding habitat. Higham Bight is a noteworthy component of the complex of wintering habitat that supports up to 300,000 wintering waders and wildfowl annually in the Thames Estuary.

In addition, Shorne Marshes and Higham Bight are not just about birds and they both provide year-round homes for many other species of conservation concern from flora through to higher groups, not least a significant population of great crested newts and invertebrates such as scarce emerald damselfly and the rare carder bees for which the Thames Estuary/North Kent coastline are a stronghold in the UK for these delightful creatures.

The visitor provision at both reserves is highly limited due to their remoteness and the use of Shorne Marshes as an overshoot area for Milton Ranges. However, with the Saxon Shore Way on the fringes of both sites, the habitat management and ecological delivery that we provide enhances the experience for the brave souls that do use this part of the famous walk in a wild and out-of-the-way location.

2a.2. Identification of Features Influencing Management

The following tables list all the important features identified in Section 1.2-1.4 and identifies which of these are the **Features Influencing Management**. These include:

✓✓ = Features for which we have legal responsibilities (e.g. SSSI interest features) and which will influence the management we undertake at the site.

✓ = Features for which we have legal responsibilities (e.g. SSSI interest features) but which will not influence the management we undertake at the site.

** = Features which are the prime reason for RSPB maintaining the reserve and which will drive its management.

* = other important conservation features whose requirements we need to take into account when deciding management of the site.

WE = Wildlife Experience (features of particular importance to visitors)

VI = Visitor Infrastructure

A = Archaeological features

1) Lowland wet grassland

Important Feature	Influencing Management?	Why? (status, designation)	Comments (population size, trend, other info)
Lowland wet grassland	**✓✓	SSSI & Ramsar interest feature. RSPB & UK BAP priority habitats	Scope exists to increase effective management across the entire habitat
Breeding wader assemblage	**✓✓	Lapwing & redshank are RSPB Reserves priority species and lapwing & oystercatcher are assessed as Near Threatened on the Global Red List	6yr mean for lapwing and redshank is 39 pairs and 45 pairs respectively. Oystercatcher has only started to breed in 2 of the last 6 years. Populations are very sensitive to water availability
Breeding wildfowl assemblage	**✓✓	Various levels of conservation concern from Amber list up to Global Red List Vulnerable for pochard and SSSI interest feature for garganey	6yr mean for 7 species (gadwall, garganey, mallard, mute swan, pochard, shoveler and teal) is 17 pairs. Populations are very sensitive to water availability
Wintering waders & wildfowl assemblage	**✓✓	SSSI interest feature(s), RSPB Reserves priority assemblage and various levels of conservation concern per species	5yr mean is very low at 240 individuals from 15 species with 10 species being present for at least 3 out of the 5 years. Whole site number
Scarce emerald damselfly	**✓✓	SSSI & Ramsar interest feature	The Thames Estuary is a stronghold for this species
Shrill and brown-banded carder bees	**	Both UK & Kent BAP priority species. Shrill carder is also Scarce on the GB Rare and Scarce species list	Not recorded here but expected to be present
Water vole	**✓	RSPB Reserves priority species (LWG + Reedbeds). W&CA 1981. UK BAP. Kent BAP	High level of legal protection under the Wildlife and Countryside Act for the animals and their habitat
European eel	*✓	RSPB Reserves priority species (Reedbeds + Swamp). Global Red List Critically Endangered. European Red List Critically Endangered. UK BAP. Kent BAP	Yet to be confirmed but expected to be present. Any works that may impact on this species should be conducted as if they are confirmed present
Notable plant species	*✓	Various designations and SSSI interest features	No data gathered since 2010
Archaeological features	A	Archaeological heritage and protected against damage and/or destruction	Ensure that any new ecological features are created around/away from footprints of archaeological feature to avoid damage and/or destruction

2) Scrub/Rough grassland mosaic

Important Feature	Influencing Management?	Why? (status, designation)	Comments (population size, trend, other info)
Scrub/Rough grassland mosaic	**	RSPB priority habitats as Scrub and Lowland dry grassland	Habitat for great crested newt, nightingales and nesting and hibernating resource for scarce bumblebees
Great crested newt	**✓	European Protected Species. W&CA 1981. UK BAP. Kent BAP	Considered to be significant population in the southeast of England
Nightingale	**	RSPB Reserves priority species (Woodland/Scrub). BoCC4 Red List	Nightingale has just started to colonise the scrub. Previous species that would have been targets i.e. turtle dove are considered highly unlikely going forward and nightingale is assessed at the best species to target management for in this habitat
Scarce emerald damselfly	**✓✓	SSSI & Ramsar interest feature	The Thames Estuary is a stronghold for this species
Shrill and brown-banded carder bees	**	Both UK & Kent BAP priority species. Shrill carder is also Scarce on the GB Rare and Scarce species list	Not recorded here but expected to be present
Water vole	**✓	RSPB Reserves priority species (LWG + Reedbeds). W&CA 1981. UK BAP. Kent BAP	High level of legal protection under the Wildlife and Countryside Act for the animals and their habitat
European eel	*✓	RSPB Reserves priority species (Reedbeds + Swamp). Global Red List Critically Endangered. European Red List Critically Endangered. UK BAP. Kent BAP	Yet to be confirmed but expected to be present. Any works that may impact on this species should be conducted as if they are confirmed present
Archaeological features	A	Archaeological heritage and protected against damage and/or destruction	Ensure that any new ecological features are created around/away from footprints of archaeological feature to avoid damage and/or destruction

3) Reedbed/Rough grassland mosaic

Important Feature	Influencing Management?	Why? (status, designation)	Comments (population size, trend, other info)
Reedbed/Rough grassland mosaic	*✓✓	RSPB & UK BAP priority habitats. Common Reed is a SSSI & Ramsar interest feature.	Habitat for species listed below and nesting and hibernating resource for scarce bumblebees
Bearded tit	**	SSSI interest feature. RSPB Reserves priority species (Reedbeds). W&CA 1981	1 pair in 2016
Breeding and wintering wildfowl assemblage	**✓✓	SSSI interest feature(s), RSPB Reserves priority assemblage and various levels of conservation concern per species	See objective 1
Water vole	**✓	RSPB Reserves priority species (LWG + Reedbeds). W&CA 1981. UK BAP. Kent BAP	High level of legal protection under the Wildlife and Countryside Act for the animals and their habitat
European eel	*✓	RSPB Reserves priority species (Reedbeds + Swamp). Global Red List Critically Endangered. European Red List Critically Endangered. UK BAP. Kent BAP	Yet to be confirmed but expected to be present. Any works that may impact on this species should be conducted as if they are confirmed present

4) Lowland dry grassland (seawall), saltmarsh and intertidal mudflats

Important Feature	Influencing Management?	Why? (status, designation)	Comments (population size, trend, other info)
Lowland dry grassland (+seawall)	**✓✓	SSSI interest feature. RSPB & UK BAP priority habitats	The condition of the seawall, in vegetation terms, moved forward during the period of the last management plan but there is scope for much more enhancement
Shrill and brown-banded carder bees	**	Both UK & Kent BAP priority species. Shrill carder is also Scarce on the GB Rare and Scarce species list	Recorded in August 2017
Linnet	**	BoCC4 Red List. UK BAP	Breeds in the scrub along the base of the seawall
Saltmarsh	**✓✓	SSSI & Ramsar interest feature. RSPB & UK BAP priority habitats	The condition of the saltmarsh, in vegetation and extent, has deteriorated
Saltmarsh plants assemblage	**✓	Various SSSI interest features and levels of conservation concern	Much more work is required to provide the correct conditions for the saltmarsh vegetation to proliferate
Intertidal mudflats	**✓✓	SSSI, SPA & Ramsar interest feature	Essential component of the wintering bird assemblage habitat. Long-term, this may be lost without innovative solutions to maintain the extent and provision
Wintering waders & wildfowl assemblage at Higham Bight	**✓✓	SSSI, SPA & Ramsar interest feature(s), RSPB Reserves priority assemblage and various levels of conservation concern per species	6yr mean is 2038 individuals from 32 species with 14 species being present for at least 3 out of the 6 years
Shornemead Fort and other archaeological features	A	Archaeological heritage and protected against damage and/or destruction	Shornemead Fort is a significant H&S risk

2a.3. Condition of the Features Influencing Management and the Main Factors affecting them

The following tables identify the target condition of the Features Influencing Management and the Main Factors influencing whether these target conditions are attained.

1) Lowland wet grassland

Feature	Attribute(s)	Current	Target(s) for attribute	Main factor(s)	Target for main factor(s)	Comments
Lowland wet grassland	Habitat extent	106.75 (ha)	106.75 (ha)	See all below	See all below	See all below
	Water management	Controlled and managed across hydro units 1 & 2	Controlled and managed across all hydro units	Abstraction licence	Maintain the provision of an abstraction licence with adequate volumes and rates of pumping to support the wetland habitat	Shorne Marshes ceases to function as an effective lowland wet grassland without the support of an abstraction licence
				Surface flooding conditions	According to abstraction licence conditions, pump water annually from the external landscape level drainage system into the internal ditch network to maintain controlled water levels and surface flooding throughout the key times of the year: • Begin significant flooding in December (at the latest) to achieve 30% (minimum) to 50% (optimum) surface flooding of all fields through January (at the latest) to April • From April onwards, manage a steady drawdown to achieve 5% surface flooding by the end of June • From July to December, maintain water levels in the ditch network as high as possible in so far as rainfall allows by holding water back by	Also refer to 'Hydrology' in Appendix A2.2 Where capacity issues arise with managing water levels, prioritise Higham Marshes to receive greater attention.

Feature	Attribute(s)	Current	Target(s) for attribute	Main factor(s)	Target for main factor(s)	Comments
					maintaining hydro unit overflows as closed • Overflows only opened either: ○ In serious flood events to alleviate flooding, or ○ To raise water levels in the ditch network if they are below the level of the landscape drainage system If abstraction licence limits are reached and no further abstraction from the external landscape level drainage system can be undertaken: • Isolate the ditch network from the fields where possible • Supplement surface flooding conditions using mobile pumps to transfer excess water from the internal ditch network into fields as required/possible Under this scenario, ensure that water levels are not lowered to the point that they undermine the ecology of the internal ditch network During drought conditions, prioritise surface flooding to maintain optimal conditions according to the hydrological unit hierarchy: 1. Unit 1 2. Unit 2 3. Unit 3 4. Unit 4 5. Unit 5	

Feature	Attribute(s)	Current	Target(s) for attribute	Main factor(s)	Target for main factor(s)	Comments
				Hydrological infrastructure	General: • Install small-scale bunds to isolate further fields from the internal ditch network with simple connections (pipe & elbow) • Maintain and repair (inc. re-install if beyond repair) all hydrological infrastructure (earth bunds, dams, culverts etc) as required • Maintain and repair all fixed pump installations including the electricity supply as required Unit 3: • Develop and deliver a project to effectively separate unit 3 from units 1 & 2 allowing unit 3 to become an excess winter-water storage facility (see objective 3) Unit 4: • Investigate options for a dedicated abstraction pump to maintain optimum surface flooding conditions as described above • Post investigation of options develop and deliver a project to install a dedicated abstraction pump Unit 5: • Develop and deliver a project to effectively separate unit 5 from the landscape drainage level system allowing unit 5 to become an effective lowland wet grassland unit. This includes the provision of a suitable abstraction pump to provide the water required for management	Delivery of projects is subject to sourcing sufficient funding

Feature	Attribute(s)	Current	Target(s) for attribute	Main factor(s)	Target for main factor(s)	Comments
	Vegetation management (Cs 3-7, 9a, 10, 11a-16a, 20-25, 30-32, 37-40)	Controlled - Sward conditions: 1st March; Tussocky sward with median vegetation height <5cm over 90% of the LWG - November; Tussocky sward with median vegetation height <10cm over 80% of the LWG - Low levels of livestock poaching 75% of rills, scrapes and other depressions free from <i>Scirpus</i>, <i>Juncus</i> and dock spp except in and around the pond system in Cs 3 & 4 where large stands of dense, emergent vegetation is required specifically for Scarce emerald damselfly - No scrub present	Controlled	Grazing	Graze with cattle and sheep: - Maximum stocking density of 0.75 LSU/ha in any one grazing area (set stocking) by mid-April until June i.e. during the breeding season - Maximum stocking rate during the breeding season is 75 LSU - Higher densities are allowable during summer either by the addition of more animals or using rotational (mob) grazing - Low level densities in winter to ensure that the sward is at the correct structure prior to the beginning of March - No insecticides within livestock whilst livestock are on site unless for distinct veterinary concerns and always the minimum medication required to alleviate the issue i.e. no Ivermectins	See 'Grazing plan' at section 4a.2 for a guide to livestock numbers
				Mechanical management	Undertake topping and weed control (+/- herbicide applications) as required post breeding season	Injurious weeds: - Creeping thistle - Spear thistle - Ragwort - Broad leaved dock - Curled dock
				Scrub management	Maintain control over re-generating scrub (including bramble) by grazing & mechanical management (topping, brushcutter, chainsaw, hand saws, herbicide etc) as required	-
	Ditch management	Reactive	Regular rotational management	Rotational management plan	Create a whole site rotational ditch management plan that includes main rivers	-

Feature	Attribute(s)	Current	Target(s) for attribute	Main factor(s)	Target for main factor(s)	Comments
				Management	Undertake rotational ditch cleaning and/or restoration: • 7-13 year rotation on key ditches required to be maintained as wet fencing • 10-15 year rotation on non-key ditches to maintain senescing condition for Scarce emerald damselfly and flora and invertebrate assemblage Management is mainly dredging unless ditch banks have become greater than 45° or become too shallow to maintain the existing bank profile. In this instance, the bank should be re-profiled (ideally with a berm/shelf). Only one bank should be re-profiled at any one time	-
				Senescence conditions	Percentage of ditches across the network (whole site target): • Open 10-30% • Mid succession 30-60% • Choked 20-30%	-
Breeding wader assemblage	Population of breeding pairs in the final year of the plan	• Lapwing = 32 (39) • Redshank = 56 (45) • Oystercatcher = 0 (1)	• Lapwing = ≥65 • Redshank = ≥75 • Oystercatcher = ≥5	Availability of suitable habitat provided by suitable management	As per 'Lowland wet grassland' +...	Figures for 'current' from 2017 breeding season with 6yr mean in brackets
					Maintain 75% of rills, scrapes and other depressions free from <i>Scirpus</i> , <i>Juncus</i> and dock spp (except in and around the pond system in Cs 3 & 4) via topping, brushcutting, herbicide applications and rotavating as required	
					Create increased topographical variation i.e. new rills and scrapes or enhance existing features, as opportunities allow	Delivery of projects is subject

Feature	Attribute(s)	Current	Target(s) for attribute	Main factor(s)	Target for main factor(s)	Comments
						to sourcing sufficient funding
					Remove scrub either side of track in C34 between Cs 24 & 32 to create an open aspect between the eastern and western sides of the reserve and dispose of brash by appropriate burning if required	-
	Productivity	• Lapwing = 1.22 (1.06) • Redshank = 0.68 (0.97)	>0.8 fledged chicks per pair annually	Predator control	Maintain low levels of nest and chick predation by: • Maintain the integrity of the electric fence throughout the year with the fence effective at all times, which includes: ○ Vegetation management at the base of the fence by a combination of grazing, cutting or spraying with herbicide as required ○ Maintain and repair all power supply infrastructure including the electricity supply as required • Undertaking fox control (primarily by shooting) according to RSPB policies and Codes of Practice on vertebrate control	Figures for 'current' from 2017 breeding season with 6yr mean in brackets Although the headline outcome of predator control is to increase breeding wader productivity and populations, the positive effects will translate directly to all ground-nesting bird species
Breeding wildfowl assemblage	Population of breeding pairs in the final year of the plan (whole site target including areas	5 species* = 12prs (17) *Species present in 2017 - Gadwall, mallard, mute swan, pochard, shoveler	≥5 species = ≥20prs	Availability of suitable habitat provided by suitable management	As per 'Lowland wet grassland' + 'Breeding wader assemblage' + 'Scarce emerald damselfly' + 'Shrill and brown-banded carder bees'	Figures for 'current' from 2017 breeding season with 6yr mean in brackets

Feature	Attribute(s)	Current	Target(s) for attribute	Main factor(s)	Target for main factor(s)	Comments
	covered by objective 3)					
Wintering waders & wildfowl assemblage	Mean of winter maxima during the life of the plan (whole site target including areas covered by objective 3)	13 species* = 239 (709) *Species present during the last 6 years - Curlew, gadwall, green sandpiper, lapwing, mallard, mute swan, pochard, redshank, shelduck, shoveler, snipe, teal, wigeon	≥13 species = ≥500 + wigeon to be present for at least 3/5 seasons	Availability of suitable habitat provided by suitable management	As per 'Lowland wet grassland' + 'Breeding wader assemblage'	Figures for 'current' from 6yr mean with totalled peak of each species from 6yr period in brackets
Scarce emerald damselfly	Population (whole site target including areas covered by objective 2)	Present	Maintain presence	Availability of suitable habitat provided by suitable management	Maintain large stands of dense, emergent vegetation (<i>Scirpus</i> , <i>Juncus</i> and dock spp) in and around the pond system in Cs 3 & 4 specifically by not undertaking topping All other management requirements as per 'Lowland wet grassland' + 'Breeding wader assemblage'	-
Shrill and brown-banded carder bees	Population (whole site target including areas covered by objective 2)	Possibly present	Confirm and maintain presence	Grazing (Cs 8, 9b, 11b & P1-P6)	Biennially graze with cattle (+/- sheep) for short periods between late summer and autumn on rotation Grazing periods may be anywhere between a few days to a few weeks depending on the number of animals used	-

Feature	Attribute(s)	Current	Target(s) for attribute	Main factor(s)	Target for main factor(s)	Comments
					As these compartments are so small, stocking densities and rates are an inappropriate measure to guide the grazing. The objective is not to reduce the sward to a level akin to breeding wader habitat, but to open up 'pockets' within the sward. As such, grazing may be with as many animals as appropriate for short periods until an effect is noted	
				Mechanical management (Cs 8, 9b, 11b & P1-P6)	Weed control (+/- herbicide applications) as required post breeding season	Injurious weeds: • Creeping thistle • Spear thistle • Ragwort • Broad leaved dock • Curled dock
				Scrub (including bramble) management (Cs 8, 9b, 11b & P1-P6)	Maintain control over re-generating scrub by grazing & mechanical management (brushcutter, clearing saw, chainsaw, hand saws, herbicide etc) and dispose of brash by appropriate burning if required	-
Water vole	Transects with signs of low density presence at a minimum (whole site target including areas covered by objectives 2 & 3)	5 out of 5	5 out of 5 ≥ low density	Availability of suitable habitat provided by suitable management	As per 'Lowland wet grassland' + 'Breeding wader assemblage' + 'Shrill and brown-banded carder bees'	Density of presence based on number of latrines per 100m of available habitat where >6/100m=high, 3-6/100m=medium, <3/100m=low
				Absence of American mink	No American mink present: • Maintain vigilance for the presence of mink • Confirm presence if suspected (+/- the use of mink rafts as required)	Maintenance of the electric fence will allow the

Feature	Attribute(s)	Current	Target(s) for attribute	Main factor(s)	Target for main factor(s)	Comments
					Undertake mink control as necessary (trapping & shooting) according to RSPB policies and Codes of Practice on vertebrate control	vegetation to proliferate around the perimeter of the LWG due to much reduced grazing pressure
				Sensitive and controlled ditch re-profiling	Ensure that banks are clear of active water vole burrows prior to any re-profiling operations Follow the licensing procedures if active burrows are likely to be affected	
European eel	Death by pumping (whole site target including areas covered by objectives 2 & 3)	Fish-friendly pumps used	Maintain use of fish-friendly equipment	Efficacy of equipment and supplementary equipment i.e. screens	Ensure that suitable screens are added to intakes of non-fish-friendly pumps i.e. Sykes, trash, submersible etc, when these are used	-
	Migration passage (whole site target including areas covered by objective 2 & 3)	Potentially inadequate passage at all hydrological infrastructure	Adequate passage at all hydrological infrastructure	Eel passes	Assess all water control structures (dams & culverts) for eel accessibility. If assessed as inaccessible, install simple eel passes to aid eel passage	-
Notable plant species	Populations of 7 species Divided sedge, sea barley, frogbit, annual beard-grass, water-soldier, stiff saltmarsh-grass, Borrer's saltmarsh-grass	Present	Maintain presence and/or increase presence where feasible	Availability of suitable habitat provided by suitable management	As per 'Lowland wet grassland' + 'Breeding wader assemblage' + 'Scarce emerald damselfly' + 'Shrill and brown-banded carder bees'	-

Feature	Attribute(s)	Current	Target(s) for attribute	Main factor(s)	Target for main factor(s)	Comments
Archaeological features	Number	8	8	Damage through landscaping & agricultural operations	Follow the general principles of: • Ensure that any new ecological features are created around/away from archaeological features • Do not allow any agricultural operations to damage the features i.e. subsoiling, over-grazing etc	-

Resolution of potential conflicts/overcoming of potential constraints

- Ecological conflicts that are present are overcome by the management set out above
- Constraints to site management are either irresolvable i.e. access constraints due to the MPSTC, or outside of the local team's ability to resolve i.e. staff resource

2) Scrub/Rough grassland mosaic

Feature	Attribute(s)	Current	Target(s) for attribute	Main factor(s)	Target for main factor(s)	Comments
Scrub/Rough grassland mosaic	Habitat extent	12.46 (ha)	12.46 (ha)	See all below	See all below	See all below
	Grazing	Controlled	Controlled	Timing of management	Biennially graze with cattle (+/- sheep) for short periods between late summer and autumn on rotation Grazing periods may be anywhere between a few days to a few weeks depending on the number of animals used	C35 is not subject to this grazing regime
	Scrub (including bramble) management	Controlled	Controlled	Cover	Maintain hawthorn/blackthorn cover ≤50% Maintain ≤10% bramble cover across the open rough grassland	-
				Age	Provide variation in age up to a maximum of 15 years	The majority of the scrub needs to develop to a sufficient age so cutting in most areas may not be entirely relevant during the life of this plan
				Cutting	Cut a relevant percentage of the scrub stands on a rotation of one-fifth every 3 years by cutting (brushcutter, clearing saw, chainsaw, hand saws etc) and dispose of brash by appropriate burning if required	
	Ditch management	Reactive	Regular rotational management	Rotational management plan	As per 'Lowland wet grassland; Ditch management' in objective 1	-
Great crested newt	Population	Present	Maintain presence	Shading of crater-ponds	Maintain control of the scrub around the crater-ponds to prevent excessive	-

Feature	Attribute(s)	Current	Target(s) for attribute	Main factor(s)	Target for main factor(s)	Comments
					shading by cutting (brushcutter, clearing saw, chainsaw, hand saws etc) and dispose of brash by appropriate burning	
Nightingale	Population of singing males in the final year of the plan	2	≥2	Availability of suitable habitat provided by suitable management	As per 'Scrub/Rough grassland'	Nightingale first colonised site in 2017
Scarce emerald damselfly	See objective 1	See objective 1	See objective 1	Availability of suitable habitat provided by suitable management	As per 'Scrub/Rough grassland'	-
Shrill and brown-banded carder bees	See objective 1	See objective 1	See objective 1	Availability of suitable habitat provided by suitable management	As per 'Scrub/Rough grassland'	-
Water vole	See objective 1	See objective 1	See objective 1	Availability of suitable habitat provided by suitable management	As per 'Scrub/Rough grassland' + 'Water vole' in objective 1	-
European eel	See objective 1	See objective 1	See objective 1	Availability of suitable habitat provided by suitable management	As per 'Scrub/Rough grassland' + 'European eel' in objective 1	-

Feature	Attribute(s)	Current	Target(s) for attribute	Main factor(s)	Target for main factor(s)	Comments
Archaeological features	The craters in Cs 28 & 29	Present	Maintain presence	Damage through landscaping & agricultural operations	Follow the general principles of: • Ensure that any new ecological features are created around/away from archaeological features • Do not allow any agricultural operations to damage the features i.e. subsoiling, over-grazing etc	-

Resolution of potential conflicts/overcoming of potential constraints

- Ecological conflicts that are present are overcome by the management set out above
- Constraints to site management are either irresolvable i.e. access constraints due to the MPSTC, or outside of the local team's ability to resolve i.e. staff resource

3) Reedbed /Rough grassland mosaic

Feature	Attribute(s)	Current	Target(s) for attribute	Main factor(s)	Target for main factor(s)	Comments
Reedbed/Rough grassland mosaic	Habitat extent	5.51 (ha)	5.51 (ha)	See all below	See all below	See all below
	Habitat mosaic	• Dense reed stand = @47% • Rank sward with a small component of scrub to the south = @38% • Open water and ditches = @15%	• Dense reed stand = @60% • Rank sward with a small component of scrub to the south = @25% • Open water and ditches = @15%	See all below	See all below	-
	Vegetation management	Controlled	Controlled	Grazing	Maintain isolation from indiscriminate grazing and graze lightly once during the life of this plan	-
				Mechanical management	Supplement bed re-generation operation with appropriate management such as raking & burning of brash if required	-
				Scrub (including bramble) management	Maintain current levels of scrub cover and maintain ≤10% bramble cover across the open rough grassland Remove regenerating scrub as required (by brushcutter, clearing saw, chainsaw, hand saws etc) and dispose of brash by appropriate burning to ensure no increase on existing scrub presence	-

Feature	Attribute(s)	Current	Target(s) for attribute	Main factor(s)	Target for main factor(s)	Comments
	Water management	Uncontrolled	Controlled	Hydrological infrastructure	Develop and deliver a project to effectively separate the reedbed from units 1 & 2 allowing the reedbed to hold higher water levels, thereby increasing the quantity of wet reedbed from dry reedbed	Delivery of projects is subject to sourcing sufficient funding
				Pumping	Once the reedbed is effectively separated, pump water from units 1 & 2 into the reedbed to maintain higher water levels until drawdown is required	-
	Ditch management	Reactive	Regular rotational management	Rotational management plan	As per 'Lowland wet grassland; Ditch management' in objective 1	-
Bearded tit	Breeding pairs throughout the life of the plan	1 intermittently	≥1 regularly	Availability of suitable habitat provided by suitable management	As per 'Reedbed/Rough grassland mosaic'	-
Breeding and wintering wildfowl assemblage	See objective 1	See objective 1	See objective 1	Availability of suitable habitat provided by suitable management	As per 'Reedbed/Rough grassland mosaic'	-
Water vole	See objective 1	See objective 1	See objective 1	Availability of suitable habitat provided by suitable management	As per 'Reedbed/Rough grassland mosaic' + 'Water vole' in objective 1	-
European eel	See objective 1	See objective 1	See objective 1	Availability of suitable habitat provided by	As per 'Reedbed/Rough grassland mosaic' + 'European eel' in objective 1	-

Feature	Attribute(s)	Current	Target(s) for attribute	Main factor(s)	Target for main factor(s)	Comments
				suitable management		

Resolution of potential conflicts/overcoming of potential constraints

- Ecological conflicts that are present are overcome by the management set out above
- Constraints to site management are either irresolvable i.e. access constraints due to the MPSTC, or outside of the local team's ability to resolve i.e. staff resource

4) Lowland dry grassland (+seawall), saltmarsh and intertidal mudflats

Feature	Attribute(s)	Current	Target(s) for attribute	Main factor(s)	Target for main factor(s)	Comments
Lowland dry grassland (+seawall)	Habitat extent	RSPB; 11.53 (ha) EA; 28.57 (ha)	RSPB; 11.53 (ha) EA; 28.57 (ha)	See all below	See all below	
	Vegetation management (Cs 16b-d, 18, 41 & EA)	Partially controlled: • Short sward with intermittent rank patches • Occasional forage plants present (Birds-foot trefoil & Red clover)	Controlled: • Increased quantity of rank sward (>10cm over 25% of the seawall) • Increased presence of forage plants (20-30% of the seawall between June and September)	Grazing	Continue to maintain control of the horses grazing the entire length of the seawall to a maximum of 45 adults year-round. Foals at foot are allowed between April and October inclusive each year No insecticides within livestock whilst livestock are on site unless for distinct veterinary concerns and always the minimum medication required to alleviate the issue i.e. no Ivermectins	This is the total including the Higham Marshes-Ledger section of the seawall
				Mechanical management	Work with EA partners to limit their mowing of the seawall to outside the flowering season (May to September)	-
				Scrub (including bramble) management	Maintain the presence of low levels of scrub along the landward base of the seawall and around Shornemead Fort	-
	Vegetation management (Cs 19, 27, 34 & 26)	Controlled: • Cs 19, 27 & 26 with short sward and occasional scrub • C 34 with varied sward, regular scrub and regular	Controlled: • Cs 19, 27 & 26 with short sward and occasional scrub • C 34 with varied sward, regular but reduced scrub and regular dense emergent	Grazing	Graze with low numbers of horses	-
				Scrub management	Remove scrub (including bramble) either side of track in C34 between Cs 24 & 32 as per 'Breeding wader assemblage' in objective 1 and dispose of excess and unsuitable brash by appropriate burning	-

Feature	Attribute(s)	Current	Target(s) for attribute	Main factor(s)	Target for main factor(s)	Comments
		dense emergent bank side vegetation	bank side vegetation		Beyond this section, maintain the presence of scrub at existing levels	
	Ditch management	Reactive	Regular rotational management	Rotational management plan	As per 'Lowland wet grassland; Ditch management' in objective 1	-
Shrill and brown-banded carder bees	Population	Present	Maintain presence	As per 'Lowland dry grassland (seawall)'	As per 'Lowland dry grassland (+seawall)'	-
Linnet	Population	Present	Maintain presence	As per 'Lowland dry grassland (seawall)'	As per 'Lowland dry grassland (+seawall)'	-
Saltmarsh	Habitat extent	RSPB; 3.44 (ha) EA; 3.9 (ha)	RSPB; ≥3.44 (ha) EA; ≥3.9 (ha)	Erosion and coastal squeeze	Investigate opportunities for saltmarsh restoration and develop suitable projects to increase the extent and resilience of the habitat. Potential solutions are: • The placement of hurdles to stop erosion of existing habitat • The strategic placement of dredgings (recharge) to replace lost habitat	Delivery of projects is subject to sourcing sufficient funding
	Vegetation management (Cs 42, 43 & EA)	Uncontrolled with no flowering	Controlled with flowering	Grazing	Where feasible, work with EA partners to install a livestock fence(s) to cease the indiscriminate grazing of the saltmarsh by the horses	Delivery of projects is subject to sourcing sufficient funding

Feature	Attribute(s)	Current	Target(s) for attribute	Main factor(s)	Target for main factor(s)	Comments
Saltmarsh plants assemblage	Populations of SSSI species: • Prostrate glasswort • Sea aster • Sea lavender • Sea purslane • Golden-samphire	Present	Maintain presence	As per 'Saltmarsh'	As per 'Saltmarsh'	-
Intertidal mudflats	Habitat extent	40.54 (ha)	40.54 (ha) unless saltmarsh expands naturally or via a project to specifically address saltmarsh losses	Erosion	Investigate opportunities for the strategic placement of dredgings (recharge) to increase the resilience of the habitat if required	Delivery of projects is subject to sourcing sufficient funding
Wintering waders & wildfowl assemblage at Higham Bight	Mean of winter maxima at the end of this plan	2038 (6206)	≥2038	Availability of suitable habitat	As per 'Intertidal mudflats'	Figures for 'current' from 6yr mean with totalled peak of each species from 6yr period in brackets
Shornemead Fort and other archaeological features	Number	18	18	Damage through structural deterioration, landscaping & agricultural operations	Undertake necessary activities to maintain the condition and the safety of Shornemead Fort as required Follow the general principles of: • Ensure that any new ecological features are created around/away from archaeological features	Some features are outside of RSPB control to maintain

Feature	Attribute(s)	Current	Target(s) for attribute	Main factor(s)	Target for main factor(s)	Comments
					Do not allow any agricultural operations to damage the features i.e. subsoiling, over-grazing etc	

Resolution of potential conflicts/overcoming of potential constraints

- Ecological conflicts that are present are overcome by the management set out above
- Constraints to site management are outside of the local team's ability to resolve i.e. staff resource

2a.4. Condition of Visitor Infrastructure and Maintenance Implications

Infrastructure Type	Individual Structure	Current Condition overall	Current Condition individual	Current Maintenance Schedule	Target Condition	Target Maintenance Schedule	Comments/ Constraints
n/a	-	-	-	-	-	-	-

3. MANAGEMENT OBJECTIVES

3a. Conservation Objectives

1. To maintain favourable SSSI condition across the 107ha of lowland wet grassland at Shorne Marshes and maintain or increase populations of RSPB Priority Species and SSSI interest features. Specifically breeding and wintering waders and wildfowl alongside rare/scarce invertebrates, water voles, European eel and notable plant species.

Species targets

- Breeding **lapwing ≥65 pairs** in the final year of the plan
- Breeding **redshank ≥75 pairs** in the final year of the plan
- Breeding **oystercatcher ≥5 pairs** in the final year of the plan
- Lapwing & redshank productivity of **>0.8 fledged chicks per pair** annually
- Breeding **wildfowl ≥20 pairs from ≥5 species** in the final year of the plan.
Whole site target including areas covered by objective 3
- 5-year mean winter maxima of **wintering waders and wildfowl ≥500 from ≥13 species** in the final year of the plan
Whole site target including areas covered by objective 3
- Wintering **wigeon present for ≥3 of the 5 years** of the life of this plan
- **Scarce emerald damselfly present**
Whole site target including areas covered by objective 2
- **Shrill and brown-banded carder bees present**
Whole site target including areas covered by objective 2
- **Water vole present in 5/5 transects** with low density presence at a minimum
Whole site target including areas covered by objective 2 & 3
- Confirm and maintain **presence of European eel**
Whole site target including areas covered by objective 2 & 3
- Maintain **populations of 7 species of notable plants** (divided sedge, sea barley, frogbit, annual beard-grass, water-soldier, stiff saltmarsh-grass, Borrer's saltmarsh-grass)

Habitat conditions

- Habitat extent
 - 106.75ha
- Sward conditions (Cs 3-7, 9a, 10, 11a-16a, 20-25, 30-32, 37-40):
 - 1st March; Tussocky sward with median vegetation height <5cm over 90% of the LWG
 - November; Tussocky sward with median vegetation height <10cm over 80% of the LWG
 - 75% of rills, scrapes and other depressions free from *Scirpus*, *Juncus* and dock spp except in and around the pond system in Cs 3 & 4 where large stands of dense, emergent vegetation is required specifically for scarce emerald damselfly
- Sward conditions (Cs 8, 9b, 11b & P1-P6):
 - Predominantly rank sward
 - Regular dense emergent bank side vegetation (+/- *Scirpus*, *Phragmites* etc)
- Flooding conditions:
 - March to June; target of 30% (minimum) to 50% (optimum) flooding across all fields in March drawing down to 5% by the end of June

- January to March; target of 30% (minimum) to 50% (optimum) flooding across all fields in January and maintained into March
- No scrub present (including bramble)
- Low levels of livestock poaching
- Ditch senescence (whole site target):
 - Open 10-30%
 - Mid succession 30-60%
 - Choked 20-30%
- No mink present

Activities (management and monitoring) are detailed in the Work Programme at Section 4a.1

2. To maintain favourable SSSI condition across the 12.5ha of scrub and rough grassland mosaic at Shorne Marshes and maintain or increase populations of RSPB Priority Species, SSSI interest features and other species of conservation concern. Specifically, great crested newt, nightingale and rare/scarce invertebrates

Species targets

- **Great crested newt population maintained** in Cs 28 & 29
- Breeding **nightingale ≥2 singing males** in the final year of the plan

Habitat conditions

- Habitat extent:
 - 12.46ha
- Sward conditions:
 - Predominantly rank sward
 - ≤10% bramble cover across the open rough grassland
 - Regular dense emergent bank side vegetation (+/- *Scirpus*, *Phragmites* etc)
- Scrub conditions (including bramble):
 - Hawthorn/blackthorn cover ≤50%
 - Age ≤15 years
 - No excessive shading around crater-ponds
- Ditch senescence (whole site target):
 - Open 10-30%
 - Mid succession 30-60%
 - Choked 20-30%

Activities (management and monitoring) are detailed in the Work Programme at Section 4a.1

3. To maintain favourable SSSI condition across the 5.5ha of reedbed and rough grassland mosaic at Shorne Marshes and maintain or increase populations of RSPB Priority Species and SSSI interest features. Specifically breeding bearded tit, breeding & wintering wildfowl, water voles and European eel.

Species targets

- Breeding **bearded tit** ≥ 1 pair regularly throughout the life of the plan

Habitat conditions

- Habitat extent:
 - 5.51ha
- Habitat mosaic:
 - Dense reed stand = @60%
 - Rank sward with a small component of scrub to the south = @25%
 - Open water and ditches = @15%
- Scrub conditions (including bramble):
 - No increase to existing presence of scrub
 - $\leq 10\%$ bramble cover across the open rough grassland
- Flooding conditions:
 - Pre-separation; water levels controlled by activities for objective 1
 - Post-separation; seasonally maintain water at higher levels than areas covered by objective 1
- Ditch senescence
 - Open 10-30%
 - Mid succession 30-60%
 - Choked 20-30%
- No mink present

Activities (management and monitoring) are detailed in the Work Programme at Section 4a.1

4. To maintain favourable SSSI condition across the 80ha of lowland dry grassland (seawall) and intertidal mudflats at Shorne Marshes, Higham Bight and the Environment Agency-owned seawall and attempt to reverse the unfavourable declining SSSI condition of the 8ha of saltmarsh. To maintain or increase populations of RSPB Priority Species and SSSI & SPA interest features. Specifically wintering waders & wildfowl, breeding linnet, scarce bumblebees and the saltmarsh plant assemblage.

Species targets

- **Shrill and brown-banded carder bees present**
- Mean of winter maxima of **wader & wildfowl assemblage** ≥ 2038 in the final year of the plan
- Breeding **linnet present**
- Populations of **prostrate glasswort, sea aster, sea lavender, sea purslane, golden-samphire present**

Habitat conditions

- Habitat extent:
 - Lowland dry grassland (seawall):
 - RSPB; 11.53ha
 - EA; 28.57ha
 - Saltmarsh
 - RSPB; 3.44ha
 - EA; 3.9ha
 - Intertidal mudflats:

- 40.54ha
- Sward conditions (Cs 16b-d, 18, 34, 41-43 & EA):
 - Tussocky sward with median vegetation height >10cm over 25% of the seawall
 - Bird's-foot trefoil and red clover present over 20-30% of the seawall between June and September
 - Regular dense emergent bank side vegetation (+/- *Scirpus*, *Phragmites* etc) where ditches are present
 - Saltmarsh plants flowering
- Sward conditions (Cs 19, 27 & 26):
 - Short sward
 - Regular dense emergent bank side vegetation (+/- *Scirpus*, *Phragmites* etc) where ditches are present
- Scrub conditions (including bramble):
 - Low levels of scrub present along the landward side of the base of the seawall and in the vicinity of Shornemead Fort
 - Scrub present along either side of the bridleway between Cs 22 & 29 and Cs 25 & 34
 - Occasional scrub in and around Cs 19, 27 & 26
- Low levels of livestock poaching
- Ditch senescence (whole site target):
 - Open 10-30%
 - Mid succession 30-60%
 - Choked 20-30%

Activities (management and monitoring) are detailed in the Work Programme at Section 4a.1

5. To inform our management of the site and contribute to other recording schemes, surveys and research projects by permitting recording and monitoring of invertebrates, plants and fungi in accordance with RSPB policy, the Invertebrate Link code of conduct for collecting insects and other invertebrates, the Wild Mushroom Pickers' Code of Conduct or the BSBI Code of Conduct as appropriate.

6. To ensure systems are in place to meet legal obligations, and protect reserve assets, in relation to the following:

- NE SSSI consents (for activities not specified in this plan)
- NE HLS derogations (for activities that do not comply with HLS agreement prescriptions)
- EA environmental permits (Main river, sea defence, associated flood defence structures and flood plain)
- EA abstraction licences & returns
- EA impoundment licences
- EA herbicides authorisations
- EA waste management licence exemptions
- North Kent Marshes Internal Drainage Board consents (for activities in on or around ordinary watercourses)

- European Protected Species licences (great crested newts)
- W&C Act/CRoW Act licences (schedule 1 species, water vole, reptiles)
- Local Authority planning permissions
- Local Authority Hedge Removal Notices
- Forestry Commission felling licences
- Cross-compliance (RSPB, graziers or contractors do not raise issues for any claimant):
 - SMR1
 - SMR2
 - SMR3
 - SMR10
 - GAEC1
 - GAEC2
 - GAEC3
 - GAEC4
 - GAEC5
 - GAEC6
 - GAEC7a
 - GAEC7b
 - GAEC7c
 - GAEC7d
- RPA derogations for activities in, or potentially in breach of, cross compliance obligations
- H&S legislation (risk assessments, COSHH, training & refreshers, quarterly inspections)
- Occupiers Liability Act (trespass)
- Construction (Design & Management) Regulations 2015
- Contract management
- Inspection of site structures (Shornemead Fort, electrical inspections)
- Milton Ranges lease & tenant
- Farm Business Tenancies, annual grazing licences and annual exchanges of information
- Ensure livestock and the public are protected when fields with public rights of way are grazed (Seawall & surroundings and bridleway)
- Notifiable weeds (ragwort, creeping thistle & spear thistle in particular)
- Vertebrate control (American mink and fox)
- Measures to meet funders' grant requirements
- Status of boundaries, rights of way, and bridleway protected

3b. Visitor Objectives

No objectives

4. WORK PROGRAMME

4a.1 Ecological Work Programme and Priorities for the duration of this Plan

1 = essential actions, 2 = important actions, 3 = desirable actions												= planned			= extension to planned period if required		= reactive						
Activity	Objective				Description	Year						Indicative activity period											
	1	2	3	4		2019 -20	2023 -24	2020 -21	2021 -22	2022 -23	2024 -25	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Grazing	✓				Graze Cs 3-7, 9a, 10, 11a-16a, 20-25, 30-32, 37-40 with cattle and sheep from mid-April until June to a stocking density of 0.75 LSU/ha in any one grazing area (set stocking)	1	1	1	1	1	1												
Grazing	✓				Graze Cs 3-7, 9a, 10, 11a-16a, 20-25, 30-32, 37-40 with cattle and sheep from July to mid-April with variable stocking densities (+/-0.75 LSU/ha)	1	1	1	1	1	1												
Grazing	✓				Graze Cs 8, 9b, 11b & P1-P6 with cattle (+/- sheep) biennially for short periods between late summer and autumn. However, grazing in years between the rotational pattern is allowed if it has been a poor grass growth year and fodder is limited elsewhere on site. In this scenario, re-set the rotational pattern	1	1	3	1	3	1												
Grazing	✓	✓	✓	✓	Graziers/Keepers to undertake livestock husbandry as required to ensure compliance with SMR, GAEC and animal welfare regulations	1	1	1	1	1	1												
Grazing	✓	✓	✓	✓	Allow Graziers/Keepers to supplementary feed livestock during winter grazing as required/appropriate with mineral supplements.	3	3	3	3	3	3												
Grazing		✓			Graze Cs 28, 29, 33 & 36 with cattle (+/- sheep) biennially for short periods between late summer and autumn. However, grazing in years between the rotational pattern is allowed if it has been a poor grass growth year and fodder is limited elsewhere on site. In this scenario, re-set the rotational pattern	3	3	1	3	1	3												
Grazing			✓		Graze the reedbed with cattle lightly once during the life of this plan					1													
Grazing				✓	Graze Cs 16b-d, 18, 34 & EA in combination with the Higham Marshes section with ≤45 adult horses on the seawall year-round and +/- ≤45 foals at foot between April and October	1	1	1	1	1	1												
Grazing				✓	Graze Cs 19, 27 & 26 year-round with low densities	1	1	1	1	1	1												
Installing - Water Control Structures	✓	✓	✓	✓	Install new hydrological infrastructure (bunds, pipes, dams, culverts, fixed pump installations) to support the hydrological management operation	1	1	1	1	1	1												
Installing - Livestock Infrastructure	✓	✓	✓	✓	Install new grazing infrastructure (fencing, gates, corral, crossing points etc) as appropriate to support the grazing operation.	1	1	1	1	1	1												
Installing - Livestock Infrastructure				✓	Where feasible, work with EA partners to install a livestock fence(s) to cease the indiscriminate grazing of the saltmarsh by the horses	2	2 (if not resolved in the previous year)	2 (if not resolved in the previous year)	2 (if not resolved in the previous year)	2 (if not resolved in the previous year)	2 (if not resolved in the previous year)												
Installing - Other Infrastructure	✓	✓	✓	✓	Install new vehicle tracks as appropriate to facilitate site operations and ensure SMR & GAEC compliance.	3	3	3	3	3	3												

Installing - Other Infrastructure	✓	✓	✓	✓	Install new site security infrastructure to reduce impacts of trespass, anti-social and criminal activities on site including infrastructure required to limit access to the seawall for off-road motor biking.	1	1	1	1	1	1												
Maintaining Habitat - Other Habitat	✓				Rill & scrape management; maintain control over dense, emergent vegetation where necessary by rotavating	2	2	2	2	2	2												
Maintaining Habitat - Water Levels	✓	✓	✓		Maintain the provision of an abstraction licence with adequate volumes and rates of pumping to support the wetland habitat	1	1	1	1	1	1												
Maintaining Habitat - Water Levels	✓	✓	✓		According to abstraction licence conditions, pump water annually from the external landscape level drainage system into the internal ditch network to maintain controlled water levels and surface flooding throughout the key times of the year. Undertake abstraction via the fixed abstraction pump or via the use of mobile pumps	1	1	1	1	1	1												
Maintaining Habitat - Water Levels	✓	✓	✓		Manipulate and maintain seasonal flooding via use of hydrological infrastructure (pipes & weirs) and fixed or mobile pumps to transfer water around the internal system to provide conditions for target species. In drought years, prioritise surface flooding according to the hydrological unit hierarchy: 1. Unit 1 2. Unit 2 3. Unit 3 4. Unit 4 5. Unit 5	1	1	1	1	1	1												
Maintaining Habitat - Wet Features	✓	✓	✓	✓	Create a whole site rotational ditch management plan: • 7-13 year rotation on key ditches required to be maintained as wet fencing • 10-15 year rotation on non-key ditches to maintain senescing condition for Scarce emerald damselfly etc	1	1 (if not resolved in the previous year)	1 (if not resolved in the previous year)	1 (if not resolved in the previous year)	1 (if not resolved in the previous year)	1 (if not resolved in the previous year)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Maintaining Habitat - Wet Features	✓	✓	✓	✓	Undertake ditch management including re-profiling where necessary to maintain a variety of senescence conditions as well as performing the function of wet fencing. If any ditching works are likely to impact on active water vole burrows, follow the licensing procedures to ensure that no harm is caused	1	1	1	1	1	1												
Maintaining Habitat - Wet Features	✓		✓		Post effective separation of unit 3 from units 1 & 2, pump water from units 1 & 2 into the reedbed to maintain higher water levels until drawdown is required	3	3	3	3	3	3												
Maintaining Habitat - Wet Features			✓		Supplement reedbed bed re-generation operation with appropriate management such as raking & burning of brash if required	3	3	3	3	3	3												
Maintaining Infrastructure - Fencing / Walling	✓				Electric fence; maintain the integrity of the electric fence throughout the year with the fence to be effective at all times.	1	1	1	1	1	1												
Maintaining Infrastructure - Fencing / Walling	✓				Anti-predator barrier fence; maintain the integrity of the fence throughout the year with the fence to be effective at all times.																		
Maintaining Infrastructure - Fencing / Walling	✓				Electric fence; maintain control of the vegetation at the base of the electric fence via cutting to stop the vegetation interrupting the voltage of the fence as required.	1	1	1	1	1	1												
Maintaining Infrastructure -	✓				Anti-predator barrier fence; maintain control of the vegetation at the base of the fence via cutting to ensure that																		

Fencing / Walling					vegetation does not hide issues with nor hamper maintenance of the fence.																			
Maintaining Infrastructure - Fencing / Walling	✓		✓		Electric fence; maintain and repair all power supply infrastructure including the electricity supply and cabling as required	1	1	1	1	1	1													
Maintaining Infrastructure - Other Infrastructure	✓	✓	✓	✓	Maintain and repair (inc. re-install if beyond repair) grazing infrastructure (fencing, gates, crossing points, corral etc) to support the grazing operation	1	1	1	1	1	1													
Maintaining Infrastructure - Other Infrastructure	✓	✓		✓	Maintain presence of archaeological features in so far as is feasible including the craters in Cs 28 & 29	1	1	1	1	1	1													
Maintaining Infrastructure - Other Infrastructure	✓	✓	✓	✓	Maintain existing vehicle tracks to facilitate site operations and ensure SMR, GAEC & Bridleway compliance	1	1	1	1	1	1													
Maintaining Infrastructure - Other Infrastructure				✓	Undertake necessary activities to maintain the condition and the safety of Shornemead Fort as required	1	1	1	1	1	1													
Maintaining Infrastructure - Other Infrastructure	✓	✓	✓	✓	Maintain and repair (inc. re-install if beyond repair) site security infrastructure to reduce impacts of trespass, anti-social and criminal activities on site	1	1	1	1	1	1													
Maintaining Infrastructure - Water Control Structures	✓	✓	✓	✓	Eel management; maintain use of fish-friendly pumping equipment	1	1	1	1	1	1													
Maintaining Infrastructure - Water Control Structures	✓	✓	✓	✓	Eel management; provide eel passage structures as required	1	1	1	1	1	1													
Maintaining Infrastructure - Water Control Structures	✓	✓	✓	✓	Maintain and repair (inc. re-install if beyond repair) existing hydrological infrastructure (bunds, pipes, dams, culverts, fixed pump installations) to support the hydrological management operation	1	1	1	1	1	1													
Monitoring / Surveying - Habitat	✓				Monitor sward heights and flooding monthly during late winter and the breeding season to ensure target conditions are being met	1	1	1	1	1	1													
Monitoring / Surveying - Predators	✓	✓	✓	✓	<i>Ad hoc</i> monitoring for signs of mink and deploying mink rafts as required	2	2	2	2	2	2													
Monitoring / Surveying - Species	✓				Monitor breeding waders annually following the O'Brien and Smith (1992) method of 3 visits, at least one week apart between 15 April and 19 June.	1	1	1	1	1	1													
Monitoring / Surveying - Species	✓				Monitor lapwing and redshank productivity annually according to current RSPB methodology	1	1	1	1	1	1													
Monitoring / Surveying - Species	✓	✓	✓	✓	Monitor all BoCC Amber & Red List breeding bird species annually as part of the 3 breeding wader surveys	1	1	1	1	1	1													
Monitoring / Surveying - Species	✓	✓	✓	✓	Monitor all breeding bird species once during the life of this plan as part of the 3 breeding wader surveys			1	1 (if not resolved in the previous year)	1 (if not resolved in the previous year)														
Monitoring / Surveying - Species	✓	✓	✓	✓	Undertake monthly WeBS counts: • April to June for spring passage	1	1	1	1	1	1													

					- July to October for autumn passage - November to March for wintering																			
Monitoring / Surveying - Species	✓	✓			Survey scarce emerald damselfly at the appropriate times of the year once during the life of this plan		2 (if not resolved in the previous year)	2	2 (if not resolved in the previous year)	2 (if not resolved in the previous year)	2 (if not resolved in the previous year)													
Monitoring / Surveying - Species	✓	✓	✓	✓	Survey bumblebees at the appropriate times of the year twice during the life of this plan		2		2		2													
Monitoring / Surveying - Species	✓	✓	✓	✓	Survey water voles in May and September once during the life of this plan					2														
Monitoring / Surveying - Species	✓	✓	✓	✓	Survey European eel at the appropriate times of the year once during the life of this plan		3		3	3	3													
Monitoring / Surveying - Species	✓				Survey notable plant species at the appropriate times of the year once during the life of this plan	3	3	3	3	3	3													
Monitoring / Surveying - Species		✓			Survey great crested newt at the appropriate times of the year twice during the life of this plan	2	2				2													
Monitoring / Surveying - Species			✓		Allow Constant Effort Site ringing in the reedbed according to RSPB CoP E11, BTO best practice guidelines and by BTO licenced ringers only	3	3	3	3	3	3													
Monitoring / Surveying - Species		✓	✓		<i>Ad hoc</i> moth trapping in the reedbed and scrub areas using light traps	3	3	3	3	3	3													
Monitoring / Surveying - Species	✓	✓	✓	✓	Monitor seawall sward heights and flowering at the appropriate times of the year annually	2	2	2	2	2	2													
Monitoring / Surveying - Species				✓	Survey saltmarsh plants assemblage at the appropriate times of the year once during the life of this plan	3	3	3	3	3	3													
Monitoring / Surveying - Species	✓	✓	✓	✓	Encourage people to record, survey and monitor invertebrates. Allow people to collect or sample invertebrates in accordance with RSPB policy and the Invertebrate Link code of conduct for collecting insects and other invertebrates	3	3	3	3	3	3													
Monitoring / Surveying - Species	✓	✓	✓	✓	Encourage people to record, survey and monitor plants and fungi. Allow people to collect or sample plants and fungi in accordance with RSPB policy and the Wild Mushroom Pickers' Code of Conduct or the BSBI Code of Conduct	3	3	3	3	3	3													
Monitoring / Surveying - Species	✓	✓	✓	✓	Encourage people to record, survey and monitor mammals, herptiles and fish. Allow people to collect or sample plants and fungi in accordance with RSPB policies	3	3	3	3	3	3													
Monitoring / Surveying - Vegetation	✓	✓	✓	✓	<i>Ad hoc</i> monitoring for signs of invasive aquatic plants	2	2	2	2	2	2													
Other Activities - Plan / Project Development	✓				Develop and deliver appropriate projects to enhance the lowland wet grassland as detailed in the table in section 2a.3 according to available funding and appropriate permissions, consents and licences.	3	3	3	3	3	3	Delivery	Delivery					Delivery	Delivery	Delivery	Delivery	Delivery	Delivery	Delivery
Other Activities - Plan / Project Development		✓			Develop and deliver appropriate projects to enhance the scrub and rough grassland mosaic as detailed in the table in section 2a.3 according to available funding and appropriate permissions, consents and licences.	3	3	3	3	3	3	Delivery	Delivery					Delivery	Delivery	Delivery	Delivery	Delivery	Delivery	Delivery
Other Activities - Plan / Project Development			✓		Develop and deliver appropriate projects to enhance the reedbed and rough grassland mosaic as detailed in the	3	3	3	3	3	3	Delivery	Delivery					Delivery	Delivery	Delivery	Delivery	Delivery	Delivery	Delivery

					table in section 2a.3 according to available funding and appropriate permissions, consents and licences.																		
Other Activities - Plan / Project Development				✓	Develop and deliver appropriate projects to enhance the saltmarsh and intertidal mudflats as detailed in the table in section 2a.3 according to feasibility and available funding and appropriate permissions, consents and licences.	3	3	3	3	3	3	Delivery	Delivery					Delivery	Delivery	Delivery	Delivery	Delivery	Delivery
Pesticide Use - Herbicide	✓				Electric fence; maintain control of the vegetation at the base of the electric fence via herbicide applications to stop the vegetation interrupting the voltage of the fence as required.	1	1	1	1	1	1												
Pesticide Use - Herbicide	✓	✓			Anti-predator barrier fence; maintain control of the vegetation at the base of the fence via herbicide applications to ensure that vegetation does not hide issues with nor hamper maintenance of the fence.																		
Pesticide Use - Herbicide	✓	✓	✓	✓	Maintain control over undesirable and notifiable weed species by herbicide applications	1	1	1	1	1	1					Heavy Thistle infestation spot spraying							
Pesticide Use - Herbicide	✓				Rill & scrape management; maintain control over dense, emergent vegetation where necessary by herbicide applications	2	2	2	2	2	2												
Pesticide Use - Insecticide	✓	✓	✓	✓	No or minimum use of insecticides within livestock whilst livestock are on site	3	3	3	3	3	3												
Vegetation Control - Mowing				✓	Work with EA partners to limit their mowing of the seawall to outside the flowering season (May to September)	1	1	1	1	1	1												
Vegetation Control - Pulling / Hand Collection	✓	✓	✓	✓	Maintain control over undesirable and notifiable weed species by hand-pulling	1	1	1	1	1	1												
Vegetation Control - Scrub	✓	✓	✓	✓	Maintain control over regenerating scrub (including bramble) as required and according to targets. Burn brash if required	1	1	1	1	1	1												
Vegetation Control - Scrub		✓			Cut a relevant percentage of the scrub stands in Cs 28, 29, 33 & 36 on a rotation of one-fifth every 3 years. Burn brash if required	3	3	3	1	3	3												
Vegetation Control - Scrub		✓			Cut shading scrub around the crater-ponds in Cs 28 & 29 annually or as required. Burn brash if required	3	3	3	2	3	3												
Vegetation Control - Scrub	✓			✓	Remove scrub (including bramble) either side of the track in C34 between Cs 24 & 32. Dispose of excess and unsuitable brash by dead hedging or appropriate burning	1	3	2	3	3	3												
Vegetation Control - Strimming / Brush Cutting	✓	✓	✓	✓	Maintain control over undesirable and notifiable weed species by cutting	1	1	1	1	1	1												
Vegetation Control - Strimming / Brush Cutting	✓				Rill & scrape management; maintain control over dense, emergent vegetation where necessary by cutting	2	2	2	2	2	2												
Vegetation Control - Strimming / Brush Cutting		✓	✓		Cut bramble in Cs 2, 28, 29, 33 & 36 as required to maintain ≤10% cover	3	3	3	3	3	3												
Vegetation Control - Topping	✓				Undertake topping across all relevant fields post breeding season	1	1	1	1	1	1												
Vegetation Control - Topping	✓	✓	✓	✓	Maintain control over undesirable and notifiable weed species by topping	1	1	1	1	1	1												
Vegetation Control - Topping	✓				Rill & scrape management; maintain control over dense, emergent vegetation where necessary by topping	1	1	1	1	1	1												

Vertebrate Control	✓	✓	✓		Undertake fox control (primarily by shooting) according to RSPB policies and Codes of Practice on vertebrate control between 1st January to 31st March and then 1st April to 31st May on approval from RSPB RSAG. Deploy high seats and stink pits where necessary to maximise the efficiency of the operation	1	1	1	1	1	1												
Vertebrate Control	✓	✓			Undertake corvid control (primarily by primarily by trapping) according to RSPB policies and Codes of Practice on vertebrate control between 1 st March to 30 th June on approval from RSPB RSAG.	1	1	1	1	1	1												
Vertebrate Control	✓	✓	✓	✓	Maintain vigilance for the presence of mink using mink rafts and undertake control (trapping & shooting) according to RSPB policies and Codes of Practice on vertebrate control if presence is confirmed	1	1	1	1	1	1	Monitor & control	Monitor & control	Monitor & control	Monitor only	Monitor only	Monitor only	Monitor only	Monitor & control	Monitor & control	Monitor & control	Monitor & control	Monitor & control

4a.2. Grazing plan: Indicative stocking densities during the breeding season for objective 1

Cows and calves at foot								LSU totals			
Grazing Block	Compartment Number	Hectares	Target	Average LSU/Block	Adult Cattle (0.75)	Calves (0.3)	Stores (0.54)	Adult Cattle	Calves	Stores	Total /area
Block 1	3	8.49	0.75	0.72	12	12	0	9.00	3.60	0.00	12.60
	7	2.82									
	9a	1.45									
	10	2.86									
	11a	1.92									
Block 2	4	4.67	0.75	0.79	9	9	0	6.75	2.70	0.00	9.45
	5	1.53									
	6	5.82									
Block 3	12a	1.33	0.75	0.77	17	17	0	12.75	5.10	0.00	17.85
	12b	1.04									
	12c	0.06									
	13	11.89									
	15	0.52									
	16a	0.61									
	20	2.33									
	21	2.62									
Block 4	22	2.93	0.75	0.73	13	13	0	9.75	3.90	0.00	13.65
	14	6.76									
	23	6.04									
	24	3.94									
Block 5	25	2.02	0.75	0.77	12	12	0	9.00	3.60	0.00	12.60
	30	6.91									
	31	6.53									
Block 6	32	2.95	0.75	0.75	9	9	0	6.75	2.70	0.00	9.45
	37	2.21									
	38	3.00									
	39	3.33									
Totals	40	4.13									
		100.71		0.75	72	72	0	54.00	21.60	0.00	75.60

Or

Cows and calves at foot + stores							
Grazing Block	Compartment Number	Hectares	Target	Average LSU/Block	Adult Cattle (0.75)	Calves (0.3)	Stores (0.54)
Block 1	3	8.49	0.75	0.72	12	12	0
	7	2.82					
	9a	1.45					
	10	2.86					
	11a	1.92					
Block 2	4	4.67	0.75	0.79	9	9	0
	5	1.53					
	6	5.82					
Block 3	12a	1.33	0.75	0.77	17	17	0
	12b	1.04					
	12c	0.06					
	13	11.89					
	15	0.52					
	16a	0.61					
	20	2.33					
	21	2.62					
	22	2.93					
Block 4	14	6.76	0.75	0.73	13	13	0
	23	6.04					
	24	3.94					
	25	2.02					
Block 5	30	6.91	0.75	0.76	0	0	23
	31	6.53					
	32	2.95					
Block 6	37	2.21	0.75	0.77	0	0	18
	38	3.00					
	39	3.33					
	40	4.13					
Totals		100.71		0.75	51	51	41

LSU totals			
Adult Cattle	Calves	Stores	Total /area
9.00	3.60	0.00	12.60
6.75	2.70	0.00	9.45
12.75	5.10	0.00	17.85
9.75	3.90	0.00	13.65
0.00	0.00	12.42	12.42
0.00	0.00	9.72	9.72
38.25	15.30	22.14	75.69

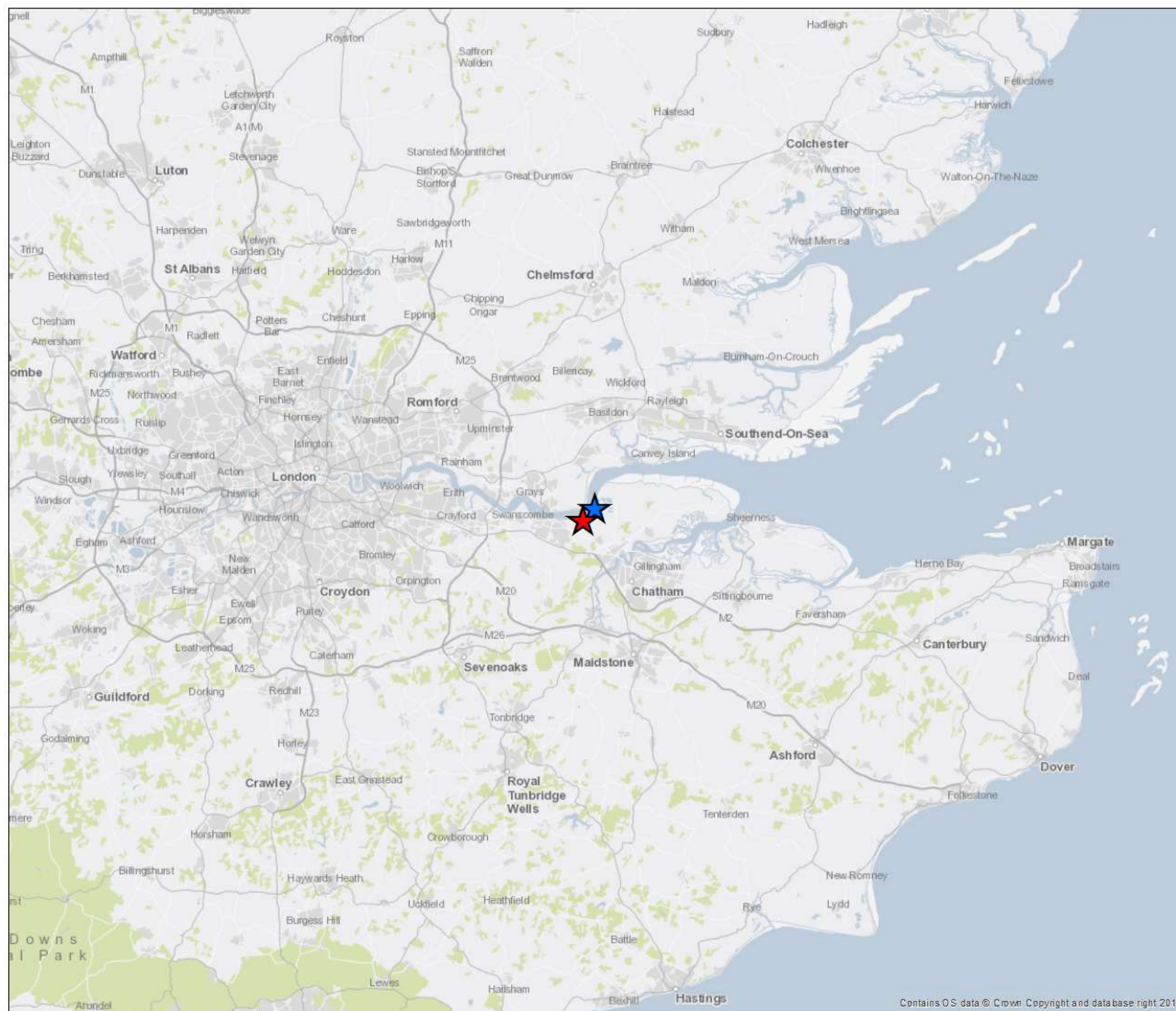
4b.1. Visitor Work Programme for the duration of this Plan

No objectives

4.b.2. Visitor Projects Identified

No objectives

5. MAPS

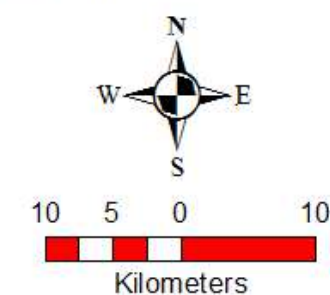


RSPB Shome Marshes & Higham Bight, Kent

Map 1a: Location of the reserves

-  Shome Marshes central grid ref; TQ68807420
-  Higham Bight central grid ref; TQ70507580

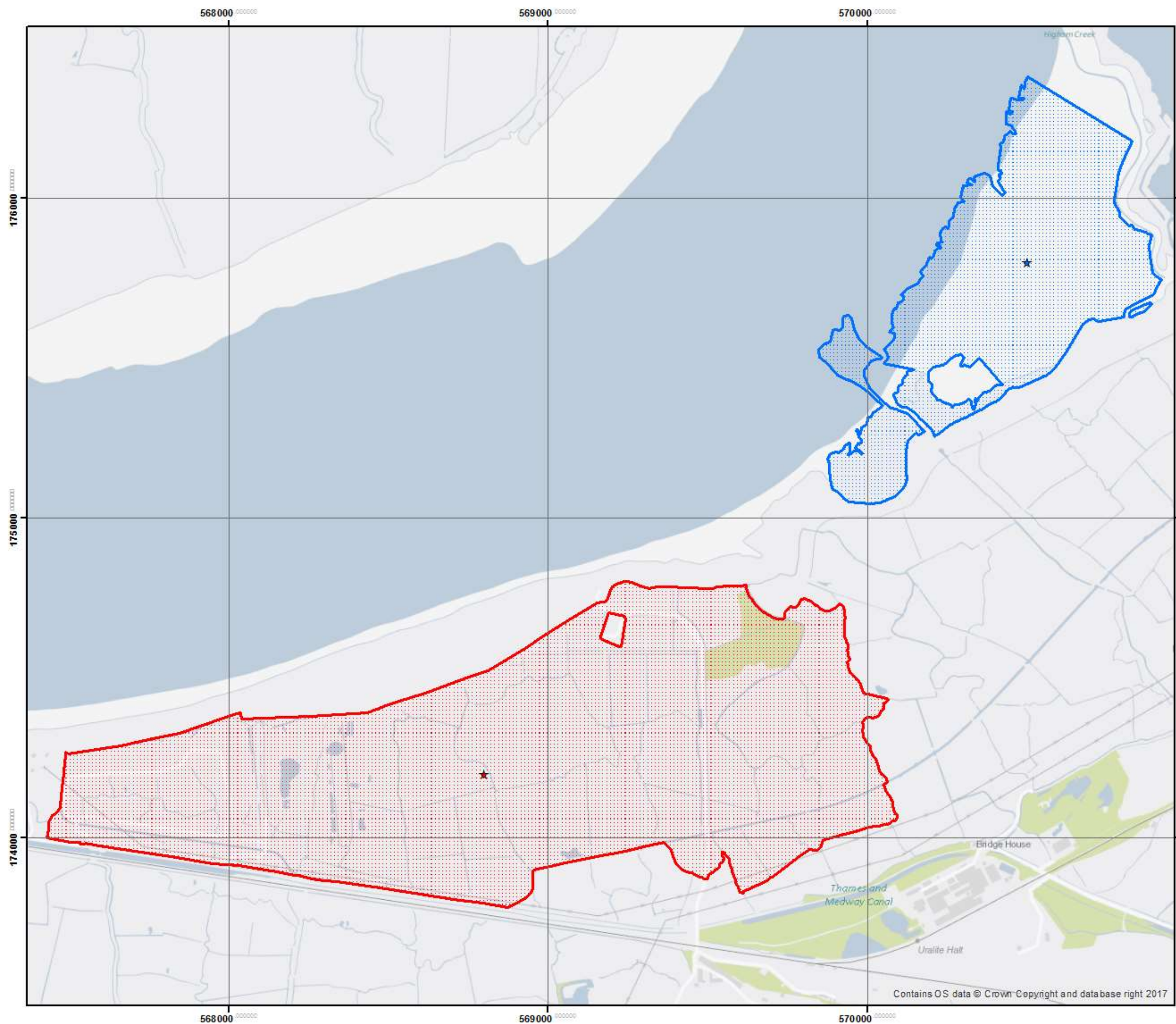
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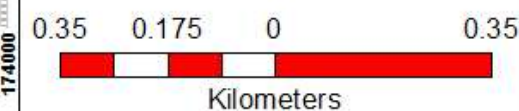


RSPB Shorne Marshes & Higham Bight, Kent

Map 1b: Reserves boundaries

- ★ Shorne Marshes central grid ref; TQ68807420
- Shorne Marshes site boundary
- ★ Higham Bight central grid ref; TQ70507580
- Higham Bight site boundary

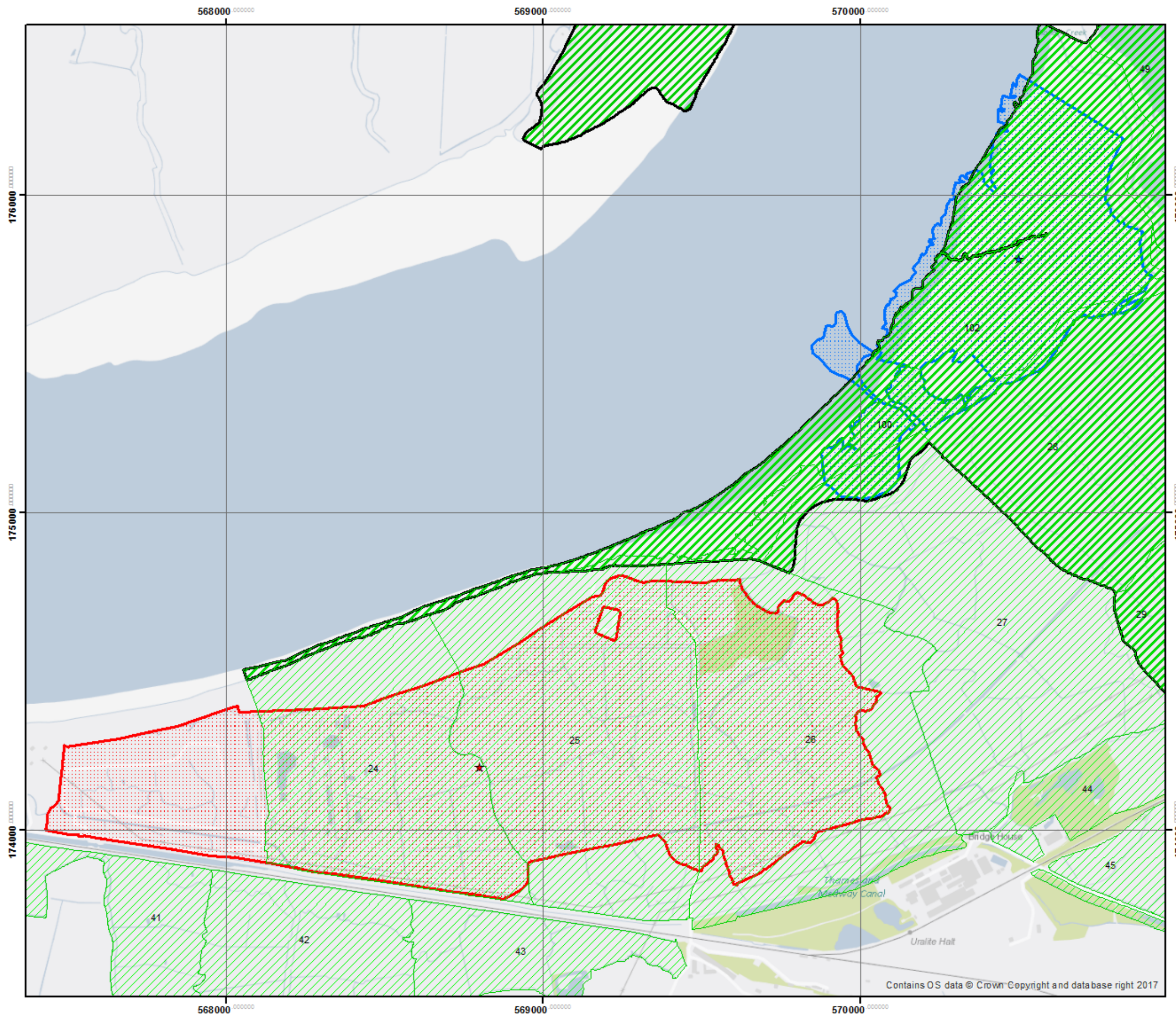
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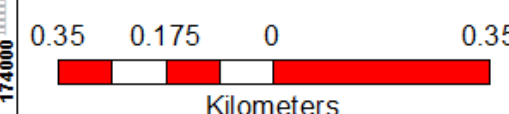


RSPB Shorne Marshes & Higham Bight, Kent

Map 2: Statutory, planning and other designations

- South Thames Estuary and Marshes SSSI (Units)
- Thames Estuary and Marshes SPA, Ramsar & IBA
- Shorne Marshes central grid ref, TQ68807420
- Shorne Marshes site boundary
- Higham Bight central grid ref, TQ70507580
- Higham Bight site boundary

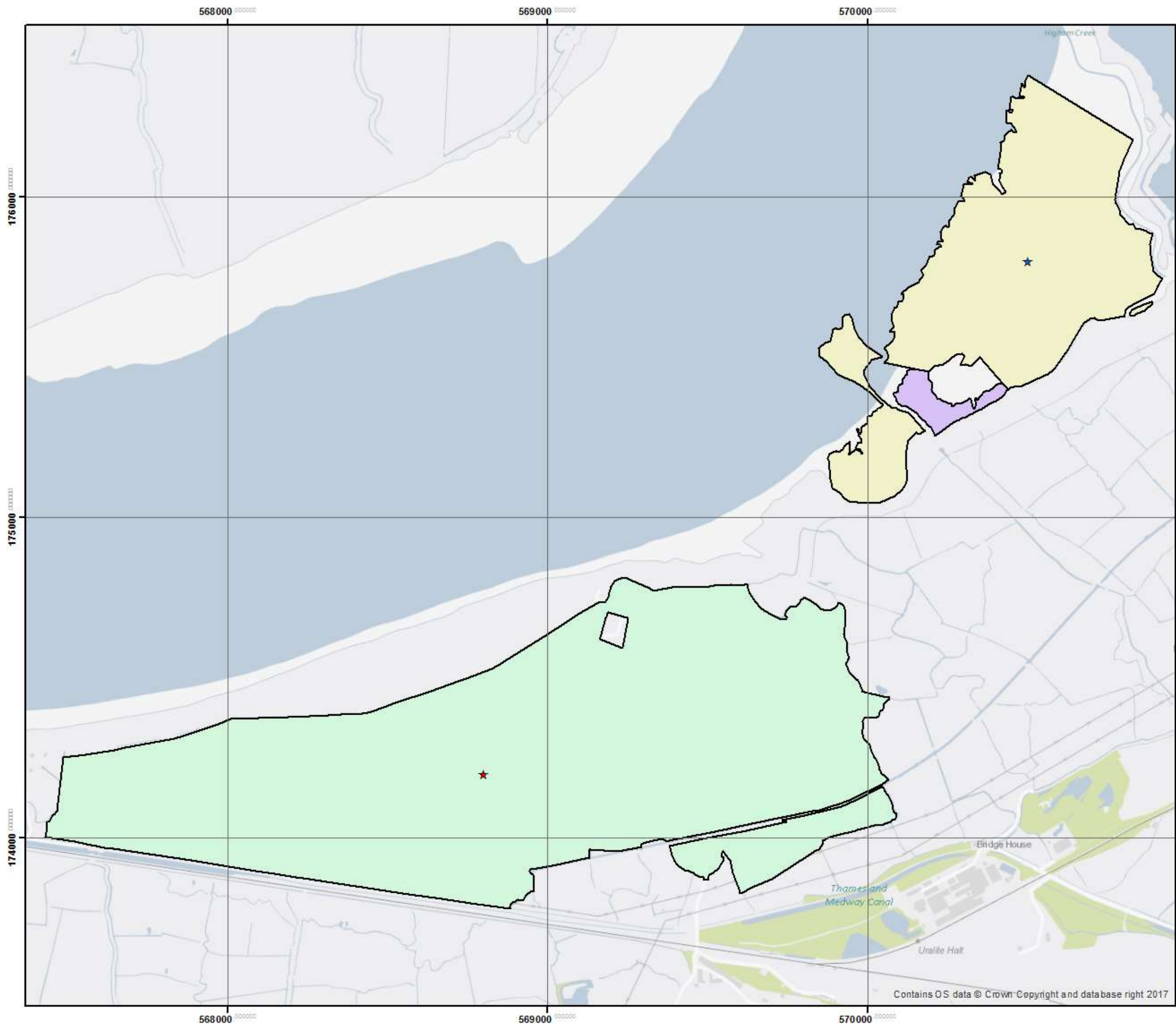
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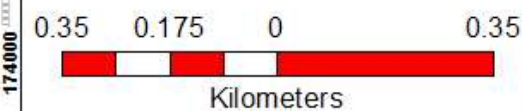


RSPB Shorne Marshes & Higham Bight, Kent

Map 3: Land/rights held by RSPB

- ★ Shorne Marshes central grid ref, TQ68807420
- ★ Higham Bight central grid ref, TQ70507580
- Shorne Marshes Deeds 1
- Shorne Marshes Deeds 21
- Shorne Marshes Deeds 23

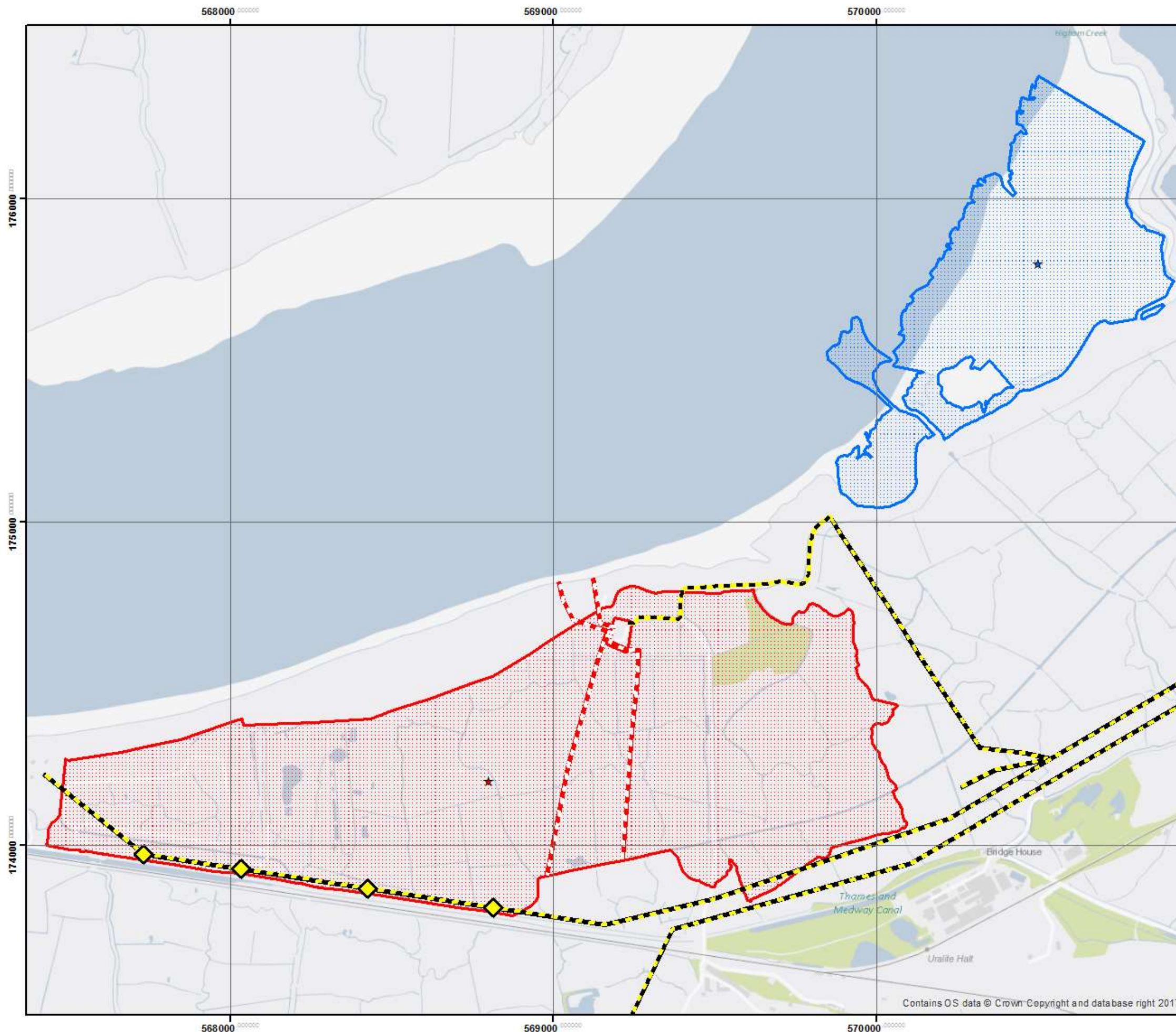
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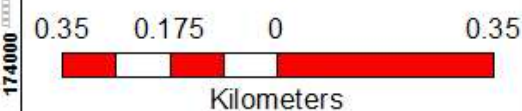


RSPB Shorne Marshes & Higham Bight, Kent

Map 5: Wayleaves and easements

-  Overhead High Voltage pylon
-  Overhead High Voltage cables
-  Underground High Pressure gas pipelines
-  Underground electricity cable
-  Shorne Marshes central grid ref; TQ68807420
-  Shorne Marshes site boundary
-  Higham Bight central grid ref; TQ70507580
-  Higham Bight site boundary

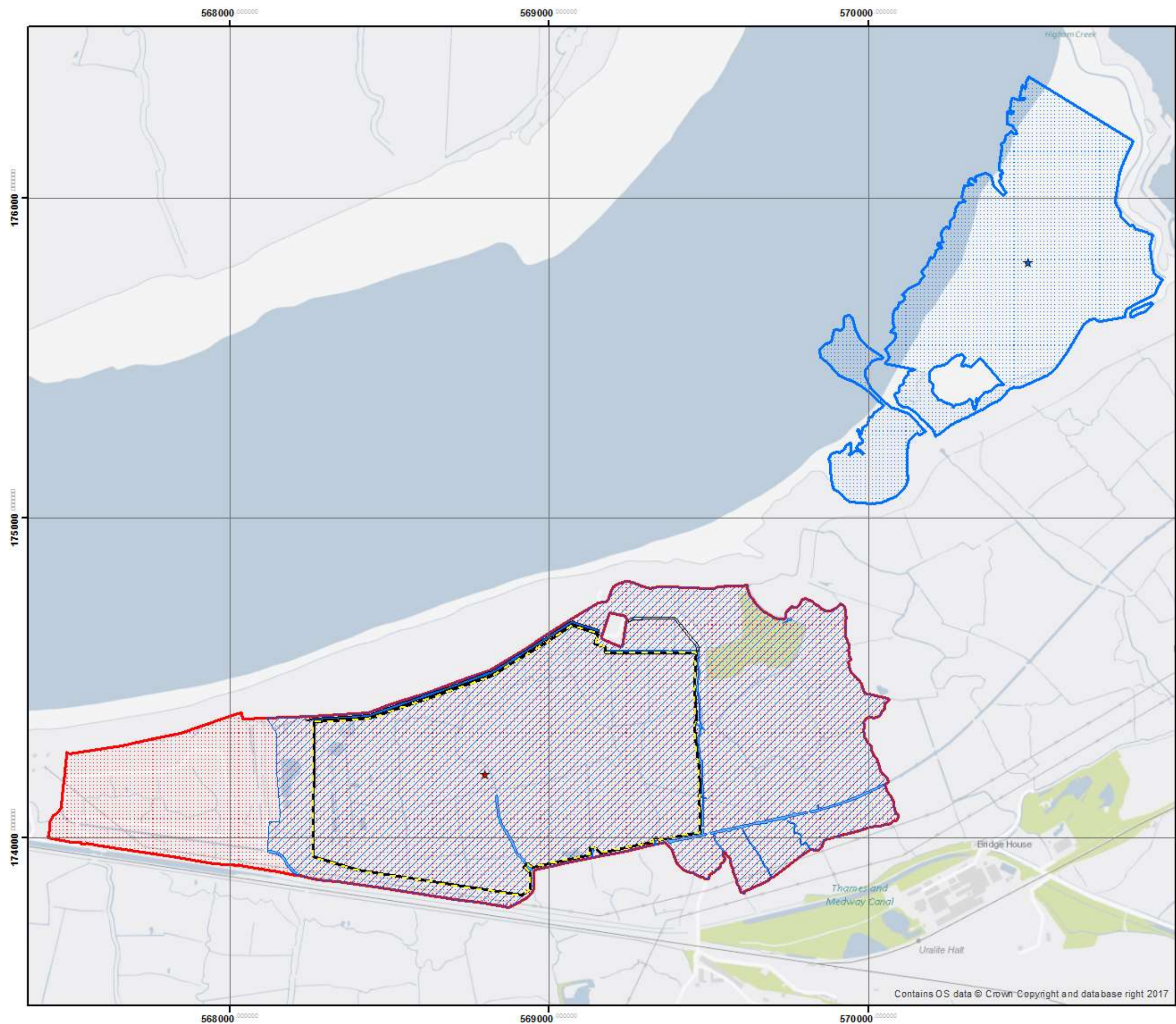
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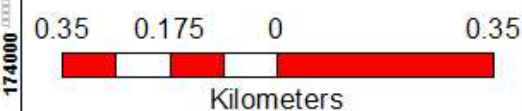
RSPB Shorne Marshes & Higham Bight, Kent

Map 6:

Planning permissions, statutory consents and statutory licences

- Anti-predator electric fence & associated hydrological structures - SSSI Consent + EA Flood Defence Consent
- Security Ditch A - Gravesham Planning Permission + SSSI Consent (via HLS) + EA Seawall Consent
- Security Ditch B - Gravesham Planning Permission + SSSI Consent (via HLS) + EA Seawall Consent
- EA licensed abstraction area
- Landscape drainage level ditches where abstraction can take place anywhere along the length of each ditch
- Shorne Marshes central grid ref, TQ68807420
- Shorne Marshes site boundary - SSSI Consents for various management plans + EA Waste Exemptions
- Higham Bight central grid ref, TQ70507580
- Higham Bight site boundary - SSSI Consents for various management plans

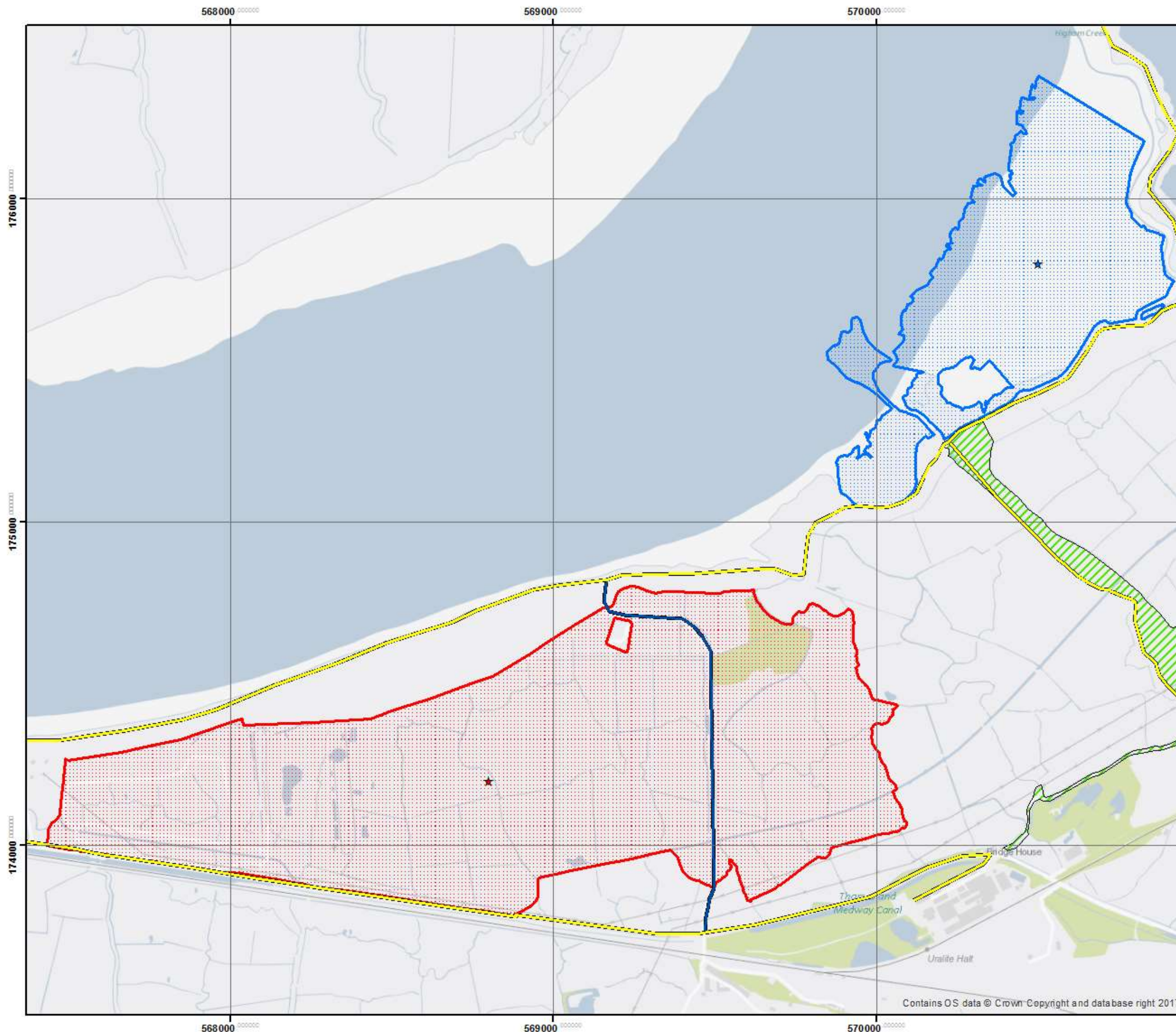
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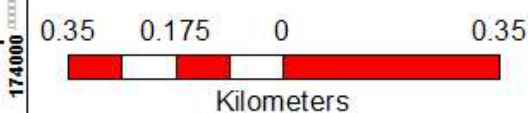


RSPB Shorne Marshes & Higham Bight, Kent

Map 7: Public access

- Public Right of Way
- Bridleway
- CROW Access Land Registered Common
- Shorne Marshes central grid ref. TQ68807420
- Shorne Marshes site boundary
- Higham Bight central grid ref. TQ70507580
- Higham Bight site boundary

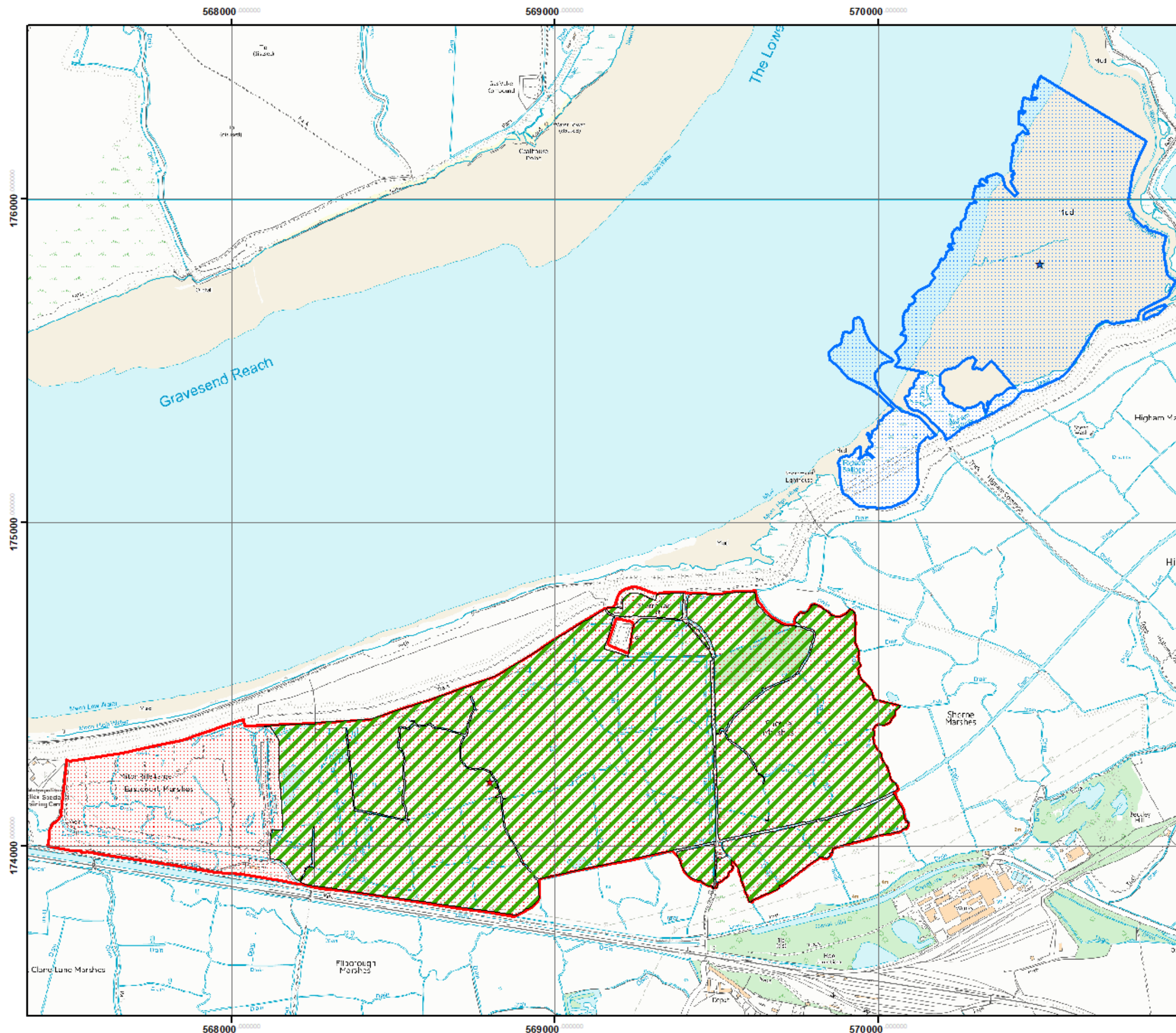
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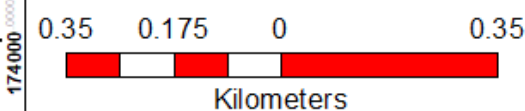


RSPB Shorne Marshes & Higham Bight, Kent

Map 8: Revenue grants schemes and area-based subsidies

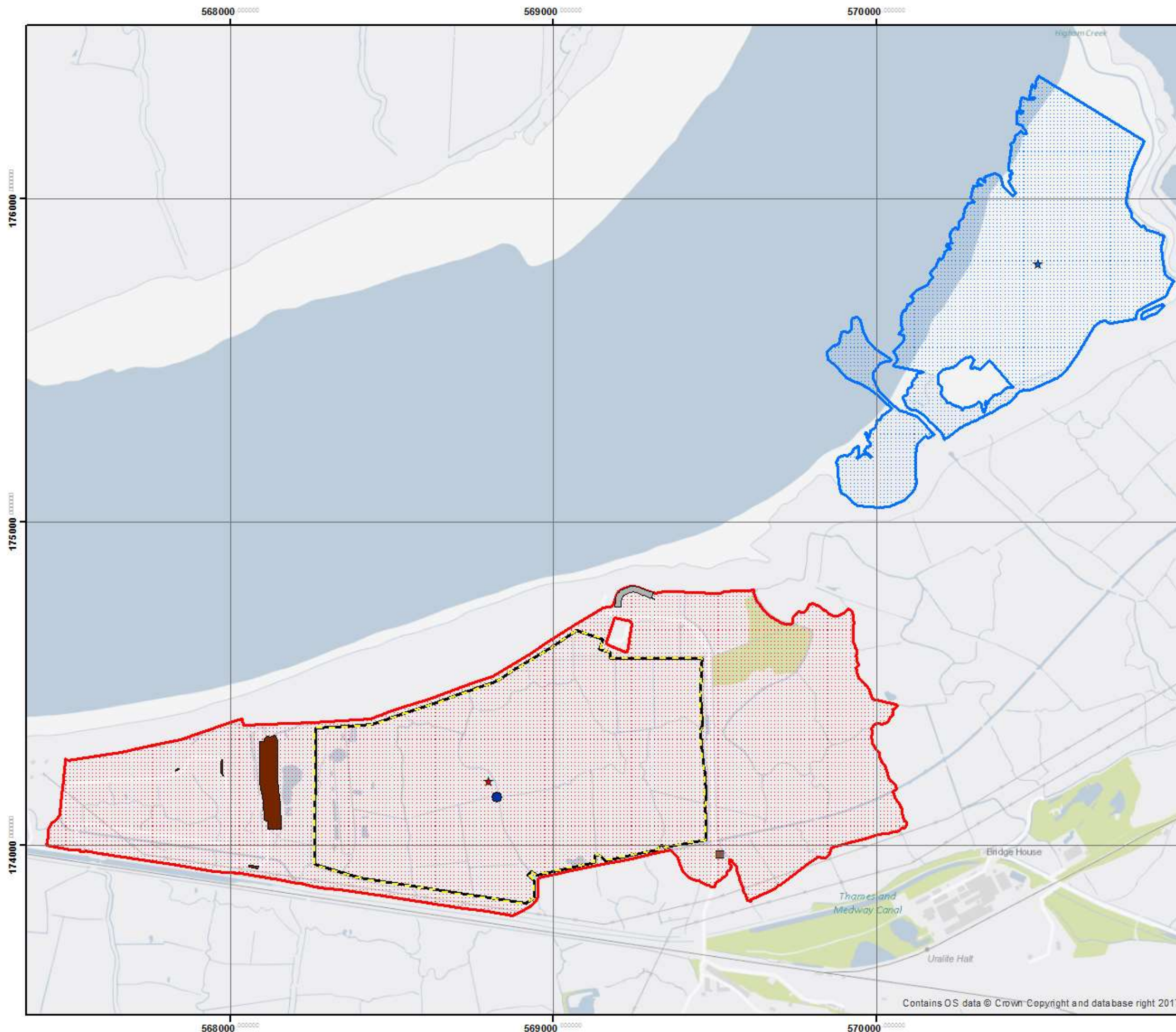
-  Countryside Stewardship
01/01/2021 to 31/12/2025
-  Shorne Marshes central grid
ref, TQ68807420
-  Shorne Marshes site boundary
-  Higham Bight central grid ref,
TQ70507580
-  Higham Bight site boundary

Date: 29/01/2024



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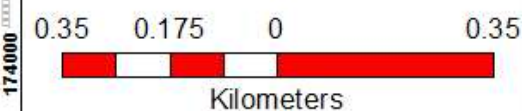


RSPB Shorne Marshes & Higham Bight, Kent

Map 9: Main fixed assets

- Shornemead Fort
- Anti-predator electric fence
- Milton Range buildings and butts
- Abstraction pump station
- Corral
- Shorne Marshes central grid ref, TQ68807420
- Shorne Marshes site boundary
- Higham Bight central grid ref, TQ70507580
- Higham Bight site boundary

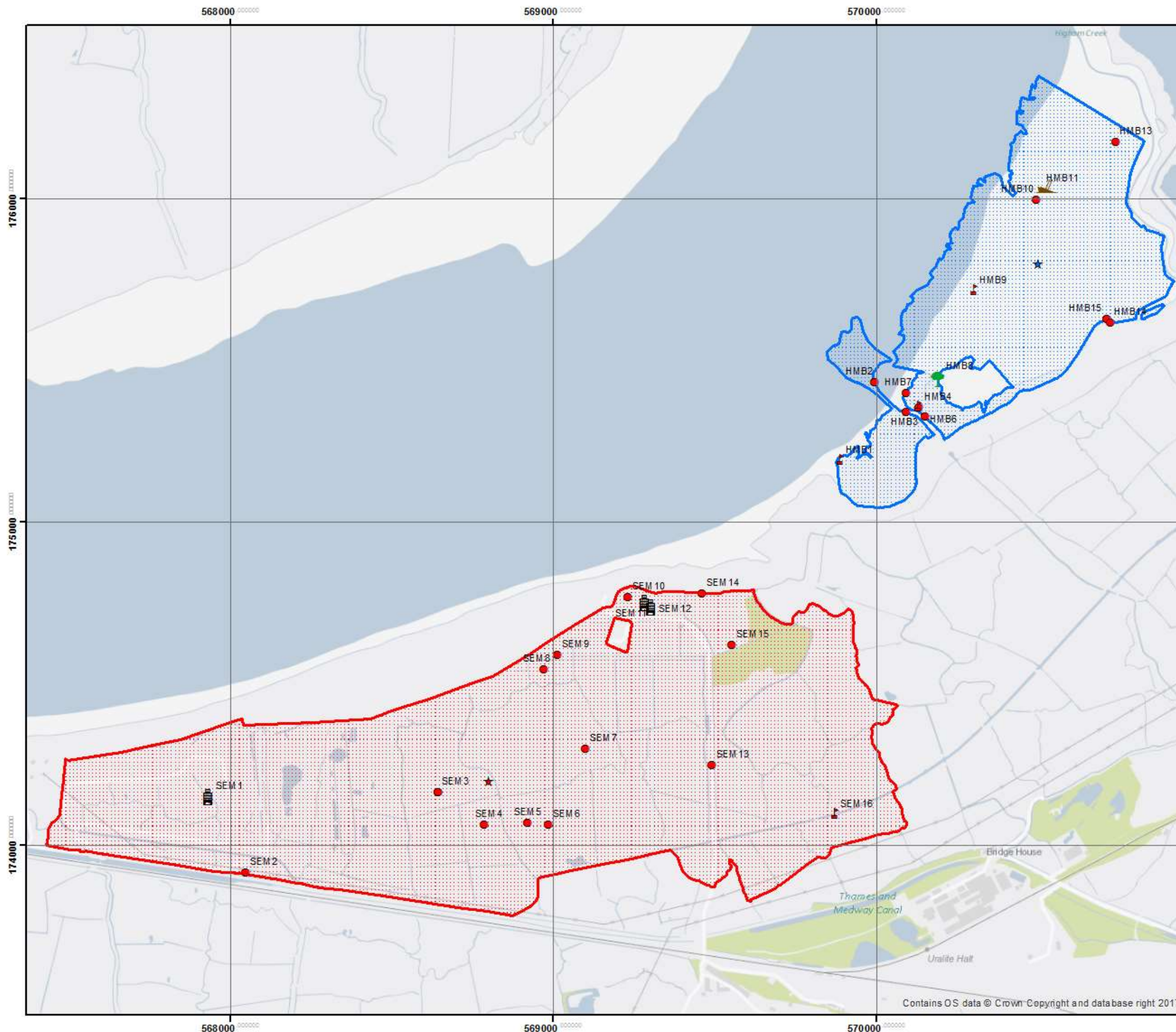
Date: 14/08/2017



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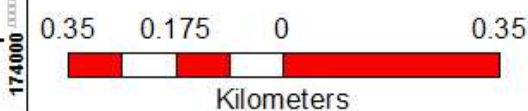


RSPB Shorne Marshes & Higham Bight, Kent

Map 9b: Archaeological and historic assets

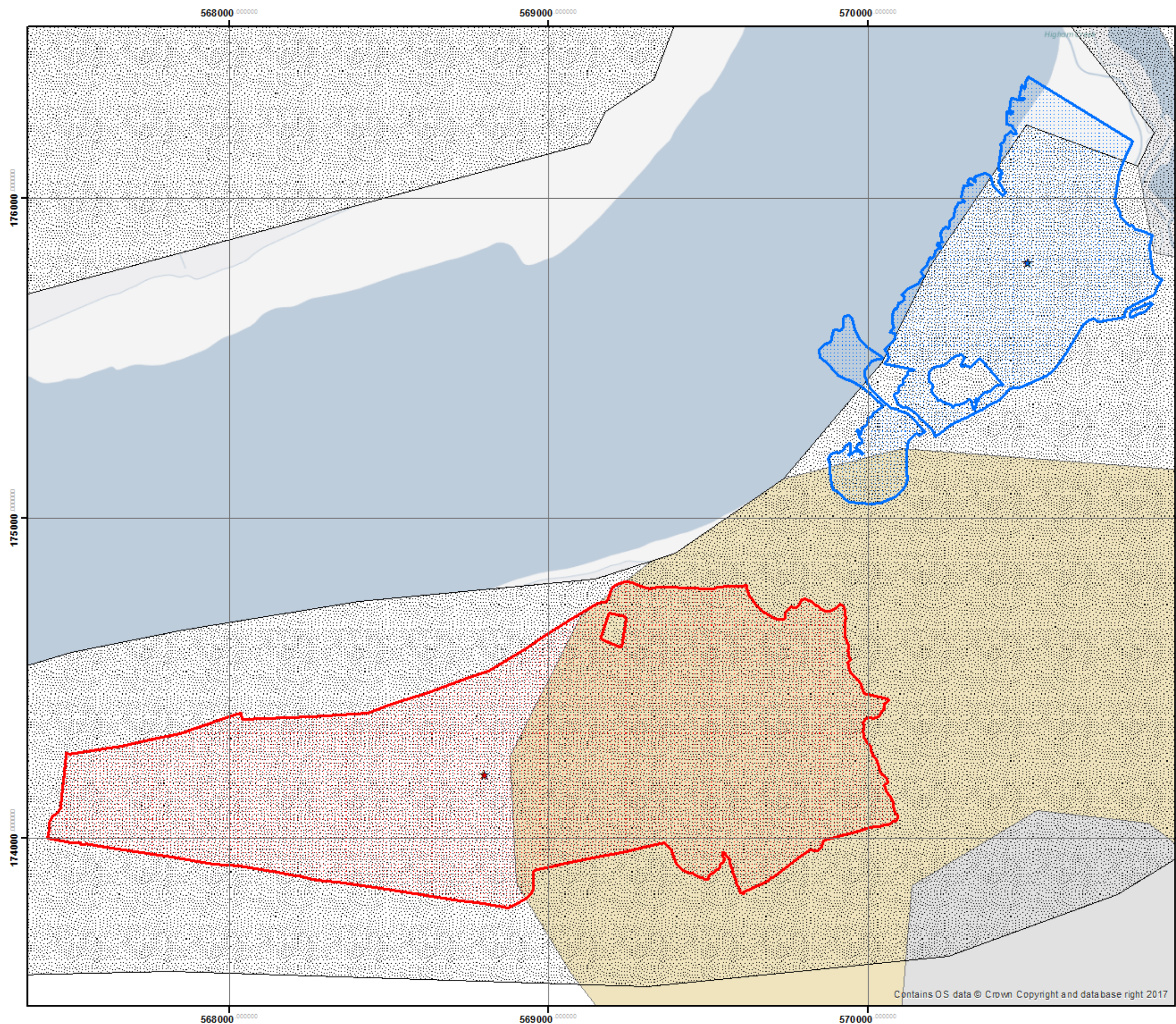
- Wreck
- Landscape
- Findspot
- Monument (Site)
- Building
- Shorne Marshes central grid ref, TQ68807420
- Shorne Marshes site boundary
- Higham Bight central grid ref, TQ70507580
- Higham Bight site boundary

Date: 14/08/2017



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RSPB Shome Marshes & Higham Bight, Kent

Map 10: Geology and soils

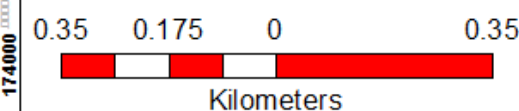
Superficial geology (soils)

- Sand and Gravel
- Clay, Silt and Sand

Bedrock geology

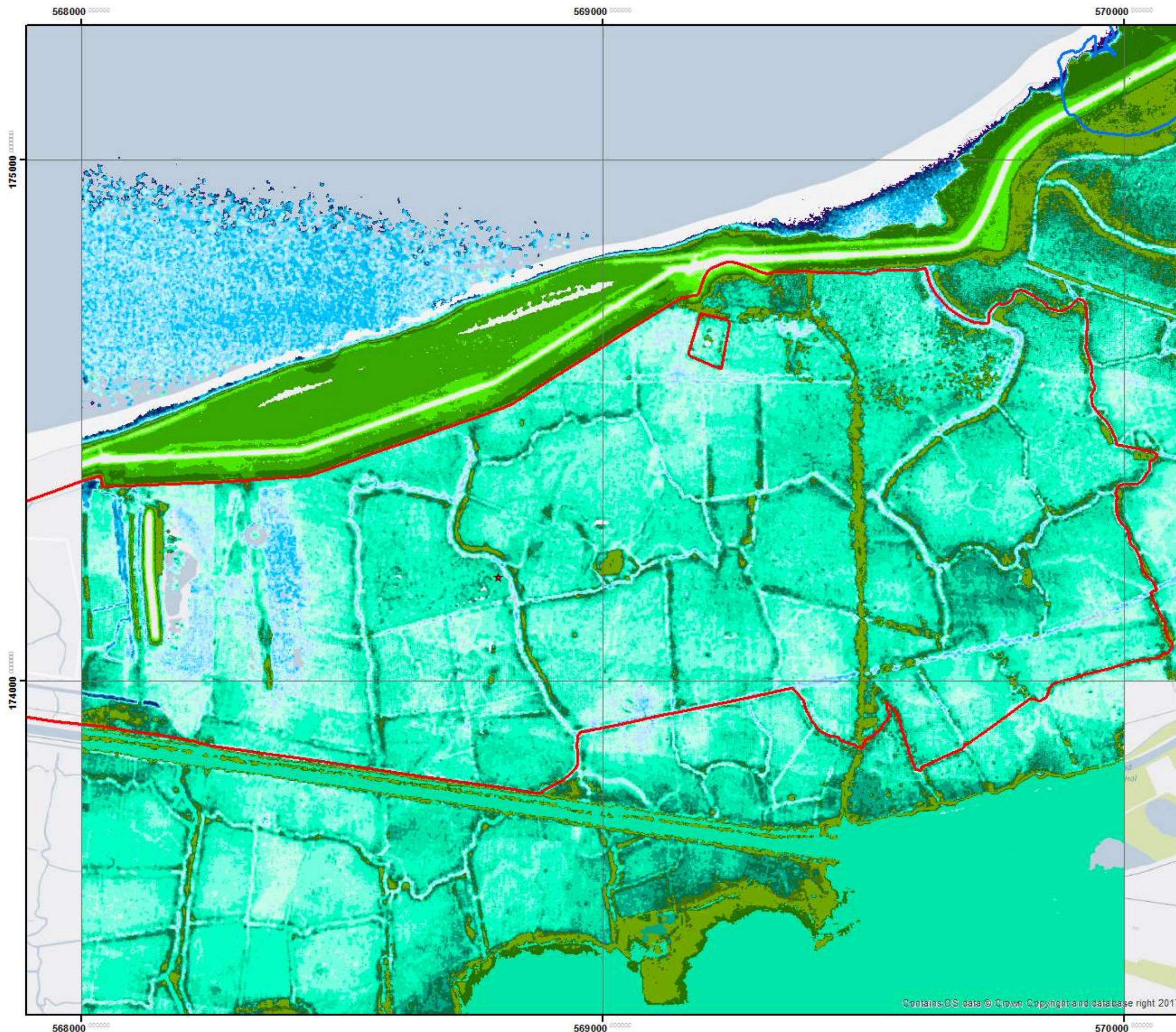
- Chalk including Red Chalk
- Oldhaven, Blackheath, Woolwich and Reading and Thanet beds
- London Clay
- Shome Marshes central grid ref; TQ68807420
- Shome Marshes site boundary
- Higham Bight central grid ref; TQ70507580
- Higham Bight site boundary

Date: 14/08/2017



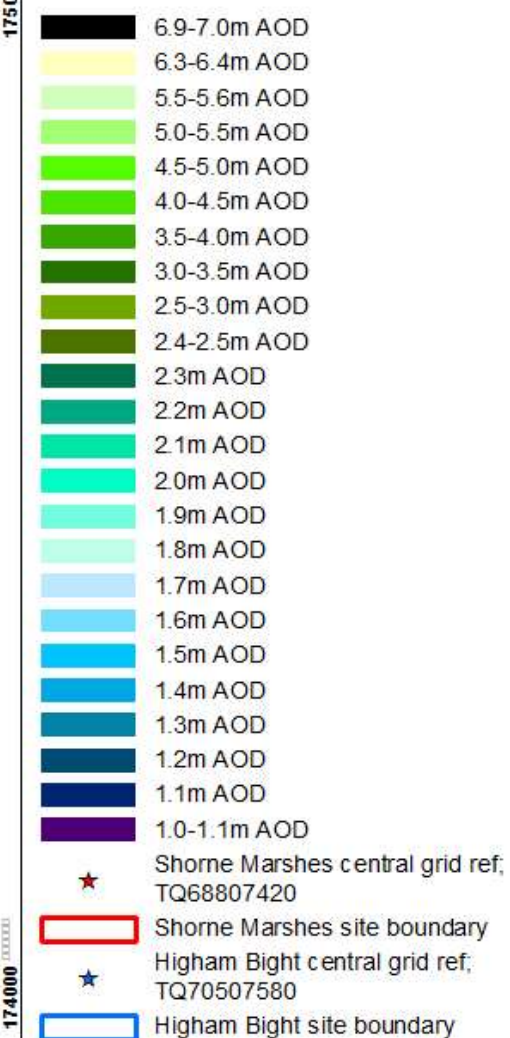
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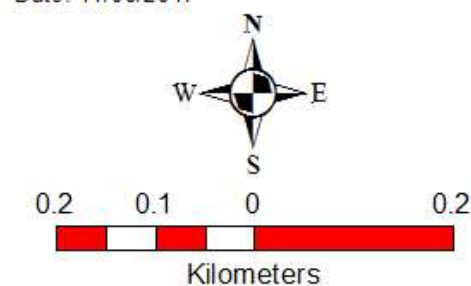


RSPB Shorne Marshes & Higham Bight, Kent

Map 10b: Topography (LiDAR) for Shorne Marshes



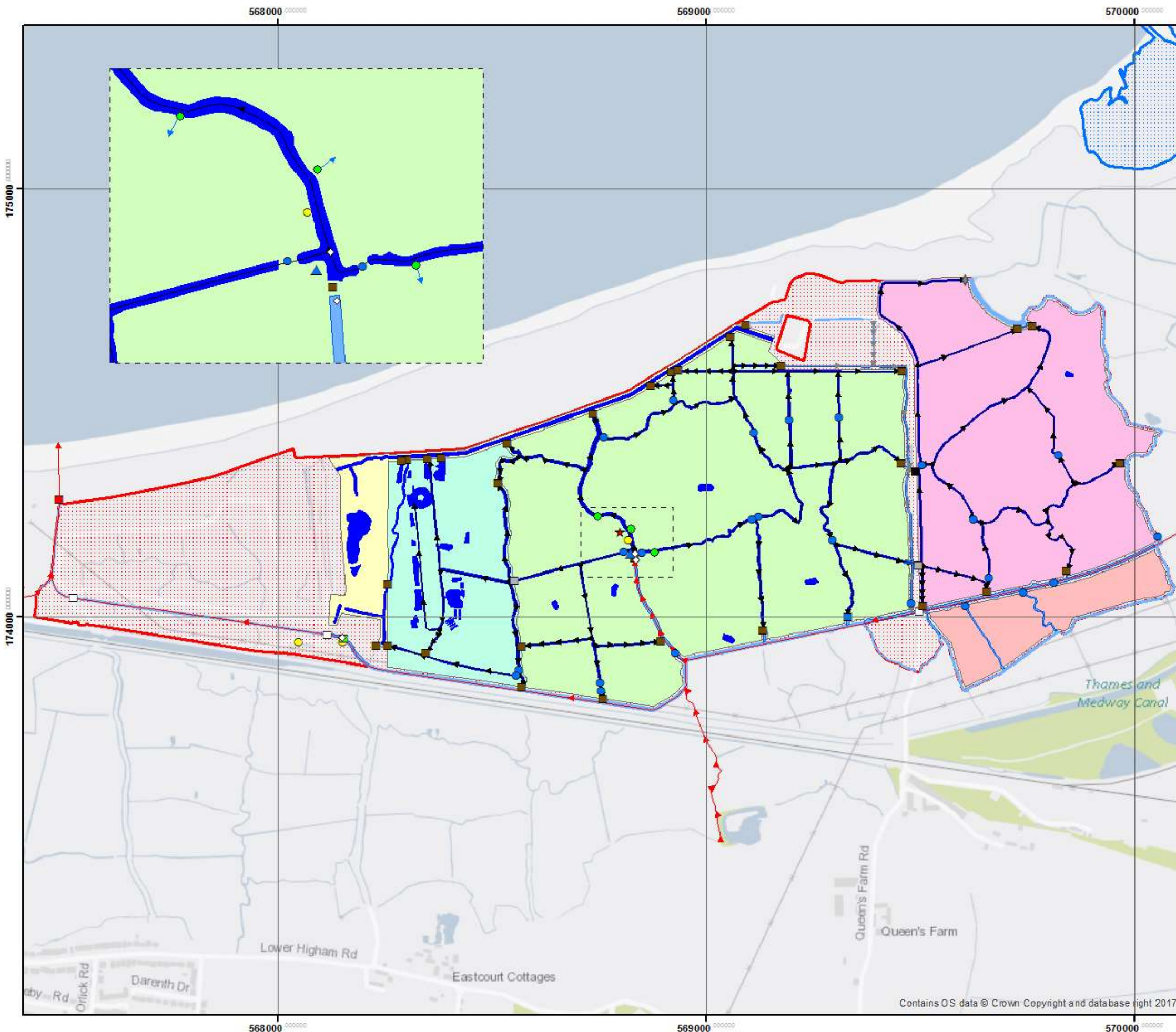
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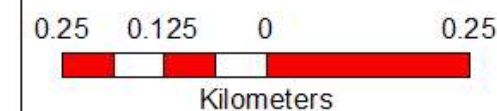


RSPB Shorne Marshes & Higham Bight, Kent

Map 11: Hydrology

- ◇ Gauge board
- Tidal sluice (flap)
- ▲ Main pumping station
- Milton Stop Weir (EA controlled)
- Electric pumping point
- ◆ Sheet piling dam
- Culvert with control
- Open culvert
- Earth dam
- In-field pipe with 'elbow' control
- Concrete sluice/weir
- Redundant concrete sluice/weir
- Clear-span bridge
- Flow direction (Internal network)
- Flow direction (Gas compound drainage)
- Flow direction (Main River network)
- Above-ground pipe linking hydrological units 1 & 4
- Landscape drainage level ditches
- Ditches where abstraction can take place anywhere along the length of each ditch according to licence conditions
- High level (internal) ditches
- Hydrological unit 1
- Hydrological unit 2
- Hydrological unit 3
- Hydrological unit 4
- Hydrological unit 5 (potential)
- ★ Shorne Marshes central grid ref; TQ68807420
- ★ Shorne Marshes site boundary
- ★ Higham Bight central grid ref; TQ70507580
- ★ Higham Bight site boundary

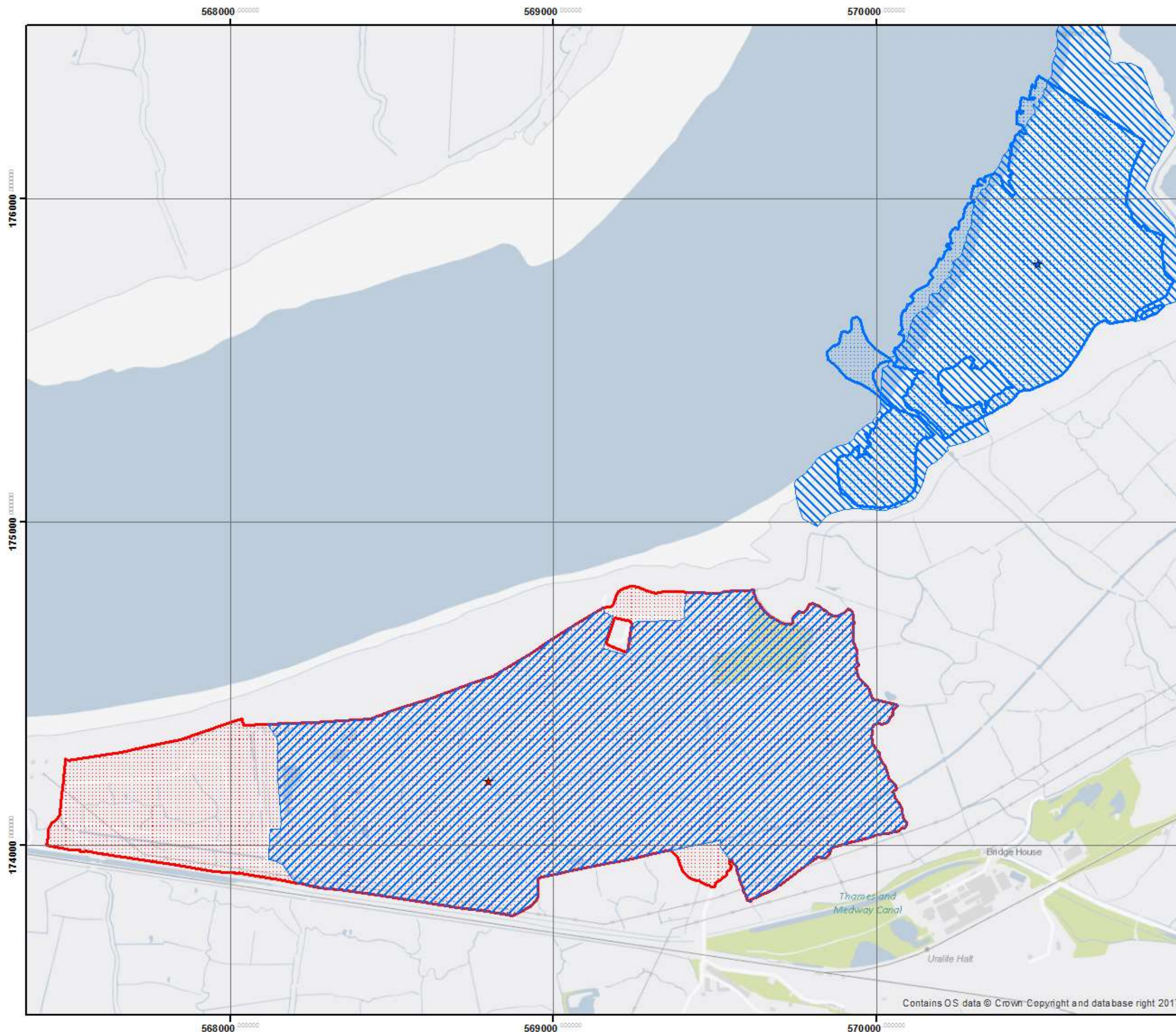
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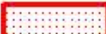


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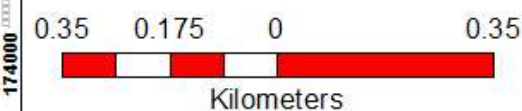


RSPB Shorne Marshes & Higham Bight, Kent

Map 12a: Reserve recording areas

-  Shorne Marshes reserve recording area
-  Higham Bight reserve recording area
-  Shorne Marshes central grid ref, TQ68807420
-  Shorne Marshes site boundary
-  Higham Bight central grid ref, TQ70507580
-  Higham Bight site boundary

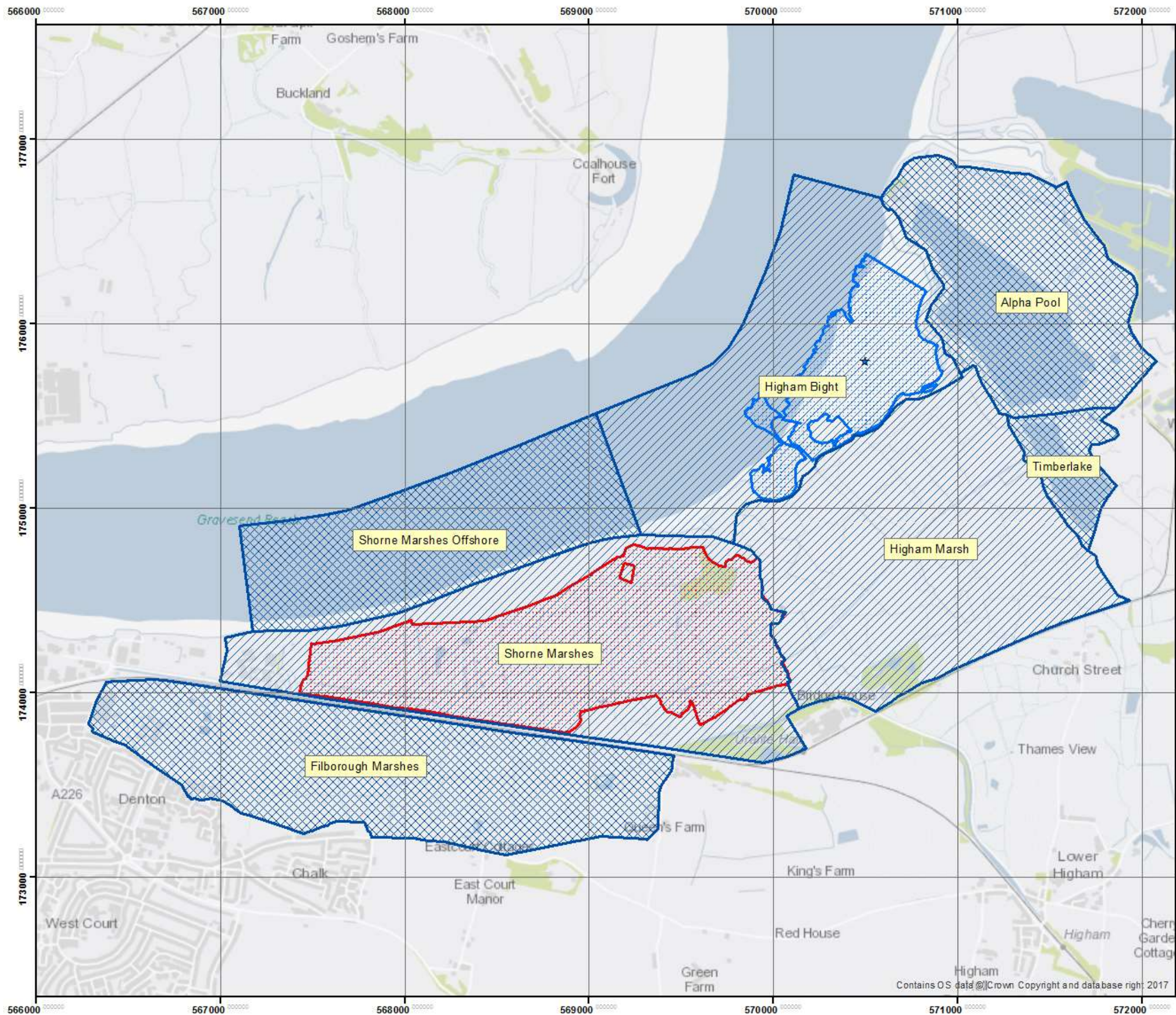
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RSPB Shorne Marshes & Higham Bight, Kent

Map 12b: WeBS sectors

-  WeBS sectors monitored by RSPB
-  WeBS sectors not monitored by RSPB
-  Shorne Marshes central grid ref. TQ68807420
-  Shorne Marshes site boundary
-  Higham Bight central grid ref. TQ70507580
-  Higham Bight site boundary

Date: 14/08/2017

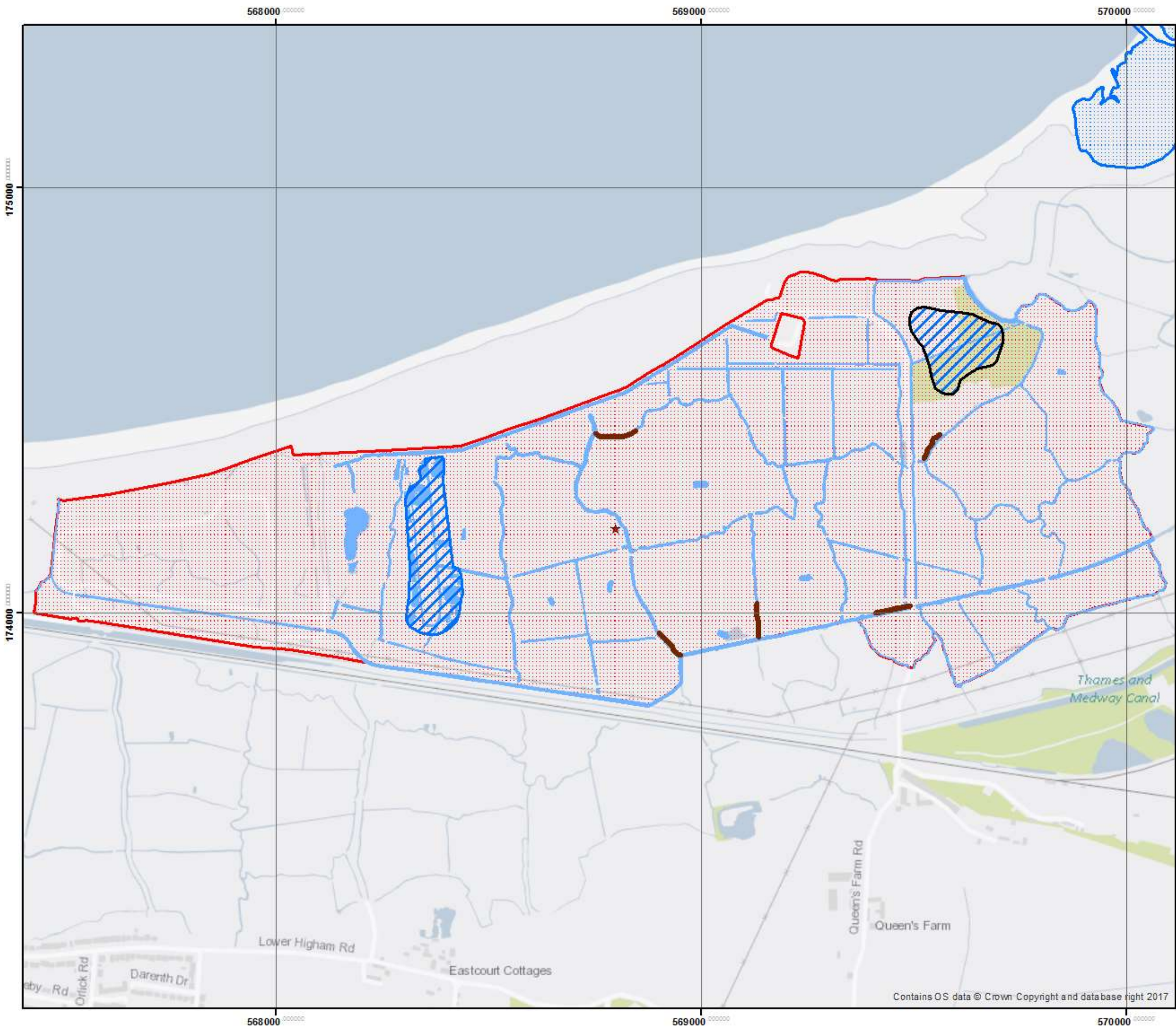


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Kilometers

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RSPB Shorne Marshes & Higham Bight, Kent

Map 12f: Other recording areas

- Water vole transects
- Lestes dryas recording area
- Great crested newt & Lestes dryas recording area
- Ditch network
- Shorne Marshes central grid ref. TQ68807420
- Shorne Marshes site boundary
- Higham Bight central grid ref. TQ70507580
- Higham Bight site boundary

Date: 14/08/2017

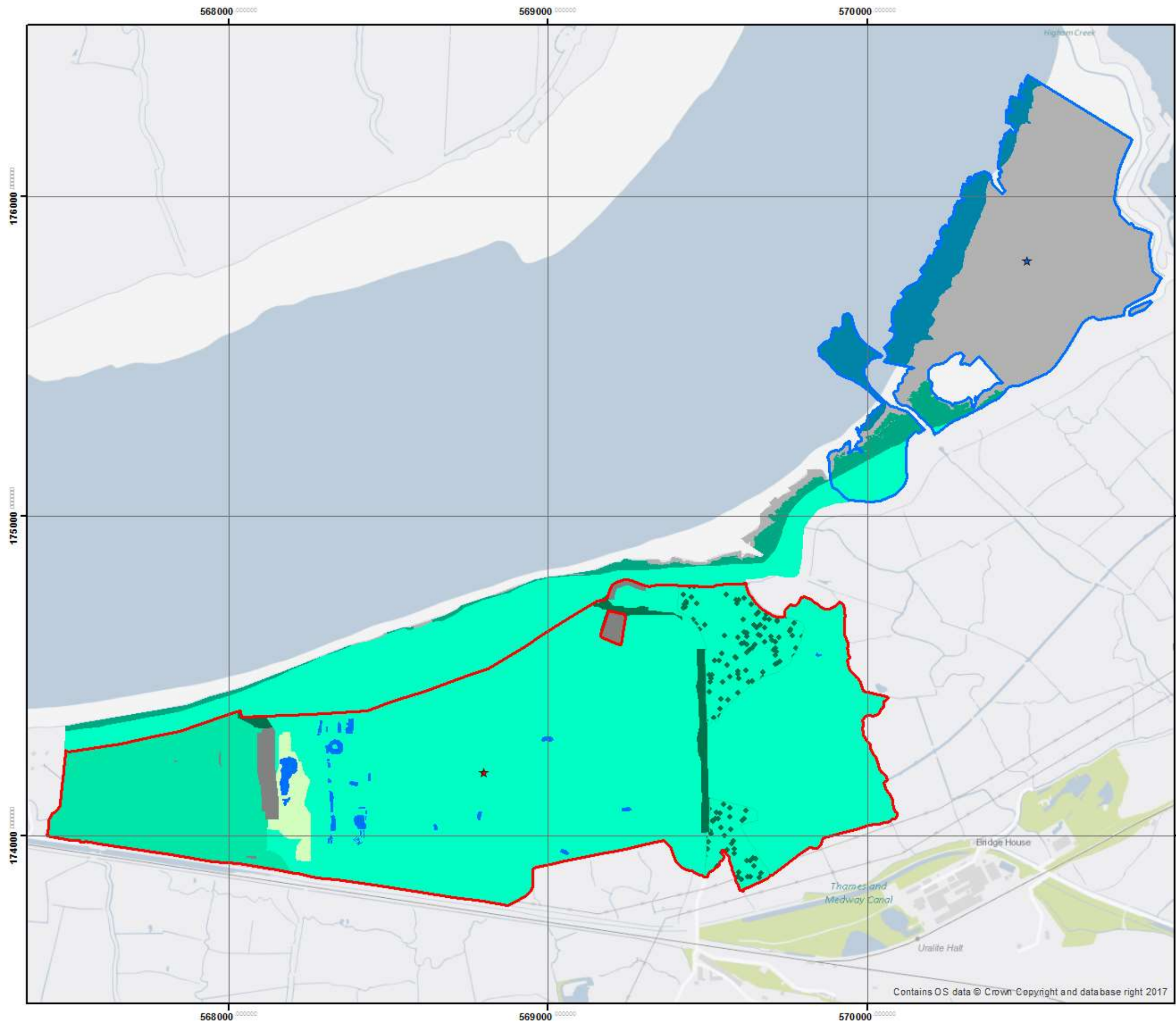


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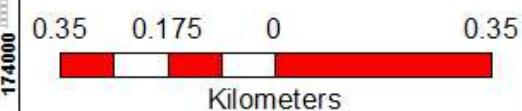


RSPB Shorne Marshes & Higham Bight, Kent

Map 13a(i): Habitats on the reserve in 2024; Phase 1 habitats

- Scrub; A.2.1.2
- Scrub; A.2.2.2
- Grassland; B.2.1.2
- Grassland; B.2.2.2
- Swamp; F.1.1
- Open water; G.1.1.1
- Coastland; H.1.1
- Coastland; H.2.6
- Built up area; J.3.6
- Marine; K
- Shorne Marshes central grid ref; TQ68807420
- Shorne Marshes site boundary
- Higham Bight central grid ref; TQ70507580
- Higham Bight site boundary

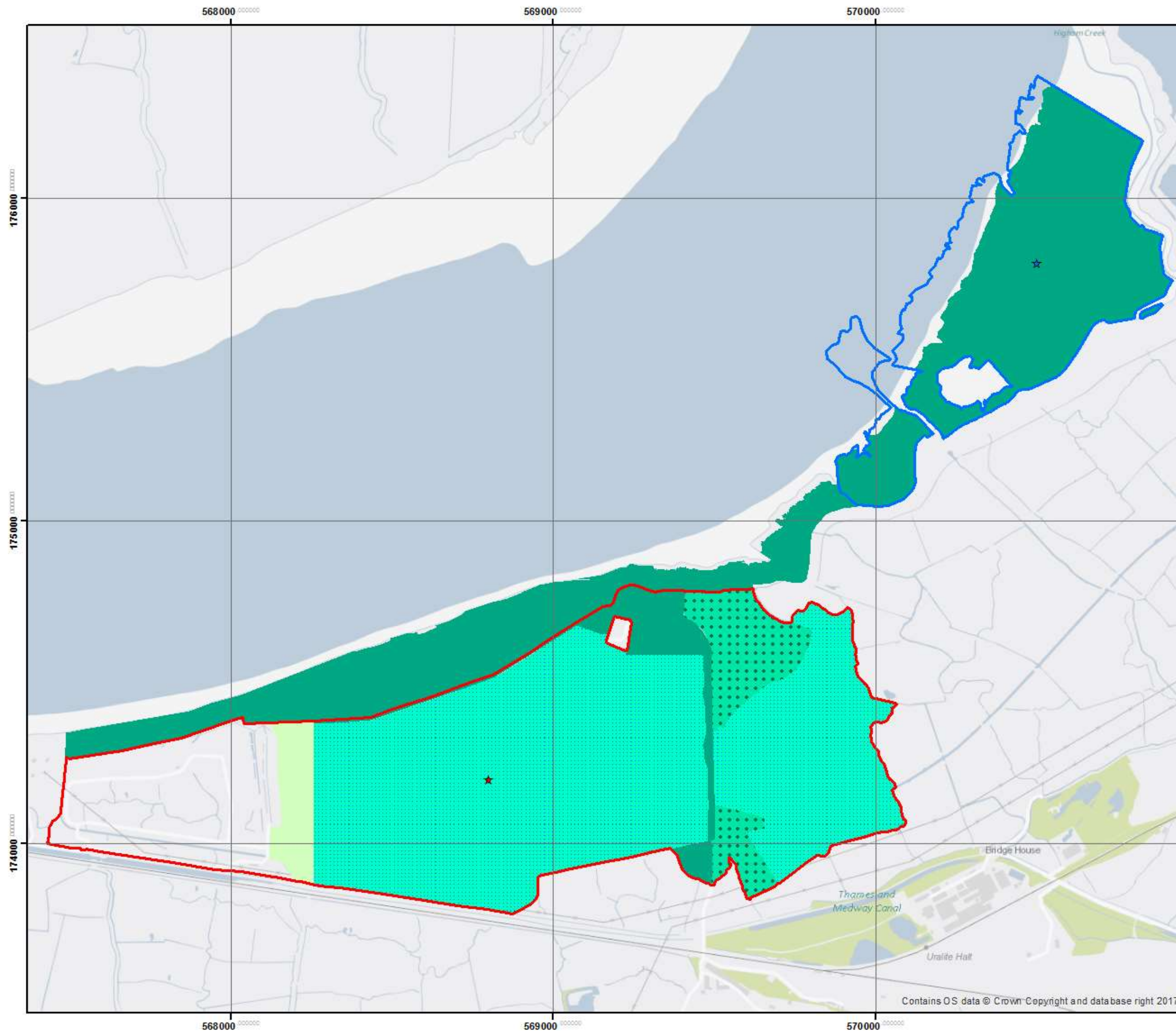
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RSPB Shorne Marshes & Higham Bight, Kent

Map 13a(ii):
Habitats on the reserve
in 2024; habitats by
objective

- Objective 1
- Objective 2
- Objective 3
- Objective 4
- Shorne Marshes central grid ref, TQ68807420
- Shorne Marshes site boundary
- Higham Bight central grid ref, TQ70507580
- Higham Bight site boundary

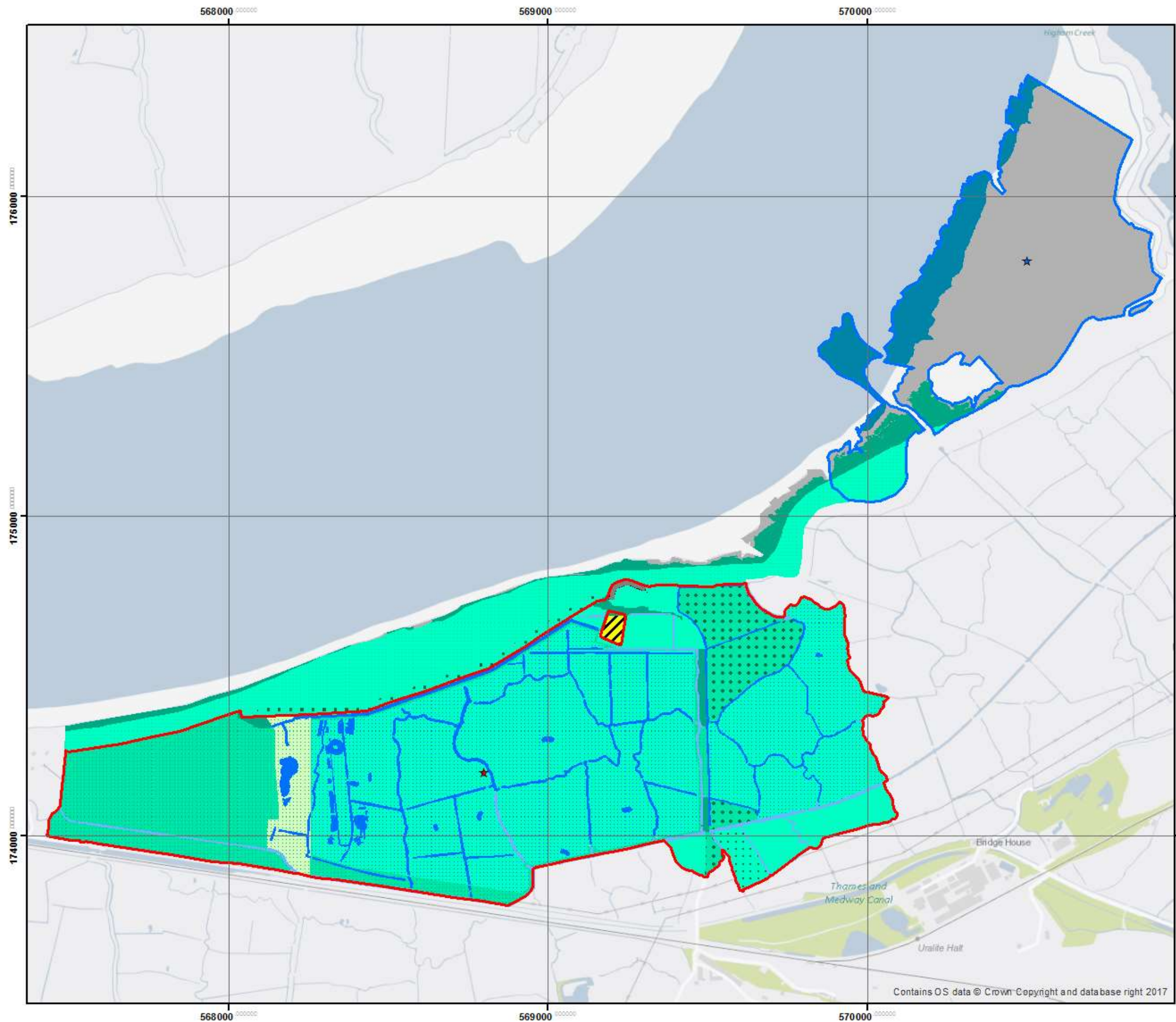
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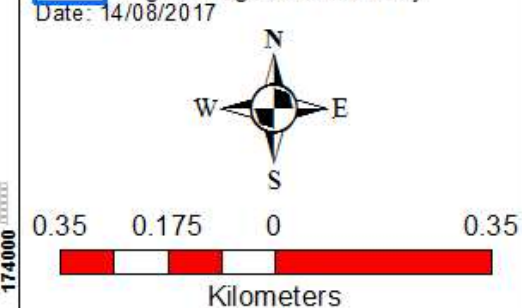




RSPB Shorne Marshes & Higham Bight, Kent

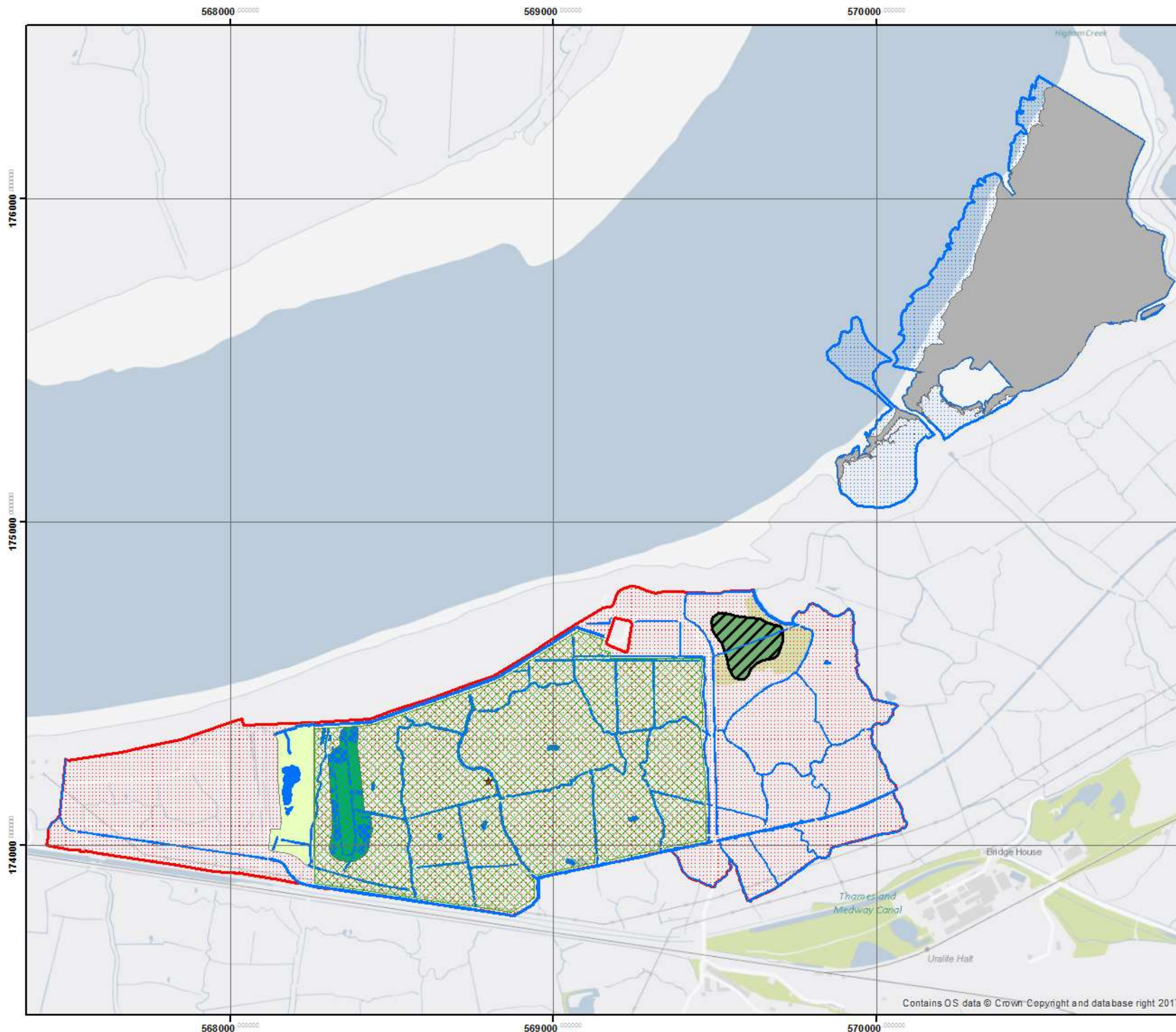
Map 13a(iii): Habitats on the reserve in 2024; habitats by management & structure

- High level ditches and ponds
- Low level ditches
- Low land wet grassland
- Low land dry grassland
- Low land dry grassland (Seawall)
- Low land dry grassland (Seawall) with scattered scrub
- Low land dry grassland with scattered scrub
- Rough grassland
- Rough grassland with scattered and dense scrub
- Dense scrub
- Wet and dry reed and rough grassland mosaic
- Saltmarsh
- Mudflats
- Open water (Thames)
- Shornemead Fort
- Gas compound
- Shorne Marshes central grid ref, TQ68807420
- Shorne Marshes site boundary
- Higham Bight central grid ref, TQ70507580
- Higham Bight site boundary



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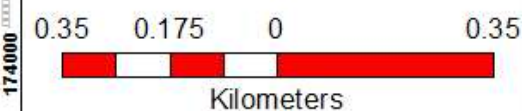


RSPB Shorne Marshes & Higham Bight, Kent

Map 14a: Location of important species

- Breeding waders & wildfowl
- Wintering waders & wildfowl
- Breeding Marsh harrier & Bearded tit
- Water vole
- Great crested newt & Lestes dryas
- Lestes dryas
- Shorne Marshes central grid ref, TQ68807420
- Shorne Marshes site boundary
- Higham Bight central grid ref, TQ70507580
- Higham Bight site boundary

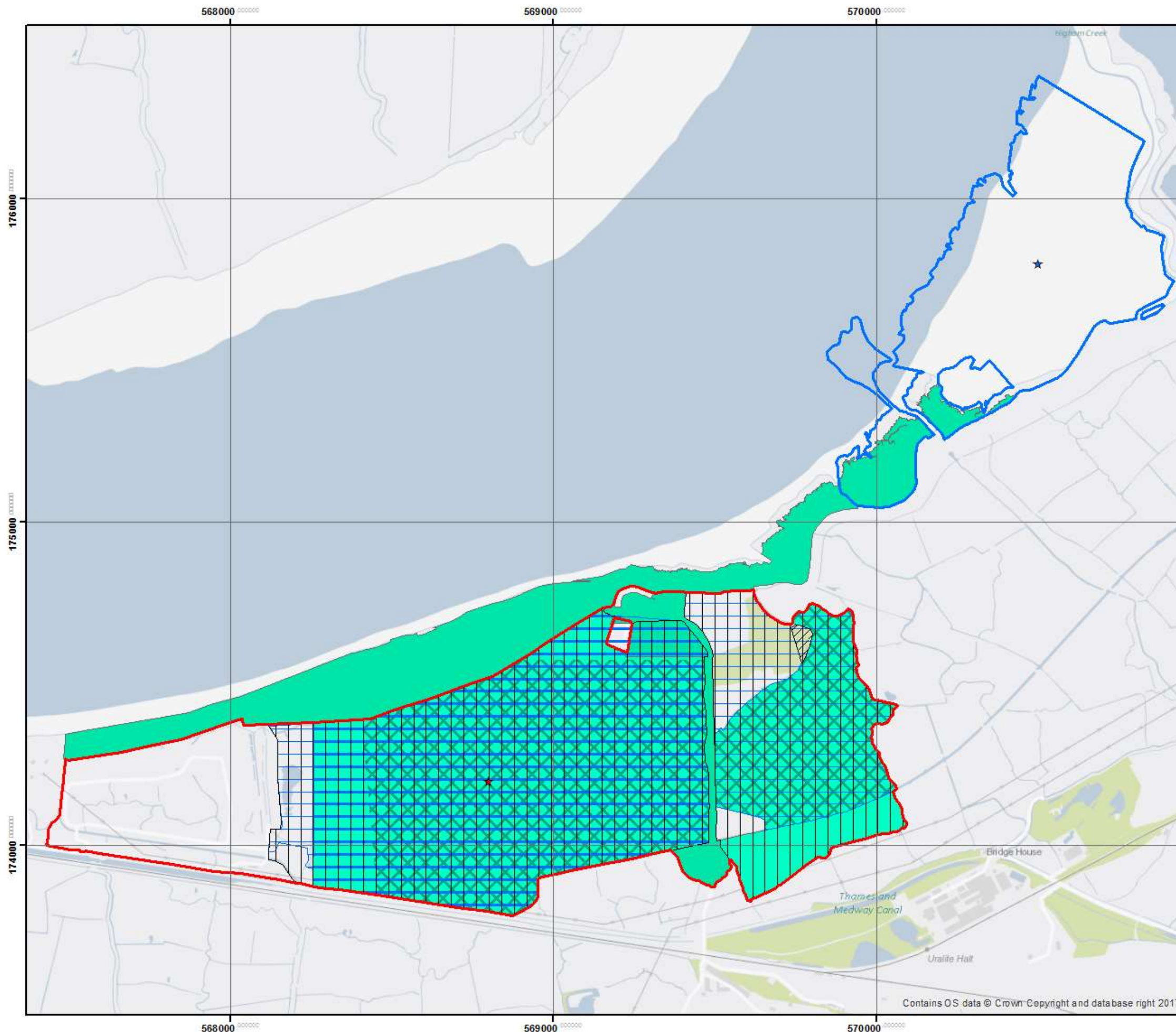
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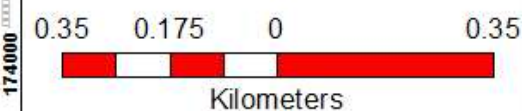


RSPB Shorne Marshes & Higham Bight, Kent

Map 15(i): Maintenance management over the period 2012-2013

- Cattle (+ winter sheep) grazing
- Controlled late winter & spring flooding
- Partially controlled late winter flooding
- Fox control
- Topping
- Rotational crater-scrub management
- Horse grazing
- Shorne Marshes central grid ref, TQ68807420
- Shorne Marshes site boundary
- Higham Bight central grid ref, TQ70507580
- Higham Bight site boundary

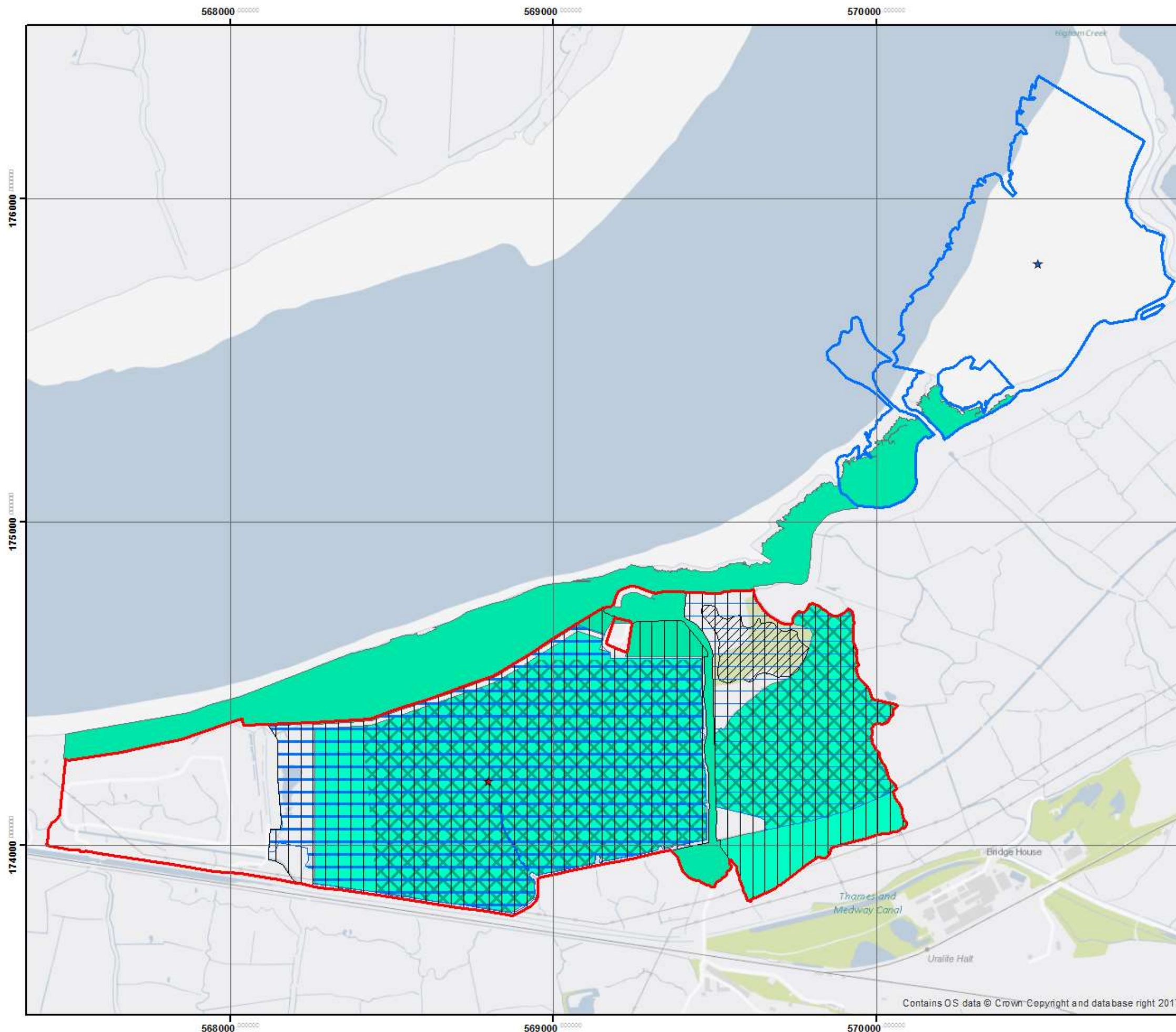
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RSPB Shorne Marshes & Higham Bight, Kent

Map 15(ii): Maintenance management over the period 2013-2014

- Cattle (+ winter sheep) grazing
- Controlled late winter & spring flooding
- Partially controlled late winter & spring flooding
- Ditch de-silted
- Fox control
- Topping
- Rotational crater-scrub management
- Horse grazing
- Shorne Marshes central grid ref, TQ68807420
- Shorne Marshes site boundary
- Higham Bight central grid ref, TQ70507580
- Higham Bight site boundary

Date: 14/08/2017

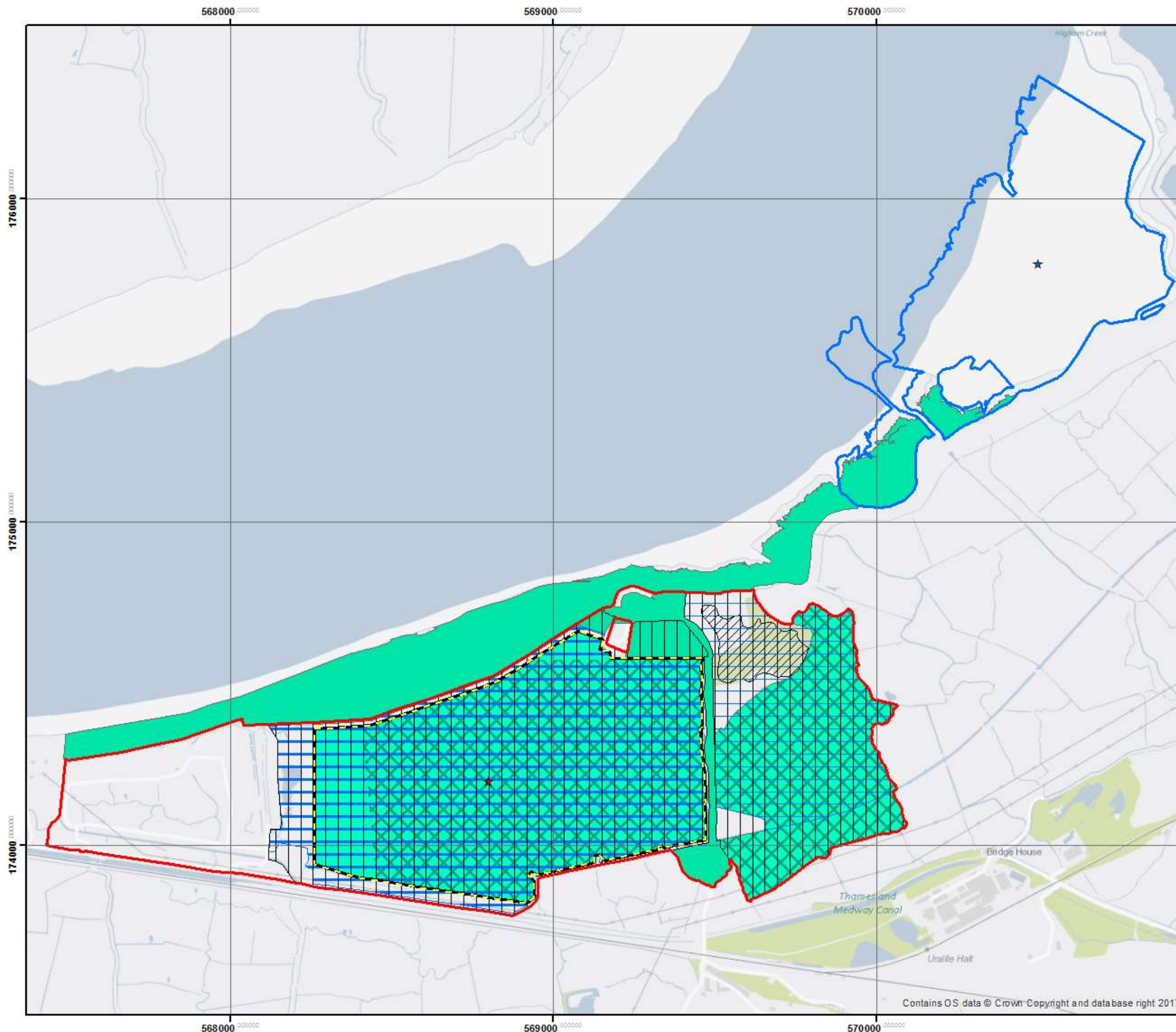


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Kilometers

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RSPB Shorne Marshes & Higham Bight, Kent

Map 15(iii): Maintenance management over the period 2014-2015

- Cattle (+ winter sheep) grazing
- Controlled late winter & spring flooding
- Partially controlled late winter & spring flooding
- Fox control
- Electric fence maintenance and modifications
- Topping
- Rotational crater-scrub management
- Horse grazing
- Shorne Marshes central grid ref. TQ68807420
- Shorne Marshes site boundary
- Higham Bight central grid ref. TQ70507580
- Higham Bight site boundary

Date: 14/08/2017

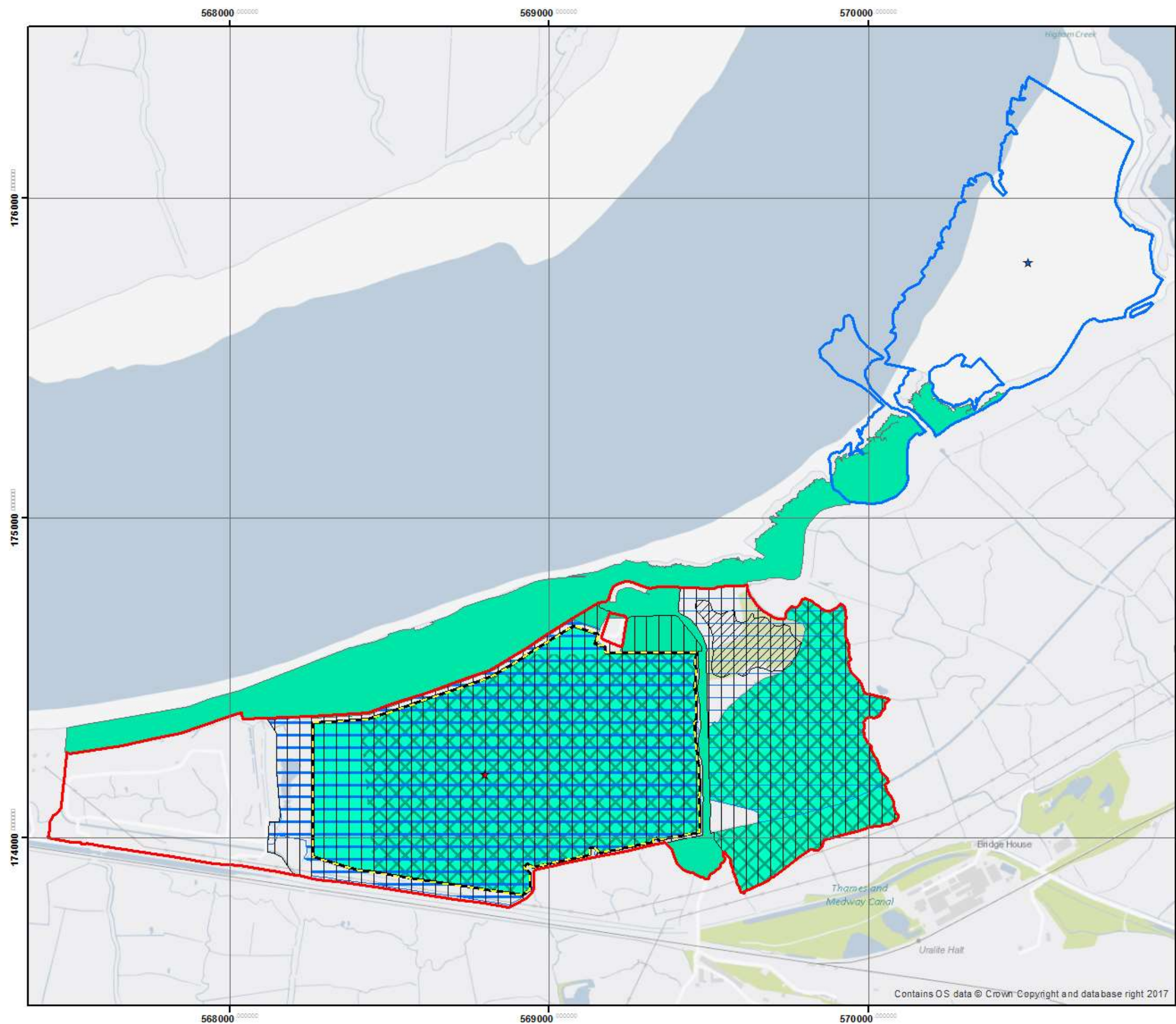


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RSPB Shorne Marshes & Higham Bight, Kent

Map 15(iv): Maintenance management over the period 2015-2016

- Cattle (+ winter sheep) grazing
- Controlled late winter & spring flooding
- Partially controlled late winter & spring flooding
- Fox control
- Electric fence maintenance and modifications
- Topping
- Rotational crater-scrub management
- Horse grazing
- Shorne Marshes central grid ref, TQ68807420
- Shorne Marshes site boundary
- Higham Bight central grid ref, TQ70507580
- Higham Bight site boundary

Date: 14/08/2017

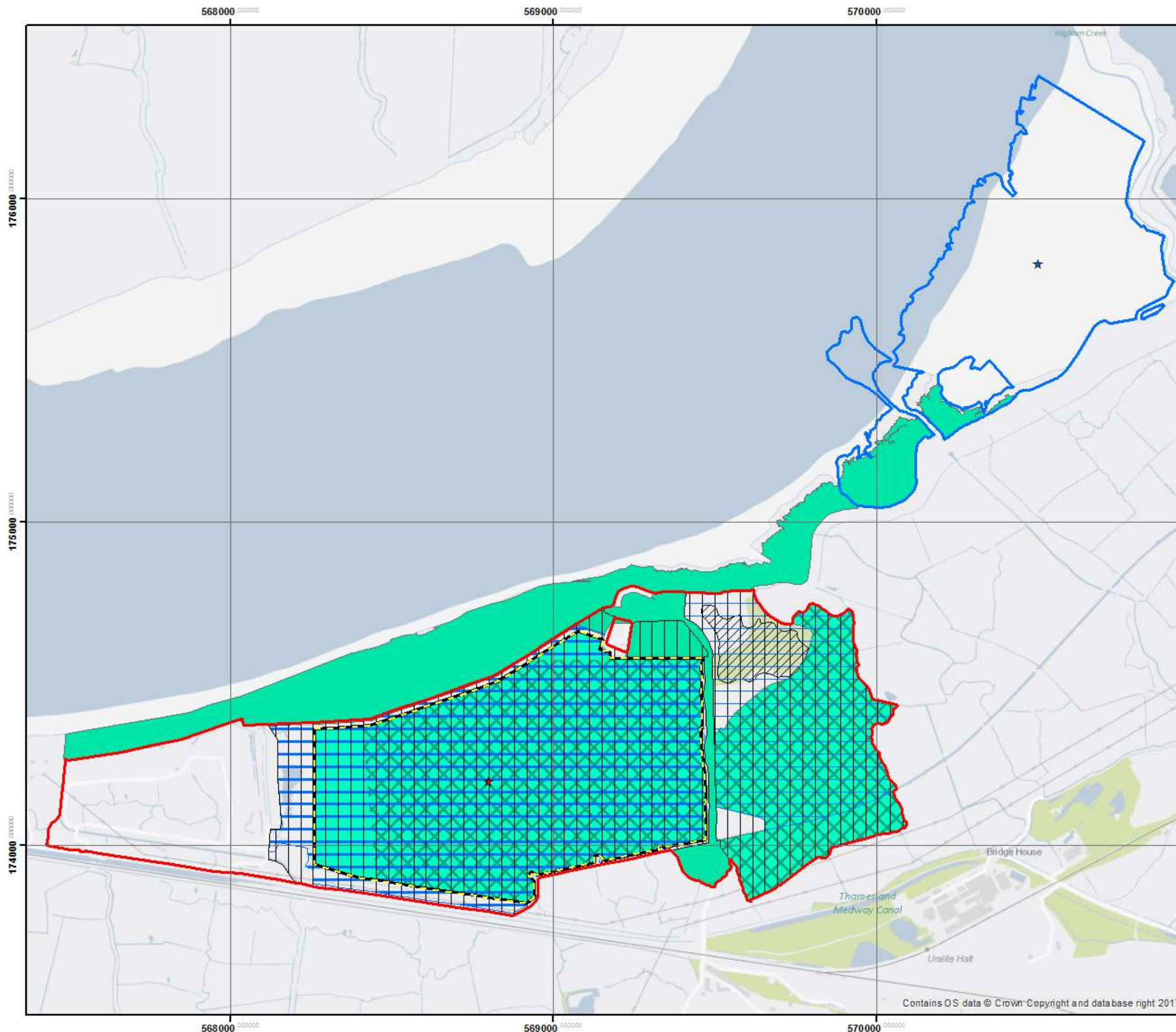


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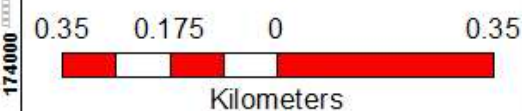


RSPB Shorne Marshes & Higham Bight, Kent

Map 15(v): Maintenance management over the period 2016-2017

- Cattle (+ winter sheep) grazing
- Controlled late winter & spring flooding
- Partially controlled late winter & spring flooding
- Fox control
- Electric fence maintenance and modifications
- ✕ Topping
- Rotational crater-scrub management
- Horse grazing
- ★ Shorne Marshes central grid ref, TQ68807420
- Shorne Marshes site boundary
- ★ Higham Bight central grid ref, TQ70507580
- Higham Bight site boundary

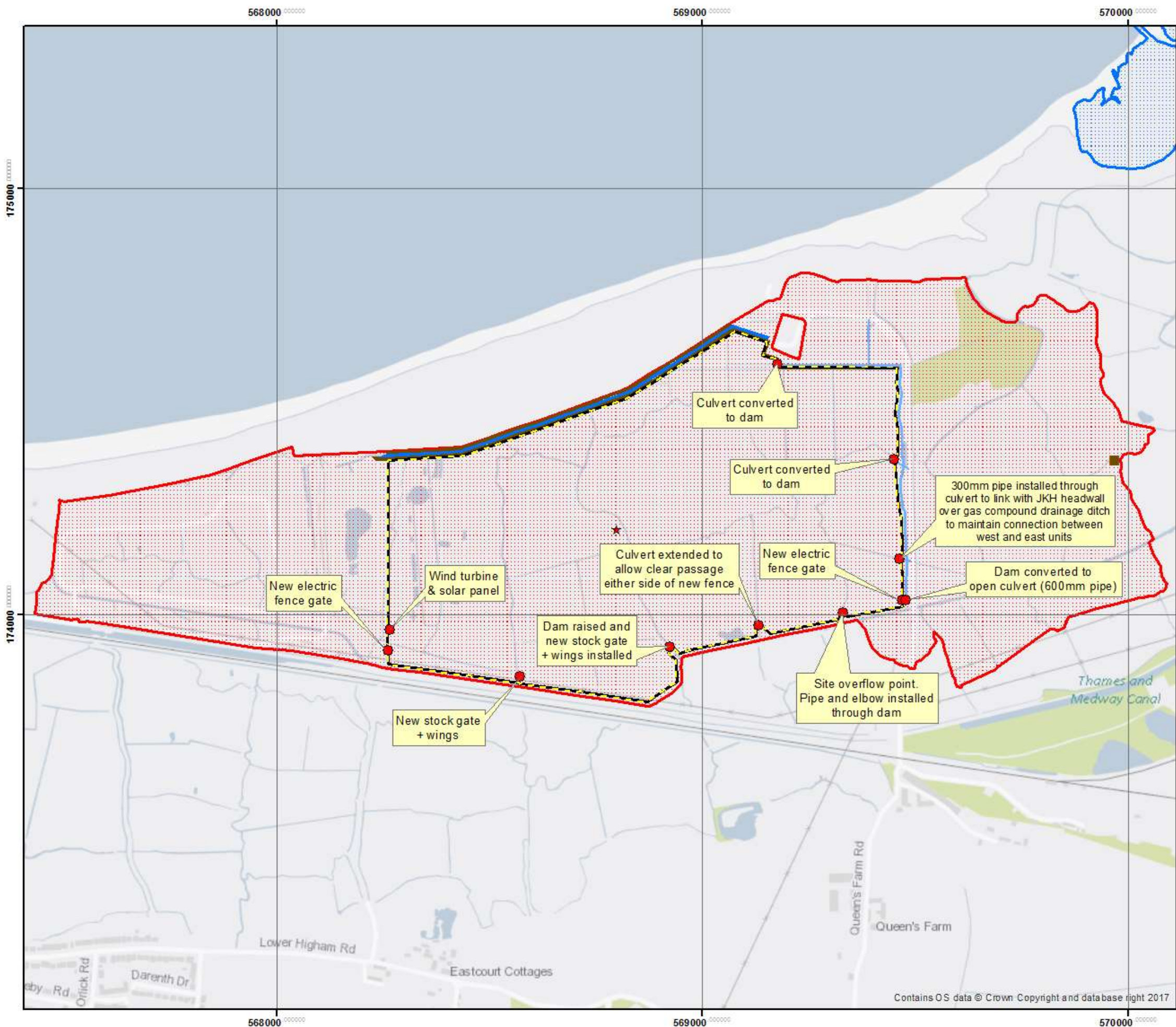
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RSPB Shome Marshes & Higham Bight, Kent

Map 16(i):

Special projects over the period 2013-2014

- Unreliable JKH dec ommissioned with an earth dam
- Various electric fence supplementary and hydrological works
- Ditch converted to landscape drainage system for drainage of gas compound
- New electric fence
- Electric fence and security ditch supplementary bunding
- New security ditch (Ditch A)
- Shome Marshes central grid ref, TQ68807420
- Shome Marshes site boundary
- Higham Bight central grid ref, TQ70507580
- Higham Bight site boundary

Date: 14/08/2017

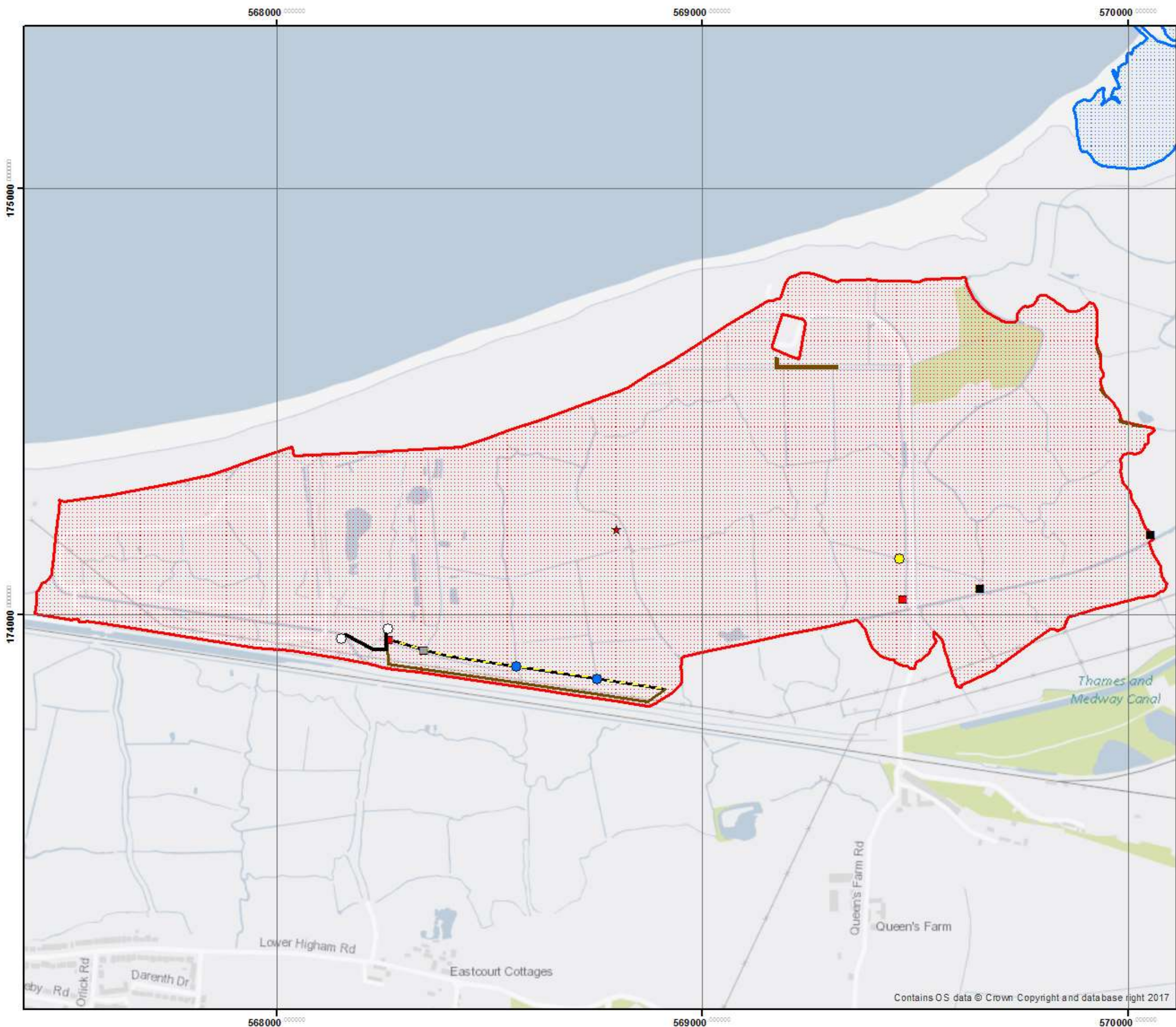


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RSPB Shome Marshes & Higham Bight, Kent

Map 16(ii):

Special projects over the period 2014-2015

- Wind turbine and solar panel decommissioned post theft
- Mains cable laid to power electric fence post solar panel theft
- Leaking pipe fixed
- Crossing built up
- New gate for re-aligned electric fence
- New crossing point for re-aligned electric fence
- New open culvert for re-aligned electric fence
- Electric fence de-powered
- - - Electric fence re-aligned
- Extra bunding to block hydrological unit leaks
- ★ Shome Marshes central grid ref, TQ68807420
- Shome Marshes site boundary
- ★ Higham Bight central grid ref, TQ70507580
- Higham Bight site boundary

Date: 14/08/2017

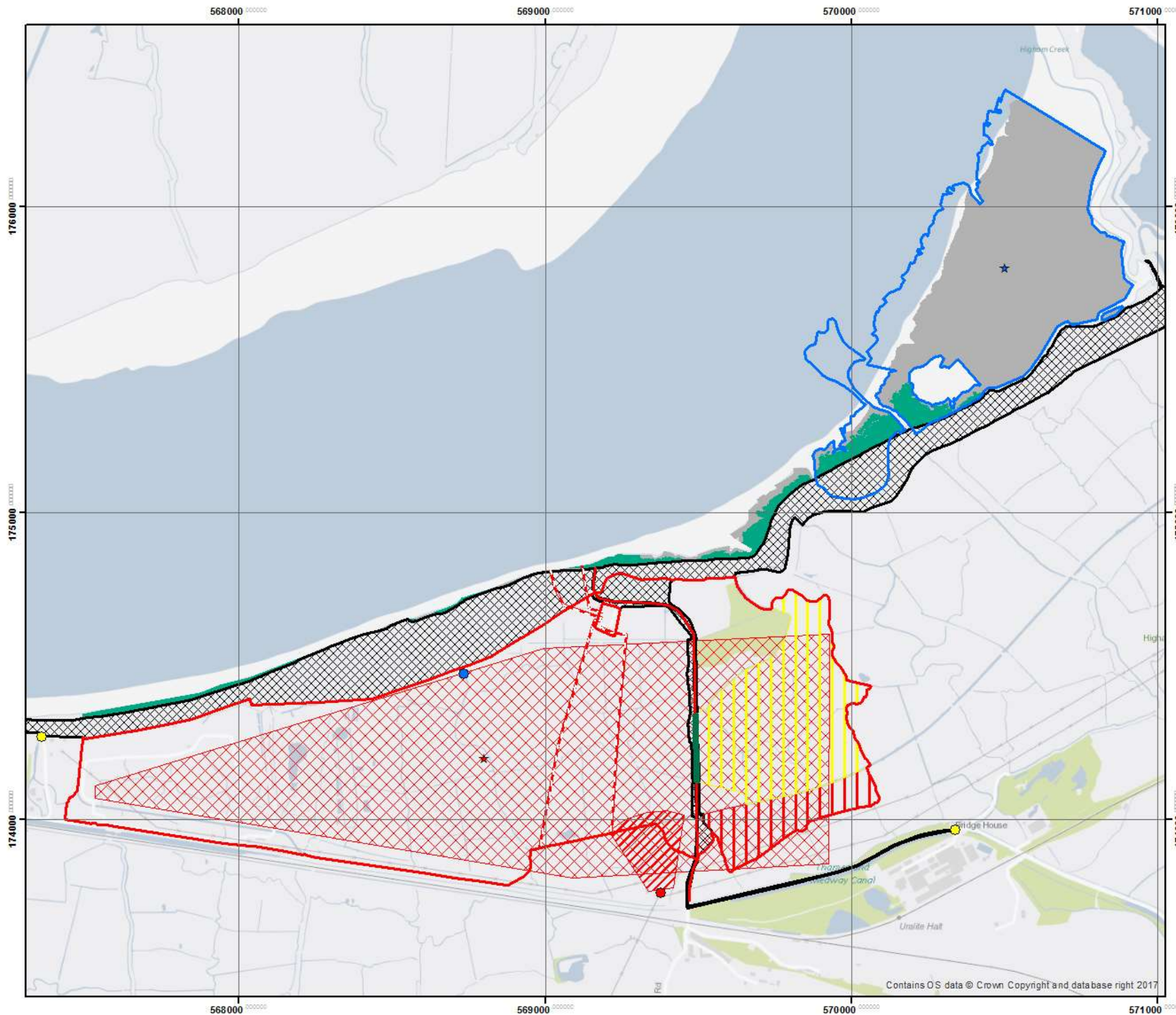


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Kilometers

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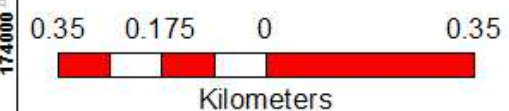


RSPB Shorne Marshes & Higham Bight, Kent

Map 17: Current issues and constraints

- Rifle range safety template - limits access to site
- Motorcycles - uncontrollable and illegal activity
- Motorcycles - prime access points
- Poor breeding wader performance - issues with managing water
- No breeding wader performance - too dry and requires disconnection from the landscape drainage system
- Link required to join the security ditch (+ hydro unit 3) to hydro unit 1 (+ abstraction facility)
- Hedgerows - presence disrupts open landscape for breeding waders
- Underground High Pressure gas pipelines - constraints for landscaping in the vicinity of the pipes
- Bridleway - use causes disturbance
- Saltmarsh - eroding
- Intertidal mudflats - eroding
- Clay pigeon shoot - disturbance
- Clay pigeon shoot area - safety issues
- Shorne Marshes central grid ref; TQ68807420
- Shorne Marshes site boundary
- Higham Bight central grid ref; TQ70507580
- Higham Bight site boundary

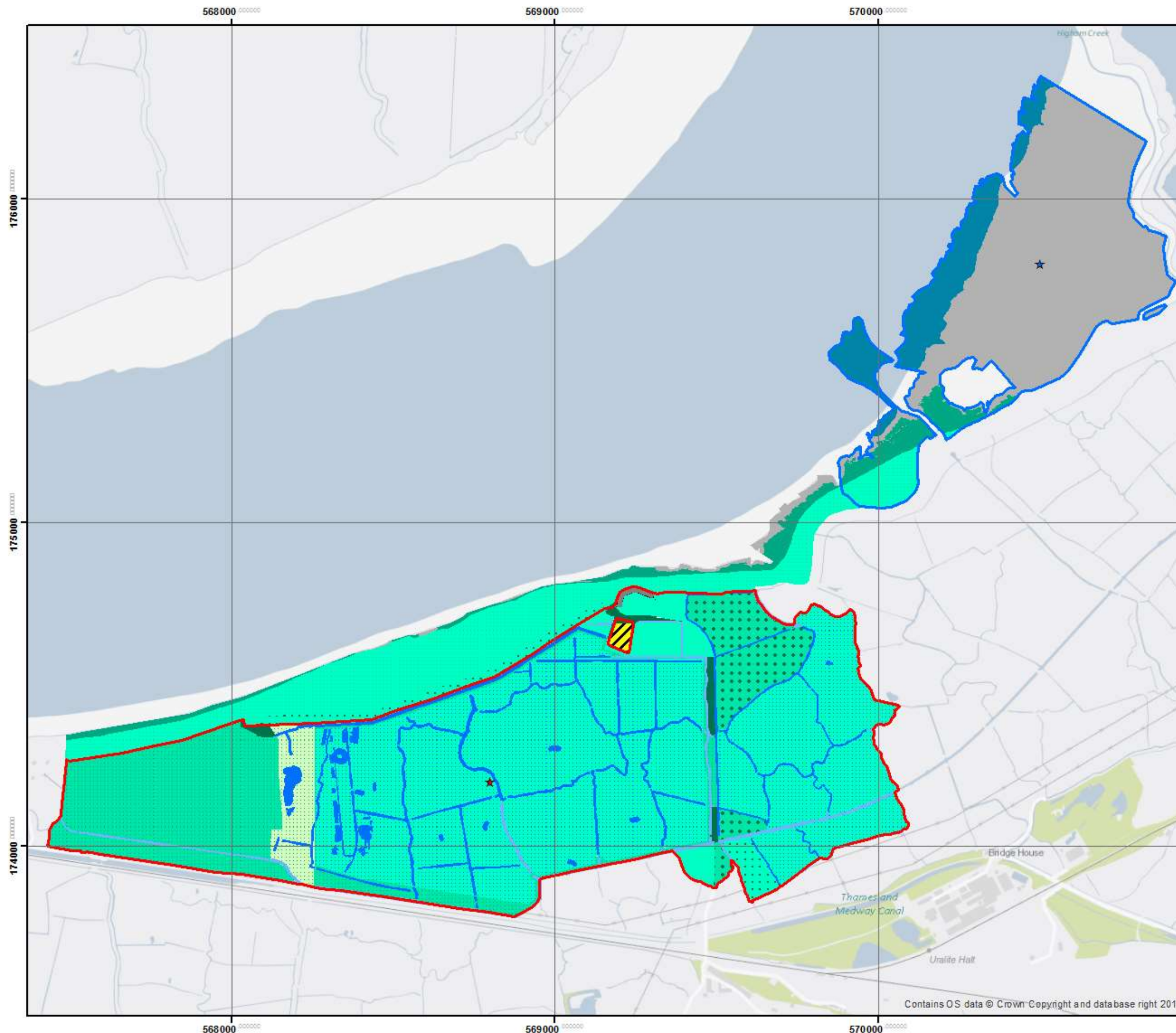
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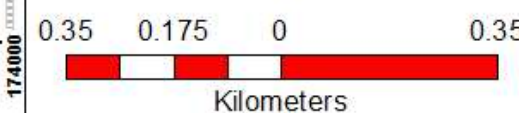


RSPB Shorne Marshes & Higham Bight, Kent

Map 18: Habitats on the reserve in 2025 by management & structure

- High level ditches and ponds
- Low level ditches
- Lowland wet grassland
- Lowland dry grassland
- Lowland dry grassland (Seawall)
- Lowland dry grassland (Seawall) with scattered scrub
- Lowland dry grassland with scattered scrub
- Rough grassland
- Rough grassland with scattered and dense scrub
- Dense scrub
- Wet and dry reed and rough grassland mosaic
- Saltmarsh
- Mudflats
- Open water (Thames)
- Shornemead Fort
- Gas compound
- Shorne Marshes central grid ref; TQ68807420
- Shorne Marshes site boundary
- Higham Bight central grid ref; TQ70507580
- Higham Bight site boundary

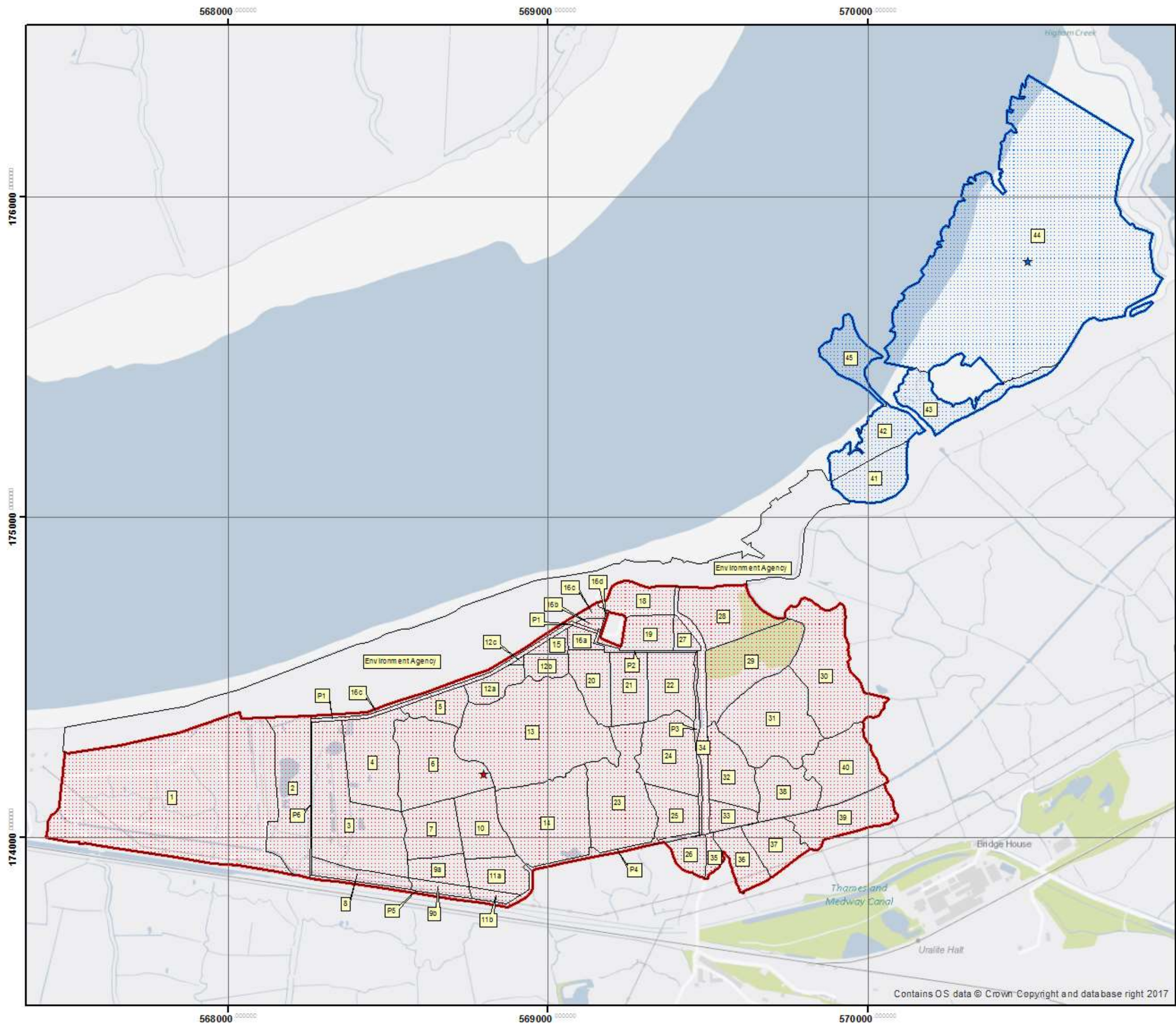
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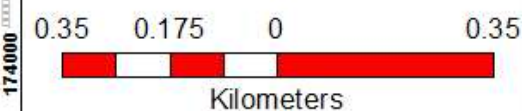


RSPB Shorne Marshes & Higham Bight, Kent

Map 19(i): Compartments

- Compartment boundary
- Shorne Marshes central grid ref; TQ68807420
- Shorne Marshes site boundary
- Higham Bight central grid ref; TQ70507580
- Higham Bight site boundary

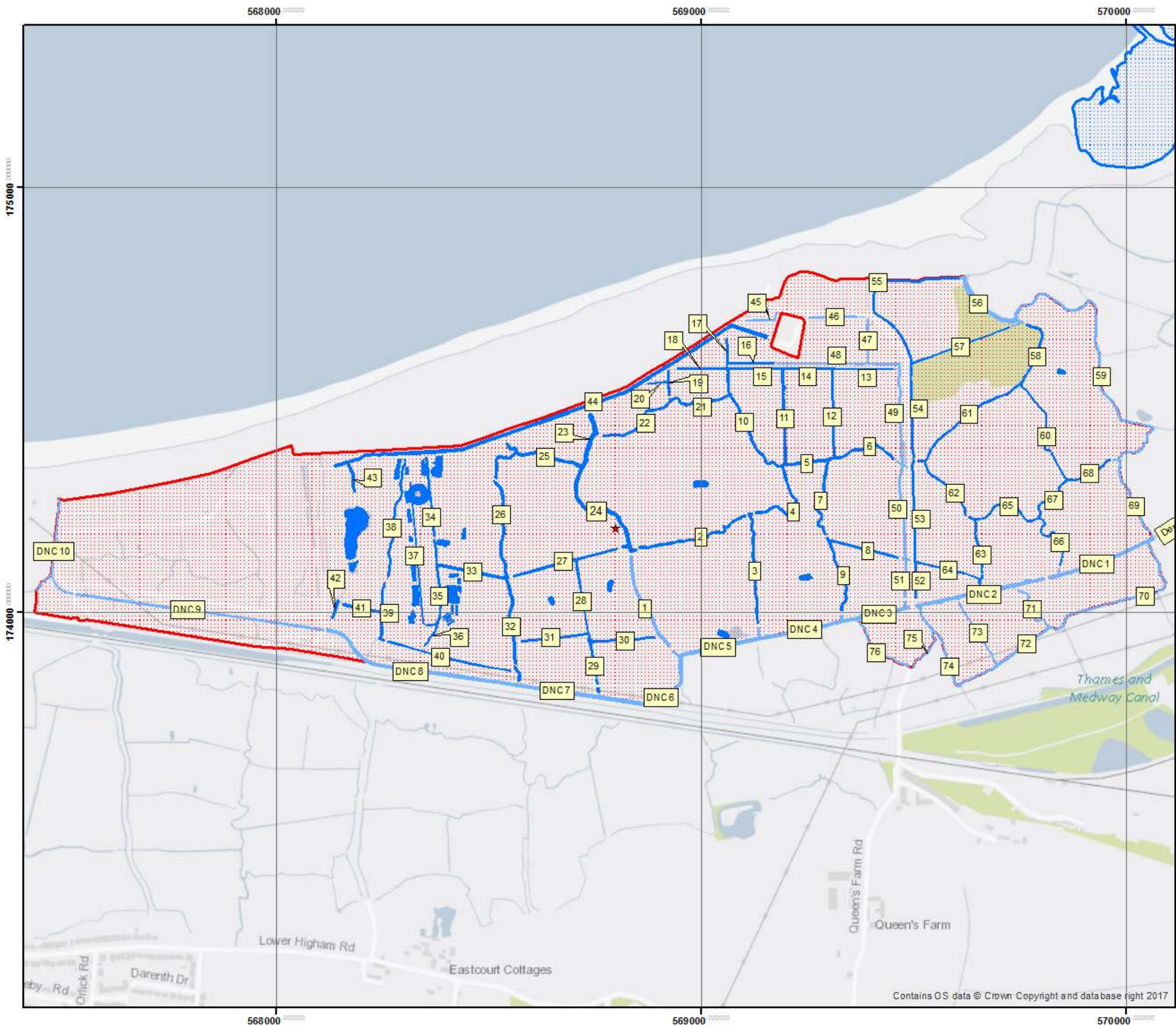
Date: 14/08/2017



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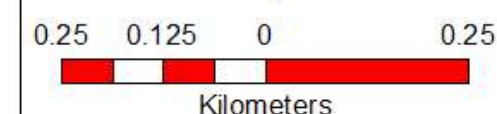


RSPB Shorne Marshes & Higham Bight, Kent

Map 19(ii): Ditch numbers

- High level ditches and ponds
- Low level ditches
- Shorne Marshes central grid ref, TQ68807420
- Shorne Marshes site boundary
- Higham Bight central grid ref, TQ70507580
- Higham Bight site boundary

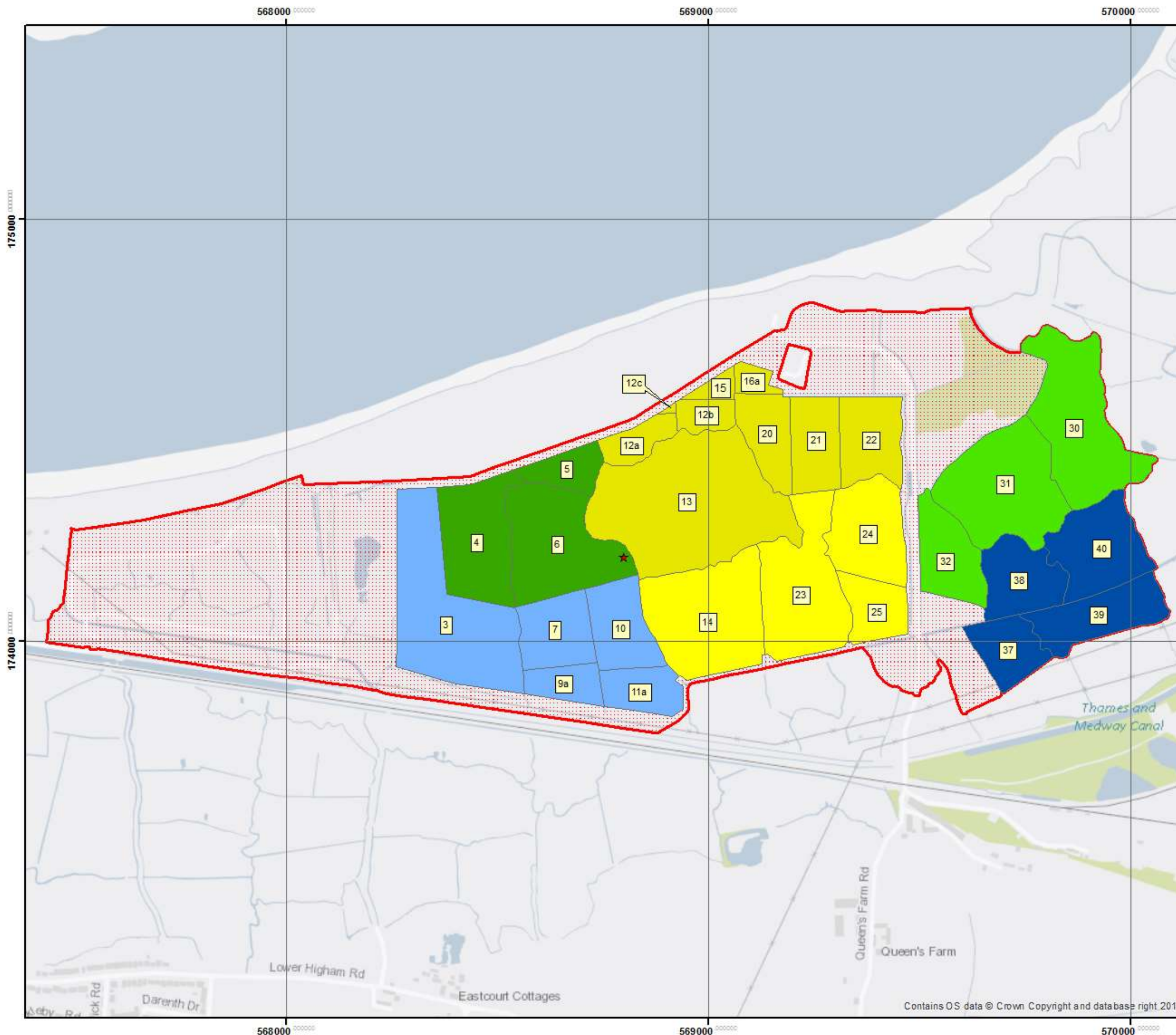
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RSPB Shorne Marshes & Higham Bight, Kent

Map 19(iv):

Breeding season
grazing blocks at
Shorne Marshes

- Block 1
- Block 2
- Block 3
- Block 4
- Block 5
- Block 6
- Shorne Marshes central grid ref, TQ68807420
- Shorne Marshes site boundary

Date: 06/12/2017

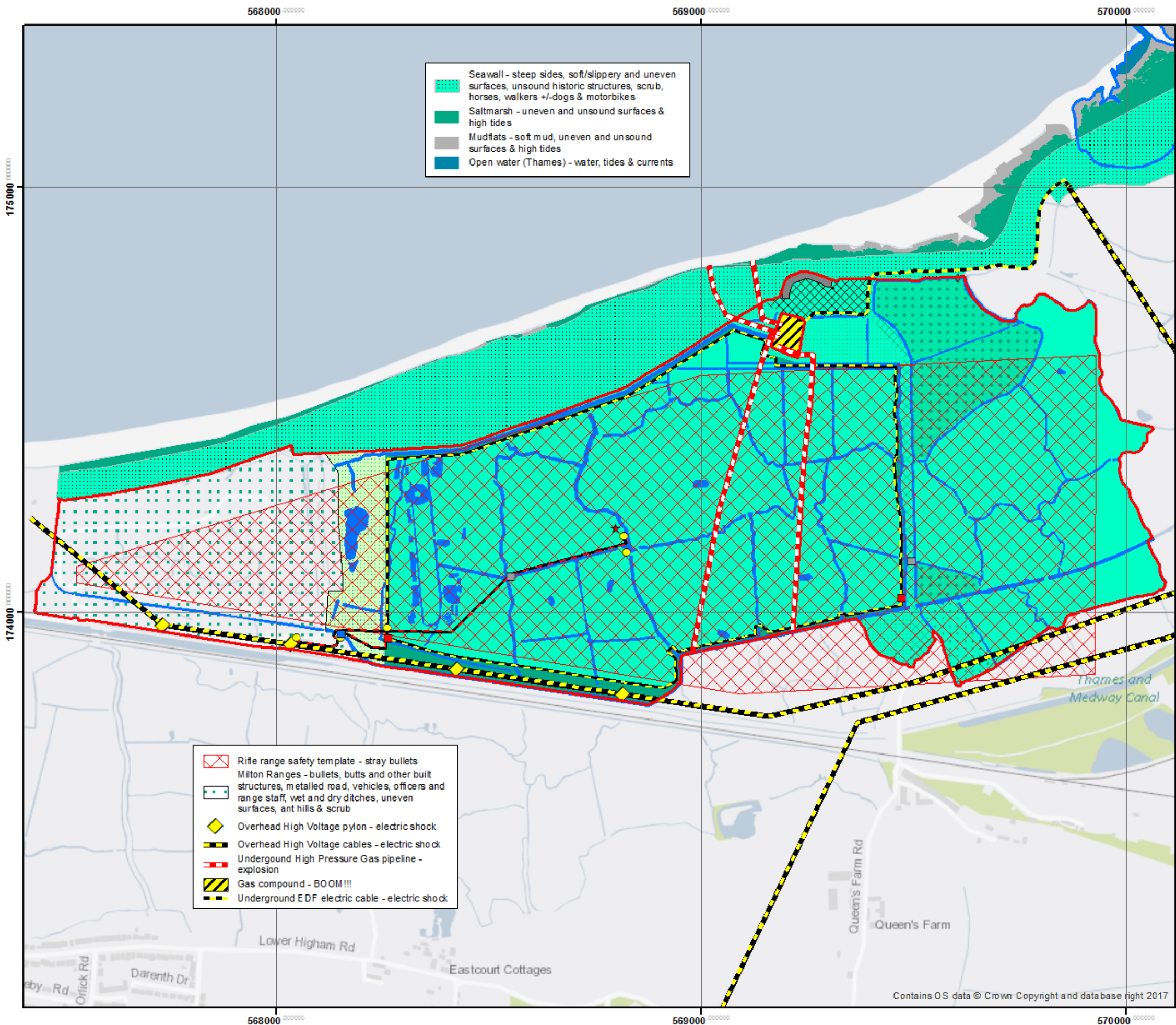


0.25 0.125 0 0.25
Kilometers

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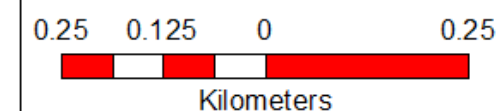


RSPB Shorne Marshes & Higham Bight, Kent

Map 21(i): Shorne Marshes hazard map

- Shornemead Fort - unsound structure, steep drops & rusty metal
- Shornemead Fort surroundings - steep drops, rusty metal, scrub, horses & motorbikes
- Underground RSPB electric cable - electric shock
- Electric power supply units & connections - electric shock
- Electric fence - electric shock
- Electric fence gate - electric shock
- Milton Stop (Denton New Cut) weir - water, steep drops, slippery surfaces & sharp metal
- Concrete sluice - sharp metal, steep drops & slippery surfaces
- Sheet piling dam - rusty metal & steep drops
- Ditches and ponds - steep sided & water +/- soft mud
- Grassland - uneven surfaces, ant hills, craters, cattle and/or sheep & seasonally flooded
- Grassland - uneven surfaces, craters, & horses
- Rough grassland - uneven surfaces, ant hills, craters, cattle and/or sheep & seasonally flooded
- Rough grassland - uneven surfaces, ant hills, cattle and/or sheep & seasonally flooded
- Rough grassland - uneven surfaces, ant hills, craters, scrub, cattle and/or sheep & seasonally flooded
- Reed and rough grassland mosaic - hidden water hazards, soft/slippery and uneven surfaces, ant hills & seasonally flooded
- Track - metalled road, vehicles, motorbikes, walkers +/- dogs, horses, horse riders, scrub, uneven surfaces & corral +/- livestock
- Shorne Marshes central grid ref, TQ68807420
- Shorne Marshes site boundary
- Higham Bight site boundary

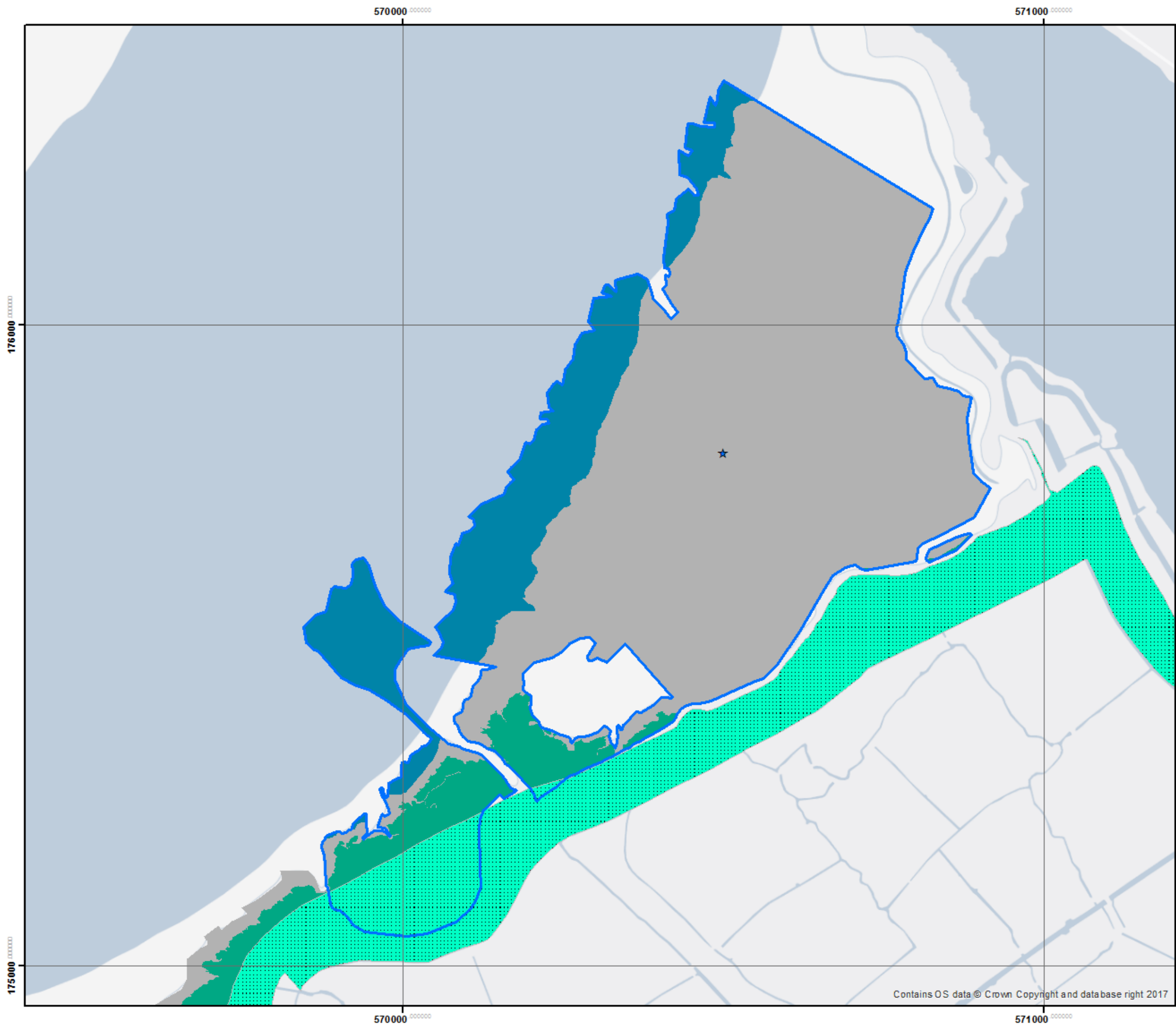
Date: 14/08/2017



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RSPB Shorne Marshes & Higham Bight, Kent

Map 21(ii): Higham Bight hazard map

- Seawall - steep sides, soft/slippery and uneven surfaces, unsound historic structures, scrub, horses, walkers +/- dogs & motorbikes
- Saltmarsh - uneven and unsound surfaces & high tides
- Mudflats - soft mud, uneven and unsound surfaces & high tides
- Open water (Thames) - water, tides & currents
- ★ Higham Bight central grid ref; TQ70507580
- Higham Bight site boundary
- ★ Shorne Marshes central grid ref; TQ68807420
- Shorne Marshes site boundary

Date: 14/08/2017



0.15 0.075 0 0.15
Kilometers

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Appendix 1: SITE LOCATION AND DESIGNATION

A1.1. Location and relevant authorities

The location of the reserve is shown in Map 1 and details of relevant authorities given in the table below.

Site name	Shorne Marshes and Higham Bight	
SSDB/CMS code	990079/990036	
Area (ha)	215.6 (Shorne Marshes - 133.8; Higham Bight – 56.2; Metropolitan Police Authority tenancy – 25.6)	
Grid ref (centre of reserve)	Shorne Marshes - TQ 688742 Higham Bight - TQ 705758	
District	Gravesham	
County Council * ¹	Kent County Council County Hall Maidstone Kent ME14 1XQ	
District Council**²	Gravesham Borough Council Civic Centre Windmill Street Gravesend Kent DA12 1AU	
Parish Council	Shorne Parish Council Mrs Teresa Martin 70 Colyer Rd Northfleet Gravesend Kent DA11 8AY	Higham Parish Council Mrs Linda Carnall 24 Chilton Drive Higham Kent ME3 7BW
Parliamentary Constituency	Gravesham	
Local Environment Agency office³	Orchard House Endeavour Park London Road Addington West Malling Kent ME19 5SH	
Drainage Authority⁴	North Kent Marshes Internal Drainage Board c/o Medway Council Gun Wharf Dock Road Chatham Kent ME4 4TR	
Airport Safeguarding zone	N/A	

* mineral planning authority

** general planning authority

¹ or Unitary Authority

² or London Borough Council

³ or relevant authority in Scotland

⁴ or Internal Drainage Board

A1.2. Designations

Details of statutory, planning and other designations are given in the following table and shown in Map 2.

Designation	All or part of site?	Name and other details
SSSI/ASSI	All except majority of Compartment 1	South Thames Estuary & Marshes
NNR		-
SPA	Higham Bight only	Thames Estuary & Marshes
pSAC		
RAMSAR	Higham Bight only	Thames Estuary & Marshes
SINC		-
LNR		-
Statutory Bird Sanctuary		-
National Park		-
ESA	Formerly North Kent Marshes ESA	Transferred into HLS 1st October 2010
RSS		-
Habitat Scheme		-
SNH Natural Care Scheme		-
AONB		-
Heritage Coast		-
National Scenic Area (NSA)		-
World Heritage Site (WHS)		-
Conservation Area		-
Common Land		-
Listed Building		-
Archaeological site		See Map 9b for locations of sites and Appendix A2.6 for gazetteer. General precautions of non-disturbance/non-destruction by excavation should be adhered to where these features exist.
Finds		As above
Scheduled Ancient Monument		-
IACS registered		-
AAPS		-
Extensification		-
UKWAS registered		-
Contaminated land	Compartment 1 (rifle range)	Potential for contaminants associated with materials used for this operation
	Higham Bight	Unsubstantiated informal references to significant rubbish dumping "from London" post clay extraction many decades ago and now covered by riparian silt and mud
Past military landuse	Shornemead Fort	Napoleonic battery on site prior to the building of Shornemead Fort. It was in use from its completion in 1870 to its abandonment in the 1950s. Much of it was demolished by the Army Demolition School of the Royal

		Engineers in the 1960s. The barracks and administrative buildings have been completely destroyed and only the front of the casemates survives along with the magazines underneath, though the latter are now flooded and inaccessible. Shornemead Fort - Wikipedia
	Milton Range	Continued use of the 1862 military Milton Range, on Eastcourt Marshes, east of Gravesend. It consists of a succession of low earthen mound firing points, a target mound and markers' gallery, as well as a weather shelter. The butts were modified in the 1890s and perhaps again later. It continued in use for military rifle training until around 1980 and perhaps afterwards, when there was certainly private use. It is now the firing range element of the Metropolitan Police Training Facility, with substantial survivals of the original structures. In addition to small arms, mortars were used that resulted in the creation of the significant number of shell craters concentrated in Cs 28 & 29, which have subsequently allowed the Great crested newt population to proliferate
Other		-

A1.3. Statutory site condition assessment

a) SSSI/ASSI

RSPB Responsible					
SSSI/ASSI name	Unit or feature	Assessment	Date	Reason	Remedy
South Thames Estuary & Marshes	24 (majority), 25 (majority), 26 (majority) & 102 (majority)	Favourable	12/02/2009		
South Thames Estuary & Marshes	100 (part)	Unfavourable declining	19/03/2009	Areas of saltmarsh scattered along the coast between the mudflats and the sea wall, hence the Unfavourable declining condition due to coastal squeeze	Beyond RSPB ability to reverse
RSPB not responsible					
SSSI/ASSI name	Unit or feature	Assessment	Date	Reason	Remedy
None					

b) designated heritage sites

RSPB Responsible					
Designated heritage site	Unit or feature	Assessment	Date	Reason	Remedy
None					
RSPB not responsible					
Designated heritage site	Unit or feature	Assessment	Date	Reason	Remedy
None					

A1.4. SSSI citation

South Thames Estuary and Marshes SSSI citation

COUNTY: KENT

SITE NAME: SOUTH THAMES ESTUARY AND MARSHES

BOROUGHS: GRAVESHAM, ROCHESTER UPON MEDWAY

Status: Site of Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act 1981 as amended

Local Planning Authorities: GRAVESHAM BOROUGH COUNCIL, Rochester upon Medway Borough Council

National Grid Reference: TQ 770785 Area. 5449.14 (ha.) 13459.38 (ac.)

Ordnance Survey Sheet 1:50,000: 178. 1:10,000: TQ 67 SE, NE; TQ 77 SW, NW, NE; TQ 87 NW, NE

Dates Notified (Under 1949 Act): 1951, 1968 Date of Last Revision: 1981

Date Notified (Under 1981 Act): 1984 Date of Last Revision: 1991

Other Information:

Parts of the site are listed in 'A *Nature Conservation Review*', D A Ratcliffe (ed) CUP 1979. The site is also a candidate for designation under the Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar Convention) and as a Special Protection Area under European Community Directive 79/409 on the Conservation of Wild Birds. The site includes the former sites of Higham Marshes SSSI, Cliffe and Cooling Marshes SSSI and part of Medway Marshes SSSI. There are also four extensions to the existing SSSIs.

Reasons for Notification:

The South Thames Estuary and Marshes SSSI from Gravesend to the eastern end of the Isle of Grain forms a major component of the Greater Thames Estuary. The site consists of an extensive mosaic of grazing marsh, saltmarsh, mudflats and shingle characteristic of the estuarine habitats of the north Kent marshes. Freshwater pools and some areas of woodland provide additional variety and complement the estuarine habitats. The site supports outstanding numbers of waterfowl with total counts regularly exceeding 20,000. Many species regularly occur in nationally important¹ numbers and some species regularly use the site in internationally important² numbers. The breeding bird community is also of particular interest. The diverse habitats within the site support a number of nationally rare³ and scarce⁴ invertebrate species and an assemblage of nationally scarce plants.

Birds

The mudflats attract large numbers of feeding waders and wildfowl with the site being regularly used by redshank *Tringa totanus* in internationally important numbers. There is evidence from recent winter low-water counts that knot *Calidris canuta* and dunlin *Calidris alpina* exceed internationally important numbers when feeding on the mudflats. These counts also indicate that avocet *Recurvirostra avosetta* and ringed plover *Charadrius hiaticula* regularly exceed nationally important numbers.

During the high tide period, waterfowl disperse to roosts in marshes in north Kent and Essex. Nevertheless, high tide counts for this site clearly reveal species regularly reaching nationally important numbers in winter including European white-fronted goose *Anser albifrons* spp *albifrons*, shelduck *Tadorna tadorna*, gadwall *Anas strepera*, teal *Anas crecca*, pintail *Anas acuta*, shoveler *Anas clypeata*, grey plover *Pluvialis squatarola*, curlew *Numenius arquata* and black-tailed godwit *Limosa limosa*. In addition, nationally important numbers of grey plover, curlew, black-tailed godwit, redshank and greenshank *Tringa nebularia* occur during autumn passage with redshank maintaining their nationally important numbers on spring passage.

During the breeding season, the south Thames marshes support an outstanding assemblage of breeding birds including rare⁵ species such as garganey *Anas querquedula*, pintail, avocet and bearded tit *Panurus biarmicus*.

Specially protected birds⁶ found within the site include hen harrier *Circus cyaneus*, short-eared owl *Asio flammeus*, ruff *Philomachus pugnax*, common tern *Sterna hirundo*, avocet and golden plover *Pluvialis apricaria*.

Vegetation

The saltmarshes support characteristic vegetation dominated by the saltmarsh grasses *Puccinellia*, the glassworts *Salicornia*, sea aster *Aster tripolium*, sea lavender *Limonium vulgare* and sea purslane *Halimione portulacoides*, with nationally scarce plants such as golden samphire *Inula crithmoides*⁴ and *Puccinellia fasciculata*⁴.

The grazing marsh complexes, including seawalls, counterwalls, fleets, dykes, runnels and seasonally wet depressions provide suitable conditions for a wide range of plants and animals. The grassland habitats range from the damp muddy areas near the dykes, where characteristic plants include divided sedge *Carex divisa*⁴, small goosefoot *Chenopodium botryodes*⁴ and golden dock *Rumex maritimus*⁴, to the dry seawalls and counterwalls which support scarce species in addition to many widespread plants. These scarce plants include slender hare's ear *Bupleurum tenuissimum*⁴, sea clover *Trifolium squamosum*⁴ and sea barley *Hordeum marinum*⁴, all of which are more abundant in the Thames estuary than elsewhere in Britain. Some seasonally damp depressions in the grassland contain the bulbous foxtail grass *Alopecurus bulbosus*⁴ whilst the more level turf is dominated by a variety of grasses including other foxtails *Alopecurus*, bents *Agrostis*, rye-grass *Lolium perenne* and fescues *Festuca*, with various herbs such as clovers *Trifolium* and buttercups *Ranunculus* also present. The rare and specially protected least lettuce *Lactuca saligna*⁷ which was previously recorded on seawalls in this site may still survive.

The dykes and fleets which are an integral part of the grazing marsh have a range of salinities and consequently support an interesting range of plants. Those nearest the sea tend to be the most brackish, and generally have sea club-rush *Scirpus maritimus*, common reed *Phragmites australis* and fennel pondweed *Potamogeton pectinatus* as the most abundant species; some also include nationally scarce species such as brackish water-crowfoot *Ranunculus baudotii*⁴. In the freshwater dykes further inland there is a greater variety of species, plants such as branched bur-reed *Sparganium erectum* and reed-maces *Typha* spp. May become dominant. Nationally scarce plants associated with the dykes include soft hornwort *Ceratophyllum submersum*⁴ with water soldier *Stratiotes aloides*⁴ present in dykes near Higham.

The mudflats have beds of eelgrass including *Zostera angustifolia*⁴ and *Z. noltii*⁴ and the Allhallows region of the site has areas of vegetated shingle with the nationally scarce sea kale *Crambe maritima*⁴ present.

Invertebrates

This site supports a diverse invertebrate fauna and includes nationally rare³ beetles, flies and true bugs. The 'scarce emerald damselfly' *Lestes dryas*, listed in the British Red Data Book*, in the Cliffe area of the site. In addition, 100 nationally scarce species of invertebrate have been recorded including *Lejops vittata* (a hoverfly), *Saldula opacula* (a shorebug) and the dotted fan-foot moth *Macrochilo cribrumalis*, all of which are restricted to wetland, estuarine or grazing marsh habitats. The water beetle fauna is of particular interest and includes four species of *Bagous* (aquatic weevils), three species of *Berosus* and the great silver water beetle *Hydrophilus piceus*.

Notes

¹ Nationally important numbers corresponds to more than 1% of the British population.

² Internationally important numbers corresponds to more than 1% of the northwest European population.

³ Species regarded as nationally rare are recorded from 1-15 of the 10 x 10km squares in Britain.

⁴ Species regarded as nationally scarce are recorded from 16-100 of the 10 x 10km squares in Britain.

⁵ Listed in 'Red Data Birds in Britain', NCC/RSPB 1990.

⁶ Species listed on Annex 1 of the EEC Birds Directive (79/409/EEC).

⁷ Plants listed on Schedule 8 of the Wildlife and Countryside Act 1981.

A1.5. SSSI/ASSI Conservation Objectives

A1.5.i South Thames Estuary and Marshes SSSI – NE Views About Management (VAM)

A statement of English Nature's views about the management of South Thames Estuary and Marshes Site of Special Scientific Interest (SSSI).

This statement represents English Nature's views about the management of the SSSI for nature conservation. This statement sets out, in principle, our views on how the site's special conservation interest can be conserved and enhanced. English Nature has a duty to notify the owners and occupiers of the SSSI of its views about the management of the land.

Not all of the management principles will be equally appropriate to all parts of the SSSI. Also, there may be other management activities, additional to our current views, which can be beneficial to the conservation and enhancement of the features of interest.

The management views set out below do not constitute consent for any operation. English Nature's written consent is still required before carrying out any operation likely to damage the features of special interest (see your SSSI notification papers for a list of these operations). English Nature welcomes consultation with owners, occupiers and users of the SSSI to ensure that the management of this site conserves and enhances the features of interest, and to ensure that all necessary prior consents are obtained.

Management Principles

Littoral sediments (mud and sand flats)

Intertidal mud and sand flats include a range of generally muddy or sandy low-gradient shores that are exposed to air during low tide and submerged during the higher tides. High energy shores, such as those on open coasts, are generally sandy in nature whilst more sheltered, low energy flats are muddier. They support a wide variety of marine invertebrates that represent an important food source for many fish and bird species.

Good water quality and sediment quality should be maintained, and the sediment budget within the estuarine or coastal system should not be restricted by anthropogenic influences.

The birds that use mud and sandflats for feeding and roosting are vulnerable to disturbance from human activities, for example, bait digging, dog walking and wildfowling. These activities can lead to reduced time spent feeding, or individuals being restricted to areas with a poor food supply. Disturbance should therefore be minimised, especially at times when bird populations may be stressed, such as during severe winter weather.

The location and extent of mud or sandflats is dependent on the extent to which the estuary or coast where they occur is constrained from responding to sea level rise and changing sediment regimes. Management needs to create space to enable landward roll-back to take place in response to sea-level rise, and should also allow the system to be dynamic and retain the flexibility to respond to associated changes such as the movement of physical features within the system, e.g. migrating subtidal sandbanks.

Coastal saltmarsh

Saltmarshes form the upper vegetated portions of intertidal mudflats in sheltered coastal locations, such as estuaries, lagoons and beach plains. There is typically a zonation of vegetation, from plants adapted to regular immersion by the tides (halophytes), through to more widespread plant

species in the areas less frequently covered by the sea. The halophyte plant species are confined to this type of habitat, and areas of structurally diverse vegetation provide good invertebrate habitat. Saltmarshes are also important nursery sites for several fish species, and important refuge, feeding and breeding grounds for wading birds and wildfowl.

Where saltmarshes require management, this has traditionally been achieved by grazing, and previously used regimes should be continued. Grazing provides a variety of different habitats, particularly for wintering bird species, and if grazing were to cease there may be a loss of botanical diversity. The precise timing and intensity will vary according to local conditions and requirements, for example the type or availability of stock, or the need to avoid trampling ground nesting birds. However, on many sites, the aim will be to create a short turf that can be attractive to over-wintering wildfowl, with a reduction in stock density in the early summer for the benefit of ground-nesting birds. Indeed, careful reduction of grazing can increase the number of breeding birds, without significantly altering the plant species composition. Care should be taken not to overgraze the site, as this may reduce the diversity of animal and plant species that the saltmarsh is able to support, as well as potentially impact the sediments supporting the saltmarsh.

Not all saltmarsh habitats require active management to retain their conservation interest. Where there has not been a history of grazing, the saltmarsh will be able to maintain itself and grazing-sensitive species are likely to be present, therefore grazing should not be introduced.

There are a number of factors that are contributing to saltmarsh change that management may need to take into consideration. These include coastal erosion as a result of coastal flood-defence works, rising sea-levels, variations in sediment deposition, and land claim for development.

Wet grassland with breeding and wintering bird interest

Wet grasslands occur on land that is subject to periodic flooding or has a seasonally high water table and is waterlogged for much of the year. Wet grassland often supports a wide variety of plants and animals, in particular birds and invertebrates, and is an important habitat for breeding waders and wintering wildfowl.

Wet grassland requires active management if it is to retain its conservation interest. Generally, each year's growth of vegetation must be removed. Otherwise the sward becomes dominated by tall, vigorous grasses and rushes which, together with an associated build-up of dead plant matter, suppress less vigorous species and lower the botanical richness of the sward. Traditionally, this management is achieved by grazing. Cattle are often the preferred stock, being relatively tolerant of wet conditions and able to control tall grasses and rank vegetation. Cattle also tend to produce a rather uneven, structurally diverse sward. However, ponies, or even hill sheep, can be used if necessary. Grazing usually takes place at times between late spring and early autumn, but the precise timing and intensity will depend on local conditions and requirements, such as the need to avoid trampling ground-nesting birds. Heavy poaching should be avoided but light trampling can be beneficial in breaking down leaf litter and providing areas for seed germination. Agricultural operations in general should be avoided before mid-June to minimise disturbance to breeding birds or the destruction of nests. An element of managed scrub, both within and fringing a field can be of importance to birds and invertebrates, as can a surrounding hedge.

Partial winter flooding is important in maintaining suitable habitat conditions for wintering birds. A mosaic of winter flooded grassland and permanently un-flooded grassland is desirable, with both temporary and permanent pools present. The maintenance of a mosaic of shallow surface pools and un-flooded areas during the winter will provide roosting and feeding habitat for wintering wildfowl and waders. From April onwards, the area of standing surface water should be reduced to increase the area available for nesting waders and also by concentrating aquatic invertebrates in small pools to provide suitable feeding areas for their young. Some shallow areas of flooding should be maintained until late June to provide patches of bare muddy ground on which the birds and their young can feed as raised sward height makes feeding on the drier areas more difficult.

The birds using these features are directly vulnerable to disturbance, which can cause them to lose time spent feeding or drive them to areas with a poorer supply of food. Management should seek to minimise any harmful disturbance, especially at times when bird populations are under stress, such as severely cold conditions. Predators, especially crows and related species, should be controlled and this may be best achieved by limiting their nesting sites. Careful maintenance of existing ditches and drains is usually acceptable practice, but abandonment or deepening of ditches can be harmful.

Ditches

Ditches are artificial habitats created by land drainage, or occasionally by the channelisation of small streams. They may represent the only remaining freshwater habitat within former wetland areas, and often support a wide range of aquatic plant and animal (in particular invertebrate) species that would have previously been more widespread in ponds and wetlands.

If left unmanaged, silt accumulates in the bottom of the ditches, and emergent plants such as reeds are able to colonise across the width of the ditch, leading to a loss of aquatic plant diversity and a gradual drying out of the ditch. To prevent this, periodical removal of sediment and vegetation may be necessary to return the ditch to an early stage of the management cycle. Ideally, ditch management should be undertaken on a rotation, creating a series of different management stages across a site at any one time. All stages of the management cycle have wildlife interest; recently cleared ditches are good for plants and animals which favour newly created habitats and cannot tolerate competition with other species; middle-stage ditches support a rich aquatic plant flora; and late-stage ditches may be important for a variety of invertebrates. The removal of both sediment and vegetation is usually better than simply cutting the vegetation, which does not recreate the earliest stages of the ditch management cycle. Where possible, management should aim to create shallow shelving margins rather than steep ditch sides. Where water voles are known to be present, the relevant good practice guidelines for ditch management and conservation should be followed.

Most ditch systems are subject to water level control, which should be managed to ensure that there is a sufficient depth of water (0.3-0.5m) in ditches throughout the year. Rapid or extreme changes in water level should be avoided unless they are known to be important to plant or animal communities relying on such fluctuations.

Ditches are susceptible to increased levels of nutrients which can cause a loss of aquatic plants and increases in algal growth. Other activities that can lead to this include the control or removal of aquatic plants, or the introduction of species such as bottom feeding coarse fish which uproot plants and disturb ditch sediments. Ditches are also susceptible to invasion by non-native aquatic plants such as floating pennywort and water fern, which are able to grow rapidly taking up available habitat and smothering other plants. Some native plants including a number of duckweed species are also able to take over in this way (although such growths are usually exacerbated by increased nutrients in the water) and management may be necessary to control such invasions where they cause a problem.

An important feature of many coastal ditch systems relating to water quality is the transition between freshwater and brackish water conditions, which often results in interesting changes in plant and animal species along ditch lengths or across the site. Management should aim to maintain such freshwater-brackish transitions where they occur.

Seagrass (*Zostera*) beds

Seagrass refers to a group of flowering marine plants that usually form beds or meadows on soft sediments in shallow coastal waters and some shores. Seagrass beds perform the important function of binding and stabilising sediment, and they support rich communities of plants and animals. They produce large amounts of organic matter that provides an important source of food for the wider marine ecosystem, and there are a number of species that are entirely dependent on

seagrass habitats. Seagrass beds also provide an important nursery area for fish in the summer, as well as a food source for wintering wildfowl.

Management should aim to maintain good water and sediment quality, as seagrass beds are sensitive to excessive nutrient enrichment, which can lead to outbreaks of algae that can smother the seagrass, thus reducing the amount of light that is available to individual plants. Management should also aim to ensure that the sediment budget within the estuarine or coastal system is not restricted by anthropogenic influences.

Coastal lagoons

Coastal lagoons are saline water bodies separated from the sea by a barrier (e.g. sand, shingle or rock sill). A small number are separated by tidal narrows which restrict the flow of water into and out of the lagoon. This separation from the sea makes them unique among coastal habitats and means that saline lagoons are either tideless, or where inlets occur, the tide has only a restricted effect on the lagoon. They retain part of their water-body at low tide, and this water may be either saline or brackish. They often support unusual assemblages of marine, estuarine and aquatic plants and animals, including lagoonal specialist species.

Any management needs to be carefully tailored to the needs of each individual lagoon and should be based on an understanding of the natural features of importance and the external factors affecting the lagoon. Indeed, where a lagoon is in a good and stable condition, active management is unlikely to be necessary. Maintaining salinity and water depths can be a key management priority, particularly where some lagoons become increasingly separated from the sea as a result of natural coastal processes - the balance between freshwater (e.g. from rainfall, streams or artificial outputs) and saline (i.e. sea water) inputs may change as a result. It may be necessary to actively manage freshwater and seawater input to favour certain species or communities. Whilst freshwater input is not essential to the conservation of lagoons, some connectivity with seawater is.

The water depth is also critical to many of the lagoonal specialist species with a depth between 0.5 and 1m being desirable. Some deeper water refuges are also beneficial. Siltation from surrounding land run-off may need to be addressed.

Water quality, and any direct and/or diffuse inputs from the surrounding land, can have a profound effect upon the productivity of lagoons and well-being of specialist species. Saline lagoons can show extreme reactions to a build-up of some types of nutrients and therefore it may be necessary to actively manage inputs, especially where in close proximity to farmland.

In some cases, it may be desirable to allow vegetation to encroach into the lagoon to increase the diversity of habitats present, particularly for some breeding and migratory bird species. However, vegetation should not be allowed to encroach to such an extent that it significantly reduces the areas of open water and shallow water, thus reducing the variety of habitats available to specialist species within the lagoon itself.

Islands in saline lagoons can be important for breeding birds and some management of the vegetation on these islands may be necessary to provide the best conditions for breeding birds. Two typical methods of vegetation control include flooding and hand clearance.

Vegetated shingle

Shingle is defined as sediment with particle sizes from 2-200mm. Shingle beaches form where sediment is first deposited on the shore by wave action. These deposits can then build up into more stable spits, bars or forelands. The types of vegetation that occur on shingle depend on the stability and structure of the shingle itself, but all must be able to cope with the unique physical and hydrological conditions typical of this habitat. This results in some communities being unique

to shingle; including unusual moss- and lichen-rich communities that are of great conservation value. Shingle structures also provide important habitats for invertebrates and breeding birds.

A key management requirement is to avoid or minimise surface disturbance, especially in the more open communities. Many of the vegetation types and species associated with shingle are fragile and vulnerable to damage from trampling. This breaks up the fine humus that develops in the upper layers of the shingle that is vital for the plants to survive. Where recreational pressures are significant enough to result in the loss of vegetation cover, or prevent its recovery, it may be necessary to take steps to manage access. Disturbance of areas important for breeding birds should be minimised during the breeding season.

Where there is more closed vegetation cover, light grazing, by rabbits for example, may be all that is needed to prevent scrub encroachment on areas of grassland and heath. However, if there is a tradition of sheep grazing; it may be beneficial to continue this practice at a low intensity. In some cases, grazing is not necessary, because of the low rates of plant growth on shingle structures, and can even be damaging, due to the fragility of shingle habitats. The introduction of grazing where it has not been traditionally practiced would not be beneficial.

All habitats

The habitats within this site are highly sensitive to inorganic fertilisers and pesticides, applications of which should be avoided both within the site itself and in adjacent surrounding areas.

Herbicides may be useful in targeting certain invasive species, but should be used with extreme care. Access to this site, and any recreational activities within, may also need to be managed.

A1.5.ii South Thames Estuary and Marshes SSSI – NE Operations Likely to Damage (OLD)

Operations likely to damage the special interest

Site name: South Thames Estuary and Marshes

OLD1003874

Ref. No.	Type of Operation
1	Cultivation, including ploughing, rotovating, harrowing, and re-seeding.
2	Grazing.
3	Stock feeding.
4	Mowing or other methods of cutting vegetation.
5	Application of manure, fertilisers and lime.
6	Application of pesticides, including herbicides (weedkillers).
7	Dumping, spreading or discharge of any materials.
8	Burning.
9	The release into the site of any wild, feral or domestic animal*, plant or seed.
10	The killing or removal of any wild animal*, including pest control.
11	The destruction, displacement, removal or cutting of any plant or plant remains, including tree, shrub, herb, hedge, dead or decaying wood, moss, lichen, fungus, leaf-mould, turf.
12	Tree and/or woodland management+.
13a	Drainage (including the use of mole, tile, tunnel or other artificial drains).
13b	Modification of the structure of watercourses (eg rivers, streams, springs, ditches, dykes, drains) including their banks and beds, as by re-alignment, re-grading and dredging.
13c	Management of aquatic and bank vegetation for drainage purposes
14	The changing of water levels and tables and water utilisation (including irrigation, storage and abstraction from existing water bodies and through boreholes).
15	Infilling of ditches, dykes, drains, ponds, pools, marshes or pits.
16a	Freshwater fishery production and/or management, including sporting fishing and angling.
16b	Coastal fishing or fisheries management and seafood or marine life collection including the use of traps or fish cages.
17	Reclamation of land from sea, estuary or marsh.
18	Bait digging in intertidal areas.
19	Erection of sea defences or coast protection works, including cliff or landslip drainage or stabilisation measures.
20	Extraction of minerals, including peat, shingle, sand and gravel, topsoil, subsoil shells and spoil.
21	Construction, removal or destruction of roads, tracks, walls, fences, hardstands, banks, ditches or other earthworks, or the laying, maintenance or removal of pipelines and cables, above or below ground.
22	Storage of materials.
23	Erection of permanent or temporary structures, or the undertaking of engineering works, including drilling.
24	Modification of natural or man-made features, clearance of boulders, large stones, infilling of pits and quarries.
26	Use of vehicles or craft likely to damage or disturb features of interest.
17	Recreational or other activities likely to damage or disturb features of interest.
28	Game and waterfowl management and hunting practices.
*	'animal' includes any mammal, reptile, amphibian, bird, fish or invertebrate.
+	including afforestation, planting, clear and selective felling, thinning, coppicing, modification of the stand or underwood, changes in species composition, cessation of management.

A1.6. SPA, SAC, Ramsar, NNR or archaeological citations

A1.6.i Thames Estuary and Marshes SPA – 2000

EC Directive 79/409 on the Conservation of Wild Birds: Special Protection Area

Name: Thames Estuary and Marshes

Unitary Authority/County: Essex County Council, Gravesham Borough Council, Kent County Council, Medway Council, and Thurrock Borough Council.

Consultation proposal: Mucking Flats and Marshes SSSI and South Thames Estuary and Marshes SSSIs have been recommended as a Special Protection Area because of the site's European ornithological interest.

The Thames Estuary and Marshes Special Protection Area is a wetland of European importance comprising a mosaic of intertidal habitats, saltmarsh, coastal grazing marshes, saline lagoons and chalk pits. The site provides wintering and breeding habitats for important assemblages of wetland bird species, particularly wildfowl and waders as well as supporting migratory birds on passage. The site forms part of the wider Thames Estuary together with other classified SPAs in both Essex and Kent.

Boundary of SPA: The SPA boundary is within or coincident with the above SSSI boundaries. See SPA map for further detail.

Size of SPA: The SPA covers an area of 4,838.94 ha.

European ornithological importance of the SPA: Thames Estuary and Marshes SPA is of European importance because:

- a) the site qualifies under **article 4.1** of the Directive (79/409/EEC) as it is used regularly by 1% or more of the GB populations of the following species listed on Annex I, in any season:

Annex I species	5 year peak mean 1993/94 - 1997/98	% GB population
Avocet <i>Recurvirostra avosetta</i>	283 individuals - wintering	28.3% GB
Hen Harrier <i>Circus cyaneus</i>	7 individuals - wintering	1.0% GB

- b) the site qualifies under **article 4.2** of the Directive (79/409/EEC) as it is used regularly by 1% or more of the biogeographical populations of the following regularly occurring migratory species (other than those listed on Annex I), in any season:

Species	5 year peak mean 1993/94 - 1997/98	% of population
Ringed Plover <i>Charadrius hiaticula</i>	1,324 individuals - passage	2.6% Europe/ Northern Africa (win)
Grey Plover <i>Pluvialis squatarola</i>	2,593 individuals - wintering	1.7% Eastern Atlantic (wintering)
Dunlin <i>Calidris alpina alpina</i>	29,646 individuals - wintering	2.1% N Siberia/Europe/ W Africa
Knot <i>Calidris canutus islandica</i>	4,848 individuals - wintering	1.4% NE Can/Grl/ Iceland/NW Eur
Black-tailed Godwit <i>Limosa limosa islandica</i>	1,699 individuals - wintering	2.4% Iceland (breeding)
Redshank <i>Tringa totanus totanus</i>	3,251 individuals - wintering	2.2% Eastern Atlantic (wintering)

- b) the site qualifies under **article 4.2** of the Directive (79/409/EEC) as it is used regularly by over 20,000 waterfowl in any season:

Period	Season	Population
1993/94 - 1997/98	Wintering	75,019

Non-qualifying species of interest

Other Annex 1 species which regularly occur on the site in non-qualifying numbers are breeding Common Tern *Sterna hirundo*, and passage and wintering Bewick's Swan *Cygnus columbianus bewickii*, Golden Plover *Pluvialis apricaria*, Ruff *Philomachus pugnax*, Short-eared Owl *Asio flammeus* and Kingfisher *Alcedo atthis*.

The site also supports nationally important populations of Shelduck *Tadorna tadorna*, Teal *Anas crecca*, Pintail *Anas acuta*, Gadwall *Anas strepera*, Shoveler *Anas clypeata*, Tufted Duck *Aythya fuligula* and Pochard *Aythya ferina*.

Status of SPA

The Thames Estuary and Marshes SPA was classified on 31 March 2000.

Thames Estuary & Marshes SPA UK9012021

Compilation date: March 2000 Version: 0.4



A1.6.ii Thames Estuary and Marshes SPA Review – 2001

SPA description

(information as published 2001)

Thames Estuary and Marshes

Country	England
Unitary Authority	Medway, Thurrock, Kent
SPA status	Classified 31/03/2000
Latitude	51 29 08 N
Longitude	00 35 47 E
SPA EU code	UK9012021
Area (ha)	4838.94
Component SSSI/ASSIs	Mucking Flats and Marshes South Thames Estuary and Marshes



The Thames Estuary and Marshes SPA is located on the south side of the Thames Estuary in southern England. The marshes extend for about 15 km along the south side of the estuary and also include intertidal areas on the north side of the estuary. To the south of the river, much of the area is brackish grazing marsh, although some of this has been converted to arable use. At Cliffe, there are flooded clay and chalk pits, some of which have been infilled with dredgings. Outside the sea wall, there is a small extent of saltmarsh and broad intertidal mud-flats. The estuary and adjacent grazing marsh areas support an important assemblage of wintering waterbirds including grebes, geese, ducks and waders. The site is also important in spring and autumn migration periods.

Qualifying species

For individual species accounts visit the [Species Accounts section](#)

This site qualifies under **Article 4.1** of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive:

Over winter;

Avocet *Recurvirostra avosetta*, 276 individuals representing at least 21.7% of the wintering population in Great Britain (5 year peak mean 1991/2 - 1995/6)

Hen Harrier *Circus cyaneus*, 7 individuals representing at least 0.9% of the wintering population in Great Britain (5 year mean 93/4-97/8)

This site also qualifies under **Article 4.2** of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species:

On passage;

Ringed Plover *Charadrius hiaticula*, 559 individuals representing at least 1.1% of the Europe/Northern Africa - wintering population (5 year peak mean 1991/2 - 1995/6)

Over winter;

Ringed Plover *Charadrius hiaticula*, 541 individuals representing at least 1.1% of the wintering Europe/Northern Africa - wintering population (5 year peak mean 1991/2 - 1995/6)

Assemblage qualification: A wetland of international importance.

The area qualifies under **Article 4.2** of the Directive (79/409/EEC) by regularly supporting at least 20,000 waterfowl

Over winter, the area regularly supports 33,433 individual waterfowl (5 year peak mean 1991/2 - 1995/6) including: Redshank *Tringa totanus*, Black-tailed Godwit *Limosa limosa islandica*, Dunlin *Calidris alpina alpina*, Lapwing *Vanellus vanellus*, Grey Plover *Pluvialis squatarola*, Shoveler *Anas clypeata*, Pintail *Anas acuta*, Gadwall *Anas strepera*, Shelduck *Tadorna tadorna*, White-fronted Goose *Anser albifrons albifrons*, Little Grebe *Tachybaptus ruficollis*, Ringed Plover *Charadrius hiaticula*, Avocet *Recurvirostra avosetta*, Whimbrel *Numenius phaeopus*.

A1.6.iii Thames Estuary and Marshes SPA Natura 2000 Standard Data Form – 2015

NATURA 2000 – STANDARD DATA FORM

Special Protection Areas under the EC Birds Directive.

Each Natura 2000 site in the United Kingdom has its own Standard Data Form containing site-specific information. The data form for this site has been generated from the Natura 2000 Database submitted to the European Commission on the following date:

22/12/2015

The information provided here, follows the officially agreed site information format for Natura 2000 sites, as set out in the [Official Journal of the European Union recording the Commission Implementing Decision of 11 July 2011](#) (2011/484/EU).

The Standard Data Forms are generated automatically for all of the UK's Natura 2000 sites using the European Environment Agency's Natura 2000 software. The structure and format of these forms is exactly as produced by the EEA's Natura 2000 software (except for the addition of this coversheet and the end notes). The content matches exactly the data submitted to the European Commission.

Please note that these forms contain a number of codes, all of which are explained either within the data forms themselves or in the end notes.

Further technical documentation may be found here
http://bd.eionet.europa.eu/activities/Natura_2000/reference_portal

As part of the December 2015 submission, several sections of the UK's previously published Standard Data Forms have been updated. For details of the approach taken by the UK in this submission please refer to the following document:
http://jncc.defra.gov.uk/pdf/Natura2000_StandardDataForm_UKApproach_Dec2015.pdf

More general information on Special Protection Areas (SPAs) in the United Kingdom is available from the [SPA home page on the JNCC website](#). This webpage also provides links to Standard Data Forms for all SPAs in the UK.

Date form generated by the Joint Nature Conservation Committee
25 January 2016.



NATURA 2000 - STANDARD DATA FORM

For Special Protection Areas (SPA),
Proposed Sites for Community Importance (pSCI),
Sites of Community Importance (SCI) and
for Special Areas of Conservation (SAC)

SITE UK9012021
SITENAME Thames Estuary and Marshes

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- [2. SITE LOCATION](#)
- [3. ECOLOGICAL INFORMATION](#)
- [4. SITE DESCRIPTION](#)
- [5. SITE PROTECTION STATUS AND RELATION WITH CORINE BIOTOPES](#)
- [6. SITE MANAGEMENT](#)

1. SITE IDENTIFICATION

1.1 Type A	1.2 Site code UK9012021	Back to top
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1.3 Site name

Thames Estuary and Marshes

1.4 First Compilation date 2000-03	1.5 Update date 2015-12
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1.6 Respondent:

Name/Organisation: Joint Nature Conservation Committee
Address: Joint Nature Conservation Committee Monkstone House City Road Peterborough PE1 1JY
Email:

1.7 Site indication and designation / classification dates

Date site classified as SPA:	2000-03
National legal reference of SPA designation	Regulations 12A and 13-15 of the Conservation Habitats and Species Regulations 2010, (http://www.legislation.gov.uk/ukxi/2010/490/contents/made) as amended by The Conservation of Habitats and Species (Amendment) Regulations 2011 (http://www.legislation.gov.uk/ukxi/2011/625/contents/made).

2. SITE LOCATION

2.1 Site-centre location [decimal degrees]:

Longitude
0.596388889

Latitude
51.48555556

2.2 Area [ha]:

4802.47

2.3 Marine area [%]

55.7

2.4 Site length [km]:

0.0

2.5 Administrative region code and name

NUTS level 2 code **Region Name**

UKJ4	Kent
UKH3	Essex

2.6 Biogeographical Region(s)

Atlantic (100.0
%)

3. ECOLOGICAL INFORMATION

3.2 Species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC and site evaluation for them

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Species					Population in the site					Site assessment			
G	Code	Scientific Name	S	NP	T	Size		Unit	Cat.	D.qual.	A B C D	A B C	
						Min	Max				Pop.	Con.	Iso. Glo
B	A672	Calidris alpina alpina			w	29646	29646	i		G	B		C
B	A143	Calidris canutus			w	4848	4848	i		G	C		C
B	A137	Charadrius hiaticula			c	1324	1324	i		G	B		C
B	A082	Circus cyaneus			w	7	7	i		G	C		C
B	A616	Limosa limosa islandica			w	1699	1699	i		G	B		C
B	A141	Pluvialis squatarola			w	2593	2593	i		G	C		C
B	A132	Recurvirostra avosetta			w	283	283	i		G	A		C
		Tringa					101						

B	A162	totanus			w	3251	3251	i		G	B		C	
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- **Group:** A = Amphibians, B = Birds, F = Fish, I = Invertebrates, M = Mammals, P = Plants, R = Reptiles
- **S:** in case that the data on species are sensitive and therefore have to be blocked for any public access enter: yes
- **NP:** in case that a species is no longer present in the site enter: x (optional)
- **Type:** p = permanent, r = reproducing, c = concentration, w = wintering (for plant and non-migratory species use permanent)
- **Unit:** i = individuals, p = pairs or other units according to the Standard list of population units and codes in accordance with Article 12 and 17 reporting (see [reference portal](#))
- **Abundance categories (Cat.):** C = common, R = rare, V = very rare, P = present - to fill if data are deficient (DD) or in addition to population size information
- **Data quality:** G = 'Good' (e.g. based on surveys); M = 'Moderate' (e.g. based on partial data with some extrapolation); P = 'Poor' (e.g. rough estimation); VP = 'Very poor' (use this category only, if not even a rough estimation of the population size can be made, in this case the fields for population size can remain empty, but the field "Abundance categories" has to be filled in)

3.3 Other important species of flora and fauna (optional)

Species					Population in the site				Motivation					
Group	CODE	Scientific Name	S	NP	Size		Unit	Cat.	Species Annex		Other categories			
					Min	Max		C R V P	IV	V	A	B	C	D
B	WATR	Waterfowl assemblage			75019	75019	i						X	

- **Group:** A = Amphibians, B = Birds, F = Fish, Fu = Fungi, I = Invertebrates, L = Lichens, M = Mammals, P = Plants, R = Reptiles
- **CODE:** for Birds, Annex IV and V species the code as provided in the reference portal should be used in addition to the scientific name
- **S:** in case that the data on species are sensitive and therefore have to be blocked for any public access enter: yes
- **NP:** in case that a species is no longer present in the site enter: x (optional)
- **Unit:** i = individuals, p = pairs or other units according to the standard list of population units and codes in accordance with Article 12 and 17 reporting, (see [reference portal](#))
- **Cat.:** Abundance categories: C = common, R = rare, V = very rare, P = present
- **Motivation categories:** IV, V: Annex Species (Habitats Directive), A: National Red List data; B: Endemics; C: International Conventions; D: other reasons

4. SITE DESCRIPTION

4.1 General site character

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Habitat class	% Cover
N07	3.7
N06	5.6
N03	1.5
N09	1.9
N05	0.9
N10	29.1
N02	57.3
Total Habitat Cover	100.00000000000001

Other Site Characteristics

1 Terrestrial: Soil & Geology: shingle, alluvium, mud 2 Terrestrial: Geomorphology and landscape: coastal, floodplain 4 Marine: Geomorphology: estuary, intertidal sediments (including sandflat/mudflat)

4.2 Quality and importance

ARTICLE 4.1 QUALIFICATION (79/409/EEC) Over winter the area regularly supports: Circus cyaneus 1% of the population in Great Britain Five year peak mean for 1993/94 to 1997/98 Recurvirostra avosetta (Western Europe/Western Mediterranean - breeding) 28.3% of the population in Great Britain Five year peak mean for 1993/93 to 1997/98 ARTICLE 4.2 QUALIFICATION (79/409/EEC) Over winter the area regularly supports: Calidris alpina alpina (Northern Siberia/Europe/Western Africa) 2.1% of the population Five year peak mean for 1993/94 to 1997/98 Calidris canutus (North-eastern Canada/Greenland/Iceland/North-western Europe) 1.4% of the population Five year peak mean for 1993/94 to 1997/98 Limosa limosa islandica (Iceland breeding) 2.4% of the population Five year peak mean for 1993/94 to 1997/98 Pluvialis squatarola (Eastern Atlantic - wintering) 1.7% of the population Five year peak mean for 1993/94 to 1997/98 Tringa totanus (Eastern Atlantic - wintering) 2.2% of the population Five year peak mean for 1993/94 to 1997/98 On passage the area regularly supports: Charadrius hiaticula (Europe/Northern Africa - wintering) 2.6% of the population Five year peak mean for 1993/94 to 1997/98 ARTICLE 4.2 QUALIFICATION (79/409/EEC): AN INTERNATIONALLY IMPORTANT ASSEMBLAGE OF BIRDS Over winter the area regularly supports: 750 waterfowl (5 year peak mean 1991/92-1995/96) Including: Recurvirostra avosetta, Pluvialis squatarola, Calidris canutus, Calidris alpina alpina, Limosa limosa islandica, Tringa totanus

4.3 Threats, pressures and activities with impacts on the site

The most important impacts and activities with high effect on the site

Negative Impacts			
Rank	Threats and pressures [code]	Pollution (optional) [code]	inside/outside [i o b]
H	M01		B
H	I01		B
H	G01		I
H	M02		B

Positive Impacts			
Rank	Activities, management [code]	Pollution (optional) [code]	inside/outside [i o b]
H	A02		I
H	G03		I
H	D05		I
H	A04		I
H	A06		I

Rank: H = high, M = medium, L = low

Pollution: N = Nitrogen input, P = Phosphor/Phosphate input, A = Acid input/acidification,

T = toxic inorganic chemicals, O = toxic organic chemicals, X = Mixed pollutions

i = inside, o = outside, b = both

4.5 Documentation

Conservation Objectives - the Natural England links below provide access to the Conservation Objectives (and other site-related information) for its terrestrial and inshore Natura 2000 sites, including conservation advice packages and supporting documents for European Marine Sites within English waters and for cross-border sites. See also the 'UK Approach' document for more information (link via the JNCC website).

Link(s): http://jncc.defra.gov.uk/pdf/Natura2000_StandardDataForm_UKApproach_Dec2015.pdf

<http://publications.naturalengland.org.uk/category/3212324>

<http://publications.naturalengland.org.uk/category/6490068894089216>

5. SITE PROTECTION STATUS (optional)

5.1 Designation types at national and regional level:

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Code	Cover [%]	Code	Cover [%]	Code	Cover [%]
UK04	100.0		103		

6. SITE MANAGEMENT

6.1 Body(ies) responsible for the site management:

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Organisation:	Natural England
Address:	
Email:	

6.2 Management Plan(s):

An actual management plan does exist:

☐	Yes
☐	No, but in preparation
☒	No

6.3 Conservation measures (optional)

For available information, including on Conservation Objectives, see Section 4.5.

A1.6.iv Thames Estuary and Marshes Ramsar – 2000

Information Sheet on Ramsar Wetlands (RIS)

Categories approved by Recommendation 4.7 (1990), as amended by Resolution VII.13 of the 8th Conference of the Contracting Parties (2002) and Resolutions IX.1 Annex B, IX.6, IX.21 and IX.22 of the 9th Conference of the Contracting Parties (2005).

Notes for compilers:

1. The RIS should be completed in accordance with the attached *Explanatory Notes and Guidelines for completing the Information Sheet on Ramsar Wetlands*. Compilers are strongly advised to read this guidance before filling in the RIS.
2. Further information and guidance in support of Ramsar site designations are provided in the *Strategic Framework for the future development of the List of Wetlands of International Importance* (Ramsar Wise Use Handbook 7, 2nd edition, as amended by COP9 Resolution IX.1 Annex B). A 3rd edition of the Handbook, incorporating these amendments, is in preparation and will be available in 2006.
3. Once completed, the RIS (and accompanying map(s)) should be submitted to the Ramsar Secretariat. Compilers should provide an electronic (MS Word) copy of the RIS and, where possible, digital copies of all maps.

1. Name and address of the compiler of this form:

Joint Nature Conservation Committee
Monkstone House
City Road
Peterborough
Cambridgeshire PE1 1JY
UK
Telephone/Fax: +44 (0)1733 – 562 626 / +44 (0)1733 – 555 948
Email: RIS@JNCC.gov.uk

FOR OFFICE USE ONLY:

DD MM YY

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Designation date

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Site Reference Number

2. Date this sheet was completed/updated:

Designated: 31 March 2000

3. Country:

UK (England)

4. Name of the Ramsar site:

Thames Estuary and Marshes

5. Designation of new Ramsar site or update of existing site:

This RIS is for: Updated information on an existing Ramsar site

6. For RIS updates only, changes to the site since its designation or earlier update:

a) Site boundary and area:

**** Important note:** If the boundary and/or area of the designated site is being restricted/reduced, the Contracting Party should have followed the procedures established by the Conference of the Parties in the Annex to COP9 Resolution IX.6 and provided a report in line with paragraph 28 of that Annex, prior to the submission of an updated RIS.

b) Describe briefly any major changes to the ecological character of the Ramsar site, including in the application of the Criteria, since the previous RIS for the site:

7. Map of site included:

Refer to Annex III of the *Explanatory Notes and Guidelines*, for detailed guidance on provision of suitable maps, including digital maps.

a) A map of the site, with clearly delineated boundaries, is included as:

- i) **hard copy** (required for inclusion of site in the Ramsar List): yes ✓ -or- no ☐;
- ii) **an electronic format** (e.g. a JPEG or ArcView image) Yes
- iii) **a GIS file providing geo-referenced site boundary vectors and attribute tables** yes ✓ -or- no ☐.

b) Describe briefly the type of boundary delineation applied:

e.g. the boundary is the same as an existing protected area (nature reserve, national park etc.), or follows a catchment boundary, or follows a geopolitical boundary such as a local government jurisdiction, follows physical boundaries such as roads, follows the shoreline of a waterbody, etc.

The site boundary is the same as, or falls within, an existing protected area.

For precise boundary details, please refer to paper map provided at designation

8. Geographical coordinates (latitude/longitude):

51 29 08 N 00 35 47 E

9. General location:

Include in which part of the country and which large administrative region(s), and the location of the nearest large town.

Nearest town/city: Gravesend

Contains part of the north coast of Kent and part of the southern coast of Essex, straddling the Thames estuary.

Administrative region: Essex; Kent; Medway; Thurrock

10. Elevation (average and/or max. & min.) (metres):

Min. -2
Max. 20
Mean 1

11. Area (hectares): 5588.59**12. General overview of the site:**

Provide a short paragraph giving a summary description of the principal ecological characteristics and importance of the wetland.

A complex of brackish, floodplain grazing marsh ditches, saline lagoons and intertidal saltmarsh and mudflat. These habitats together support internationally important numbers of wintering waterfowl. The saltmarsh and grazing marsh are of international importance for their diverse assemblages of wetland plants and invertebrates.

13. Ramsar Criteria:

Circle or underline each Criterion applied to the designation of the Ramsar site. See Annex II of the *Explanatory Notes and Guidelines* for the Criteria and guidelines for their application (adopted by Resolution VII.11).

2, 5, 6

14. Justification for the application of each Criterion listed in 13 above:

Provide justification for each Criterion in turn, clearly identifying to which Criterion the justification applies (see Annex II for guidance on acceptable forms of justification).

Ramsar criterion 2

The site supports one endangered plant species and at least 14 nationally scarce plants of wetland habitats. The site also supports more than 20 British Red Data Book invertebrates.

Ramsar criterion 5

Assemblages of international importance:

Species with peak counts in winter:

45118 waterfowl (5 year peak mean 1998/99-2002/2003)

Ramsar criterion 6 – species/populations occurring at levels of international importance.

Qualifying Species/populations (as identified at designation):

Species with peak counts in spring/autumn:

Ringed plover , <i>Charadrius hiaticula</i> , Europe/Northwest Africa	595 individuals, representing an average of 1.8% of the GB population (5 year peak mean 1998/9-2002/3)
Black-tailed godwit , <i>Limosa limosa islandica</i> , Iceland/W Europe	1640 individuals, representing an average of 4.6% of the population (5 year peak mean 1998/9-2002/3)

Species with peak counts in winter:

Grey plover , <i>Pluvialis squatarola</i> , E Atlantic/W Africa -wintering	1643 individuals, representing an average of 3.1% of the GB population (5 year peak mean 1998/9-2002/3)
Red knot , <i>Calidris canutus islandica</i> , W & Southern Africa (wintering)	7279 individuals, representing an average of 1.6% of the population (5 year peak mean 1998/9-2002/3)
Dunlin , <i>Calidris alpina alpina</i> , W Siberia/W Europe	15171 individuals, representing an average of 1.1% of the population (5 year peak mean 1998/9-2002/3)
Common redshank , <i>Tringa totanus totanus</i> ,	1178 individuals, representing an average of 1% of the GB population (5 year peak mean 1998/9-2002/3)

Contemporary data and information on waterbird trends at this site and their regional (sub-national) and national contexts can be found in the Wetland Bird Survey report, which is updated annually. See www.bto.org/survey/webs/webs-alerts-index.htm.

Details of bird species occurring at levels of National importance are given in Section 22

15. Biogeography (required when Criteria 1 and/or 3 and /or certain applications of Criterion 2 are applied to the designation):

Name the relevant biogeographic region that includes the Ramsar site, and identify the biogeographic regionalisation system that has been applied.

a) biogeographic region:

Atlantic

b) biogeographic regionalisation scheme (include reference citation):

Council Directive 92/43/EEC

16. Physical features of the site:

Describe, as appropriate, the geology, geomorphology; origins - natural or artificial; hydrology; soil type; water quality; water depth, water permanence; fluctuations in water level; tidal variations; downstream area; general climate, etc.

Soil & geology	alluvium, mud, shingle
Geomorphology and landscape	coastal, floodplain, intertidal sediments (including sandflat/mudflat), estuary
Nutrient status	eutrophic
pH	no information
Salinity	brackish / mixosaline, fresh, saline / euhaline
Soil	no information
Water permanence	usually permanent, usually seasonal / intermittent
Summary of main climatic features	Annual averages (Greenwich, 1971–2000) (www.metoffice.com/climate/uk/averages/19712000/sites/greenwich.html) Max. daily temperature: 14.8° C Min. daily temperature: 7.2° C Days of air frost: 29.1 Rainfall: 583.6 mm Hrs. of sunshine: 1461.0

General description of the Physical Features:

The marshes extend for about 15 km along the south side of the Thames estuary and also include intertidal areas on the north side of the estuary. To the south of the river, much of the area is brackish grazing marsh, although some of this has been converted to arable use. At Cliffe, there are flooded clay and chalk pits, some of which have been infilled with dredgings. Outside the sea-wall, there is a small extent of saltmarsh and broad intertidal mudflats.

17. Physical features of the catchment area:

Describe the surface area, general geology and geomorphological features, general soil types, general land use, and climate (including climate type).

The marshes extend for about 15 km along the south side of the Thames estuary and also include intertidal areas on the north side of the estuary. To the south of the river, much of the area is brackish grazing marsh, although some of this has been converted to arable use. At Cliffe, there are flooded clay and chalk pits, some of which have been infilled with dredgings. Outside the sea-wall, there is a small extent of saltmarsh and broad intertidal mudflats.

18. Hydrological values:

Describe the functions and values of the wetland in groundwater recharge, flood control, sediment trapping, shoreline stabilization, etc.

Shoreline stabilisation and dissipation of erosive forces, Sediment trapping, Flood water storage / desynchronisation of flood peaks, Maintenance of water quality (removal of nutrients)

19. Wetland types:

Marine/coastal wetland

Code	Name	% Area
G	Tidal flats	49.6
4	Seasonally flooded agricultural land	38.6
Q	Saline / brackish lakes: permanent	4.2
Ss	Saline / brackish marshes: seasonal / intermittent	3.2
Other	Other	1.6
H	Salt marshes	1.3
E	Sand / shingle shores (including dune systems)	0.8
O	Freshwater lakes: permanent	0.7

20. General ecological features:

Provide further description, as appropriate, of the main habitats, vegetation types, plant and animal communities present in the Ramsar site, and the ecosystem services of the site and the benefits derived from them.

The intertidal flats are mostly fine, silty sediment, though in parts they are sandy. The saltmarsh shows a transition from pioneer communities containing *Zostera* to saltmarsh dominated by, for example, *Atriplex portulacoides*. The grazing marsh grassland is mesotrophic and generally species-poor. It does, however, contain scattered rarities, mostly annuals characteristic of bare ground. Where the grassland is seasonally inundated and the marshes are brackish the plant communities are intermediate between those of mesotrophic grassland and those of saltmarsh. The grazing marsh ditches contain a range of flora of brackish and fresh water. The aquatic flora is a mosaic of successional stages resulting from periodic clearance of drainage channels. The dominant emergent plants are *Phragmites communis* and *Bolboschoenus maritimus*. The saline lagoons have a diverse molluscan and crustacean fauna. Dominant plants in the lagoons include *Ulva* and *Chaetomorpha*.

Ecosystem services

21. Noteworthy flora:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 12. Justification for the application of the Criteria) indicating, e.g. which species/communities are unique, rare, endangered or biogeographically important, etc. Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.

Nationally important species occurring on the site:

Higher plants:

The site supports a population of the endangered least lettuce *Lactuca saligna*, and also supports several nationally scarce plants, including bulbous foxtail *Alopecurus bulbosus*, slender hare's-ear *Bupleurum tenuissimum*, divided sedge *Carex divisa*, saltmarsh goosefoot *Chenopodium chenopodioides*, sea barley *Hordeum marinum*, golden samphire *Inula crithmoides*, annual beard grass *Polypogon monspeliensis*, Borrer's saltmarsh-grass *Puccinellia fasciculata*, stiff saltmarsh-grass *P. rupestris*, one-flowered glasswort *Salicornia pusilla*, clustered clover *Trifolium glomeratum*, sea clover *T. squamosum*, narrow-leaved eelgrass *Zostera angustifolia* and dwarf eelgrass *Z. noltei*.

22. Noteworthy fauna:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 12. Justification for the application of the Criteria) indicating, e.g. which species/communities are unique, rare, endangered or biogeographically important, etc., including count data. Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.

Birds

Species currently occurring at levels of national importance:

Species with peak counts in spring/autumn:

Little grebe, <i>Tachybaptus ruficollis ruficollis</i> , Europe to E Urals, NW Africa	251 individuals, representing an average of 3.2% of the GB population (5 year peak mean 1998/9- 2002/3)
Little egret, <i>Egretta garzetta</i> , West Mediterranean	54 individuals, representing an average of 3.2% of the GB population (5 year peak mean 1998/9- 2002/3)
Ruff, <i>Philomachus pugnax</i> , Europe/W Africa	23 individuals, representing an average of 3.2% of the GB population (5 year peak mean 1998/9- 2002/3)
Common greenshank, <i>Tringa nebularia</i> , Europe/W Africa	38 individuals, representing an average of 6.3% of the GB population (5 year peak mean 1998/9- 2002/3)

Species with peak counts in winter:

Common shelduck , <i>Tadorna tadorna</i> , NW Europe	1238 individuals, representing an average of 1.5% of the GB population (5 year peak mean 1998/9-2002/3)
Gadwall , <i>Anas strepera strepera</i> , NW Europe	359 individuals, representing an average of 2% of the GB population (5 year peak mean 1998/9-2002/3)
Northern shoveler , <i>Anas clypeata</i> , NW & C Europe	288 individuals, representing an average of 1.9% of the GB population (5 year peak mean 1998/9-2002/3)
Water rail , <i>Rallus aquaticus</i> , Europe	6 individuals, representing an average of 1.3% of the GB population (5 year peak mean 1998/9-2002/3)
Pied avocet , <i>Recurvirostra avosetta</i> , Europe/Northwest Africa	607 individuals, representing an average of 17.8% of the GB population (5 year peak mean 1998/9-2002/3)
Spotted redshank , <i>Tringa erythropus</i> , Europe/W Africa	6 individuals, representing an average of 4.4% of the GB population (5 year peak mean 1998/9-2002/3)

Species Information

Nationally important species occurring on the site:

Invertebrates:

The endangered species *Bagous longitarsis* occurs on the site.

The following vulnerable species occur on the site: a groundbug *Henestaris halophilus*, a weevil *Bagous cylindrus*, a ground beetle *Polystichus connexus*, a crane fly *Erioptera bivittata*, a crane fly *Limnophila pictipennis*, a horse fly *Hybomitra expollicata*, a hoverfly *Lejops vittata*, a dancefly *Poecilobothrus ducalis*, a snail-killing fly *Pteromicra leucopeza*, a solitary wasp *Philanthus triangulum* and a damselfly *Lestes dryas*.

The following rare species occur on the site: a ground beetle *Anisodactylus poeciloides*, the water beetles *Aulacochthebius exaratus*, *Berosus fulvus*, *Cercyon bifenestratus*, *Hydrochus elongatus*, *H. ignicollis*, *Ochthebius exaratus* and *Hydrophilus piceus*, a beetle *Malachius vulneratus*, a rove beetle *Philonthus punctus*, a fungus beetle *Telmatophilus brevicollis*, a fly *Campsicnemus magius*, a horsefly *Haematopota bigoti*, a soldier fly *Stratiomys longicornis* and a spider *Baryphyma duffeyi*.

23. Social and cultural values:

Describe if the site has any general social and/or cultural values e.g. fisheries production, forestry, religious importance, archaeological sites, social relations with the wetland, etc. Distinguish between historical/archaeological/religious significance and current socio-economic values.

Aesthetic

Archaeological/historical site

Environmental education/ interpretation

Fisheries production

Livestock grazing

Non-consumptive recreation

Scientific research

Sport fishing

Sport hunting

Tourism

Transportation/navigation

b) Is the site considered of international importance for holding, in addition to relevant ecological values, examples of significant cultural values, whether material or non-material, linked to its origin, conservation and/or ecological functioning? No

If Yes, describe this importance under one or more of the following categories:

- i) sites which provide a model of wetland wise use, demonstrating the application of traditional knowledge and methods of management and use that maintain the ecological character of the wetland:
- ii) sites which have exceptional cultural traditions or records of former civilizations that have influenced the ecological character of the wetland:
- iii) sites where the ecological character of the wetland depends on the interaction with local communities or indigenous peoples:
- iv) sites where relevant non-material values such as sacred sites are present and their existence is strongly linked with the maintenance of the ecological character of the wetland:

24. Land tenure/ownership:

Ownership category	On-site	Off-site
Non-governmental organisation (NGO)	+	+
Local authority, municipality etc.	+	+
Private	+	+
Public/communal	+	

25. Current land (including water) use:

Activity	On-site	Off-site
Nature conservation	+	+
Tourism	+	+
Recreation	+	+
Current scientific research	+	+
Fishing: commercial	+	
Fishing: recreational/sport	+	
Gathering of shellfish	+	
Bait collection	+	
Arable agriculture (unspecified)		+
Permanent arable agriculture		+
Livestock watering hole/pond	+	+
Grazing (unspecified)	+	+
Permanent pastoral agriculture	+	+
Hunting: recreational/sport	+	
Industrial water supply		+
Industry		+
Sewage treatment/disposal	+	+
Harbour/port	+	+
Flood control	+	
Transport route	+	+
Urban development		+
Military activities	+	

26. Factors (past, present or potential) adversely affecting the site's ecological character, including changes in land (including water) use and development projects:

Explanation of reporting category:

1. Those factors that are still operating, but it is unclear if they are under control, as there is a lag in showing the management or regulatory regime to be successful
2. Those factors that are not currently being managed, or where the regulatory regime appears to have been ineffective so far.

NA = Not Applicable because no factors have been reported.

Adverse Factor Category	Reporting Category	Description of the problem (Newly reported Factors only)	On-Site	Off-Site	Major Impact?
Dredging	1		+	+	+
Erosion	2		+		+
Eutrophication	2	Studies by the Environment Agency indicate that the waters in the Thames estuary are hyper-nutriented for nitrogen and phosphorus.	+	+	+
General disturbance from human activities	1		+		+

For category 2 factors only.

What measures have been taken / are planned / regulatory processes invoked, to mitigate the effect of these factors?
 Erosion - The North Kent Coastal Habitat Management Plan (CHaMP) has been produced. The Environment Agency is producing a Flood Defence Strategy for the Thames (Thames 2100) and decisions on future flood risk management will need to take into account the effects on features within the designated sites.
 Studies of sediment transport and hydrodynamics within Thames estuary. Investigation of beneficial use of dredgings for mudflat recharge and creation of compensatory habitat.

Eutrophication - Water quality and sources of nutrient inputs are subject to further investigation by the Environment Agency as part of the Agency's review of consents under the Habitats Regulations. Stage 3 of the Review of Consents (appropriate assessment) is scheduled for completion by March 2006, at which point any consented discharges having an adverse effect on site integrity will be identified.

Is the site subject to adverse ecological change? YES

27. Conservation measures taken:

List national category and legal status of protected areas, including boundary relationships with the Ramsar site; management practices; whether an officially approved management plan exists and whether it is being implemented.

Conservation measure	On-site	Off-site
Site/ Area of Special Scientific Interest (SSSI/ASSI)	+	
Special Protection Area (SPA)	+	

Land owned by a non-governmental organisation for nature conservation	+	+
Management agreement	+	
Site management statement/plan implemented	+	
Environmentally Sensitive Area (ESA)	+	+

b) Describe any other current management practices:

The management of Ramsar sites in the UK is determined by either a formal management plan or through other management planning processes, and is overseen by the relevant statutory conservation agency. Details of the precise management practises are given in these documents.

28. Conservation measures proposed but not yet implemented:

e.g. management plan in preparation; official proposal as a legally protected area, etc.

No information available

29. Current scientific research and facilities:

e.g. details of current research projects, including biodiversity monitoring; existence of a field research station, etc.

Numbers of migratory and wintering wildfowl and waders are monitored annually as part of the national Wetland Birds Survey (WeBS) organised by the British Trust for Ornithology, Wildfowl and Wetlands Trust, the Royal Society for the Protection of Birds and the Joint Nature Conservation Committee.

Numbers of breeding waders have been monitored through the BTO/RSPB/English Nature/Defra survey Breeding Waders of Wet Meadows (2002).

Botanical surveys of vegetation of sea wall embankments and grazing marsh ditches have been carried out.

The distribution and extent of saltmarsh habitat has been mapped - North Kent Marshes Saltmarsh Survey (2002) (Blair-Myres 2003)

The RSPB monitors various species groups on its reserves within the site

30. Current communications, education and public awareness (CEPA) activities related to or benefiting the site:

e.g. visitor centre, observation hides and nature trails, information booklets, facilities for school visits, etc.

The RSPB manages a network of reserves within and adjacent to the site, which are promoted locally through existing community initiatives, and more widely through publications and via the internet.

The site forms part of proposals for a north Kent 'Regional Park', being promoted to balance development in Kent Thameside (part of the Thames Gateway growth area). The Management Guidance for the Thames Estuary aims to increase awareness of conservation and is promoted by the Thames Estuary Partnership. The Thames Estuary Partnership has also produced the Tidal Thames Habitat Action Plan to raise awareness of and address biodiversity issues.

31. Current recreation and tourism:

State if the wetland is used for recreation/tourism; indicate type(s) and their frequency/intensity.

Yachting, angling, wildfowling, jet-skiing, water-skiing and birdwatching. Bird watching occurs throughout the year and wildfowling is restricted to the period September to February. The remaining activities occur year-round but are more prevalent in the summer months. Disturbance from these activities is a current issue but is being addressed through further research, negotiation and information dissemination.

32. Jurisdiction:

Include territorial, e.g. state/region, and functional/sectoral, e.g. Dept. of Agriculture/Dept. of Environment, etc.

Head, Natura 2000 and Ramsar Team, Department for Environment, Food and Rural Affairs,
European Wildlife Division, Zone 1/07, Temple Quay House, 2 The Square, Temple Quay, Bristol,
BS1 6EB

33. Management authority:

Provide the name and address of the local office(s) of the agency(ies) or organisation(s) directly responsible for managing the wetland. Wherever possible provide also the title and/or name of the person or persons in this office with responsibility for the wetland.

Site Designations Manager, English Nature, Sites and Surveillance Team, Northminster House,
Northminster Road, Peterborough, PE1 1UA, UK

34. Bibliographical references:

Scientific/technical references only. If biogeographic regionalisation scheme applied (see 15 above), list full reference citation for the scheme.

Site-relevant references

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A1.7. Public Access

Shorne Marshes

Due to its continuing use as an overshoot area for the active Metropolitan Police rifle range, there is no direct public access to the reserve aside from Shornemead Fort, which is outside the danger area. Peripheral access is provided by:

1. The Saxon Shore Way Public Right of Way to the north along the seawall. This allows direct access to Shornemead Fort
2. The Sustrans Public Right of Way to the south parallel with the railway and the Thames and Medway Canal
3. The Bridleway bisecting the reserve running between Shornemead Fort and the Shornemead level crossing

Higham Bight

Higham Bight has full, open access along the seawall provided by the Saxon Shore Way Public Right of Way. Access to the mudflats is limited by its dangerous nature as intertidal mud.

Appendix 2: ENVIRONMENTAL INFORMATION

A2.1. Geology and soils

See Map 10.

Important geology/geomorphology

Geology/geomorphology	Status	Comments
Alluvium over Chalk		Typical of North Kent Marshes

The bedrock geology comprises either Chalk (including Red Chalk) or a combination of Oldhaven, Blackheath, Woolwich and Reading and Thanet beds. Soils are loamy and clayey, typical of coastal flats around the Thames Estuary and with naturally high groundwater where drainage is not a limiting factor.

When these soils are wetted continuously, they swell and seal and provide little opportunity for infiltration and seepage. When dry and cracked they are ineffective in retaining water at the soil surface. In field-capacity conditions, air capacity below the topsoil is expected to be low at <1% but in the topsoil may be between 5 and 10%. The hydraulic conductivity of the subsoil is expected to be very low in its swollen field capacity condition.

As stated above, the soils are excellent at retaining standing water providing that they are allowed to swell and seal and, because of this, are also extremely good for creating small-scale hydrological control structures such as dams and bunds.

See Map 10b for site topography determined from LiDAR data. Note that the data used is @10 years old and new features such as the security ditch are not shown. However, the in-field data shown remains valid.

A2.2. Hydrology

See Map 11.

Landscape context

The hydrology of the area is predominantly a surface water regulated system. Groundwater does exist in the underlying chalk aquifer, but this is confined by the fine clays and silt sediments above. The mean annual rainfall in the area is approximately 600mm per year.

Shorne Marshes is part of a catchment that includes Higham Marshes to the east and Filborough Marshes to the south. The surface waters in these areas of the catchment eventually collect in the Denton New Cut and flow out into the Thames via a tidal outfall situated at the northwest corner of Milton Ranges. Water levels for the vast majority of the catchment (specifically Shorne and Higham Marshes) are controlled by the Milton Stop Weir at the southern edge of compartment 2. Flow in the Cut is consistently high throughout the year, primarily due to it being fed from run-off from the Higham-Strood railway tunnel. However, seasonal variation is managed via removing and replacing boards in the Milton Stop Weir. In winter, a 200mm board is removed to alleviate any

potential for significant flooding across agricultural land in the catchment. This board is replaced during spring to ensure that sufficient water is maintained in the catchment to maintain linked watercourses as wet fences.

The Milton Stop Weir, the tidal outfall and a handful of other stop log structures in and around Higham Marshes that allow the function of releasing or holding water are managed and maintained by the Environment Agency as part of their remit for main river and flood management. The new North Kent Marshes Internal Drainage board has a few assets in the catchment and is currently working on updating the old, and out of date, Water Level Management Plan

Shorne Marshes hydrology

After many years of work, the majority of the site became isolated from the landscape drainage system in 2014/15 allowing the retention of high water levels irrespective of landscape level management. Strategically, there are 4 effective hydrological units and potential fifth unit:

1. Compartments 5-7, 9a-16a, 20-25, P2, P3, P4 & part P5:
This unit holds the prime abstraction facility, which is fed from the Denton New Cut via ditch number 1
2. Compartments 3, 4, 8, part P5 & P6:
This unit is linked/disconnected to unit 1 via a JKH stop log sluice at the western end of ditch 27
3. Compartments 2 & P1. This includes the northern perimeter ditch (44)
This unit is only linked to unit 2 at high water levels when water flows across the fields. This then flows north into the perimeter ditch. Some work is required to effectively separate/link the two units
4. Compartments 28-33, 38 & 40
This unit is linked/disconnected to unit 1 via a pipe at the eastern end of ditch 8 that then sits above and across ditch 51/50, runs under the bridleway and links with ditch 52/53. The control is a vertical stack inside ditch 8
5. Compartments 36, 37 & 39
This is a potential unit not linked to any other unit, it does not hold surface water and requires work to disconnect it from the landscape drainage system

The numbering of the units signifies their order of priority and importance for flooding, particularly for years where water is a scarce resource and the abstraction volume is insufficient to maintain the entire site in optimal conditions for breeding waders.

Abstraction is licensed between 1st November to 31st May and the conditions are:

- Between 1 April and 31 May:
 - 23,750m³ per year
 - 2,160 m³ per day
 - 90m³ per hour
- Between 1 November and 31 March:
 - 93,125m³ per year
 - 2,169 m³ per day
 - 90m³ per hour
- Points of abstraction can be from any ditch within the abstraction licence boundary but not from ditches that form the boundary
- The trigger level is 0.73m AOD or above as measured at the Milton Stop Weir
- The licence allows the use of the fixed pump and mobile pumps

In addition, the licence contains a volume and conditions for Higham Marshes and no abstraction is permitted at both sites at the same time.

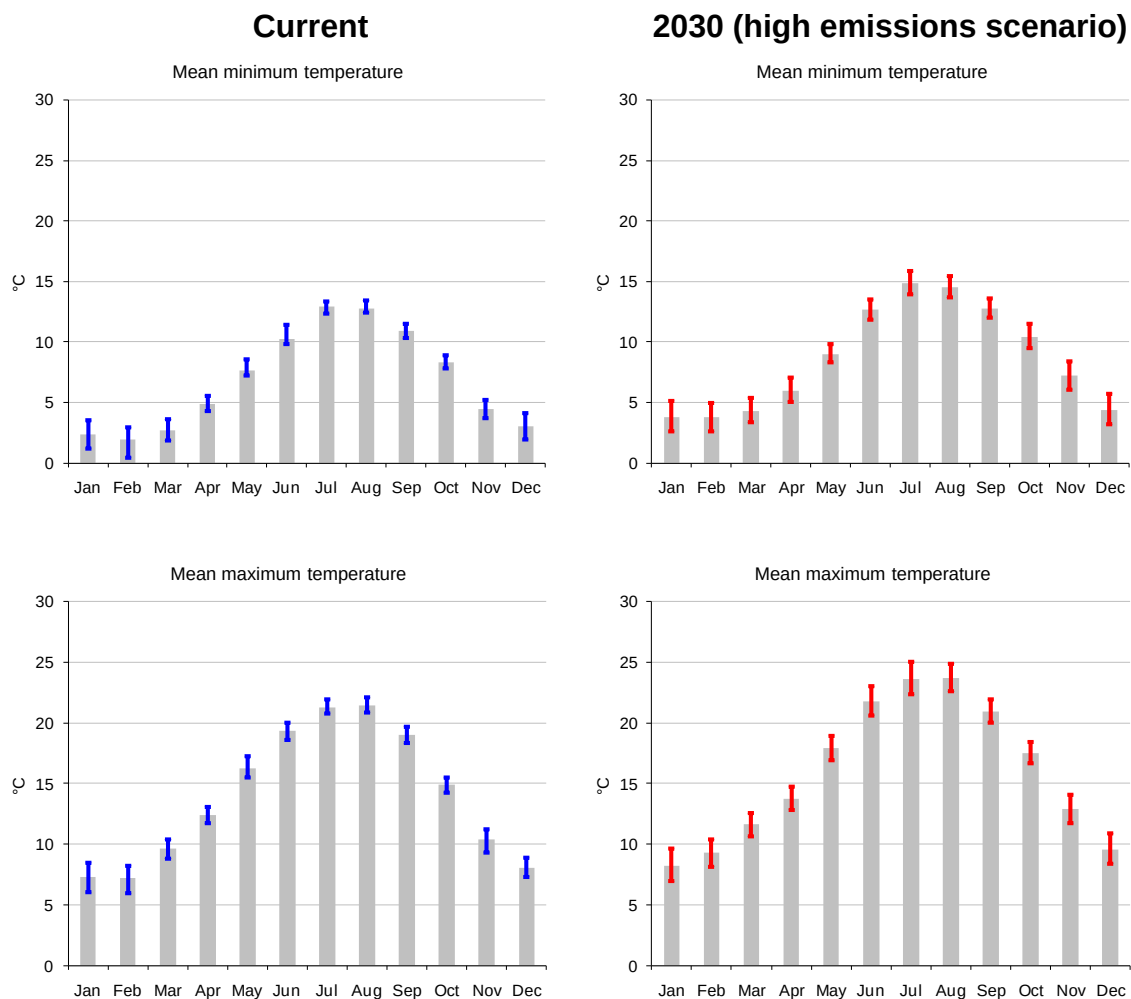
The high-level ditch network can act as a water storage facility but, to date, the scope is very limited and care must be taken to not remove too much water from the system and undermine the ecology of the ditches and their provision as wet fencing throughout the year. Within unit 1, compartments 6, 13 & 14 have been individually isolated from the network and each compartment has a pipe and vertical stack linking/disconnecting them from the ditch system. The vertical stack can be lowered to allow water in from the ditch system at high water levels or raised to contain in-field water. In times of extreme drought, and providing that enough water is available in the ditch network, the internal pump point adjacent to the main abstraction point is used to transfer water from the ditch system into the compartments to maintain a core of flooded fields. Alternatively, mobile pumps can be used to provide the same function as the fixed pump.

Higham Bight hydrology

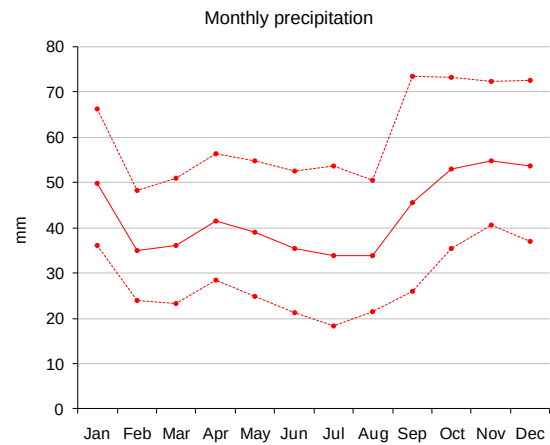
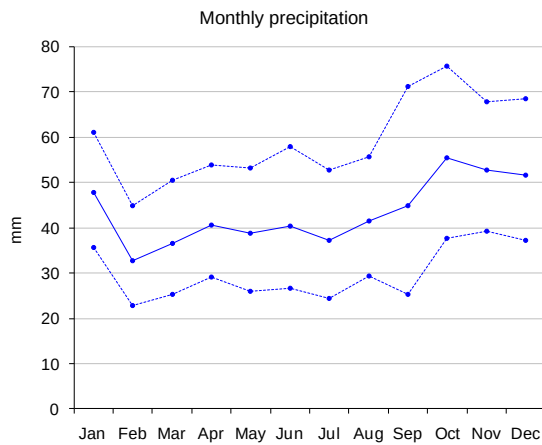
Higham Bight is subject to tidal influences and by sea level rise, estimated to be 8mm per annum at Sheerness.

A2.3. Projected changes in climate

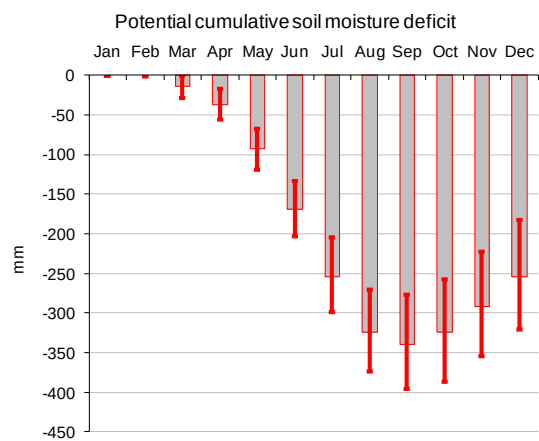
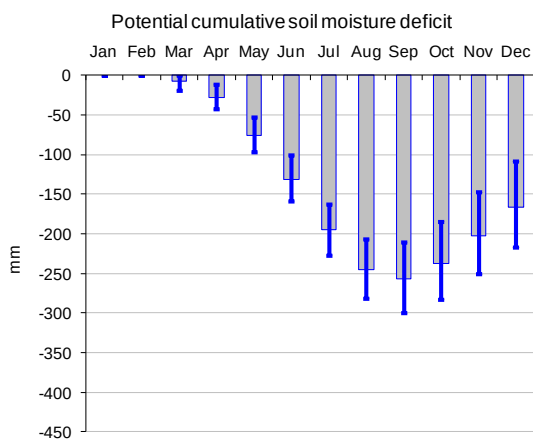
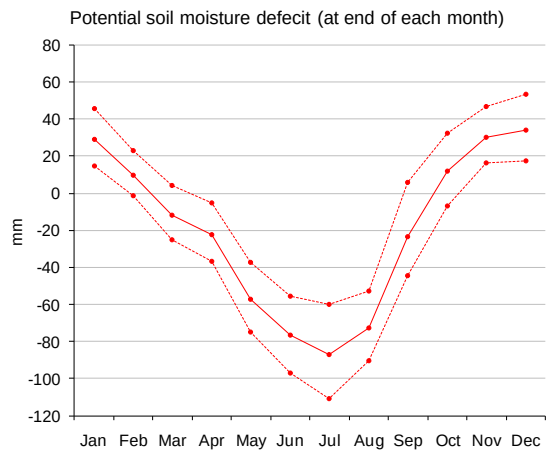
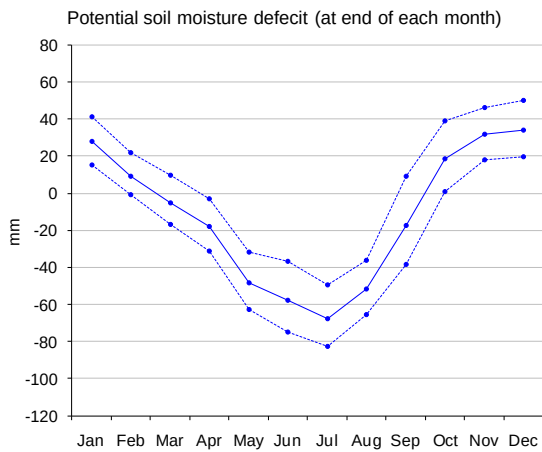
Weather generator results for 2030s. Blue based on 1960–1990 observations, red based on high carbon emissions scenario.



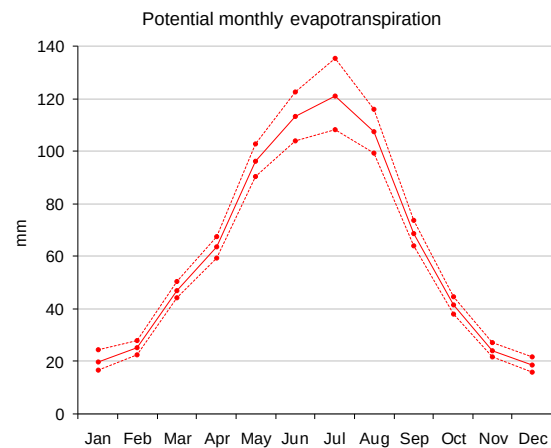
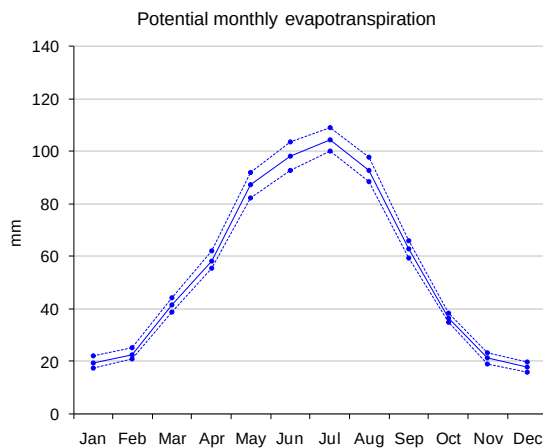
The scenarios for projected temperature clearly show an increase in the minimum and maximum temperatures year round.



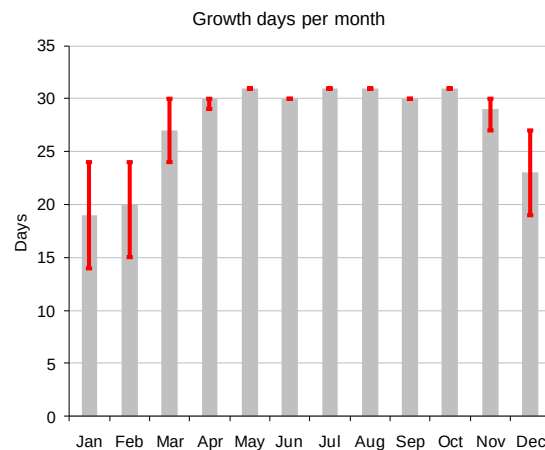
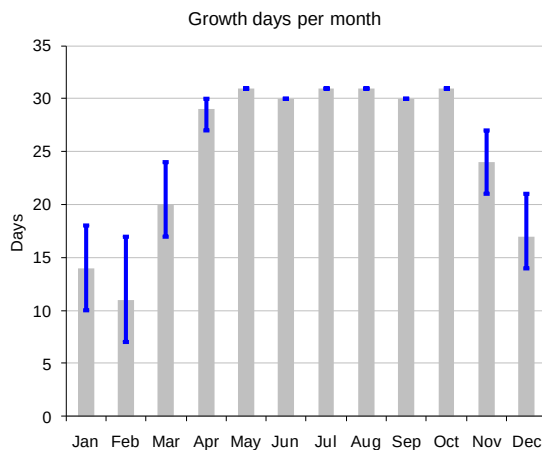
The scenarios for rainfall predict reduced rainfall during late spring and early summer with higher levels of rainfall over late summer and in winter months.



The scenarios for projected soil moisture deficit clearly show a significant decrease between March and September



Evapotranspiration scenarios indicate projected increases during peak summer months.



The scenarios for growth days per month clearly show a significant increase during winter months.

A2.4. History of management

Maintenance management and special projects over the last management plan cycle are shown on Maps 15(i)-(v) and 16(i) & (ii), and older features on map 9b.

a. Brief history of the area

The history of the area can be described in 6 key words:

1. Settlement & invasion
2. Reclamation
3. Drainage
4. Farming
5. Defence

The earliest recorded evidence of settlement in the very local area are the remains of a number of Bronze Age round barrows present directly to the south of Shorne Marshes and dated somewhere between -2600 to -700. As part of the Thames Estuary, Shorne & Higham Marshes experienced the ramifications

of the four major invasions of Britain that have shaped our civilisation with the effects of the change still felt today; Roman, Saxon, Danish and Norman. There is much evidence locally of Roman settlements but scant remains from Saxon, Danish and Norman periods. However, the most visible evidence of Saxon/Norman settlement is St Mary's Church in Higham.

The quantity of remains builds again from medieval times and it is during this period that the first attempts to 'control' the Thames and reclaim the marsh are found with remains of the first seawalls and counter walls being identified. The seawalls were gradually increased in height and drainage began in earnest to allow increased farming culminating in the building of the current seawalls in the 1980s in response to the 1953 floods.

In addition, all of Higham Bight was grazeable saltmarsh with Land Registry titles for the many parcels thereon. Around the end of the 19th and beginning of the 20th centuries, the saltmarsh and substrate was excavated, it is believed, to provide material for the burgeoning brick and cement making industry associated with the Cliffe area.

From the 16th century, the military influence significantly expanded around the area with various batteries established by the end of the 18th Century. The 3 forts of Shornemead, Tilbury and Cliffe were completed around 1870 and the construction of defences for the Thames Estuary culminated during World War 2 with the installation of more structures along the banks of the river, such as the numerous pillboxes that still remain. Milton Ranges were in use as musket ranges. This morphed into rifle ranges and saw a significant increase in activity with Milton Barracks built in the early 1860s. Continued use as a military firing range finally ceased in the 1970s and saw the ranges used by private rifle clubs until resumption of use as part of the Metropolitan Police Specialist Training Centre operation in 2000.

b. History of RSPB involvement

Shorne Marshes:

2000:

- The RSPB purchased the site in July from the Ministry of Defence (MoD). One sitting tenants came with the purchase – a tenant grazier grazing the site
- First management plan produced
- Habitat restoration commenced
- Cattle grazing (sub-optimal)
- Resumption of active firing at Milton Ranges by the new Metropolitan Police Specialist Training Centre (MPSTC) including modification and renovation work on the range
- Uncontrolled horse grazing on the seawall
- Illegal motorbike activity on the seawall and the reserve

2001:

- Cattle grazing (sub-optimal)
- Licences to abstract and impound water granted by EA in January
- Electricity supply installed for abstraction pumps
- Abstraction conducted to manage and maintain water levels during the breeding season

- New lease issued in April for Metropolitan Police Authority (MPA) to resume use of Milton Ranges as an active firing range
 - Milton Ranges active
 - Works to improve safety at Shornemead Fort started
 - Uncontrolled horse grazing on the seawall
 - Illegal motorbike activity on the seawall and the reserve
- 2002:**
- Cattle grazing (sub-optimal)
 - Grazing excluded from reedbed
 - Abstraction continued to manage and maintain water levels during the breeding season
 - Milton Ranges active
 - Works to improve safety at Shornemead Fort completed
 - Uncontrolled horse grazing on the seawall
 - Illegal motorbike activity on the seawall and the reserve
- 2003:**
- Cattle grazing (sub-optimal)
 - Grazing excluded from reedbed
 - Abstraction continued to manage and maintain water levels during the breeding season
 - Drought year – sub-optimal hydrological conditions
 - Ditch-side scrub removal started
 - Milton Ranges active
 - Uncontrolled horse grazing on the seawall
 - Illegal motorbike activity on the seawall
- 2004:**
- Second management plan produced and now incorporating Higham Bight
 - New grazier appointed
 - Cattle grazing increased
 - Sheep grazing started
 - Grazing excluded from reedbed
 - Abstraction continued to manage and maintain water levels during the breeding season
 - Drought year – sub-optimal hydrological conditions
 - Ditch-side scrub removal continued
 - Milton Ranges active
 - Uncontrolled horse grazing on the seawall
 - Illegal motorbike activity on the seawall
- 2005:**
- Cattle grazing
 - Sheep grazing
 - Grazing excluded from reedbed
 - Abstraction continued to manage and maintain water levels during the breeding season
 - Drought year – sub-optimal hydrological conditions
 - Ditch-side and in-field scrub removal completed
 - Milton Ranges active
 - Uncontrolled horse grazing on the seawall
 - Illegal motorbike activity on the seawall
- 2006:**
- Cattle grazing
 - Sheep grazing increased

- Grazing excluded from reedbed
- Gates & wings installed to begin refining the grazing operation
- New security ditches excavated:
 - To the north of C2
 - Along the southern edge of C37
- Abstraction continued to manage and maintain water levels during the breeding season
- Milton Ranges active
- Uncontrolled horse grazing on the seawall
- Illegal motorbike activity on the seawall

2007:

- Cattle grazing
- Sheep grazing reduced
- Further gates & wings installed to begin refining the grazing operation
- Horses used to graze thatch out of C13
- Grazing excluded from reedbed
- Corral installed
- 800m of ditch maintenance undertaken
- Abstraction continued to manage and maintain water levels during the breeding season
- Hydrology improvement plan commenced with:
 - New abstraction pump installed
 - 3 new stop log sluices installed
 - 3 new dams installed
 - 1km of bunding
- Topping commenced
- Crater-scrub rotational management started
- Ringing undertaken
- New security gates and fencing installed at strategic locations off-site
- Mitigation for the new Shorne-Grain gas pipeline installation began with the creation of a scrape in C19
- Milton Ranges active
- Uncontrolled horse grazing on the seawall
- Illegal motorbike activity on the seawall

2008:

- Cattle grazing
- Sheep grazing
- Grazing excluded from reedbed
- Abstraction continued to manage and maintain water levels during the breeding season
- Hydrology improvement plan continued with:
 - Bunding along the southern edges of Cs 3, 9 & 11 as well as a length between Cs 2 & 3
 - 3 new gate valves. 1 for each of Cs 6, 13 & 14
- Topping
- Crater-scrub rotational management
- Ringing undertaken
- New Shorne-Grain gas pipeline installed
- Milton Ranges active
- Uncontrolled horse grazing on the seawall
- Illegal motorbike activity on the seawall

2009:

- Cattle grazing

- Sheep grazing
- Grazing excluded from reedbed
- Abstraction continued to manage and maintain water levels during the breeding season
- Hydrology improvement plan continued with:
 - 2 stop log sluices installed to provide a direct link between the west and east sides of the bridleway. These structures constituted part of the mitigation package for the new Shorne-Grain gas pipeline installation
 - Ditching along the northern edge of C28 and the western edges of Cs 29 & 32
 - Bunding along the southern edges of Cs 38 & 40
- Topping
- Milton Ranges active
- Uncontrolled horse grazing on the seawall
- Illegal motorbike activity on the seawall

2010:

- Cattle grazing
- Sheep grazing
- Grazing excluded from reedbed
- Abstraction continued to manage and maintain water levels during the breeding season.
- Drought year – sub-optimal hydrological conditions and abstraction licence volumes found to be insufficient with only hydro unit 1 maintained as wet
- Hydrology improvement plan amended with:
 - 3 gate valves for each of Cs 6, 13 & 14 replaced with pipes and vertical stacks
 - Various dams installed along the eastern boundary as a result of the neighbour's activity, which included removal of a strategic dam. Eastern boundary ditch no longer part of the high-level system
- Topping
- Ditch-side and in-field scrub re-growth removed
- Crater-scrub rotational management
- Several crossing points improved for better access
- Milton Ranges active
- Uncontrolled horse grazing on the seawall
- Illegal motorbike activity on the seawall

2011:

- Third management plan produced
- Cattle grazing – eastern compartments finally optimal with combinations of yearlings and suckler cows grazed. 70 suckler cows grazed the western side of the bridleway and 40 yearlings grazed the eastern side of the bridleway
- Sheep grazing with 200 ewe lambs year-round
- Grazing excluded from reedbed
- Abstraction continued to manage and maintain water levels during the breeding season.
- Drought year – sub-optimal hydrological conditions and abstraction licence volumes found to be insufficient with only hydro unit 1 maintained as wet
- Hydrology improvement plan amended with:

- Plastic sheet piling dam to the north of C28 replaced with steel sheet piling post vandalism of the plastic installation
 - Ditch 64 cleaned to allow flow of water into hydro unit 4
- Nest cameras used to prove predation by foxes and the need for an electric fence
- Topping
- Ditch-side and in-field scrub re-growth removal completed
- Site security improvements by replacing field gates into Cs 25 & 33 with heavy duty steel box-frame gates and wings
- Milton Ranges active
- Uncontrolled horse grazing on the seawall
- Illegal motorbike activity on the seawall

Higham Bight:

1994:

- The RSPB purchased the majority of the site in March from Lamb & Bates
- Uncontrolled horse grazing on the seawall and saltmarsh
- Illegal motorbike activity on the seawall and the reserve

1995-2006:

- Uncontrolled horse grazing on the seawall and saltmarsh
- Illegal motorbike activity on the seawall and the reserve

2007:

- The RSPB purchased the final part of the site in September from Blue Circle Industries Plc
- Uncontrolled horse grazing on the seawall and saltmarsh
- Illegal motorbike activity on the seawall and the reserve

2007-2011:

- Uncontrolled horse grazing on the seawall and saltmarsh
- Illegal motorbike activity on the seawall and the reserve

c. Management in the last 7 years

2012/13:

Maintenance management:

- a. Managed hydrology for breeding and wintering waders and wildfowl via licensed abstraction. West side of bridleway semi-optimal, east side sub-optimal due to leaking sluice
- b. Fields maintained as dry between July and November to allow agricultural operations i.e. topping, and special projects to be conducted
- c. Fox control commenced from January to June across compartments 2-6d, 19-25, 27-33, 36-40
- d. Grazing for breeding and wintering waders and wildfowl year-round with cattle and sheep in compartments 3–16d, 20–25, 30–32, 36-40. Stocking density only prescribed for the breeding season at 0.75LSU per hectare. Outside of the breeding season, numbers fluctuate according to grass growth and ground conditions. Combinations of yearlings and suckler cows grazed. 70 suckler cows graze the western side of the bridleway and removed from site usually in mid-December or, if conditions allow, as late as February for indoor calving. 40 yearlings graze the eastern side of the bridleway and removed in November. Turnout is during April. 200 ewe lambs grazed year-round with turnout in September.

- e. Grazing excluded from reedbed
- f. Topping in compartments 3 (half)-7, 8 (half)-14, 20–25, 30–32, 38 & 40
- g. Uncontrolled horse grazing (150+ adults) of the Seawall, Shornemead Fort environs (Cs 18, 19 & 27), Cs 26, 34 & 35 and Higham Bight saltmarsh incorporating RSPB, Environment Agency and Ledger freehold areas
- h. Rotational crater-scrub management in compartment 29

Special Projects:

- a. None

2013/14:

Maintenance management:

- a. Managed hydrology for breeding and wintering waders and wildfowl via licensed abstraction. West side of bridleway optimal, east side sub-optimal due to leaking sluice
- b. Fields maintained as dry between July and November to allow agricultural operations i.e. topping, and special projects to be conducted
- c. Fox control from January to June across compartments 2-6d, 19-25, 27-33, 36-40
- d. Grazing for breeding and wintering waders and wildfowl year-round with cattle and sheep in compartments 3–16d, 20–25, 30–32, 36-40. Stocking density only prescribed for the breeding season at 0.75LSU per hectare. Outside of the breeding season, numbers fluctuate according to grass growth and ground conditions. Combinations of yearlings and suckler cows grazed. 70 suckler cows graze the western side of the bridleway and removed from site usually in mid-December or, if conditions allow, as late as February for indoor calving. 40 yearlings graze the eastern side of the bridleway and removed in November. Turnout is during April. 200 ewe lambs grazed year-round with turnout in September.
- e. Grazing excluded from reedbed
- f. Topping in compartments 3 (half)-7, 8 (half)-14, 20–25, 30–32, 38 & 40
- g. Controlled horse grazing of the Seawall, Shornemead Fort environs (Cs 16b, 16c, 18, 19 & 27), Cs 26, 34 & 35 and Higham Bight saltmarsh via new grazing licence incorporating RSPB, Environment Agency and Ledger freehold areas specifying 45 horses (irrespective of size or age) on the Seawall and up to 13 horses (usually Shetlands) in Cs 19, 26 & 27
- h. Rotational crater-scrub management in compartment 29
- i. Ditch number 1 de-silted

Special Projects:

- a. New security ditch (A) created
- b. New anti-predator electric fence installed with supplementary ground works and structures
- c. Gas compound removed from high-level hydrology system with conversion of ditches 48–51 returned to landscape drainage-level system to ensure adequate drainage of the compound with various hydrological structures installed and/or modified
- d. Leaking eastern sluice de-commissioned via installation of an earth dam in front of the ineffective structure
- e. Abstraction licence volume significantly increased

2014/15:

Maintenance management:

- a. Managed hydrology for breeding and wintering waders and wildfowl via licensed abstraction. West side of bridleway optimal, east side sub-optimal due to lack of available time to manage correctly
- b. Fields maintained as dry between July and November to allow agricultural operations i.e. topping, and special projects to be conducted
- c. Fox control from January to June across compartments 2-6d, 19-25, 27-33, 36-40
- d. Electric fence maintenance and modifications to higher wires to ensure optimum efficacy
- e. Grazing for breeding and wintering waders and wildfowl year-round with cattle and sheep in compartments 3–16d, 20–25, 30–32, 36-40. Stocking density only prescribed for the breeding season at 0.75LSU per hectare. Outside of the breeding season, numbers fluctuate according to grass growth and ground conditions. Combinations of yearlings and suckler cows grazed. 70 suckler cows graze the western side of the bridleway and removed from site usually in mid-December or, if conditions allow, as late as February for indoor calving. 40 yearlings graze the eastern side of the bridleway and removed in November. Turnout is during April. 200 ewe lambs grazed year-round with turnout in September.
- f. Grazing excluded from reedbed
- g. Light winter grazing with cattle and/or sheep in compartments P, 8, 9b & 11b
- h. Topping in compartments 3 (half)-7, 9a, 10, 11a, 12a-14, 20–25, 30–32, 36-40
- i. Controlled horse grazing of the Seawall, Shornemead Fort environs (Cs 16b, 16c, 18, 19 & 27), Cs 26, 34 & 35 and Higham Bight saltmarsh via new grazing licence incorporating RSPB, Environment Agency and Ledger freehold areas specifying 45 horses (irrespective of size or age) on the Seawall and up to 13 horses in (usually Shetlands) Cs 19, 26 & 27
- j. Rotational crater-scrub management in compartment 29

Special Projects:

- a. Anti-predator electric fence re-aligned creating compartments 9b & 11b and associated culverts and crossing points installed. The existing fence line was left *in situ* but de-powered
- b. Power for the anti-predator fence was converted to mains via the installation of a new underground cable following the theft of the solar and wind generators
- c. Various bunds installed to stop water 'leaks' from the high-level system around:
 - i. The gas compound
 - ii. The eastern edge of compartment 30
- d. Leaking pipe connecting hydro units 1 & 4 fixed
- e. Two crossing points repaired in the eastern side of the reserve

2015/16:

Maintenance management:

- a. Managed hydrology for breeding and wintering waders and wildfowl via licensed abstraction. West side of bridleway optimal, east side sub-optimal due to lack of available time to manage correctly
- b. Fields maintained as dry between July and November to allow agricultural operations i.e. topping, and special projects to be conducted
- c. Fox control from January to June across compartments 2-6d, 19-25, 27-33, 36-40

- d. Electric fence maintenance and modifications to higher wires to ensure optimum efficacy
- e. Grazing for breeding and wintering waders and wildfowl year-round with cattle and sheep in compartments 3–16d, 20–25, 30–32, 36–40. Stocking density only prescribed for the breeding season at 0.75LSU per hectare. Outside of the breeding season, numbers fluctuate according to grass growth and ground conditions. Combinations of yearlings and suckler cows grazed. 70 suckler cows graze the western side of the bridleway and removed from site usually in mid-December or, if conditions allow, as late as February for indoor calving. 40 yearlings graze the eastern side of the bridleway and removed in November. Turnout is during April. 200 ewe lambs grazed year-round with turnout in September.
- f. Grazing excluded from reedbed
- g. Light winter grazing with cattle and/or sheep in compartments P, 8, 9b & 11b
- h. Topping in compartments 3 (half)-7, 9a, 10, 11a, 12a-14, 20–25, 30–32, 36–40
- i. Controlled horse grazing of the Seawall, Shornemead Fort environs (Cs 16b, 16c, 18, 19 & 27), Cs 26, 34 & 35 and Higham Bight saltmarsh via new grazing licence incorporating RSPB, Environment Agency and Ledger freehold areas specifying 45 horses (irrespective of size or age) on the Seawall and up to 13 horses (usually Shetlands) in Cs 19, 26 & 27
- j. Rotational crater-scrub management in compartment 29

Special Projects:

- a. None

2016/17:

Maintenance management:

- a. Managed hydrology for breeding and wintering waders and wildfowl via licensed abstraction. West side of bridleway optimal, east side sub-optimal due to lack of available time to manage correctly
- b. Fields maintained as dry between July and November to allow agricultural operations i.e. topping, and special projects to be conducted
- c. Fox control from January to June across compartments 2-6d, 19-25, 27-33, 36-40
- d. Electric fence maintenance and modifications to ensure optimum efficacy
- e. Grazing for breeding and wintering waders and wildfowl year-round with cattle and sheep in compartments 3–16d, 20–25, 30–32, 36–40. Stocking density only prescribed for the breeding season at 0.75LSU per hectare. Outside of the breeding season, numbers fluctuate according to grass growth and ground conditions. Combinations of yearlings and suckler cows grazed. 70 suckler cows graze the western side of the bridleway and removed from site usually in mid-December or, if conditions allow, as late as February for indoor calving. 40 yearlings graze the eastern side of the bridleway and removed in November. Turnout is during April. 200 ewe lambs grazed year-round with turnout in September.
- f. Grazing excluded from reedbed
- g. Light winter grazing with cattle and/or sheep in compartments P, 8, 9b & 11b
- h. Topping in compartments 3 (half)-7, 9a, 10, 11a, 12a-14, 20–25, 30–32, 36–40

- i. Controlled horse grazing of the Seawall, Shornemead Fort environs (Cs 16b, 16c, 18, 19 & 27), Cs 26, 34 & 35 and Higham Bight saltmarsh via new grazing licence incorporating RSPB, Environment Agency and Ledger freehold areas. Numbers modified to allow 45 horses + foals-at-foot on the Seawall and up to 13 horses (usually Shetlands) in Cs 19, 26 & 27
- j. Rotational crater-scrub management in compartment 29

Special Projects:

- a. None

2017/18:

Maintenance management:

- a. Managed hydrology for breeding and wintering waders and wildfowl via licensed abstraction. West side of bridleway optimal, east side sub-optimal due to lack of available time to manage correctly.
- b. Some bunds and crossing points maintained for efficacy.
- c. Fields maintained as dry between July and November to allow agricultural operations i.e. topping, and special projects to be conducted
- d. Fox control from January to June across compartments 2-6d, 19-25, 27-33, 36-40
- e. Electric fence maintenance and modifications to ensure optimum efficacy
- f. Grazing for breeding and wintering waders and wildfowl year-round with cattle in compartments 3-16d, 20-25, 30-32, 36-40. Stocking density only prescribed for the breeding season at 0.75LSU per hectare. Outside of the breeding season, numbers fluctuate according to grass growth and ground conditions. Combinations of yearlings and suckler cows grazed. 70 suckler cows graze the western side of the bridleway and removed from site usually in mid-December or, if conditions allow, as late as February for indoor calving. 40 yearlings graze the eastern side of the bridleway and removed in November. Turnout is during April.
- g. Grazing excluded from reedbed
- h. Light winter grazing with cattle in compartments 8, 9b & 11b
- i. Topping in compartments 3 (half)-7, 9a, 10, 11a, 12a-14, 20-25, 30-32, 36-40
- j. Controlled horse grazing of the Seawall, Shornemead Fort environs (Cs 16b, 16c, 18, 19 & 27), Cs 26, 34 & 35 and Higham Bight saltmarsh via new grazing licence incorporating RSPB, Environment Agency and Ledger freehold areas. Numbers modified to allow 45 horses + foals-at-foot on the Seawall and up to 13 horses (usually Shetlands) in Cs 19, 26 & 27
- k. Rotational crater-scrub management in compartment 29

Special Projects:

- a. None

2018/19:

Maintenance management:

- a. Managed hydrology for breeding and wintering waders and wildfowl via licensed abstraction. West side of bridleway optimal, east side sub-optimal due to lack of available time to manage correctly.
- b. Some bunds and crossing points maintained for efficacy.
- c. Fields maintained as dry between July and November to allow agricultural operations i.e. topping, and special projects to be conducted
- d. Fox control from January to June across compartments 2-6d, 19-25, 27-33, 36-40

- e. Electric fence maintenance and modifications to ensure optimum efficacy
- f. Grazing for breeding and wintering waders and wildfowl year-round with cattle in compartments 3–16d, 20–25, 30–32, 36–40. Stocking density only prescribed for the breeding season at 0.75LSU per hectare. Outside of the breeding season, numbers fluctuate according to grass growth and ground conditions. Combinations of yearlings and suckler cows grazed. 70 suckler cows graze the western side of the bridgeway and removed from site usually in mid-December or, if conditions allow, as late as February for indoor calving. 40 yearlings graze the eastern side of the bridgeway and removed in November. Turnout is during April.
- g. Grazing excluded from reedbed
- h. Light winter grazing with cattle in compartments 8, 9b & 11b
- i. Topping in compartments 3 (half)-7, 9a, 10, 11a, 12a-14, 20–25, 30–32, 36–40
- j. Controlled horse grazing of the Seawall, Shornemead Fort environs (Cs 16b, 16c, 18, 19 & 27), Cs 26, 34 & 35 and Higham Bight saltmarsh via new grazing licence incorporating RSPB, Environment Agency and Ledger freehold areas. Numbers modified to allow 45 horses + foals-at-foot on the Seawall and up to 13 horses (usually Shetlands) in Cs 19, 26 & 27
- k. Rotational crater-scrub management in compartment 29

Special Projects:

- b. None

A2.5. Current issues and constraints

Current issues and constraints are shown on Map 17.

Shorne Marshes

- The fields to the east of the bridgeway are not delivering to the same level as the western LWG. This is partly due to insufficient hydrological infrastructure and equipment and partly due to restricted staff resource. Potential solutions in terms of insufficient hydrological infrastructure and equipment are:
 - Despite the link between hydro units 1 & 4, the LWG on the eastern side of the bridgeway would benefit from a dedicated pump for abstraction purposes that would allow the under-performing unit 4 to be managed more effectively.
 - Unit 5 is linked to the surrounding landscape-scale drainage system and cannot retain any kind of extended flooding. The installation of bunding and dams would allow the separation of the fields and allow them to start to perform for breeding waders. The material required to isolate the unit would be site-won via the creation of in-field features i.e. rills & scrapes, in this unit and/or unit 4. This newly isolated unit would also benefit from the dedicated pump identified for unit 4
 - Effective separation of unit 3 from units 1 & 2 and the installation of strategic low bunds would allow unit 3 to become a winter water storage facility for the benefit of the rest of the hydrological units. This project would be completed with the installation of a couple of control features i.e. pipes and vertical stacks, to move the water from this unit into units 1 & 2
- The requirements of maintaining and managing the reserve suite on the Hoo Peninsula is beyond the capacity of the Hoo team at current levels. This

impacts on delivery in many areas of work. In particular, when water levels need significant management to achieve breeding season habitat conditions, neither Shorne nor Higham Marshes can both be managed to the desired standards. As such, it has been agreed that, in dry/drier years, Higham Marshes will be prioritised to receive more effort in breeding season hydrological management.

- The bridleway scrub has been a bone of contention for many years. It is believed by some that it hampers breeding wader potential. Evidence doesn't suggest that this is the case – at least on the western side. Others view that it has intrinsic value to scrub species (whitethroat) although unlikely to ever see breeding turtle dove again. Additionally, it may be beneficial as screening waders/wildfowl from 'traffic' along the track. Having assessed the various arguments, it is proposed that the section between Cs 24 & 32 is removed to provide the 'open' aspect. This section is approximately 120m long and, with all of the other scrub that is being retained, the only viable section that can be removed. If the 'open' aspect is found to be detrimental due to the use of the bridleway, the hedgerow can be reinstated
- Some of the fields contain anthills that make them unsuitable for machinery operations i.e. topping. However, considering the breeding successes of the last few years, this is now not considered to be an issue at current levels
- The presence of the underground high-pressure gas pipelines constrains landscaping or other kinds of intrusive works in the vicinity of the pipelines
- Pylons run along the southern edge of the site and may discourage nesting by Lapwing and redshank. However, even if the birds do not nest directly under the pylons they do feed under the pylons, and bring their chicks to feed, when flooding conditions are present
- The firing range is almost permanently in use during week days, restricting the time available for management work during 9am-5pm Monday to Friday. However, MPSTC shut down their operations during August and activities that require extended periods of work should be timed for the shut-down. Even with the planned shut-down, we do have to formally submit our requirements for that month to MPSTC
- The firing range is a potential source of disturbance. However, considering the breeding successes of the last few years, this is now not considered to be a disturbing factor
- The clay pigeon shoot next to the southern edge of the site is a potential source of disturbance. However, as per MPSTC operations, considering the breeding successes of the last few years, this is now not considered to be a disturbing factor

Higham Bight

- Grazing by the Vines' horses is now under much improved control. However, the saltmarsh is still being damaged through over grazing. Fencing the saltmarsh will rectify this situation
- Rising sea levels in SE England are likely to lead to loss of saltmarsh at Higham Bight through the process of coastal squeeze and the saltmarsh is diminishing a little year-on-year. Potential solutions are:
 - The placement of hurdles to stop erosion of existing habitat
 - The strategic placement of dredgings (recharge) to replace lost habitat
- Illegal activities on the seawall, such as motorcycling, shooting and coursing, remain as sources of disturbance. Installing further security infrastructure in strategic locations off-reserve are required to continue to restrict inappropriate access and require a core group of organisations to assist in the delivery and funding of the infrastructure

- The saltmarsh at East Tilbury has grown above the mean high-water mark and very rarely gets inundated, therefore Higham Bight's function as a high tide roost has diminished with a reduction in use by large flocks

A2.6. Archaeology gazetteer

Archaeological and historic assets are shown in Map 9b and the table below.

Gaz. no.	HER no.	Name	Grid	Period	Description
SEM1	TQ 67 SE 1185	Milton 19th/20th century rifle range, Eastcourt Marshes, Gravesend	TQ 6793 7415	Post medieval to Modern	Continued use of the 1862 military Milton Rifle Range, on Eastcourt Marshes, east of Gravesend. It consists of a succession of low earthen mound firing points, a target mound and markers' gallery, as well as a weather shelter. The butts were modified in the 1890s and perhaps again later. It continued in use for military rifle training until around 1980 and perhaps afterwards, when there was certainly private use. It is now the firing range element of the Metropolitan Police Training Facility, with substantial survivals of the original structures.
SEM2	TQ 67 SE 342	Site of Milton Range halt	TQ 6805 7391	Post medieval to Modern	Concrete platform visible from the road
SEM3	TQ 67 SE 1020	Circular embankment, Shorne Marshes, Gravesend	TQ 68643 74167	Unknown	Circular embankment in Shorne Marshes identified from aerial photographs
SEM4	TQ 67 SE 302	Possible saltern	TQ 68786 74001	Unknown	Mound of uncertain origin, Shorne Marshes. Given its location, it could be a salt mound. Roughly oval in shape, and c.15m in diameter.
SEM5	TQ 67 SE 301	Probable saltern	TQ 6892 7407	Unknown	A mound, probably a saltmound, and associated banks, possibly evaporation channels. Visible on the 2006 and 2007 Google Earth images. The mound is c.13m in diameter. The associated banks cover an area of 70m x 50m and consist of an irregular enclosure with an internal division.
SEM6	TQ 67 SE 1022	Three mounds, Shorne Marshes	TQ 68984 74066	Unknown	Some possible mounds seen through a fence during the 2005 coastal survey.
SEM7	TQ 67 SE 35	Romano-British occupation site	TQ 691 743	Roman - 43 AD to 409 AD	During July/August 1970 gas-main excavations cut through a Roman occupation area. Roman pottery was found along with a layer of reddish clay which suggest that it is a possible "Red Hill" type of marsh settlement like that found 1/2 mile to the NE (TQ 77 NW 7).
SEM8	TQ 67 SE 1008	'Box-shaped' cropmarks	TQ 68969 74546	Unknown	'Box-shaped' cropmarks

SEM9	TQ 67 SE 1009	Linear crop marks	TQ 69012 74592	Unknown	Linear crop marks
SEM10	TQ 67 SE 63	Shornemead Fort, Gravesend	TQ 6923 7477	Post medieval to Modern	Shornemead Fort was built in the 1860s as part of a scheme to remodel the forward defences of the Thames to protect the river route to London. It crossed the fire of its guns with those of Coalhouse Fort on the north bank and with Cliffe Fort further downstream on the south bank. Now in a poor condition having been used by for demolition practise during army training operations.
SEM11	TQ 67 SE 1194	Shornemead Fort Second World War Battery Command Post and Minewatchers Post	TQ 6928 7478	Modern	Remains of a Second World War concrete command post and minewatchers post on the roof of Shornemead Fort. The command post was for the now disappeared emergency battery for 2 x 5.5-in. guns about 150 m east of the fort. The minewatchers used the same structure as was one of a sequence of places along the Thames river for the observation of the landing of parachute mines. It would have been built in 1940, decommissioned by 1945 and demolished in 1960. Only the lower part of the structure survives, with its collapsed roof on top.
SEM12	TQ 67 SE 1195	Shornemead Fort Second World War light anti-aircraft battery, Shorne	TQ 6930 7477	Modern	Shornemead Fort. This was for local air defence of the assets in and around the fort. Its slight remains are of a bolt ring or hold fast for the gun on a slightly raised concrete base. It was in position by at least as early as May, 1943 and perhaps remained until 1945.
SEM13	TQ 67 SE 1233	Second World War Operation Overlord concrete road, Shorne Marshes, Shorne, near Gravesend, Kent	TQ 6949 7425	Modern	Second World War concrete road on north-south axis across Shorne Marshes connecting the Operation Overlord embarkation hard on the riverbank in front of Shornemead Fort (NGR 569175.174810) via the railway level crossing to the south (NGR569465.173665) with the road network of the hinterland. It is a single-track road about 4 m. wide. There are several passing places along its length. Laid probably in late 1943 and continues in use as a footpath.
SEM14	TQ 67 SE 1150	Shornemead Second World War Emergency Battery	TQ 6946 7478	Modern	Second World War Emergency Battery for two 5.5-in. guns emplaced on earthen mounds next to each other in concrete-roofed gun houses as part of the Thames river defences. Built in 1941, decommissioned by 1945 and demolished c. 1976. The guns fired from a pedestal mounting through a wide opening in either gun house. There were adjacent magazines and war shelters for the gun detachments. No traces remain.
SEM15	TQ 67 SE 1010	Many circular part water filled holes	TQ 69552 74622	Modern	Many circular part water filled holes, similar to shell holes.
SEM16	TQ 67 SE 60	Kiln wasters	TQ 6987 7410	Roman - 43 AD to 409 AD	Kiln wasters

HMB1	TQ 67 NE 1014	Posts and pottery on foreshore, Higham Saltings	TQ 69886 75195	Late Iron Age to Roman - 100 BC to 409 AD	Two small wooden posts driven into peat, also Roman pottery and animal bone scattered around the area. The area extends 20m-30 m along shore to the east at base of saltmarsh cliff.
HMB2	TQ 67 NE 1007	Windpump, Higham Saltings	TQ 69993 75434	Modern	Windpump marked on the 3rd ed OS map. No remains of a windpump visible during the 2005 coastal survey.
HMB3	TQ 77 NW 1112	Upright squared posts in foreshore, Higham Saltings	TQ 70091 75342	Modern	Four upright square timbers, traces of metal fittings. possibly a navigation aid. The post stand up to 2m high and are arranged in a square. The posts are .25m x .25m.
HMB4	TQ 77 NW 1114	Late Bronze Age sherd of pottery, Higham Saltings	TQ 70128 75358	Late Bronze Age - 1000 BC to 701 BC	Sherd of very coarse pot, flint temper, has what appears to be an impressed rim, probably Late Bronze Age.
HMB5	TQ 77 NW 1113	Possible wooden pier/quay, Higham Saltings	TQ 70129 75357	Medieval to Modern	Two parallel lines of wooden vertical piles, each line consists of two or three rows of piles. Most are rounded 0.1m - 0.15m in diameter. Some are squared or made of thick planks. Over all the structure is about 5m x 25m.
HMB6	TQ 77 NW 137	Military causeway, Higham Saltings	TQ 7015 7533	Modern	Marshes in front of river wall. Earthen causeway which may have led to the now vanished Higham Blockhouse. Causeway itself may be earlier and used later for Cross Thames ferry operations. End truncated by river erosion and site photographs. A large grass covered bank running from the seawall to the eroding sea cliff. In the section view provided by the eroding sea cliff there is no visible evidence of any major foundation for the causeway.
HMB7	TQ 77 NW 7	Possible site of Roman settlement (2nd c pottery and floors)	TQ 7009 7540	Roman - 43 AD to 409 AD	About 150 yards west of the northern end of Higham Common causeway and south of the sea wall whilst cutting a trench for clay, a wide band of peat, whose top lay some 3' below the level of the marsh, was observed in May 1953. Sherds of coarse ware, one fragment of Samian, and brick and tile pieces were obtained from the peat and the stratum immediately above it. Considerable quantities of such remains had been turned up by the workman on the site, including the rim of a large mortarium. Water - logged conditions precluded proper examination but a Roman occupation site associated with the upper (Roman) peat bed was indicated. Masses of 2nd century pottery found in repairing the sea wall. Also hut floors. These finds came from throughout the length of the trench commencing at Higham Common causeway. This area was under pasture with no surface evidence of occupation.
HMB8	TQ 77 NW 1115	Eroding peat with animal bone scatter, Higham Saltings	TQ 70189 75444	Early Mesolithic to Late Neolithic - 10000	Further peat outcrops, almost continuous from outcrops to the west. This area of the exposures has animal bone scattered on it.

				BC? to 2351 BC?)	
HMB9	TQ 77 NW 18	Mortarium (c.70 AD), Higham Creek	TQ 7030 7572	Roman - 43 AD to 409 AD	Half a Roman mortarium, stamped twice on the rim with the name "VALENTINANVS" and dated to c.A.D.70, was found on the foreshore at Higham by W.H. Brown of Horton Kirby. Donated to Maidstone Museum. The find spot TQ 70307572 is approximate only and falls in an area of inaccessible soft mud. Soft mud, too dangerous to proceed out onto mudflat in 2005 coastal survey to see if there were any further remains.
HMB10	TQ 77 NW 1062	Rectangular feature on foreshore	TQ 70494 75998	Modern	Rectangular feature on foreshore, marked on the 3rd ed OS map (1). Deep soft mud, not visible from the edge of the sea cliff during the 2005 survey
HMB11	TQ 77 NW 83	Unidentified barge, Higham Creek	TQ 7052 7604	Modern	One of two barges lying side by side, roughly north-south. Appear from 1985 photograph to be double ended. In this photograph they seem to be less covered by mud than in 1961 when they showed as a single feature. Some remains are visible on the edge of foreshore, but there is no access because of deep soft mud.
HMB12	TQ 77 NW 84	Unidentified barge, Higham Creek	TQ 7053 7604	Modern	One of two barges lying side by side, roughly north-south. Appear from 1985 photograph to be double ended. In this photograph they seem to be less covered by mud than in 1961 when they showed as a single feature. Some remains are visible on the edge of foreshore, but there is no access because of deep soft mud.
HMB13	TQ 77 NW 1040	Single line of piles, foreshore by Higham Saltings	TQ 70740 76178	Unknown	Single line of piles. Photograph. No remains of the piles visible during the 2005 coastal survey, may have been buried or removed.
HMB14	TQ 77 NW 1140	Array of upright timbers in foreshore at Higham Saltings	TQ 70721 75620	Post medieval to Modern	At least six clusters of tightly grouped posts in the foreshore all lying at angles. There are possibly two parallel rows perpendicular to the shore. The longest row comprises a 3m long row of squared and round posts. They may be mooring posts.
HMB15	TQ 77 NW 20	Roman occupation site ? Higham Creek	TQ 7071 7563	Roman - 43 AD to 409 AD	A concentration of Roman briquetage, tile and late 2nd.c. potsherds, including caster ware and part of a rim of a mortarium, was discovered during field investigation in a small creek on the edge of Higham Marshes, at TQ 70717563. The finds had clearly been recently washed from an area in the close vicinity of the creek. During the 2005 coastal survey, some pottery and bone was observed at the base of the sea wall, but the greater concentrations seem to be further east.

Appendix 3: BIOLOGICAL INFORMATION

Recording areas are shown in Maps 12a, 12b and 12f.

A3.1. Habitats and Vegetation communities

The distribution of habitats on the reserve is shown in Maps 13a(i)-(iii). The areas of NCC Phase 1 habitats are given in the following table.

NCC Phase 1 habitats on the reserve

Habitat		Code	Status	Area (ha)	Comments
Scrub	dense/continuous, neutral	A.2.1.2	RSPB habitat: Scrub BAP habitat: Not a priority	2.3	Part objective 1, part objective 2 and part objective 4
Scrub	scattered, neutral	A.2.2.2	RSPB habitat: Lowland dry grassland BAP habitat: Not a priority	12.46	Majority comprises GCN fields. Objective 2
Grassland	neutral, unimproved, lowland	B.2.1.2	RSPB habitat: Lowland wet grassland BAP habitat: Coastal and floodplain grazing marsh	113.24	Objective 1
Grassland	neutral, unimproved, lowland	B.2.1.2	RSPB habitat: Lowland dry grassland BAP habitat: Lowland meadows	4.22	Area covered by Higham Bight seawall & around Shornemead Fort. Objective 4
Grassland	neutral, semi-improved, lowland	B.2.2.2	RSPB habitat: Lowland dry grassland BAP habitat: Not a priority	23.89	Area covered by Milton Ranges. No objective as this compartment is outside the scope of this plan
Swamp	single species dominant swamp	F.1.1	RSPB habitat: Fen, carr, marsh and reed BAP habitat: Reedbeds	2.57	Objective 3
Open water	standing, eutrophic, small ponds	G.1.1.1	RSPB habitat: Eutrophic waters BAP habitat:	1.48	Various ponds (+/- ephemeral)

			Not a priority		identified in the HLS agreement. Within objectives 1 & 3
Coastland	intertidal, mud/sand	H.1.1	<u>RSPB habitat:</u> Intertidal flats <u>BAP habitat:</u> Mudflats	40.61	Higham Bight. Objective 5
Coastland	saltmarsh, dense/continuous	H.2.6	<u>RSPB habitat:</u> Coastal saltmarsh <u>BAP habitat:</u> Coastal saltmarsh	3.47	Higham Bight. Objective 4
Built up area	buildings	J.3.6	<u>RSPB habitat:</u> Urban <u>BAP habitat:</u> Not a priority	1.82	Shornemead Fort, Butts and other range buildings. Objective 4 for Shornemead Fort only
Marine		K	<u>RSPB habitat:</u> Marine - inshore <u>BAP habitat:</u> Not a priority	9.85	Higham Bight. No objective as no management possible
Total					

Areas of NVC communities on the reserve are shown in the table below.

NVC community	Status	Area (ha)	Comments
MG6		No data	NVC data out of date. Details left in the plan for reference only
MG7 <i>Lolium perenne</i> leys			
SM6 <i>Spartina anglica</i> saltmarsh			
SM13 <i>Puccinellia maritime</i> saltmarsh			
SM24 <i>Elymus pycnanthus</i> saltmarsh			
Total			
Linear communities along ditch	Status	km	Comments
No data			
Total			

A3.2. Important species

Scientific name	English name	Popn. Size and Date Last Recorded	Status	Comments
Lowland wet grassland – objective 1				
<i>Vanellus vanellus</i>	Lapwing	32 pairs in 2017. 6yr mean 39 pairs	RSPB Reserves priority species (LWG). Global Red List Near Threatened. BoCC4 Red List. UK BAP. Kent BAP	Peak of 62 pairs in 2015
<i>Tringa totanus</i>	Redshank	56 pairs in 2017. 6yr mean 45 pairs	RSPB Reserves priority species (LWG). BoCC4 Amber List.	Peak of 70 pairs in 2015
<i>Haematopus ostralegus</i>	Oystercatcher	1 pair in 2015. 2 pairs in 2016	Global Red List Near Threatened. BoCC4 Amber List	Peak of 2 pairs in 2016
<i>Anas strepera</i>	Gadwall	3 pairs in 2017. 6yr mean 2 pairs (Objectives 1 & 3 population)	BoCC4 Amber List. SPA feature	Peak of 3 pairs in 2012, 2015 & 2017
<i>Anas querquedula</i>	Garganey	1 pair in 2016	SSSI feature. W&CA 1981. BoCC4 Amber List	
<i>Anas platyrhynchos</i>	Mallard	5 pairs in 2017. 6yr mean 10 pairs (Objectives 1 & 3 population)	BoCC4 Amber List	Peak of 26 pairs in 2016
<i>Cygnus olor</i>	Mute swan	2 pairs in 2017. 6yr mean 2 pairs (Objectives 1 & 3 population)	BoCC4 Amber List	Peak of 4 pairs in 2013
<i>Aythya ferina</i>	Pochard	1 pair in 2017. 6yr mean 2 pairs (Objectives 1 & 3 population)	Global Red List Vulnerable. BoCC4 Red List. SPA feature	Peak of 5 pairs in 2015
<i>Anas clypeata</i>	Shoveler	1 pair in 2017. 6yr mean 1 pair (Objectives 1 & 3 population)	BoCC4 Amber List. SPA feature	Peak of 4 pairs in 2016
<i>Anas crecca</i>	Teal	1 pair in 2012	BoCC4 Amber List. SPA feature	Last recorded breeding on site
<i>Aythya fuligula</i>	Tufted duck	5 pairs in 2016. 6yr mean 3 pairs (Objectives 1 & 3 population)	SPA feature	Peak of 5 pairs in 2014 & 2017
<i>Alauda arvensis</i>	Skylark	12 singing males in 2017. 6yr mean 26 singing males	BoCC4 Red List. UK BAP	Peak of 34 singing males in 2014

<i>Cuculus canorus</i>	Cuckoo	3 singing males in 2017. 6yr mean 1 singing male (Objectives 1, 2 & 3 population)	BoCC4 Red List. UK BAP. Kent BAP	Peak of 3 singing males in 2017
<i>Anthus pratensis</i>	Meadow pipit	7 singing males in 2017. 6yr mean 9 singing males	Global Red List Near Threatened. BoCC4 Amber List	Peak of 13 singing males in 2016
<i>Emberiza schoeniclus</i>	Reed bunting	4 singing males in 2017. 6yr mean 9 singing males (Objectives 1 & 3 population)	BoCC4 Amber List. UK BAP. Kent BAP	Peak of 11 singing males in 2013
<i>Perdix perdix</i>	Grey partridge	1 pair in 2001	BoCC4 Red List. UK BAP. Kent BAP	Last recorded breeding on site
	Wintering waders & wildfowl assemblage	Peak of 545 in 2015/16. 6yr mean 240	RSPB Reserves priority assemblage for wintering waders & wildfowl (LWG). Various levels of conservation concern and various as features of the SSSI	15 species (6yr mean/peak) and those present for 3 or more of the 6 seasons are highlighted: Curlew (72/162), gadwall (7/14), green sandpiper (2/2), kestrel (1/1), lapwing (89/320), mallard (21/35), marsh harrier (1/1), mute swan (7/12), pochard (5/10), redshank (22/32), shelduck (18/23), shoveler (14/25), snipe (3/4), teal (20/34), wigeon (20/36) WeBS under recorded during 2016/17 season and only 1 month recorded during 2014/15 Species not of conservation concern i.e. coot, are present but are not factored into this list
<i>Arvicola amphibius</i>	Water vole	Moderate population	RSPB Reserves priority species (LWG + Reedbeds). W&CA 1981. UK BAP. Kent BAP	Water vole transects show low density presence. However, surveys undertaken by Lower Thames Crossing consultants showed high density presence along and around waterbodies in Cs 2, 3, 4 & 8 and the Denton New Cut in C1

<i>Vipera berus</i>	Adder	Present but no data on population size	W&CA 1981. UK BAP. Kent BAP	1 adult and 1 juvenile found in July 2017 in P4 south of C23 1 st site record
<i>Natrix natrix</i>	Grass snake	Present but no data on population size	W&CA 1981. UK BAP. Kent BAP	
<i>Anguilla anguilla</i>	European eel	Not recorded from this location but expected to be present	RSPB Reserves priority species (Reedbeds + Swamp). Global Red List Critically Endangered. European Red List Critically Endangered. UK BAP. Kent BAP	
<i>Lestes dryas</i>	Scarce emerald damselfly	Present but no data on population size	GB Red List Near Threatened. GB Rare and Scarce species Scarce. SSSI feature. Ramsar feature	
<i>Bombus sylvarum</i>	Shrill carder bee	Not recorded here but expected to be present	GB Rare and Scarce species Scarce. UK BAP. Kent BAP	
<i>Bombus humilis</i>	Brown-banded carder bee	Not recorded here but expected to be present	UK BAP. Kent BAP	
<i>Cheilosia velutina</i>	a true fly	1987 but no data on population size	GB Rare and Scarce species Very Scarce	Location of record unknown
<i>Helius pallirostris</i>	a true fly	1976 but no data on population size	GB Rare and Scarce species Very Scarce	Location of record unknown
<i>Lejops vittatus</i>	a true fly	1987 but no data on population size	GB Red List Near Threatened. GB Rare and Scarce species Very Scarce. SSSI feature. Ramsar feature	Location of record unknown
<i>Orthoceratium lacustre</i>	a true fly	1984 but no data on population size	GB Rare and Scarce species Very Scarce	Location of record unknown
<i>Stratiomys longicornis</i>	a soldier fly	1978 but no data on population size	GB Rare and Scarce species Scarce. Ramsar feature	Location of record unknown
<i>Aspitates gilvaria</i>	Straw belle (a moth)	2000 but no data on population size	GB Rare and Scarce species Rare. UK BAP	Location of record unknown
<i>Coenonympha pamphilus</i>	Small heath	2000 but no data on population size	GB Red List Near Threatened. UK BAP. Kent BAP	Location of record unknown
<i>Lasiommata megera</i>	Wall	2000 but no data on population size	GB Red List Near Threatened. UK BAP. Kent BAP	Location of record unknown
<i>Microvelia pygmaea</i>	a true bug	2000 but no data on population size	GB Rare and Scarce species Scarce	Location of record unknown

<i>Raglius alboacuminatus</i>	a true bug	2000 but no data on population size	GB Rare and Scarce species Scarce	Location of record unknown
<i>Berosus luridus</i>	a beetle	1980 but no data on population size	GB Red List Near Threatened. GB Rare and Scarce species Scarce. SSSI feature	Location of record unknown
<i>Clanoptilus strangulatus</i>	a beetle	2000 but no data on population size	GB Rare and Scarce species Rare	Location of record unknown
<i>Cosmobaris scolopacea</i>	a beetle	1960 but no data on population size	GB Rare and Scarce species Rare.	Location of record unknown
<i>Gymnetron villosulum</i>	a beetle	1964 but no data on population size	GB Rare and Scarce species Scarce	Location of record unknown
<i>Halipilus apicalis</i>	a beetle	1985 but no data on population size	GB Rare and Scarce species Scarce	Location of record unknown
<i>Mecinus collaris</i>	a beetle	1961 but no data on population size	GB Rare and Scarce species Scarce	Location of record unknown
<i>Rhantus frontalis</i>	a beetle	1980 but no data on population size	GB Rare and Scarce species Scarce	Location of record unknown
<i>Bagous limosus</i>	a weevil	1964 but no data on population size	GB Rare and Scarce species Scarce. SSSI feature	Location of record unknown
<i>Bagous tubulus</i>	a weevil	1964 but no data on population size	GB Rare and Scarce species Rare. SSSI feature	Location of record unknown
<i>Ceratinopsis stativa</i>	a spider	2000 but no data on population size	GB Rare and Scarce species Scarce	Location of record unknown
<i>Meioneta simplicitarsis</i>	a spider	2000 but no data on population size	GB Rare and Scarce species Very scarce	Location of record unknown
<i>Mercuria confusa</i>	Swollen Spire Snail	2008 but no data on population size	GB Red List Vulnerable. GB Rare and Scarce species Rare. UK BAP.	Location of record unknown
<i>Carex divisa</i>	Divided sedge	Abundant across the reserve in 2017	GB Red List Vulnerable. GB Rare and Scarce species Scarce. SSSI feature . UK BAP. Kent BAP	Can cause problems with providing conditions according to the HLS agreement as livestock will not eat it during the breeding season. A conundrum as it is an important species
<i>Hordeum marinum</i>	Sea barley	Frequent or Abundant in 4 out of 10 survey locations in 2010	GB Red List Vulnerable. GB Rare and Scarce species Scarce. SSSI feature . UK BAP	Cadbury & Parker survey 2010

<i>Hydrocharis morsus-ranae</i>	Frogbit	Occasional, Frequent or Abundant in 7 out of 10 survey locations in 2010	GB Red List Vulnerable	Cadbury & Parker survey 2010
<i>Polypogon monspeliensis</i>	Annual beard-grass	Occasional in 1 out of 10 survey locations in 2010	GB Rare and Scarce species Scarce	Cadbury & Parker survey 2010
<i>Stratiotes aloides</i>	Water-soldier	2 plants in 1 out of 10 survey locations in 2010	GB Red List Near Threatened. GB Rare and Scarce species Very Scarce. SSSI feature	Cadbury & Parker survey 2010
<i>Puccinellia rupestris</i>	Stiff saltmarsh-grass	No data	GB Rare and Scarce species Scarce	Location of record unknown
<i>Puccinellia fasciculata</i>	Borrer's saltmarsh-grass	No data	GB Red List Vulnerable. GB Rare and Scarce species Scarce. SSSI feature . UK BAP. Kent BAP	Location of record unknown
Scrub/Rough grassland mosaic – objective 2				
<i>Luscinia megarhynchos</i>	Nightingale	2 singing males in Cs 28 & 29 in 2017	RSPB Reserves priority species (Woodland/Scrub). BoCC4 Red List	First site record
<i>Linaria cannabina</i>	Linnet	2 singing males in 2017. 6yr mean 3 singing males	BoCC4 Red List. UK BAP	Peak of 5 singing males in 2014
<i>Prunella modularis</i>	Dunnock	3 singing males in 2017. 6yr mean 3 singing males	BoCC4 Amber List. UK BAP	Peak of 4 singing males in 2016
<i>Emberiza schoeniclus</i>	Reed bunting	Population shown in objective 1	See objective 1	See objective 1
<i>Emberiza calandra</i>	Corn bunting	1 singing male in 2008	BoCC4 Red List. UK BAP	Last recorded breeding on site
<i>Emberiza citrinella</i>	Yellowhammer	1 singing male in 2015	BoCC4 Red List. UK BAP. Kent BAP	Last recorded breeding on site following a gap of 7 years with no breeding
<i>Turdus philomelos</i>	Song thrush	1 singing male in 2014	BoCC4 Red List. UK BAP	Last recorded breeding on site
<i>Phylloscopus trochilus</i>	Willow warbler	1 singing male in 2005	BoCC4 Amber List	Last recorded breeding on site
<i>Streptopelia turtur</i>	Turtle dove	1 purring male in 2008	RSPB Reserves priority species (Woodland/Scrub + Farmland). Global Red List Vulnerable. BoCC4 Red List. UK BAP. Kent BAP	Last recorded breeding on site
<i>Micromys minutus</i>	Harvest mouse	Not recorded from this location but expected to be present	GB Rare and Scarce species Scarce. UK BAP. Kent BAP	

<i>Natrix natrix</i>	Grass snake	Present but no data on population size	W&CA 1981. UK BAP. Kent BAP	
<i>Zootoca vivipara</i>	Viviparous (Common) lizard	Present but no data on population size	W&CA 1981. UK BAP. Kent BAP	
<i>Anguis fragilis</i>	Slow-worm	Present but no data on population size	W&CA 1981. UK BAP. Kent BAP	
<i>Lissotriton vulgaris</i>	Smooth newt	Present but no data on population size	W&CA 1981	
<i>Triturus cristatus</i>	Great crested newt	Present but no data on population size	European Protected Species. W&CA 1981. UK BAP. Kent BAP	
<i>Bombus sylvarum</i>	Shrill carder bee	Not recorded here but expected to be present	GB Rare and Scarce species Scarce. UK BAP. Kent BAP	
<i>Bombus humilis</i>	Brown-banded carder bee	Not recorded here but expected to be present	UK BAP. Kent BAP	
Reedbed/Rough grassland mosaic – objective 3				
<i>Panurus biarmicus</i>	Bearded tit	1 pair in 2016	RSPB Reserves priority species (Reedbeds). SSSI feature. W&CA 1981	1 pair in 2013
<i>Circus aeruginosus</i>	Marsh harrier	1 pair in 2017	RSPB Reserves priority species (Reedbeds). W&CA 1981. BoCC4 Amber List	Suspected breeding in 2015 & 2016 but not confirmed despite much activity
<i>Emberiza schoeniclus</i>	Reed bunting	Population shown in objective 1	See objective 1	See objective 1
<i>Aythya ferina</i>	Pochard	Population shown in objective 1	See objective 1	See objective 1
<i>Anas strepera</i>	Gadwall	Population shown in objective 1	See objective 1	See objective 1
<i>Anas platyrhynchos</i>	Mallard	Population shown in objective 1	See objective 1	See objective 1
<i>Cygnus olor</i>	Mute swan	Population shown in objective 1	See objective 1	See objective 1
<i>Anas clypeata</i>	Shoveler	Population shown in objective 1	See objective 1	See objective 1
<i>Anas crecca</i>	Teal	Population shown in objective 1	See objective 1	See objective 1
<i>Aythya fuligula</i>	Tufted duck	Population shown in objective 1	See objective 1	See objective 1

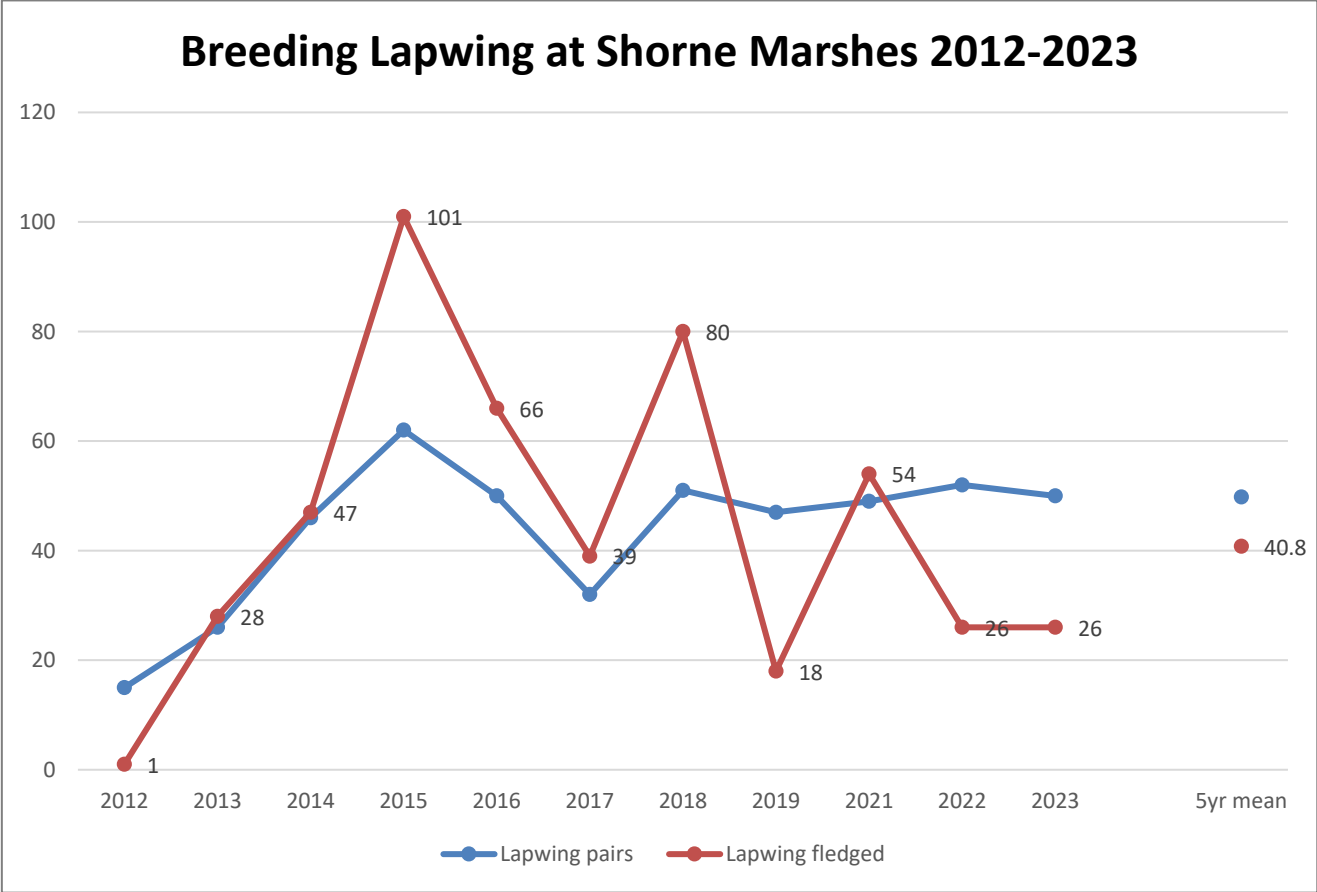
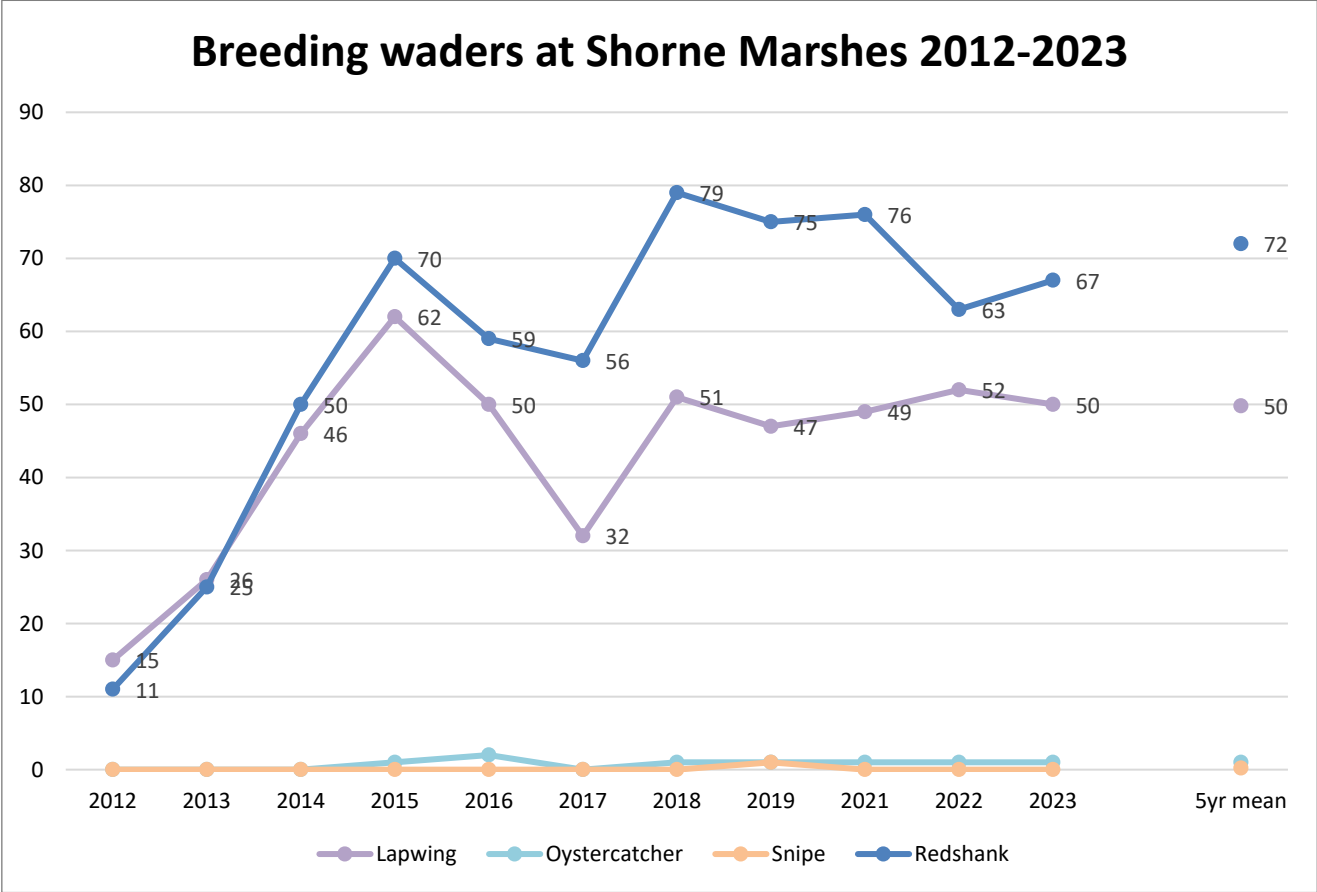
<i>Cettia cetti</i>	Cetti's warbler	5 singing males in 2017. 6yr mean 6 singing males (Objectives 1, 2 & 3 population)	W&CA 1981	Peak of 13 singing males in 2016
	Wintering wildfowl assemblage	Population shown in objective 1	See objective 1	See objective 1
<i>Arvicola amphibius</i>	Water vole	Not recorded from this location but expected to be present	RSPB Reserves priority species (LWG + Reedbeds). W&CA 1981. UK BAP. Kent BAP	
<i>Micromys minutus</i>	Harvest mouse	Not recorded from this location but expected to be present	GB Rare and Scarce species Scarce. UK BAP. Kent BAP	
<i>Natrix natrix</i>	Grass snake	Present but no data on population size	W&CA 1981. UK BAP. Kent BAP	
<i>Zootoca vivipara</i>	Viviparous (Common) lizard	Present but no data on population size	W&CA 1981. UK BAP. Kent BAP	
<i>Anguis fragilis</i>	Slow-worm	Present but no data on population size	W&CA 1981. UK BAP. Kent BAP	
<i>Anguilla anguilla</i>	European eel	Not recorded from this location but expected to be present	RSPB Reserves priority species (Reedbeds + Swamp). Global Red List Critically Endangered. European Red List Critically Endangered. UK BAP. Kent BAP	
<i>Simyra albovenosa</i>	Reed dagger (a moth)	2005 but no data on population size	GB Rare and Scarce species Scarce	
<i>Phragmites australis</i>	Common reed	Very Abundant in 2017	SSSI feature	Noted here for this species' relevance to marsh harrier, bearded tit and reed bunting
Lowland dry grassland – objective 4				
<i>Linaria cannabina</i>	Linnet	Not recorded but known to be breeding in the scrub along the seawall	BoCC4 Red List. UK BAP	
<i>Alauda arvensis</i>	Skylark	Not recorded but known to be breeding along the seawall	BoCC4 Red List. UK BAP	
<i>Anthus pratensis</i>	Meadow pipit	Not recorded but known to be breeding along the seawall	Global Red List Near Threatened. BoCC4 Amber List	

<i>Prunella modularis</i>	Dunnock	Not recorded but known to be breeding in the scrub along the seawall	BoCC4 Amber List. UK BAP	
<i>Micromys minutus</i>	Harvest mouse	Not recorded from this location but expected to be present	GB Rare and Scarce species Scarce. UK BAP. Kent BAP	
<i>Natrix natrix</i>	Grass snake	Expected to be present but no data on population size	W&CA 1981. UK BAP. Kent BAP	
<i>Zootoca vivipara</i>	Viviparous (Common) lizard	Expected to be present but no data on population size	W&CA 1981. UK BAP. Kent BAP	
<i>Anguis fragilis</i>	Slow-worm	Expected to be present but no data on population size	W&CA 1981. UK BAP. Kent BAP	
<i>Triturus cristatus</i>	Great crested newt	Small presence in and around Cs19 & 27. Recorded in 2013	European Protected Species. W&CA 1981. UK BAP. Kent BAP	Calumma Ecological Services survey 2013
<i>Bombus sylvarum</i>	Shrill carder bee	Recorded around C41 in 2017	GB Rare and Scarce species Scarce. UK BAP. Kent BAP	Earwaker & Merriman survey 2017
<i>Bombus humilis</i>	Brown-banded carder bee	Recorded around C41 in 2017	UK BAP. Kent BAP	Earwaker & Merriman survey 2017
<i>Amara strenua</i>	a ground beetle	2000 but no data on population size	GB Rare and Scarce species Very Scarce. UK BAP. Kent BAP	Location of record unknown
<i>Anisodactylus poeciloides</i>	Saltmarsh short-spur	2000 but no data on population size	RSPB Reserves priority species (Intertidal). GB Red List Near Threatened. GB Rare and Scarce species Rare. Ramsar feature	Location of record unknown
<i>Hordeum marinum</i>	Sea barley	Frequent in 1 out of 4 survey locations in 2010	GB Red List Vulnerable. GB Rare and Scarce species Scarce. SSSI feature . UK BAP. Kent BAP	Cadbury & Parker survey 2010
<i>Polypogon monspeliensis</i>	Annual beard-grass	Frequent or Very Abundant in 3 out of 4 survey locations in 2010	GB Rare and Scarce species Scarce	Cadbury & Parker survey 2010
<i>Bupleurum tenuissimum</i>	Slender hare's-ear	Frequent in 1 out of 4 survey locations in 2010	GB Red List Vulnerable. GB Rare and Scarce species Scarce. SSSI feature . UK BAP. Kent BAP	Cadbury & Parker survey 2010
<i>Chenopodium chenopodioides</i>	Saltmarsh goosefoot	Occasional and Frequent in 2 out of 4 survey locations in 2010	GB Rare and Scarce species Very Scarce	Cadbury & Parker survey 2010
<i>Inula crithmoides</i>	Golden-samphire	Frequent in 1 out of 4 survey locations in 2010	SSSI feature	Cadbury & Parker survey 2010

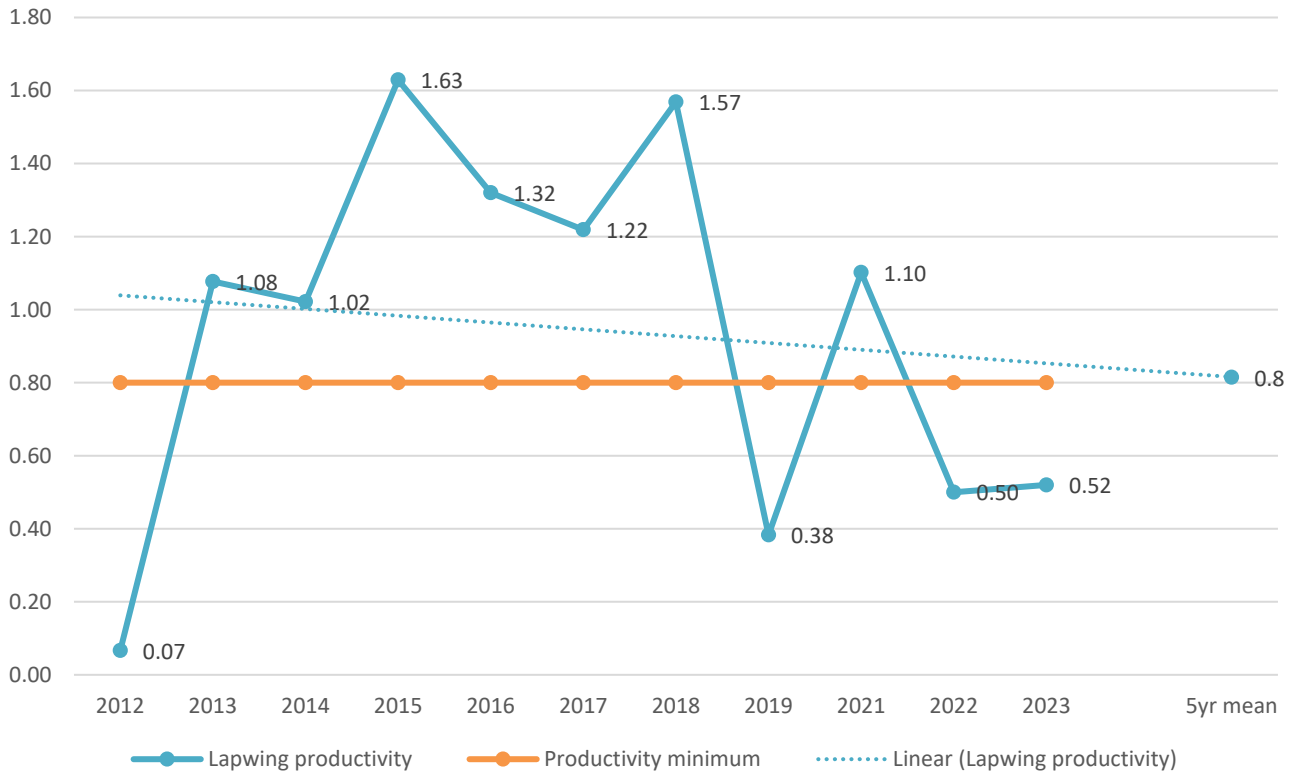
<i>Lotus corniculatus</i>	Birdsfoot trefoil	Occasional across the seawall from observations in 2017	-	Noted here for this species' relevance to long-tongued bumblebees. Occasional is a marked increase compared to previous years
<i>Trifolium pratense</i>	Red clover	Rare across the seawall from observations in 2017	-	Noted here for this species' relevance to long-tongued bumblebees
Saltmarsh – objective 4				
<i>Cosmobaris scolopacea</i>	a beetle	1960 but no data on population size	GB Rare and Scarce species Rare	Location of record unknown
<i>Pseudaplemonus limonii</i>	a beetle	1960 but no data on population size	GB Rare and Scarce species Scarce	Feeds on sea-lavender. Location of record unknown
<i>Enoplognatha mordax</i>	a spider	2000 but no data on population size	GB Rare and Scarce species Very scarce	Saltmarsh and tideline litter. Location of record unknown
<i>Limonium humile</i>	Lax-flowered sea-lavender	2 plants in 1 out of 10 survey locations in 2010	GB Rare and Scarce species Scarce	Cadbury & Parker survey 2010. 1 st record for Kent in 2010
	Saltmarsh plants assemblage	Prostrate glasswort Occasional or Abundant in 3 out of 4 survey locations in 2010. Sea aster Abundant in 1 out of 4 survey locations in 2010. Sea lavender Occasional in 1 out of 4 survey locations in 2010. Sea purslane Frequent in 1 out of 4 survey locations in 2010. Golden-samphire Occasional in 1 out of 4 survey locations in 2010	Various and Glassworts <i>Salicornia</i> , sea aster <i>Aster tripolium</i> , sea lavender <i>Limonium vulgare</i> , sea purslane <i>Halimione portulacoides</i> , golden-samphire <i>Inula crithmoides</i> and Borrer's Saltmarsh-Grass <i>Puccinellia fasciculata</i> all SSSI features	Cadbury & Parker survey 2010. No data from Higham Bight
Intertidal mudflats – objective 4				
	Wintering waders & wildfowl assemblage	Peak of 885 in 2016/17. 6yr mean 2038	RSPB Reserves priority assemblage for wintering waders & wildfowl (Intertidal). Various levels of conservation concern and various as features of the SSSI, SPA & Ramsar	32 species (6yr mean/peak) and species present for 3 or more of the 6 seasons are highlighted: Avocet (137/210) , bar-tailed godwit (59/60), black-headed gull (35/58), black-tailed godwit (24/46) , brent goose (dark-bellied) (6/6), common

				gull (3/3), common sandpiper (1/1), curlew (130/203), dunlin (727/2000), gadwall (26/48), goldeneye (1/1), great black-backed gull (10/13), grey plover (130/500), herring gull (28/28), lapwing (83/287), lesser black-backed gull (10/10), little egret (1/2), little grebe (16/16), mallard (19/60), mute swan (2/2), oystercatcher (142/420), pintail (22/60), pochard (26/40), redshank (104/400), shelduck (4/6), short-eared owl (1/1), snipe (2/2), spotted redshank (69/69), teal (435/1200), tufted duck (10/10), turnstone (4/4), wigeon (293/440) Species not of conservation concern i.e. coot, are present but are not factored into this list
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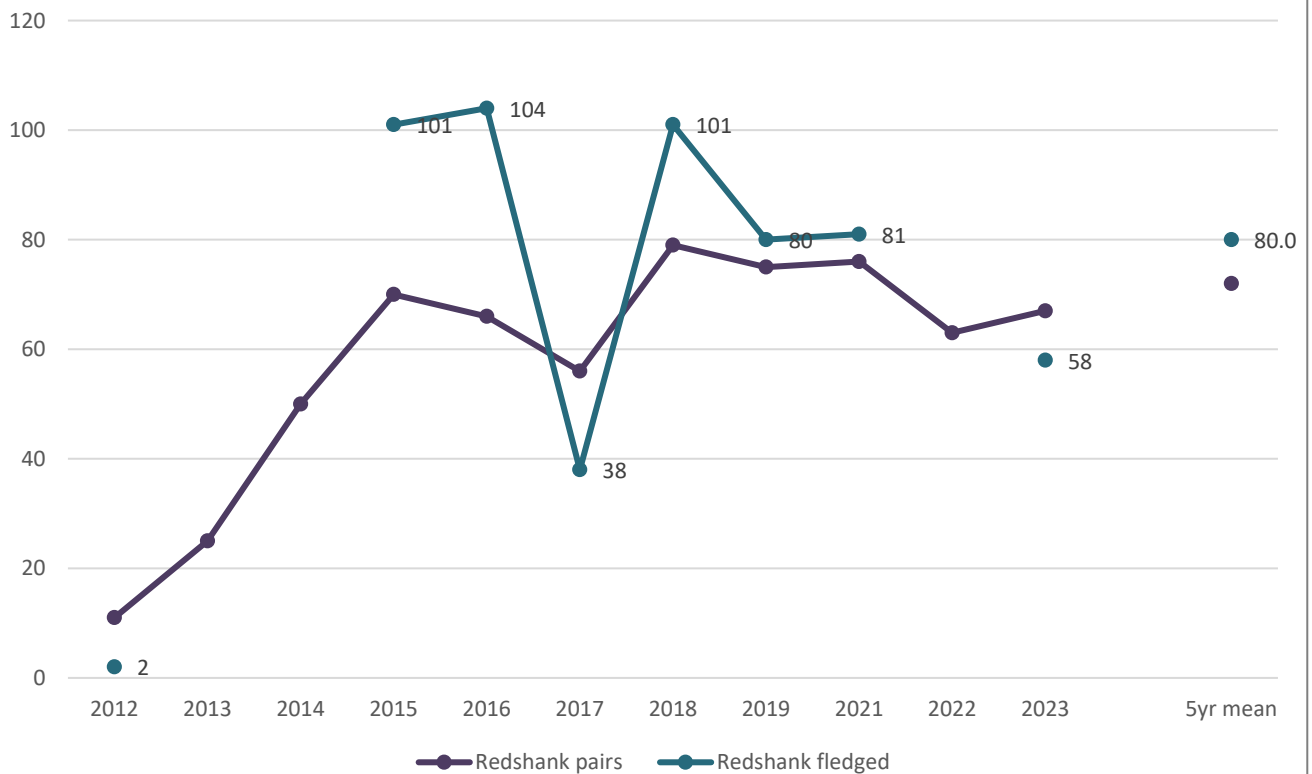
A3.3. Trends of important species



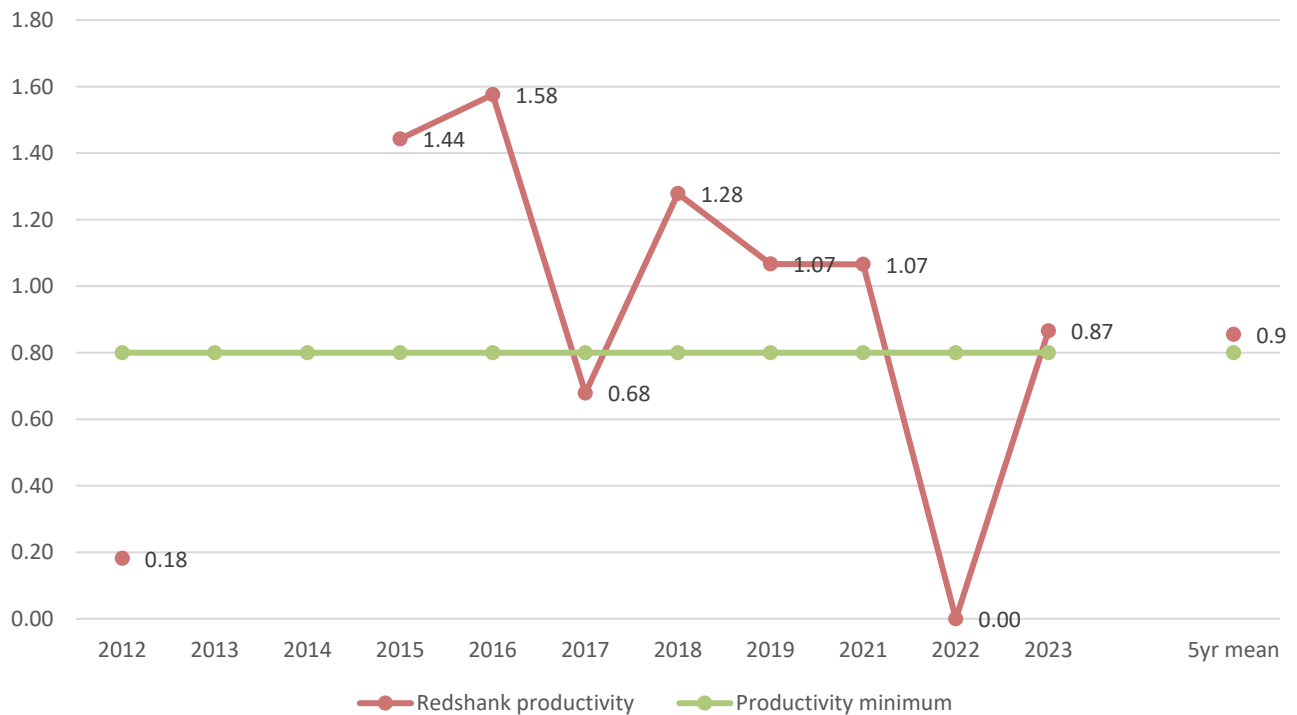
Lapwing productivity at Shorne Marshes 2012-2023



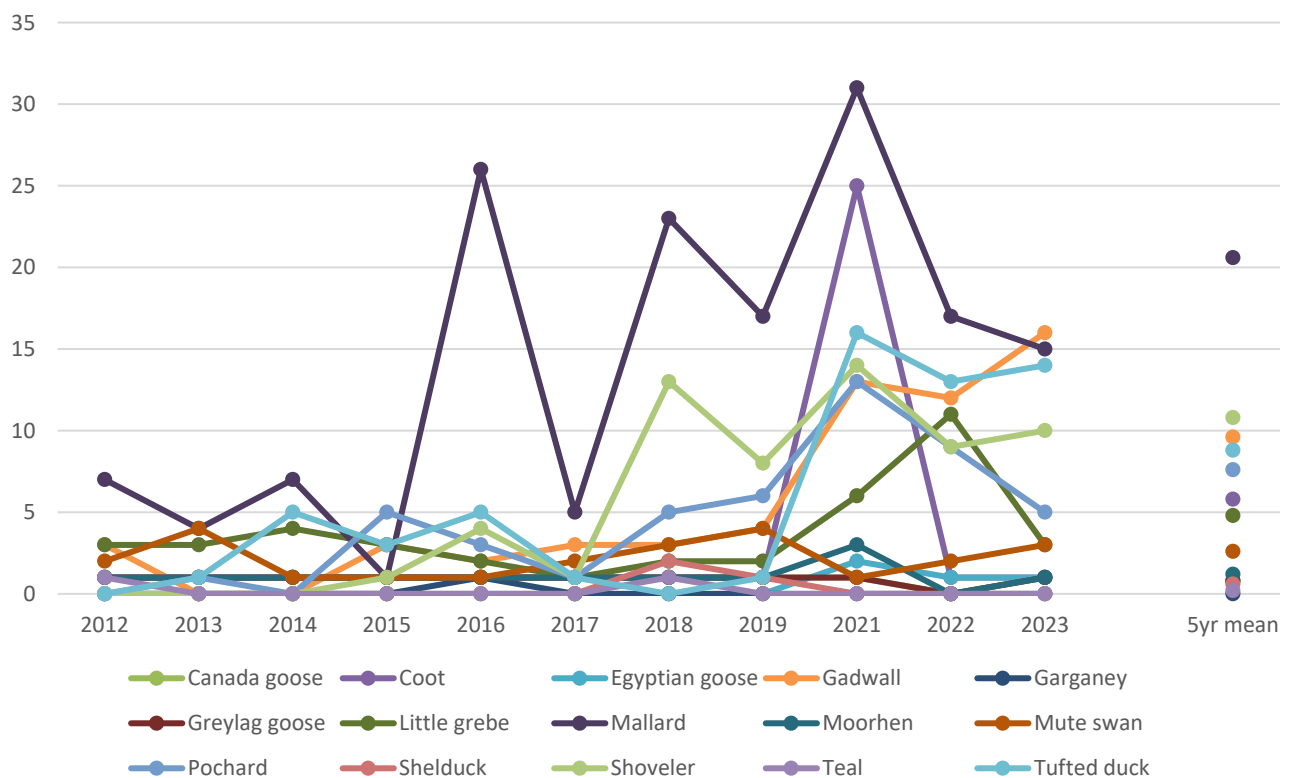
Breeding Redshank at Shorne Marshes 2012-2023



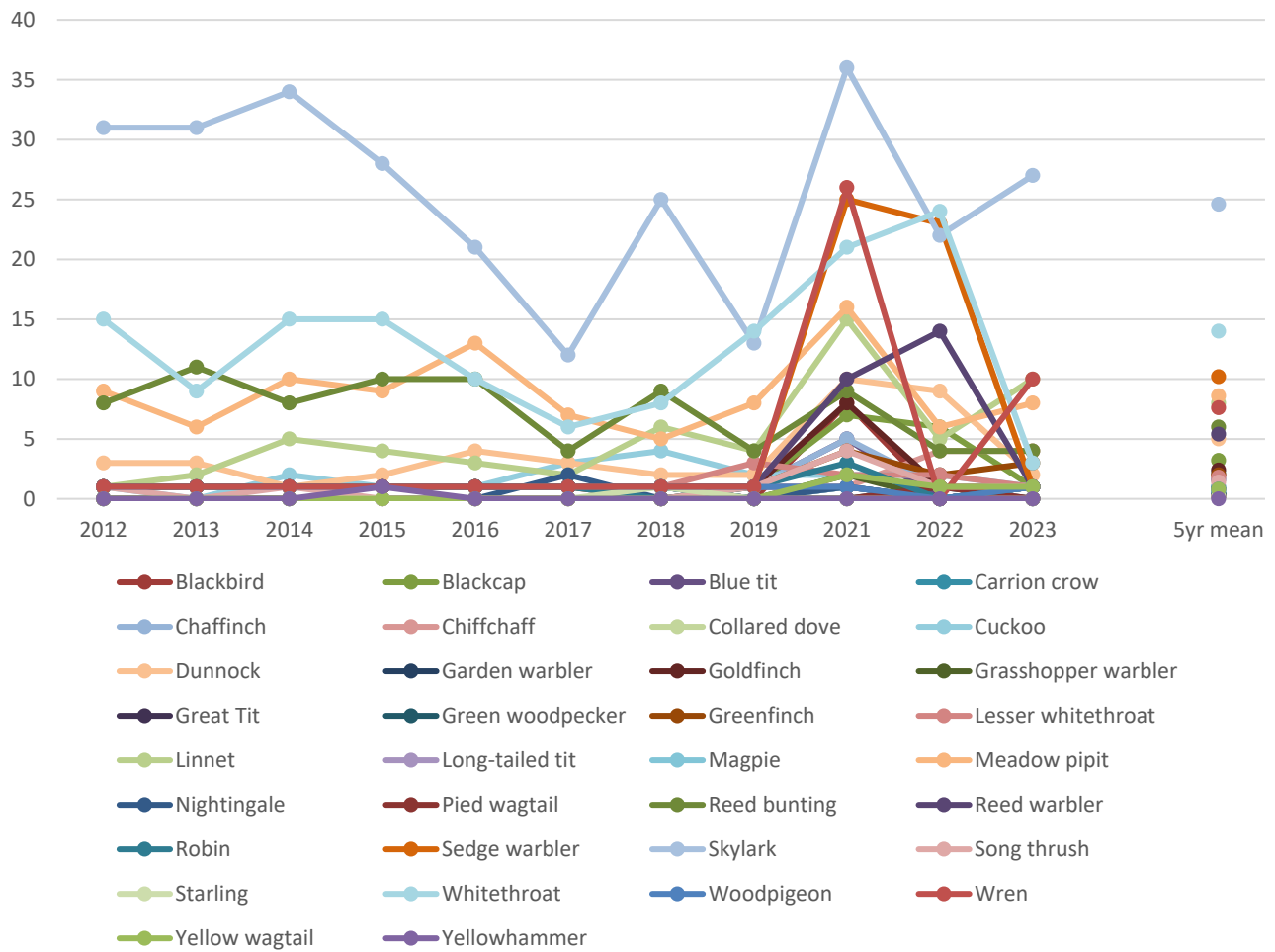
Redshank productivity at Shorne Marshes 2012-2023



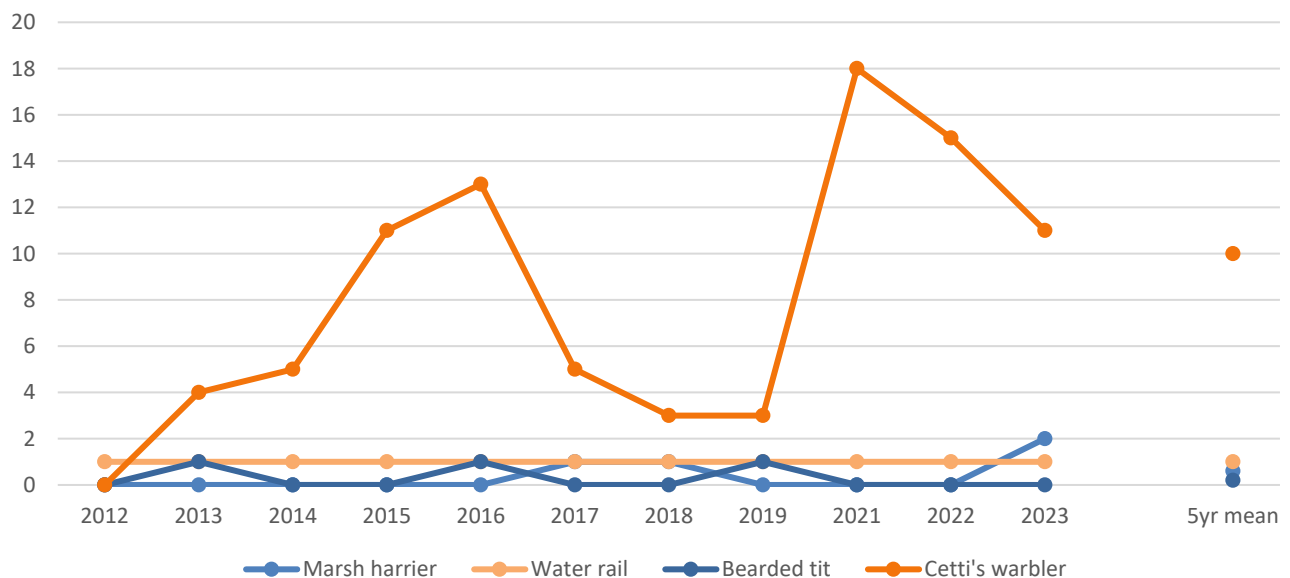
Breeding wildfowl at Shorne Marshes 2012-2023



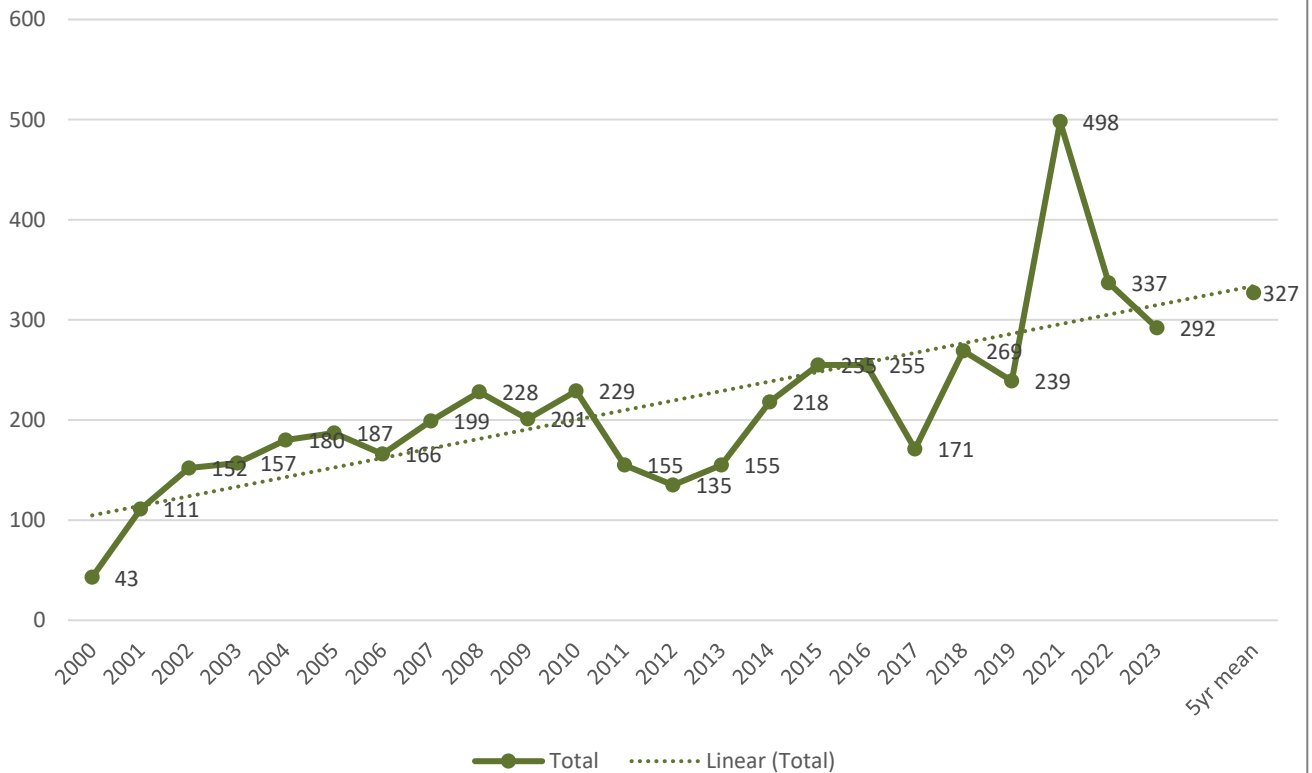
Breeding passerines (not inc. reedbed birds) at Shorne Marshes 2012-2023



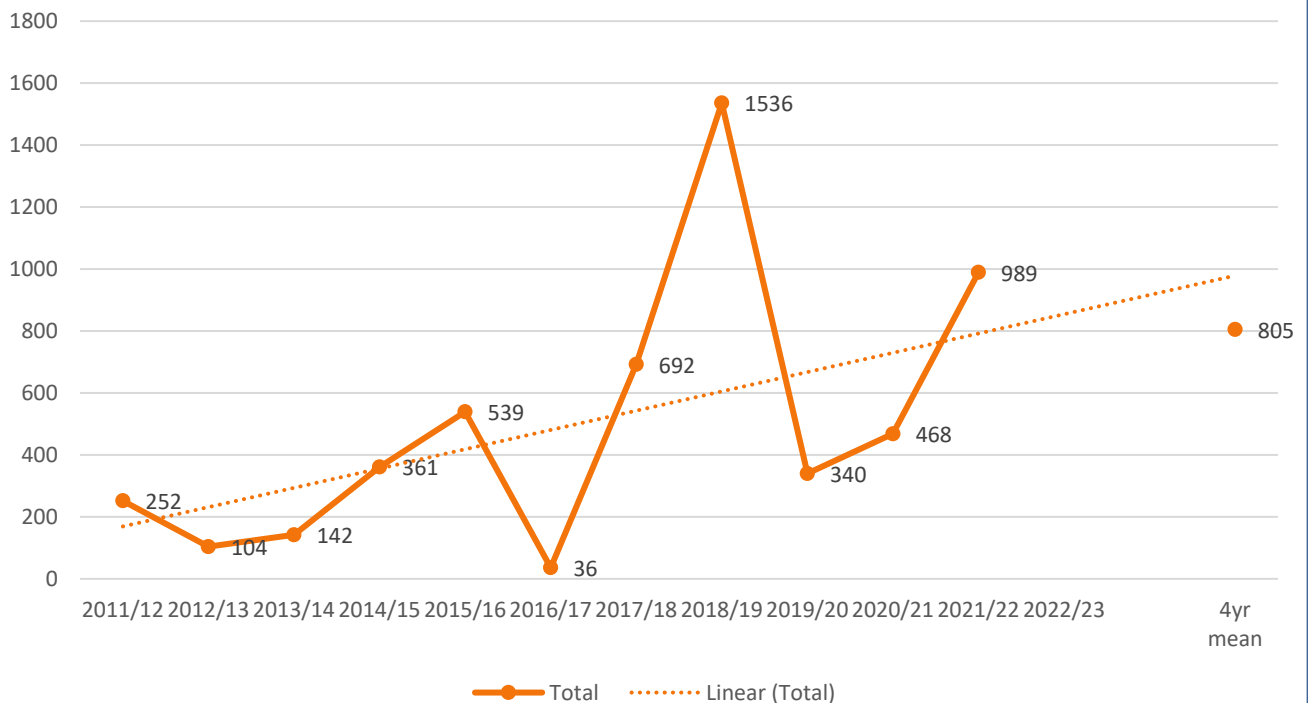
Breeding reedbed birds at Shorne Marshes 2012-2023



Total breeding birds at Shorne Marshes 2000-2023

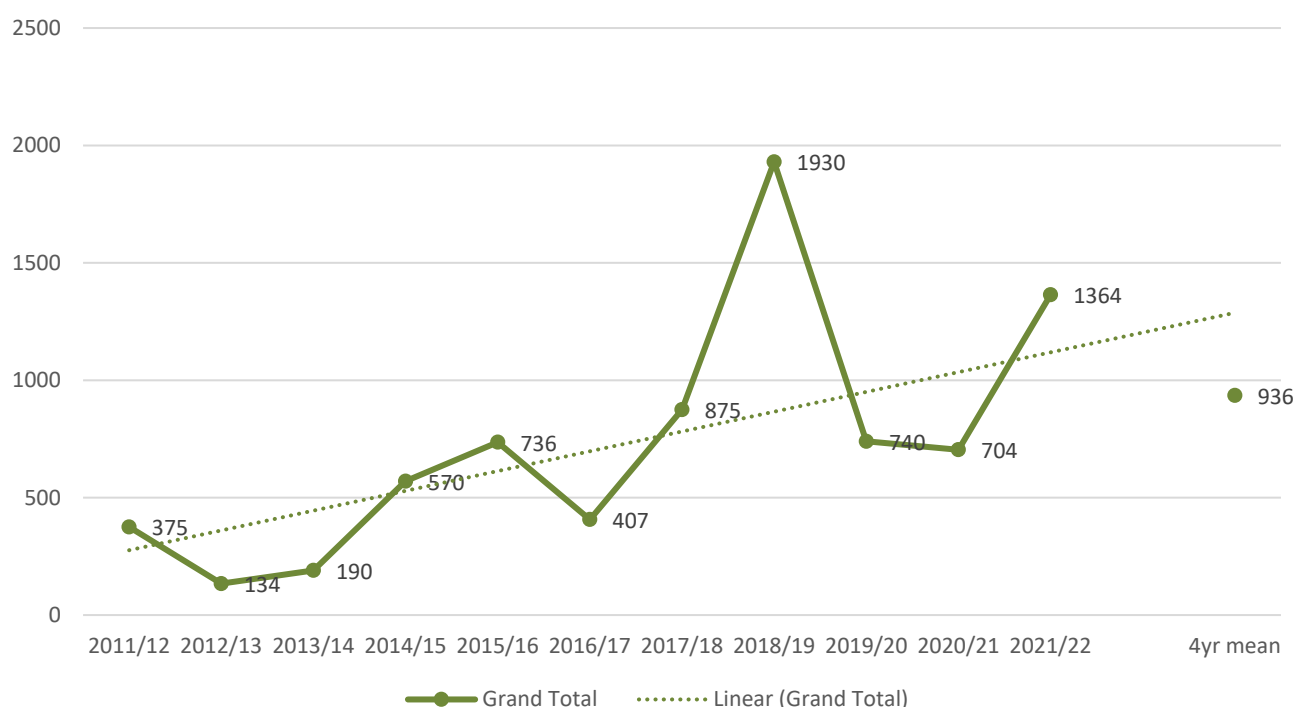


Total number of wintering birds of conservation concern and/or designated features at Shorne Marshes 2011/12-2021/22



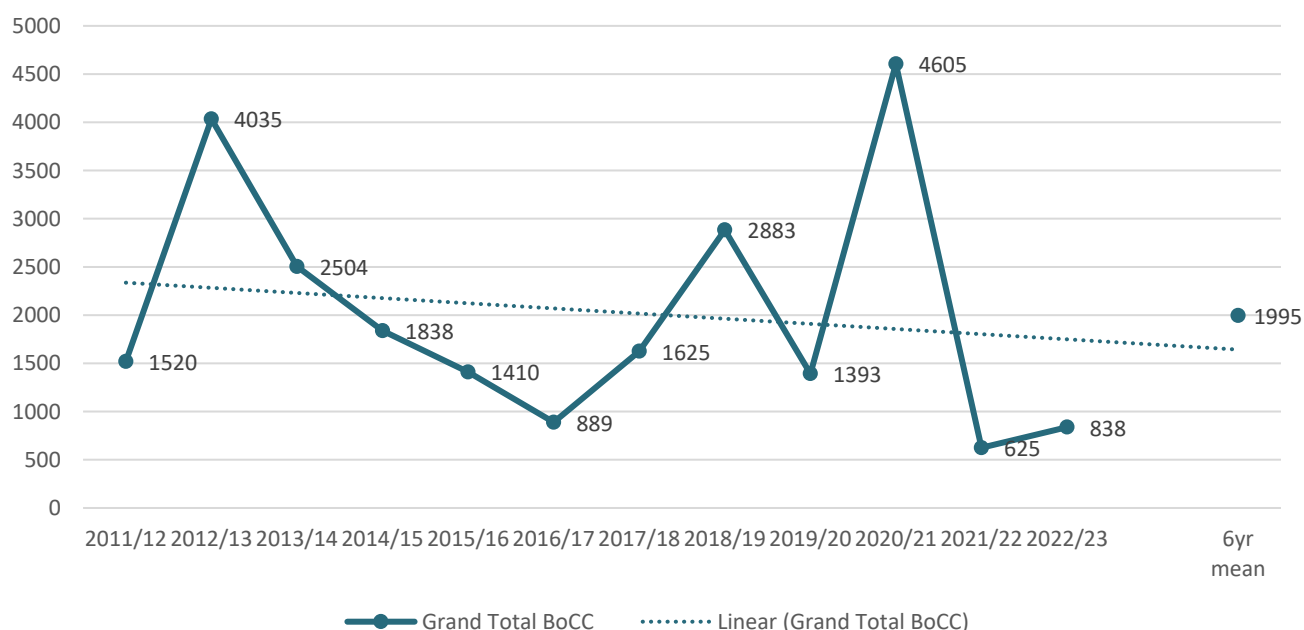
Black-tailed godwit, brent goose, curlew, dunlin, gadwall, golden plover, kestrel, lapwing, mallard, marsh harrier, moorhen, oystercatcher, pintail, pochard, redshank, ruff, shelduck, shoveler, snipe, teal, wigeon.

Total number of wintering birds at Shorne Marshes 2011/12-2021/22

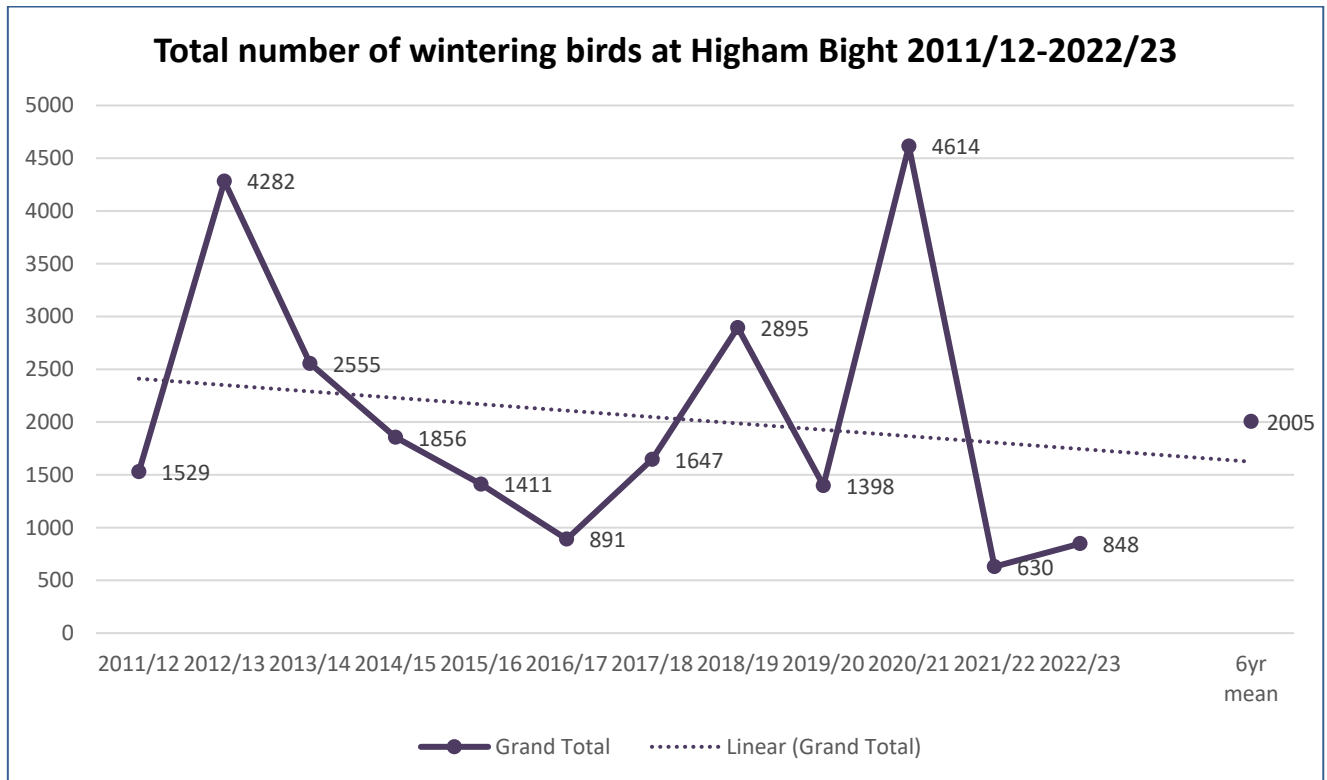


Black-tailed godwit, brent goose, buzzard, Canada goose, coot, cormorant, curlew, dunlin, Egyptian goose, gadwall, golden plover, green sandpiper, grey heron, greylag goose, kestrel, lapwing, little egret, little grebe, mallard, marsh harrier, mute swan, oystercatcher, peregrine, pintail, pochard, raven, redshank, ruff, shelduck, shoveler, snipe, teal, tufted duck, water rail, wigeon.

Total number of wintering birds of conservation concern and/or designated features at Higham Bight 2011/12-2022/23



Avocet, bar-tailed godwit, black-headed gull, black-tailed godwit, brent goose, common gull, common sandpiper, curlew, dunlin, gadwall, goldeneye, great black-backed gull, grey plover, herring gull, kestrel, knot, lapwing, lesser black-backed gull, mallard, moorhen, oystercatcher, pintail, pochard, redshank, ringed plover, shelduck, short-eared owl, snipe, spotted redshank, teal, turnstone, wigeon.



Avocet, bar-tailed godwit, black-headed gull, black-tailed godwit, brent goose, Canada goose, common gull, common sandpiper, coot, cormorant, curlew, dunlin, gadwall, golden plover, goldeneye, great black-backed gull, great crested grebe, grey heron, grey plover, greylag goose, herring gull, kestrel, knot, lapwing, lesser black-backed gull, little egret, little grebe, mallard, moorhen, mute swan, oystercatcher, peregrine, pintail, pochard, redshank, ringed plover, shelduck, short-eared owl, snipe, spotted redshank, teal, tufted duck, turnstone, wigeon.

A3.4. Predicted impacts of climate change on existing/potential Important Features

1) Lowland wet grassland

Important feature	Predicted impacts of climate change on the condition of the feature over the next ca 25 years, if no adaptation measures are taken	Potential adaptation measure(s)
Lowland wet grassland	Increased difficulty of maintaining surface flooding in spring and early summer despite an appropriate abstraction licence	Enhancements to the reedbed to provide an excess winter water storage facility as set out in objectives 1 & 3
	Increased difficulty in providing suitable sward conditions due to a longer grass growing season	Increase the use of winter grazing
Breeding wader assemblage	Reduced water availability in spring and summer might reduce the suitability of the wet grassland for feeding, and reduce the length of time that conditions remain suitable for chick rearing.	As per 'Lowland wet grassland'
	Species composition	Re-define management to accommodate habitat requirements of colonists once the species are known
Breeding wildfowl assemblage	Reduced water availability in spring and summer might reduce the suitability of the wet grassland for feeding, and reduce the length of time that conditions remain suitable for chick rearing.	As per 'Lowland wet grassland'
	Species composition	As per 'Breeding wader assemblage'
Wintering waders & wildfowl assemblage	Increased difficulty in providing suitable sward conditions due to a longer grass growing season	As per 'Lowland wet grassland'
	Species composition	As per 'Breeding wader assemblage'
Scarce emerald damselfly	Increased difficulty of maintaining surface flooding in spring and early summer despite an appropriate abstraction licence	As per 'Lowland wet grassland'
Shrill and brown-banded carder bees	Grassland is likely to suffer increasingly from summer drought, negatively affecting nectar sources	Plant with drought resilient nectar sources

	Shortage of late forage due to early flowering and seed set	Rotational cutting of floristic areas in mid-summer to stimulate late flowering; Consider planting late flowering forage sources.
Water vole	Increased difficulty of maintaining adequate ditch levels	As per 'Lowland wet grassland' + maintain consistent water levels + dredge ditches deeper to maintain water availability
European eel	As above	As above
Notable plant species	Species composition	As per 'Breeding wader assemblage'
Archaeological features	Earthen features subject to erosion through increased drying and cracking	As per 'Lowland wet grassland'

2) Scrub/Rough grassland mosaic

Important feature	Predicted impacts of climate change on the condition of the feature over the next ca 25 years, if no adaptation measures are taken	Potential adaptation measure(s)
Scrub/Rough grassland mosaic	Species composition	As per 'Breeding wader assemblage'
Great crested newt	Increased difficulty of maintaining adequate water levels in crater-ponds	As per 'Lowland wet grassland' + maintain consistent water levels + potentially deepen craters to maintain water availability
Nightingale	Reduced wetness and humidity, a possible contributing factor to woodland bird declines	As per 'Lowland wet grassland'
Scarce emerald damselfly	Increased difficulty of maintaining surface flooding in spring and early summer despite an appropriate abstraction licence	As per 'Lowland wet grassland'
Shrill and brown-banded carder bees	Grassland is likely to suffer increasingly from summer drought, negatively affecting nectar sources	Plant with drought resilient nectar sources
	Shortage of late forage due to early flowering and seed set	Rotational cutting of floristic areas in mid-summer to stimulate late flowering; plant late flowering forage sources.
Archaeological features	Earthen features subject to erosion through increased drying and cracking	As per 'Lowland wet grassland'

3) Reedbed/Rough grassland mosaic

Important feature	Predicted impacts of climate change on the condition of the feature over the next ca 25 years, if no adaptation measures are taken	Potential adaptation measure(s)
Reedbed/Rough grassland mosaic	Will become drier in summer	Maintain higher water levels in winter, to help maintain wet enough conditions in spring and summer via enhancements to the reedbed as an excess winter water storage facility (see objective 1)
Bearded tit	Conditions likely to become less suitable, due to predicted lower water levels in spring and summer	As per 'Reedbed/Rough grassland mosaic'
Wintering wildfowl assemblage	Species composition	As per 'Breeding wader assemblage'
Water vole	Increased difficulty of maintaining adequate ditch levels	As per 'Lowland wet grassland' + maintain consistent water levels + dredge ditches deeper to maintain water availability
European eel	As above	As above

4) Lowland dry grassland (seawall), saltmarsh and intertidal mudflats

Important feature	Predicted impacts of climate change on the condition of the feature over the next ca 25 years, if no adaptation measures are taken	Potential adaptation measure(s)
Lowland dry grassland (seawall)	Grassland is likely to suffer increasingly from summer drought	No adaptation feasible
	Species composition	As per 'Breeding wader assemblage'
Shrill and Brown-banded carder bees	Grassland is likely to suffer increasingly from summer drought, negatively affecting nectar sources	Plant with drought resilient nectar sources where feasible
	Shortage of late forage due to early flowering and seed set	Rotational cutting of floristic areas in mid-summer to stimulate late flowering; plant late flowering forage sources where feasible
Linnet	Unknown	-
Saltmarsh	Coastal squeeze due to sea level rise would reduce the extent of the saltmarsh	Recharge and reinforcement of the existing saltmarsh as set out in objective 4

Saltmarsh plants assemblage	As above	As above
Intertidal mudflats	Increased erosion	Recharge
Wintering waders & wildfowl assemblage	As above and potential losses of food sources through existing food source's inability to adapt to new conditions	As above
Shornemead Fort and other archaeological features	Increased erosion of saltmarsh/intertidal features	As per 'Intertidal mudflats'

A3.5. Habitat management to enhance the Visitor Experience

Feature	Attributes	Works	Comments
Not applicable	-	-	-

A3.6. Rationale for any changes to conservation objectives and targets

Whilst minor modifications have been made to the important features within the objectives, the overarching conservation objectives remain consistent with the aspirations and intentions for the reserves.

Overall, the changes have been made to reflect the developments that have occurred on the reserves over the last 5 years – changes that have occurred through RSPB management or changes outside of RSPB control.

Objective 1:

- Cs 19 & 27 have been removed from this objective to reflect the revised management post the modifications to stop the gas compound flooding
- C12c has been re-incorporated into this objective post the creation of the northern security ditch
- The targets for breeding waders have been increased to reflect the site's progression in performance for this assemblage
- A target for breeding wildfowl has been added
- The targets for wintering waders and wildfowl have been increased to reflect the aspiration for this site's performance for this assemblage
- The target for water vole has been increased to reflect the expectation that water voles are more prevalent on site
- Targets for grey partridge and yellow wagtail have been removed to reflect the lack of performance at Shorne Marshes for these species
- Brown hare has been removed as a target feature due to the consistent lack of this species' presence at Shorne Marshes
- A target for shrill and brown-banded carder bees has been added to take advantage of the opportunity provided by the installation of the electric fence to manage areas for these species
- A target for European eel has been added to recognise the conservation concern of this species and that factors for their conservation must be taken into account when managing for other features
- A target for the retention of archaeological features has been added as a matter of course as per all other NKR management plans

Objective 2:

- The habitat feature has modified from entirely scrub to scrub and rough grassland to reflect the habitat covered by the objective
- C26 is no longer scrub and moved into objective 4 to reflect actual management – grazed by horses
- C34 has scrub present but has been moved into objective 4 as per C26
- A target for nightingale has been added as the key avian feature as the habitat is maturing into a structure that will directly benefit this species
- Targets for turtle dove and other scrub species of conservation concern have been removed as it is not realistic to expect these species to use Shorne Marshes for the next 5 years at least
- Scarce emerald damselfly has been added as features to reflect the importance of Cs 28 & 29 to this species

- Shrill and brown-banded carder bees have been added as a feature in response to the greater understanding of these species' needs i.e. rough grassland for nesting and hibernating
- Water vole has been added as a feature to reflect the expectation that water voles are more prevalent on site and will be present in this area
- European eel has been added as a feature to recognise the conservation concern of this species and that factors for their conservation must be taken into account when managing for other features
- A target for the retention of the crater-ponds has been added to recognise their importance as archaeological features

Objective 3:

- The habitat feature has modified from entirely reedbed to reedbed and rough grassland to reflect the habitat covered by the objective
- The targets for breeding reedbed birds has been overhauled to focus on bearded tit. All other species will still be recorded, but focus is on this core reedbed species, which has always been the long-term aim for the reedbed
- A target for wintering wildfowl has been added to reflect that this area is used by wintering wildfowl
- Water vole has been added as a feature to reflect the expectation that water voles are more prevalent on site and will be present in this area
- European eel has been added as a feature to recognise the conservation concern of this species and that factors for their conservation must be taken into account when managing for other features
- The target for harvest mouse has been removed to reflect the local team's capacity

Objective 4:

- This objective has had a major overhaul and incorporates everywhere that horses graze along and around the seawall at Shorne-Higham:
 - Cs 19, 27, 34 & 26 incorporated
 - The EA-owned seawall incorporated to reflect that we do have management of the horse grazier on EA's behalf
 - Lowland dry grassland added as a habitat feature for all of the areas above
- Formal breeding bird monitoring along the seawall has been removed as an action to reflect the local team's capacity issues and to focus more on improving habitat management and conditions
- Targets have been added to reflect how management along the entire seawall can benefit shrill and brown-banded carder bees
- A target for breeding linnet has been added due to their status and use of the scrub on the landward edge of the seawall
- The targets for wintering waders and wildfowl have been increased to reflect Higham Bight's performance for this assemblage over the last 6 years
- The plant target has been modified to focus on saltmarsh plants
- A target for the retention of archaeological features (where feasible) has been added as a matter of course as per all other NKR management plans with Shornemead Fort specifically mentioned as recognition for its importance and management requirements

People objectives:

- All people objectives have been removed to reflect the reality that we deliver nothing for people at this reserve due to the local team's capacity issues

Appendix 4: VISITOR MANAGEMENT INFORMATION

Public Access

Public rights of way are shown in Map 7.

Shorne Marshes is not open to the visiting public; therefore, the following sections are not applicable and left blank.

Reserve information	
Reserve opened to visitors:	
Visitor Centre / Information point opening hours throughout the year (if applicable)	

A4.1. Headlines and Review of visitor targets

Project	Timescale	Project Manager

A4.2. Wildlife Experiences

January	
February	
March	
April	
May	
June	
July	
August	
September	
October	
November	
December	

b. Gardens for wildlife

A4.3 Reserve theme/s

A4.4. Priority audiences

A4.5.Visitors: counting, potential and priority audiences

Type of visit	Method	Calibration calculation (if applicable)	Last calibrated (if applicable)
Engaged			
Global			

A4.6. Visitor Income

A4.7. Membership recruitment

A4.8. Community Fundraising

A4.9. Visitor satisfaction

Visitor satisfaction measure					
Visitor Survey					
Quality of experience (% good + excellent)					
Retail mystery shop score					
Catering mystery shop score					
VAQS overall score					

A4.10. Connections to Nature and Education

A4.11. Peak flow days

A4.12. Sustainability

A4.13 Current issues and constraints

A4.14. Rationale for any changes to visitor objectives and targets

Appendix 5: DEMONSTRATION USE

Shorne Marshes and Higham Bight are not assessed as Key Demonstration Reserves

Appendix 6: REFERENCES and DATA SOURCES

Cadbury, J & Parker, A (2010)	A Survey of ditch, saltmarsh and grazing marsh flora of Shorne Marshes SSSI
Eaton, M.A <i>et al</i> (2015)	Birds of Conservation Concern 4: the population status of birds in the United Kingdom, Channel Islands and Isle of Man. <i>British Birds</i> 108, 708–746
English Nature (Williams, P) (1995)	A Survey of Ditch Flora in the North Kent Marshes SSSIs
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