

Development of an Integrated Constructed Wetland at

Kilronan, Inis Mór, Co Galway

Appropriate assessment (screening)

Report for Galway County Council

July 2013

Roger Goodwillie & Associates, Lavistown House, Kilkenny. Ph/Fax 056-7765145

1. INTRODUCTION

The purpose of this report is to supply enough information for the Local Authority to make an appropriate assessment of the proposed development with regard to its potential impacts on the Natura 2000 network of protected areas. In this it fulfils the mandatory requirement under Articles 6(3) and 6(4) of the Habitats Directive.

The report makes use of field information collected in July 2013 and was requested by Damien Mitchell, Water Services, Galway County Council. A site description is given at the outset for background information.

2. DESCRIPTION OF SITE

2.1 Habitats & Flora

The site is a recently cultivated field below the Kilronan Cottages and an adjoining B&B. It is rectangular in outline, mostly flat but rising at the western end through an overgrown scrubby part. In the main section the vegetation is still open with sand showing through the plants (Photo 1). It is covered by weeds of tillage, commonly charlock *Sinapis arvensis*, swine cress *Coronopus didymus* and scarlet pimpernel *Anagallis arvensis*. Slightly less frequent are

<i>Fumaria capreolata</i>	white ramping fumitory
<i>Pteridium aquilinum</i>	bracken
<i>Chenopodium album</i>	white goosefoot
<i>Trifolium repens</i>	white clover
<i>Veronica persica</i>	field speedwell
<i>Silene latifolia</i>	white campion
<i>Sonchus asper</i>	prickly sow thistle
<i>Medicago lupulina</i>	black medick
<i>Lotus corniculatus</i>	birdsfoot trefoil
<i>Cirsium arvense</i>	creeping thistle
<i>Plantago lanceolata</i>	ribwort plantain
<i>Rumex crispus</i>	curled dock
<i>Brassica rapa</i>	wild turnip
<i>Pimpinella major</i>	greater burnet saxifrage

The two latter species increase in the rough ground at the western end, together with much false oat *Arrhenatherum elatius*, bracken *Pteridium aquilinum*, alexanders *Smyrniolum olusatrum* and bramble *Rubus fruticosus*.

The field is edged by walls which are grown over by false oat *Arrhenatherum elatius*, bracken *Pteridium aquilinum* and cow parsley *Anthriscus sylvestris* but also including germander speedwell *Veronica chamaedrys* and herb robert *Geranium robertianum*. There is one sycamore *Acer pseudoplatanus* and some more brambles *Rubus fruticosus*.



Photo 1. View of site from NE corner. B&B above rising land covered in wild turnip

Adjoining ground

The land rises slightly to the north into two strips and one broader field of permanent grass, a mixture of cocksfoot *Dactylis glomerata*, false oat *Arrhenatherum elatius*, creeping bent *Agrostis stolonifera* and red fescue *Festuca rubra*. Then there is a low-lying trough linking two permanent lakes but drying out itself at times. The trough has some turlough affinities (a *Cinclidotis* moss-covered outcrop on the northern side from which water comes). Sea clubrush *Bolboschoenus maritimus* and saltmarsh rush *Juncus gerardii* are frequent in the basin with

<i>Glaux maritima</i>	sea pimpernel
<i>Triglochin maritimum</i>	sea arrowgrass
<i>Carex distans</i>	distant sedge
<i>Samolus valerandi</i>	brookweed
<i>Juncus articulatus</i>	jointed rush
<i>Potentilla anserina</i>	silverweed
<i>Valeriana officinalis</i>	marsh valerian
<i>Lythrum salicaria</i>	purple loosestrife
<i>Myosotis laxa.</i>	tufted forget-me-not

The western end of this feature carries permanent water with reeds (and considerable turbidity in the water) while to the east it gives onto a shallower, sandy type of lagoon which is more saline and may fluctuate with the tides.



Photo 2. Wetland in trough to north (below cottages)



Photo 3. Seaward section of wetland with sandy shore

Fauna

The birds seen using the field in summer were stonechat, linnet and goldfinch and all could nest in the vicinity. The wetland to the north would likely be used by snipe and redshank at certain times of the year.

2.3 Evaluation

The field for the proposed site is typical of made ground abandoned by agriculture and being recolonised by vegetation. No rare species were involved and, in particular no darnel *Lolium temulentum* or small-flowered buttercup *Ranunculus parviflorus*, two rare and protected species that occur on the islands.

Wetland areas to the north have considerable biodiversity and an interesting ecology though the western part appears enriched.

3. APPROPRIATE ASSESSMENT SCREENING

3.1 Introduction

Appropriate assessment was introduced by the EU Habitats Directive as a way of determining during the planning process whether a project is likely to have a significant effect on one of the Natura 2000 sites so far designated (i.e. the candidate SAC's and SPA's), or their conservation objectives. In this case the sites are Inishmore Island cSAC (Site Code 0213) and Inishmore SPA (Site Code 4152). Although parts of the other Aran Island are listed as cSAC's, there is no way realistically that they could be affected by this project.

Article 6(3) states

Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives....

In the Irish context this has been interpreted as a four stage process. Firstly a screening exercise (Stage 1, this document) determines if a project could have significant effects on a Natura site. The project should be screened without the inclusion of special mitigation measures unless potential impacts can clearly be avoided through design (or re-design). If impacts are identified or the situation is unclear a Natura Impact Statement (Stage 2) is provided to the planning or regulatory authority which then conducts an Assessment of the information supplied. Examples of significant effects are loss of habitat area, fragmentation of the habitat, disturbance to species using the site and changes in water resources or quality. If such negative effects come to light in the assessment, alternative solutions are investigated by the proponent (Stage 3) and modifications made unless the project is deemed to be driven by 'imperative reasons of overriding public interest' in its current form. If this is the case, Stage 4 then deals with compensatory action.

3.2 Project description

The proposal is for an integrated constructed wetland to treat wastewater from the cottages which currently flows into a septic tank and percolation area.

The wetland would consist of a series of ponds or lagoons planted with vegetation and receiving the effluent in sequence. The final pond would discharge to groundwater with an effluent quality in line with the Urban Wastewater Directive (The EPA have not laid down appropriate discharge parameters for treatment facilities such as this that require Certificates of Authorisation).

An integrated constructed wetland in Laois (below) gives an example of outflows (Carty, pers.comm.) which are typically in the range of BOD 5-10mg/l, suspended solids 5-10mg/l, ammonium <1mg/l, total phosphorus <1mg/l.

Clonaslee ICW Discharge mg/l (mean performance values May 2012 - January 2013)							
Parameter	BOD mg/l	COD mg/l	Suspended solids mg/l	Ammonia mg/l	Total nitrogen mg/l	Total phosphorus mg/l	Ortho-phosphate mg/l
Discharge/Cell 5	4.3	211	3.4	0.28	1.24	0.04	0.0081
Emission Limit Values	5		15	4			1

3.3 Natura 2000 sites

As mentioned above the site is close to an isolated part of the Inishmore cSAC, the saline lagoon behind the French Strand. The rest of the site lies along the coast and in inshore waters but also covers much of the higher ground in the SW half of the island. The SPA is based on the cliffs on the SW and west end of the island but extends around to cover Straw Island and the headland to its south.

The SAC is designated to conserve 16 special habitats listed on Annex I of the Habitats Directive and one species, the snail *Vertigo angustior*. The nearest habitats to the project site are coastal lagoons, perennial vegetation of stony banks and reefs.

3.4 Conservation Objectives

Inishmore Island SAC [0213]

To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected:

- *Vertigo angustior* [1014]
- *Coastal lagoons [1150]
- Reefs [1170]
- Perennial vegetation of stony banks [1220]
- Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]
- Embryonic shifting dunes [2110]

- Shifting dunes along the shoreline with *Ammophila arenaria* ("white dunes") [2120]
- *Fixed coastal dunes with herbaceous vegetation ("grey dunes") [2130]
- Dunes with *Salix repens* ssp. *argentea* *Salix arenariae* [2170]
- Humid dune slacks [2190]
- Machairs(*in Ireland) [21A0]
- European dry heaths [4030]
- Alpine and Boreal heaths [4060]
- Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (*) important orchid sites [6210]
- Lowland hay meadows (*Alopecurus pratensis*, *Sanguisorba officinalis*) [6510]
- *Limestone pavements [8240]
- Submerged or partly submerged sea caves [8330]

Inishmore SPA

To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA:

- *Rissa tridactyla* [breeding] – black guillemot
- *Sterna paradisaea* [breeding – Arctic tern
- *Strena albifrons* [breeding] – little tern
- *Uria aalga*[breeding] - guillemot

The favourable conservation condition of a habitat is achieved when:

- its natural range, and area it covers within that range, are stable or increasing
- the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future
- the conservation status of its typical species is favourable.

The favourable conservation status of a species is achieved when:

- population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats
- the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future
- there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

4.5 Likely effects

The current situation is that the nine units (one of which is enlarged as a B&B) discharge to a septic tank and percolation area which is not working as required. The result is some groundwater pollution though sampling is not regular enough to indicate the scale of this. Groundwater movement seems to be towards the east and north-east

The new system will offer tertiary treatment for the effluent and will improve the state of the groundwater. It will also supply a simple means of sampling the effluent. Negative effects on the wetland to the north which are likely to be affecting the cSAC will be removed and a more natural nutrient regime established.

Because of the proximity of the Natura 2000 site it is essential that the plants introduced to the lagoons are native species and therefore if they spread to natural habitats, will not cause vegetative changes. Wetland nurseries are renowned for spreading undesirable weeds as the growing medium offers many possibilities for cross 'infection'. Therefore close scrutiny should be given to the source of supply and the selection of species to be used.

Bulrush *Typha latifolia*, grey clubrush *Schoenoplectus tabernaemontani*, sea clubrush *Bolboschoenus maritimus* and common reed *Phragmites australis* are native to the islands but there is, for example no pond sedge *Carex riparia* on the Aran Islands (Webb 1980 and Preston *et al* 2002) and it should not be used in the mixture.

5. CONCLUSION

On the basis of the findings of this screening, it is concluded that the proposed development will not have a significant negative effect on the Natura 2000 network and a Stage 2 Appropriate Assessment is not required.

References

Dept of Environment, Heritage and Local Government (2009). Appropriate assessment of plans and projects in Ireland: guidance for planning authorities. Dublin.

Preston, C.D., Pearman D.A. & Dines T.D. 2002. *New atlas of the British and Irish flora*. Oxford University Press.

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SITE SYNOPSIS

INISHMORE ISLAND cSAC

SITE CODE 0213

Inishmore Island is the largest of the three Aran Islands, situated approximately 8km off the south coast of County Galway. Geologically an extension of the Burren, Co. Clare, the Island is formed of Upper Carboniferous limestone strata, interleaved with layers of shale and clay. In places along the coast, splendid cliffs rise to 90m. A thin cover of rendzina occurs in pockets between blocks of bare limestone. This soil is combined with a mixture of sand and seaweed to form a unique man-made soil cover, built up over the centuries. The site includes a large area of marine waters surrounding the island.

The site is a candidate SAC selected for lagoon, fixed dune, machair, orchid-rich grassland and limestone pavement, all priority habitats on Annex I of the E.U. Habitats Directive. The site is also selected as a candidate SAC for other habitats listed on Annex I of the directive – lowland hay meadows, perennial vegetation of stony banks, reefs, sea cliffs, shifting dunes, Marram dunes, dune slack, dunes with Creeping Willow, marine caves, alpine heath and dry heath. In addition, the site

is also selected as a candidate SAC for *Vertigo angustior*, an animal listed on Annex II of the E.U. Habitats Directive. Inishmore has many good examples of submerged reef communities that are extremely exposed to wave action. On the infralittoral reef are two exceptional communities. Ireland's only recorded example of a population of sublittoral purple sea urchins (*Paracentrotus lividus*) is on the west of the island, while at the reef in Blind Sound, is Ireland's best example of an extremely exposed, shallow, infralittoral community that is dominated by a forest of the brown seaweed, *Alaria esculenta*, with a red seaweed and anemone turf. Rare species are present in the infralittoral reef community, including soft corals, sea fans and anemones. In deeper water, there are many unusual and fragile circalittoral reef communities. Communities that are characterized by the rare sea fan, *Eunicella verrucosa*, are widespread and species rich despite their fragility. A number of other notable circalittoral species are found, including sponges, hydroids, nudibranchs, soft corals and ascidians. Large submerged marine caves on the south east coast are unusually species rich (76 species recorded) and are characterized by a diverse fauna of sponges, hydroids, bryozoans, soft corals, anemones, nudibranchs, echinoderms and ascidians. Some of the caves extend back as far as 20 to 30 metres. They are probably the best known sea caves in Ireland.

Limestone pavement and its associated plant communities dominate the upland area to the south of the Island. The limestone pavement includes smooth-blocky and shattered types. The bare pavement is interspersed with fine examples of species-rich, dry calcareous grasslands. Dry heath, alpine heath and lowland hay meadows are additional habitats which occur on Inishmore. A network of small, stone-walled fields dissect the Island. Each field encloses an area of limestone pavement interspersed with fine examples of species-rich, dry calcareous grasslands. Common species here include Blue Moor-grass (*Sesleria albicans*), Eyebright (*Euphrasia* spp.), Wood Sage (*Teucrium scorodonia*), Carline Thistle (*Carlina vulgaris*) and Burnet Rose (*Rosa pimpinellifolia*), along with Knapweeds (*Centaurea nigra* and *C. scabiosa*), Orchids (Orchidaceae), Bloody Cranesbill (*Geranium sanguineum*) and Spring Gentian (*Gentiana verna*). The southern part of the Island supports the highest proportion of these calcareous meadows. Elsewhere, on rocky crevices, are found two Red Data Book plant species: Pyramidal Bugle (*Ajuga pyramidalis*) and Wood Small-reed (*Calamagrostis epigejos*). The latter species is legally protected under the Flora Protection Order (1987).

Dry limestone heath has developed in places, with Ling Heather (*Calluna vulgaris*), Bell Heather (*Erica cinerea*), Purple Moor-grass and Black Bog Rush (*Schoenus nigricans*) recorded from this habitat. Hoary Rockrose (*Helianthemum canum*), a species listed in the Irish Red Data Book, occurs regularly throughout the dry heath and alpine heath habitats on the Island.

A range of coastal habitats, listed on Annex I of the Habitats Directive, occur around the Island, including embryonic dunes, Marram dunes, dunes slack, dunes with Creeping Willow (*Salix repens*), sea cliffs, perennial vegetation of stony banks, reefs and the priority habitats lagoon, fixed dunes and machair. Sea cliffs occur along much of the southern coast of Inishmore and reach in excess of 80 m at the south-west end. The cliffs are mostly sheer and very exposed to the force of the Atlantic. They support a typical cliff flora, including the scarce Roseroot (*Rhodiola rosea*). Inishmore supports a variety of karstic lagoons, a type which is believed to be rare in Europe. All are in a natural state and of good quality. Loch Phort Chorrúch and L. Dearg are good examples of karstic lagoons with cobble barriers. L. an Chara, in particular, is a good example of a karstic saline lake lagoon with underground connections to the sea. It behaves almost like a 'tidal turlough'. The flora is typically lagoonal with three lagoonal specialists. The fauna is not rich but comprises a high number of lagoonal specialists, including the rare corixid species *Sigara selecta*.

Machair is a form of coastal grassland which is characterised by a species-rich, dry calcareous grassland, with a short turf and a low abundance of sand-binding species such as Marram Grass (*Ammophila arenaria*). The coastal habitats of Inishmore support a range of Rare plant species. Purple Milk-vetch (*Astragalus danicus*) grows on machair and sandy places close to the sea. It is confined to Inishmore and Inishmaan and is legally protected under the Flora Protection Act (1999). Sea Kale (*Crambe maritima*) occurs on coastal sands and shingle around the island; Hairy Violet (*Viola hirta*) and Bee Orchid (*Ophrys apifera*) can be found among the coastal grasslands. All three

species are listed in the Irish Red Data Book, and Hairy Violet is legally protected under the Flora Protection Order (1999).

Traditional farming practices, in the form of rye cultivation for thatching, has maintained suitable habitat for a number of rare and threatened arable weeds. Darnel (*Lolium temulentum*), Smooth Brome (*Bromus racemosus*), Cornflower (*Centaurea cyanus*) and Bristle Oat (*Avena strigosa*) all occur on Inishmore. All four species are listed in The Irish Red Data Book and, prior to their discovery on the Aran Islands, some of these species were thought to have been extinct in Ireland. The birdlife of Inishmore is considered to be of international significance, due to the presence of significant numbers of bird species listed under Annex I of the European Birds Directive. Cough, Little Tern, Arctic Tern and Peregrine Falcon all breed here. Additional bird species on Inishmore include Merlin, Kestrel, Sparrowhawk, Linnet and Goldfinch. Along the western coastline, cliffs provide excellent nesting sites for Guillemot, Fulmar, Razorbill, Shag, Herring Gull, Great Black-backed Gull and Kittiwake. A colony of Common Seals is occasionally seen, resting on the island's shores. This species is listed under Annex II of the European Habitats Directive, as it is threatened in Europe.

The mollusc, *Vertigo angustior*, a species that is listed on Annex II of the E.U. Habitats Directive, occurs at three different locations within the site, two on dune and one on maritime grass, the latter an unusual habitat for the species. This is the only known island population of this rare snail. Most of the island is grazed by cattle and sheep and, in places, goats. Agricultural intensity is relatively higher here than on the other two Aran Islands. Parts of the site have been damaged by overgrazing and agricultural improvement. Elsewhere, the abandonment of farming in favour of tourism and related enterprises, has resulted in the increase in scrub and particularly Bramble (*Rubus fruticosus* agg.) thickets. This is at the expense of species-rich grasslands. An increase in leisure activities, in particular scrambling and walking, on the Marram dunes at the east of the Island, has resulted in damage to this habitat. Maintenance of traditional farming practices, which include winter grazing, absence of fertilisers and the cultivation of rye for thatching, is vital, to preserve the species richness and high diversity of the Island flora. Development plans for tourism and amenity require close monitoring, to safeguard the wildlife and scientific value of this unique environment.

Inishmore is of considerable scientific interest primarily for the wide range of good quality habitats which occur, and the floristic richness of many of these habitats. The Island supports an impressive array of critically rare and threatened plant species, and it also provides excellent habitat for several bird species which are becoming increasingly rare in Ireland and Europe. The cultural heritage of Inishmore (and in particular the continuation of traditional, low-intensity farming practices) is intrinsically linked with its scientific interest. The Island is also of high scenic and amenity value.
29.05.2003

INISHMORE SPA

SITE CODE: 4152

Situated approximately 8 km off the south coast of County Galway, Inishmore (Árainn) is the largest of the three Aran Islands. Geologically an extension of the Burren, County Clare, the island is formed of Upper Carboniferous limestone strata, interleaved with layers of shale and clay. The site comprises all of the cliffs and rocky shore along the entire southern side of the island, part of the low cliffs/rocky shore at the west end, and the low cliffs/rocky shore at the east end - a distance of over 17 km of coastline. Also included are the two islands west of Inishmore (Brannock Island and Rock Island), Straw Island at the east end of Inishmore, the dune system at Barra Coise, and the adjacent seas out to 500 m from the shoreline. The cliffs vary in height, being often less than 20 m but rising to over 80 m near Dún Aonghasa where they are notably sheer. Littoral and sublittoral reef communities are well-developed within the site.

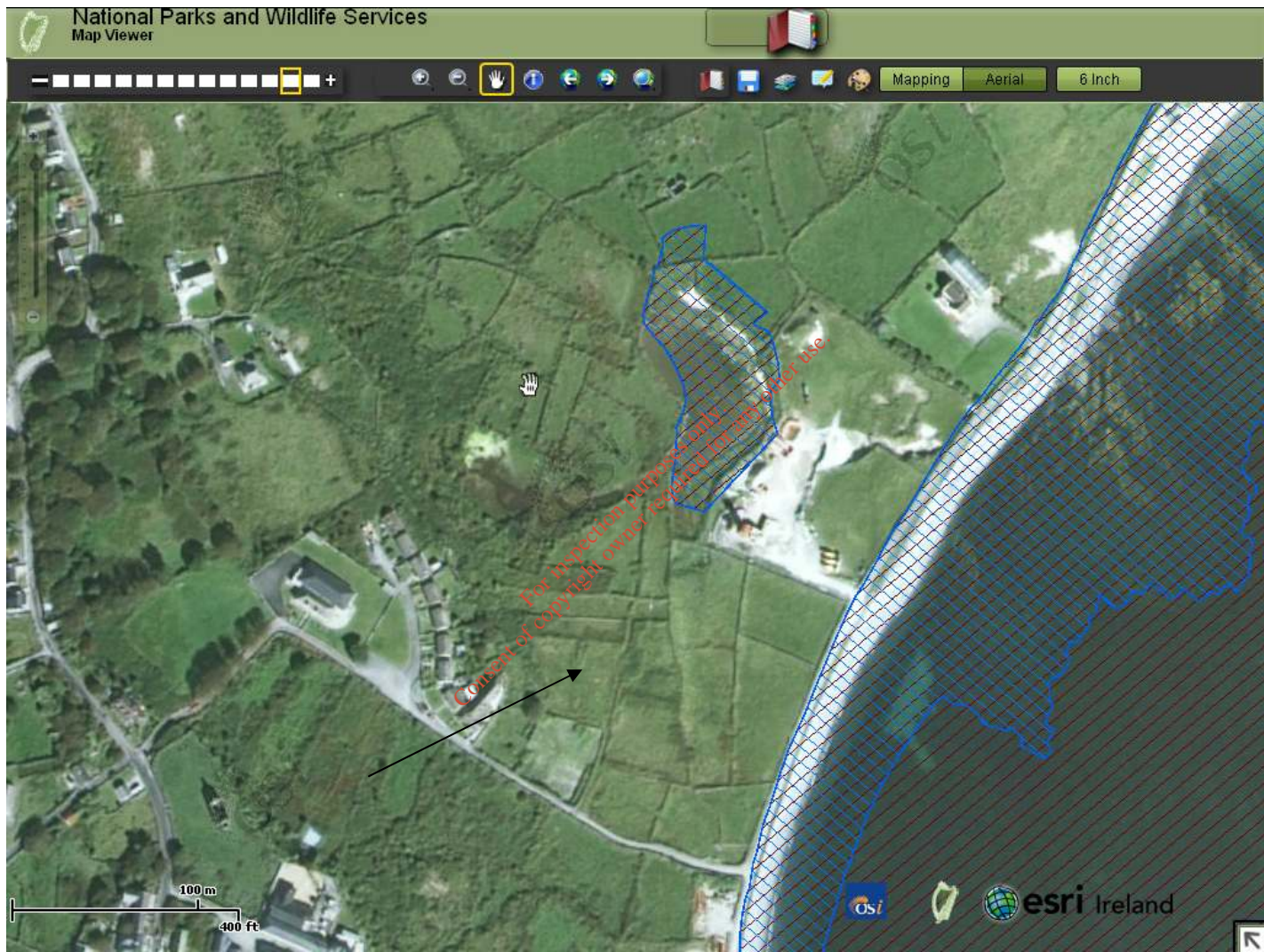
The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Kittiwake, Arctic Tern, Little Tern and Guillemot. The Inishmore

SPA is an important site for breeding seabirds, especially cliff-nesting species. A survey in 1999 showed that it supported nationally important populations of Kittiwake (587 pairs) and Guillemot (2,312 pairs). Inishmore SPA is also of importance for breeding terns, with nationally important populations of Arctic Tern (338 pairs in 1995) and Little Tern (3 pairs in 1995, 13 pairs in 1999) occurring. The terns do not breed in the site every year but alternate with sites on nearby Inishmaan. Other breeding seabirds present include Fulmar (320 pairs), Razorbill (231 pairs), Shag (14 pairs), Great Black-backed Gull (42 pairs), Herring Gull (27 pairs) and Black Guillemot (171 individuals). The Black Guillemot colony is one of the largest concentrations in the country, representing over 5% of the national total. Storm Petrel has been suspected of breeding but has never been proved. Inishmore is an important stronghold for Peregrine, with a nationally important population present (up to 4 pairs). Chough also breeds on the cliffs (6 pairs in 2003). There is a long history of recording bird populations on the island, with records dating back to the 1830s.

The Inishmore SPA is an important site for breeding seabirds, with four migratory species and two resident species having populations of national importance. Of note is that two of the seabird species, Arctic Tern and Little Tern, as well as the resident Peregrine and Chough, are listed on Annex I of the E.U. Birds Directive.

14.12.2011

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Location of proposed ICW (arrowed) in relations to cSAC (red hatching)

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