TIMARU DISTRICT SNA SURVEY

Area Name: Opihi River	**Property**: UCL, DOC, LINZ and Ecan[1] tenure (see Attachment 1 & 2).
Location (NZTM): Upper reference: 1439547, 5106782; lower reference: 1467580, 5096212	**Nearest Locality**: Temuka & Pleasant Point
Ecological District: Low Plains & Geraldine	**Area Size (ha)**: 1,400ha
Surveyor(s): Jean Jack	**Survey Duration**: 16hrs (across dates)
Survey Date: 30-31.10.2019 & 26.11.2019	**Altitude(m)**: <5m – 140m

Two sites within the area were assessed for ecological significance (Lower and Upper Opihi River) as defined by Ecological District. Both sites met multiple significance criteria as assessed under the Canterbury Regional Policy Statement. This assessment was made based on largely on desktop information and supplemented by field surveying (16 hours).

Given the contiguous nature of the sites, the interdependency of ecological processes between them and the relevancy of management recommendations to both, the consideration of both sites as a single SNA area is recommended.

The area of river mouth included within the proposed area was not included in the assessment of ecological significance as had been previously assessed as part of a wider (regional) coastal wetland survey (Grove et al. 2012).

General Description

The area covers the active riverbed, floodplain and berm areas including flood protection plantings of the Opihi River. The area extends from the Opuha confluence to within approximately 1km of the Opihi River mouth. The assessment for significance has considered two sites, the Lower and Upper Opihi River to allow the assessments where relevant to be made at the scale of the Ecological District in which each reach occurs (see Attachment 2).

Both upper and lower sites of the proposed SNA area include extensive vegetated and unvegetated riverbed of the Opihi River and plant communities across berm areas. Spanning two ecological districts (Geraldine & Low Plains) the riverbed and berms provide important habitat to birds. While the braided river bird habitat is not the largest, most intact or representative of those found in the region it contributes to the network of such habitats; providing resilience to the environment which supports several threatened river bird species.

The contiguous riparian vegetation buffers the river from adjoining land use activities and provides a corridor of habitat facilitating both the dispersal of fauna and provision of now rare forest habitat particularly within the Low Plains ecological district. Upper sections of the river include limestone outcrops with small areas of associated native vegetation.

[1] Acronyms: UCL: Unallocated Crown Land; LINZ: Land Information New Zealand; DOC: Department of Conservation; ECAN: Environment Canterbury Regional Council; TDC: Timaru District Council.

Descriptions provided below apply to both upper and lower sites unless specified otherwise.

Photographs from site visits are provided within Attachment 3.

Plant Communities

Braidplain plant communities

Various leading plant species[2] occur within the stonefields, gravelfields and sandfields of the riverbed with more extensive areas of these species forming herbfield, grassland, shrubland and, where more stable, scrub.

Stonefield/gravelfield/sandfield (sparsely vegetated)

The relative extent of densely-vegetated, sparsely-vegetated and un-vegetated bare stones within the active riverbed is directly influenced by riverflows. Common or dominant plant species occurring within these areas include naturalised exotic grasses, brassica species (*Brassica* spp.); californian poppy (*Eschscholzia californica*), monkey musk (*Erythranthe guttata*), yellow lupin (*Lupinus arboreus*) and broom (*Cytosis scoparium*).

These species form a mosaic of grassland, herbfield, shrubland and scrub vegetation within less recently disturbed areas of the active riverbed

River berm plant communities

Three main vegetation structures occur within river berms including planted (flood protection) or naturalised forest and treeland; gorse (*Ulex europaeus*) or broom-scrub and shrubland and naturalised exotic grassland. Discrete areas of native vegetation associated with limestone outcrops occur above Hanging Rock bridge.

Forest & treeland

Exotic forest is the most common vegetation type along the river berms. Canopy species primarily consist of planted (flood protection) and naturalised woody exotic vegetation including crack willow (*Salix fragilis*), poplar species (*Populus* spp.) and sycamore (*Acer pseudoplatanus*).

Sub-canopy species include exotic broom, plum (*Prunus* sp.) and black-berry (*Rubus fruticosus*). Very occasional native trees such as cabbage tree (*Cordyline australis*) and lowland ribbonwood (*Plagianthus regius*) are present. Exotic herbs and grasses dominate the under-storey alongside climbers including ivy (*Hedera helix*), old man's beard (*Clematis vitalba*) and native pohuehue (*Muehlenbeckia australis*). Other very occasional native species include kohuhu (*Pittosporum tenuifolium*), small-leaved pohuehue (*Muehlenbeckia complexa*), prickly shield fern (*Polystichum vestitum*), hound's tongue (*Zealandia pustulata*) and small-leaved coprosma (*Coprosma* spp.).

Scrub & shrubland

[2] Stonefields, gravelfields and Sandfields as defined by Atkinson 1985 where the area of unconsolidated bare stones (20-200 mm diam.) and/or gravel (2-20 mm diam.) exceeds the area covered by anyone class of plant growth form. The appropriate name is given depending on whether stones or gravel form the greater area of ground surface. Stonefields and gravel fields are named from the leading plant species when plant cover ~ 1%.

Where forest is not present, exotic scrub and shrubland is the next most common vegetation. Scotch broom, gorse and yellow lupin are the dominant species. Scattered emergent trees including crack willow, poplar and sycamore can also occur, commonly accompanied by vines of old man's beard and pohuehue.

Grassland
While less extensive than other vegetation types, exotic grassland occurs at the edge or within spaces unoccupied by the vegetation structures reported above.

Wetlands

Small riparian wetlands are common within the river berms. While generally dominated by exotic willows (and therefore difficult to distinguish from adjoining riparian willow forest) native wetland plants (e.g. *Carex* spp.) are often also present in these habitats.

Birds Observed

Native birds observed within the river-berm were common to both upper and lower sites and included pīwakawaka / South Island fantail (*Rhipidura f. fuliginosa*), silvereye (*Zosterops lateralis*), kingfisher (*Halcyon sancta*), welcome swallow (*Hirundo neoxena*) & grey warbler (*Gerygone igata*). Introduced or naturalised species included chaffinch (*Fringilla coelebs*), European greenfinch (*Carduelis chloris*), European goldfinch (*Carduelis carduelis*), California quail (*Callipepla californica*), Eurasian blackbird (*Turdus merula*), song thrush (*Turdus philomelos*) & yellowhammer (*Emberiza citronella*).

Native birds observed on or above the open riverbed during the site visits included those observed within the berms as well as black-fronted tern (*Sterna albostriata*), spur-winged plover (*Vanellus miles*), paradise shelduck (*Tadorna variegata*), pied stilt (*Himantopus himantopus leucocephalus*), black shag (*Phalacrocorax carbo novaehollandiae*) & swamp harrier (*Circus approximan*).

During the 2019 river bird survey conducted by Environment Canterbury in November the following bird species were observed on or above the open riverbed. Those observed breeding are indicated with an asterisk:

Upper site: Threatened avifauna included black-billed gull* (*Larus bulleri*), South Island pied oystercatcher (*Haematopus unicolor*), black-fronted tern*. Other species included black-fronted dotterel (*Charadrius melanops*) (Naturally Uncommon), paradise shelduck, southern black-backed gull (*Larus dominicanus*), white-faced heron (*Egretta novaehollandiae*), kingfisher, black shag, spur-winged plover and pied stilt*.

Lower site: Threatened avifauna included banded dotterel (*Charadrius b. bicinctus*), black-fronted tern, South Island pied oystercatcher. Other species included black-fronted dotterel (Naturally Uncommon), paradise shelduck, southern black-backed gull, black shag, white-faced heron, kingfisher, black shag, spur-winged plover and pied stilt.

Other Species Observed

Invertebrate species recorded during site visits included copper butterflies (*Lycaena* sp.), red & yellow admiral (*Vanessa gonerilla; V. itea*) & white cabbage butterfly (*Pieris rapae*).

Notable Flora, Fauna and Habitats

Riverbed bird habitat

The site encompasses typical river habitats of specialised river bird species including seeps, shallow & major channels, active shingle bars and flats, small river terraces. While the braided river bird habitat is not the largest, most intact or representative of those found in the region it contributes to the network of such habitats; providing resilience to the environment which supports several threatened river bird species.

Threatened, At-Risk and Uncommon indigenous river bird species which have been recorded to occur within these habitats of the Opihi River Area include (observation dates noted in brackets where infrequent; see Attachment 4 for survey data): Banded dotterel, Australasian bittern (*Botaurus poiciloptilus*)(2011), black stilt (*Himantopus novaezelandiae*) (2006; 2011; 2014), black-billed gull, South Island pied oystercatcher, black-fronted tern, Caspian tern (*Sterna caspia*), New Zealand pipit, red-billed gull (2011), South Island pied oystercatcher, white-fronted tern and wrybill (*Anarhynchus frontalis*)(1987). Black-fronted dotterel, which are Naturally Uncommon, have also been recorded to occur.

Several reports have considered the habitat values of the Opihi River. In the 1980s the New Zealand Wildlife Service listed the Opihi River as a Significant Site of Wildlife Interest (SSWI) with a rating of High (Imboden, 1978). O'Connell (2000) evaluated the significance of the Opihi River (including the Opuha River reach from SH79 to Raincliff Bridge) for river bird habitat and determined the area to have National-International significance due to the number of guilds present; the level of endemism of species using the site; the diversity of microhabitats; and the habitat being of a relatively large size and not being represented in other regions of the country. Later Hughey et al. (2010) assessed the river to be of Regional importance to birdlife and Grove (2008) assessed the contiguous wetlands of the Opihi lagoon to be of high ecological significance. A report commissioned by the Forest & Bird Protection Society of New Zealand determined the Opihi River to be an Important Bird Area (Gaskin, 2016) due to the use of the river by a threshold number of threatened species as assessed under Ramsar Convention criteria.

Riparian avifauna habitat

Indigenous species confirmed or likely to utilise the forested riparian berm areas of the Opihi and would be considered typical of a Low Plains ED assemblage within such habitat (Crossland, 2014) include: fantail, grey warbler, silvereye, kingfisher, welcome swallow, bellbird (*Anthornis melanura melanura*) (infrequent), paradise shelduck, swamp harrier, white-faced heron, black shag, little black shag (*Phalacrocorax sulcirostris*), grey duck (*Anas superciliosa superciliosa*), New Zealand shoveler (*Anas rhynchotis variegate*), Australasian coot (*Fulica atra australis*) (infrequent) & Australasian bittern (uncommon) (eBird records; Environment Canterbury river survey data; Gaskin, 2016).

This recorded assemblage is largely the same in both upper and lower reaches and represents a large proportion of the species typical of exotic riparian willow habitat.

Lizard habitat

Discrete areas within river berms were observed which may provide suitable habitat to two native lizard species including Southern grass skink (*Oligosoma aff. polychroma* Clade 5; At Risk, Declining) and McCann's skink (*Oligosoma maccanni*; Not threatened). No observations of these lizards were made during site visits; however, river berms likely provide some habitat to lizards, albeit of low quality. A history of disturbance, likely predation pressures and the extensive shading by the riparian forest structure (which reduces basking opportunities, critical for the biology of these lizards) lessens the quality of lizard habitat

provided by the berms. While lizards are likely to be in low numbers and the habitat degraded, the river berms do provide some of the last remaining habitat connecting populations which have otherwise become highly isolated across their natural ranges particularly within the Low Plains.

Long-tailed bat habitat

The only known long-tailed bat (*Chalinolobus tuberculatus;* Threatened: Nationally Critical) population on the East Coast of the South Island is known from Peel Forest in the north, southwards through the foothill rivers including the Opihi River. The Opihi river environs and berm forests provide important feeding and roosting habitat to long-tailed bats (O'Donnell, 2000b), with much of the population centred around Hanging Rock (Attachment 5).

Notable Plant and Animal Pests

Plant pests occurring within functional river protection plantings which most threaten indigenous biodiversity values include sycamore and the vines old man's beard and ivy. Exotic vegetation which may provide a better nursery environment for natural regeneration of indigenous vegetation than other exotic cover includes blackberry, willow and gorse.

Animal pests were not observed but likely include those that threaten indigenous biodiversity values through predation including feral cats (*Felis catus*), hedgehog (*Erinaceus europaeus*), mustelids (*Mustela* sp.) and rodents (Muridae). Wild deer (*Cervus elaphus*) and possum (*Trichosurus vulpecula*), particularly in the upper river site may limit indigenous vegetation regeneration.

Boundaries (buffering, fencing, adjoining plant communities and habitats)

Both upper and lower sites are bounded by land developed for agricultural use including dairying, arable crops and sheep and beef. Distances between these surrounding land uses, and the active riverbed gravels vary from only a few meters to more than 300 meters. Generally, a distance of 50-100 meters occurs. All site boundaries were not observed during site visits, however aerial imagery indicate boundaries with stocked areas are fenced.

Condition and Management Issues

<u>Indigenous faunal habitats</u>

River bird habitat

While significant river bird habitat exists within the both upper and lower sites the condition of this habitat is threatened by ongoing pressures. Predation, weed encroachment of open gravels, and disturbance from various sources (vehicles, people, dogs etc) require management. Modified flows and hydrology are also linked to reduced ecosystem function; and consequently, the ability of the site to maintain ecological integrity. Actions to address these pressures, or the issues they create, will be required if existing river bird habitat is to be maintained and protected. Climate change also presents challenges as it will exacerbate these pressures.

Climate change will alter underlying drivers of river morphology and ecosystems; adaptive management approaches will be required to address key issues as they develop. Expected climate change trends within Canterbury such as increased precipitation (alpine fed rivers),

reduced precipitation (foothill rivers), higher temps, more extreme weather events and the interactions of these changes with biotic components (indigenous & exotic) will have wide ranging consequences. Braided rivers are dynamic systems with high flows being part of what shapes their form and contributes to their natural character. Increased flows expected from climate change can reset and restore natural character – braided channels, alter habitat and remove (exotic) vegetation. Such flows however if more frequent and within constrained braid plains, may adversely affect river bird nesting success; heightening the importance of the more stable nesting environments of foothill rivers such as the Opihi. The ability of the Opihi to provide such surrogate habitat may be limited however if lower flows from climate change reduce dynamic braid processes (more stable channels) which will facilitate greater extent of vegetated riverbeds – which will have consequences for the ecology on the river – e.g. reducing braided river nesting bird habitat.

Maintaining or enhancing the natural character of braided rivers and the biodiversity of these ecosystems might be most effectively achieved by ensuring management allows for their natural processes to respond to climate change (alps rivers/braid plain extent), while also preparing to implement relevant management actions where processes have been put at risk by climate change (i.e. weed management within hill fed rivers).

Riverbed bird breeding habitat could be further protected through the implementation of predator control programmes and consideration of reduced vehicle access during the nesting season.

Lizard habitat

Habitat for the two native lizard species likely to occur within the river berms could be enhanced through provisions within operational river berm management practices. This could entail identifying suitable north-facing refuge strips within berm areas which would remain undisturbed by ongoing berm forest management. Predator control programmes for lizard conservation may also be feasible at discrete prioritised sites.

Bat habitat

The river berm forest vegetation of the Opihi river provides long-tailed bat habitat. Provisions within operational river berm management practices, such as the purposeful retention of dead or older trees with suitable resting and breeding cavities, could enhance the provision of habitat to bats. Consultation with Department of Conservation staff implementing DOC's bat (pekapeka) recovery plan for South Canterbury is recommended.

<u>Indigenous vegetation</u>

Indigenous vegetation or some individual plants located within the sites require protection from clearance and loss from invasive weed pressures if they are to be maintained. Provisions within plans or river engineering Codes of Practice to facilitate an awareness of this vegetation, its location and provisions to protect such areas. Localised (prioritised area) weed management actions, particularly of exotic vine species, would protect areas of existing/regenerating indigenous vegetation.

Any allocation of resources towards conservation management initiatives should consider any relevant regional or national conservation priorities.

Significance Assessment

Significance Assessment[3]: Lower Opihi River Site (Low Plains ED) From Pleasant Point Bridge to within 1km of river mouth. *Where relevant riverbed and river berms have been assessed separately to clarify which habitat the ecological value relates to, or where value between habitats differ. Where unspecified, both habitats are relevant to the assessment criterion. The proposed SNA area comprises of both habitats*				
Criteria Matter	**#**	**Regional Policy Statement Criteria**	**Rating - High, Mod, Low, Met**	**Notes**
Representativeness	1	**Representative, typical or characteristic**	**M/H**	**Riverbed:** Indigenous river bird habitat - moderate value. Guilds of birds typical of present-day braided river ecosystems of the Region including waders, waterfowl, divers, gulls & terns.
			M/H	**River berm:** Indigenous avifauna assemblage includes most of expected species and guilds known for riparian willow forest habitat (Low Plains ED).
	2	Relatively large example (size)	**M**	**Riverbed:** Indigenous river bird habitat - relative to other hill-fed braided river bird habitat within the Ecological Region; moderate. Lower site reach approximately 17.5km (1km from coast to Pleasant Point Bridge) Total Area 790ha inc. riverbed (363ha) & river berm(427ha).

[3] Significance criteria from CRPS with reference to guidelines (Wildlands, 2013). Bold type indicates 'Primary' criteria as identified by Timaru District Plan Part B.

			M	**River berm:** A large area of forest bird habitat and potential bat habitat (some confimed roosts) in the Low Plains ED.
Rarity/ Distinctiveness	3	Habitat or vegetation that has been reduced to less than 20% of ED	**-**	**Riverbed:** Limited data. Foothill fed braided river bird habitat of the Opihi reduced by approximately 30% of former extent (not 20% threshold) by river protection works. Braided river bird habitat of Canterbury has been reduced; a 20% threshold has yet to be determined by the author.
			-	**River berm:** n/a
	4	**Supports nationally threatened, at risk or uncommon species (or within ED)**	**H**	**Riverbed**: Ten or more threatened river bird species observed on the Opihi during bird surveys occurring between 1983 & 2019. Long-tailed bat habitat – feeding and roosting.
			H	**River berm:** Long-tailed bat habitat – feeding and roosting.
	5	**Distributional limit [TDC criteria iv]**	**Met**	**Riverbed & berm:** Long-tailed bat distribution (roosting site) south- eastern limit.
	6	**Distinctive, restricted occurrence, originally rare ecosystem, result of unusual environmental factor/s [TDC criteria iv]**	**M/H**	**Riverbed:** Braided riverbed ecosystem type (‘Originally rare’) with distinctive assemblage of river bird species.
			-	**River berm:** -
Diversity and pattern	7	**High diversity of habitat types or taxa, or reflects diverse features or ecological gradients or processes [TDC criteria iv]**	**L**	**Riverbed & berm (considered one area):** Riverine habitats including discrete springs and wetlands. Modified flows/hydrology and reduced habitat extent due to stop banks and vegetation (weed) establishment. River terraces typical of

				braided river habitat gradients are not fully present.
Ecological context	8	Important ecological linkages or network or buffering	**H**	**Riverbed:** Connectivity to and support of river mouth lagoon habitats and ecological processes.
			H	**River berm:** The site provides contiguous plant communities which provide a corridor of habitat facilitating dispersal of fauna otherwise isolated within Low Plains ED. Riparian vegetation provides direct buffering (point source) of instream values from contaminants or nutrients from surrounding land uses.
	9	Wetland with important role in natural functioning of river or coastal system	**n/a**	The site is not a wetland however discrete areas of riparian wetland occur within the river berms and the value of these have been considered under criterion 7.
	10	**Provides important habitat for species (including seasonally) [TDC criteria iv]**	**M**	**Riverbed:** Moderate value. Contributes to the resilience of a network of braided river bird habitat including small foothill and large alpine which support threatened and uncommon river bird species.
			M	**River berm:** Moderate value. Provides some habitat to long-tailed bat.

Significance Assessment[4]: Upper Opihi River Site (Geraldine ED). From Raincliff Bridge to Pleasant Point Bridge.				
Criteria	**#**		**Rank - High, Mod, Low, Met**	**Notes**
Representativeness	1	**Representative, typical or characteristic**	**M**	**Riverbed:** Indigenous river bird habitat - moderate value. Guilds of birds typical of present-day braided river ecosystems of the Region including waders, waterfowl, divers, swamp specialists, gulls & terns and riparian wetland species.
			M	**River berm:** Indigenous avifauna assemblage includes most of expected species and guilds known for riparian willow forest habitat (Geraldine ED).
	2	Relatively large example (size)	**M**	**Riverbed:** Indigenous river bird habitat - relative to other hill-fed braided river bird habitat within the Ecological Region; low/moderate. Upper site reach approximately 15km (Pleasant Point to Opuha confluence). Total area 648ha inc. riverbed (284ha) & river berm (364ha).
			M/H	**River berm:** A large area of bat habitat in the Ecological District.

[4] Significance criteria from Wildlands (2013). Bold type indicates 'Primary' criteria as identified by Timaru District Plan Part B.

Rarity/ Distinctiveness	3	Habitat or vegetation that has been reduced to less than 20% of ED	-	**Riverbed:** Limited data. Foothill fed braided river bird habitat of the Opihi has been reduced to approximately 30% of former extent (not 20% threshold) by river protection works. Braided river bird habitat of Canterbury has been reduced; a 20% threshold has yet to be determined by the author.
			-	**River berm:** n/a
	4	**Supports nationally threatened, at risk or uncommon species (or within ED)**	**H**	**Riverbed & berm:** Five or more threatened river bird species observed on the Opihi during bird surveys occurring between 1983 & 2019. Long-tailed bat habitat – feeding and roosting.
	5	**Distributional limit [TDC criteria iv]**	-	The author knows of no species distributional limits associated with the site.
	6	**Distinctive, restricted occurrence, originally rare ecosystem, result of unusual environmental factor/s [TDC criteria iv]**	**H**	Braided riverbed ecosystem type ('Originally rare') with distinctive assemblage of river bird species. Riparian limestone outcrops with associated indigenous vegetation[5].
Diversity and pattern	7	**High diversity of habitat types or taxa, or reflects diverse features or ecological gradients or processes [TDC criteria iv]**	**M**	**Riverbed & berm (considered one area):** Active riverbed, riparian margins support forested river berms with springs and wetlands; limestone outcrops.
Ecological context	8	Important ecological linkages or network or buffering	**H**	**Riverbed:** Connectivity to and support of lower river & lagoon habitats and ecological processes.

[5] A limestone outcrop within the Upper Opihi site adjacent to the Hanging Rock bridge was surveyed during site visits (see photographs Attachment 3) and other limestone outcrops were observed during the 2019 Opihi river bird survey. Many outcrops along the river were not closely surveyed for vegetation assemblages however the limestone outcrops of the Opihi River are known to contain clusters of narrow-range endemic calcicoles and it is quite possible that naturally uncommon or threatened species occur within these areas.

			H	**River berm:** Contiguous plant communities with the lower river berms; a corridor of habitat facilitating dispersal of fauna into Low Plains ED. Riparian vegetation provides direct buffering (point source) of instream values from contaminants or nutrients from surrounding land uses.
	9	Wetland with important role in natural functioning of river or coastal system	**n/a**	The site is not a wetland however discrete areas of riverine wetland occur within the river berms and the value of these have been considered under criterion 7.
	10	**Provides important habitat for species (including seasonally) [TDC criteria iv]**	**M**	**Riverbed:** Moderate value. Contributes to the network of river bird habitat providing resilience to the environment which supports several threatened river bird species.
			H	**River berm:** High value. Provides extensive habitat to long-tailed bat.

Assessment summary:

The Opihi River area met multiple criteria of the CRPS for ecological significance; rating high under Criteria 4, 6 (Rarity & Distinctiveness) 8 & 10 (Ecological Context) for both riverbed and river berm habitats.

The area represents an uncommon ecosystem type (braided rivers) and provides important habitat to threatened fauna including several braided river bird species and the native long-tailed bat.

The scheduling of this area as an SNA within the Timaru district plan has the potential to improve the protection of these significant ecological values and with additional management indigenous vegetation and habitats of indigenous fauna could be enhanced.

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Attachment 1: Extent of the Opihi River area shown with ecological district (ED) boundaries. The ED boundaries determine the upper (Geraldine ED) and lower (Low Plains ED) reaches assessed.

The total area is approximately 1,400ha and includes approximately 120ha of coastal wetlands associated with the Opihi River.

While the coastal wetlands were not assessed for significance within this report the public land of the coastal wetlands are contiguous with the Opihi River and therefore included within the proposed SNA area.

Upper Opihi River Site (Geraldine ED)

Upper site reach approximately 15km (Pleasant Point to Opuha confluence/Raincliff Bridge)
Upper extent reference point: NZTM 1439547, 5106782
Lower extent reference point: NZTM 1451758, 5098666
Total elevation: 60m to 140m a.s.l

Lower Opihi River Site (Low Plains ED)

Lower site reach approximately 17.5km (1km from coast to Pleasant Point Bridge)
Upper extent reference point: NZTM 1451758, 5098666
Lower extent reference point: NZTM 1467580, 5096212
Total elevation: <5m – 60m a.s.l

River mouth area within the proposed SNA

Public land (Unallocated and Department of Conservation tenure) directly associated with the Opihi Rivermouth and contiguous with Opihi riverbed and berms.

The ecological significance of this area was largely assessed by Grove (2008) and found to be High (see below).

Department of Conservation tenure at Opihi Rivermouth:

Environment Canterbury mapped[6] Opihi River mouth wetlands within the Opihi River Site.

Vegetation types include saltmarsh grassland, carex sedgeland, native reedland and turf herbfields, *Schedonurus phoenix* and exotic gorse shrubland, and willow and tamarisk treeland (Grove, 2008; Grove et al. 2012)

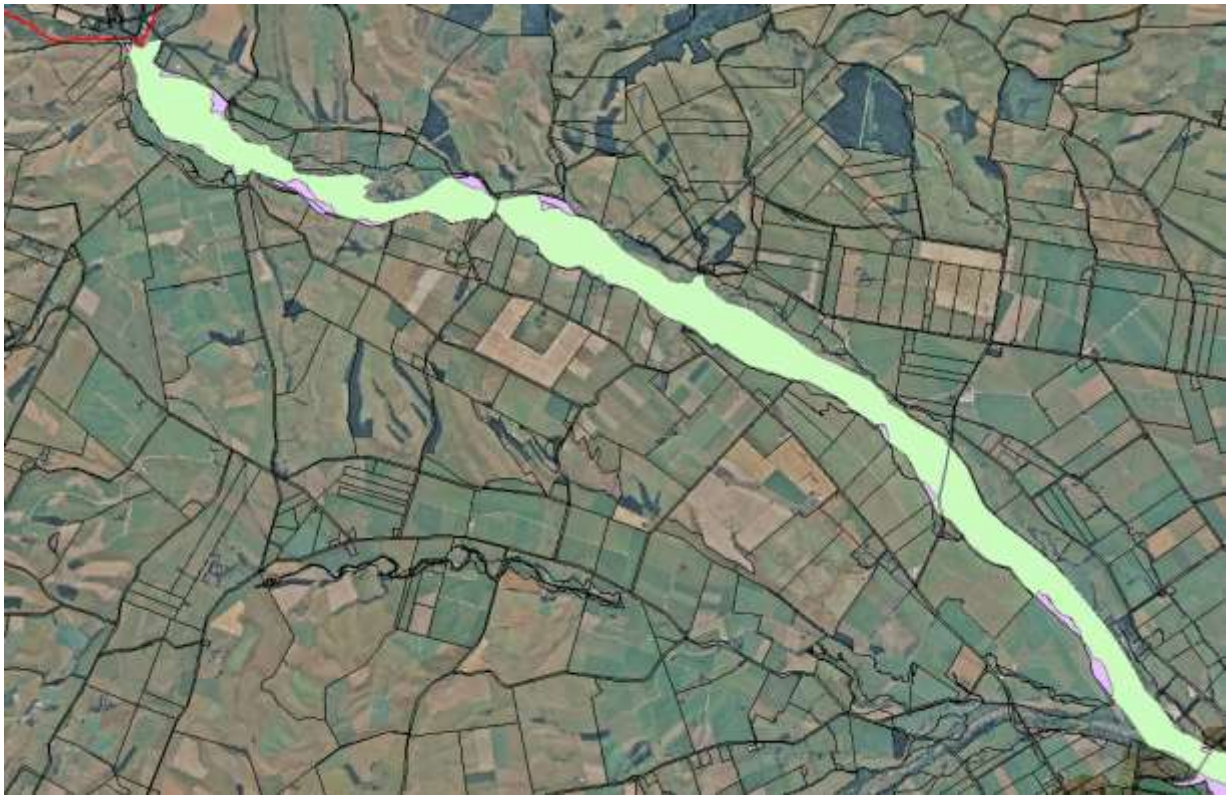
KEY: Mapped wetland hydrosystem type

[6] Mapped by Land Ecology, Science within Ecan Map layer Canterbury Coastal Wetland Vegetation/habitats.

Attachment 2: Determination of the extent of the proposed SNA area with contiguous private land.

Maps were collated in Ecan Maps and Arc Map. The extent of the Opihi River area was determined by desktop assessment of aerial imagery. Site boundaries were drawn to include the riverbed and river berms where vegetation was contiguous with the river berms. The Land Parcel feature in Base Layers was used to identify public land relevant to the Opihi River area. Unallocated land parcels (the majority of parcels), Ecan, LINZ and District Council were converted to graphics and merged. This graphic was then used ('clipped') to identify the public land for SNA consideration.

Key: Green fill: Combined unallocated, Ecan, LINZ and TDC tenure; Pink fill: Private land captured by initial desktop assessment of apparently contiguous riverbed and berm features. This is shown to explain the boundaries of the proposed SNA boundaries which may appear incongruous with the ecological boundaries of features.



Attachment 3: Photographs

Upper Opihi River Site

Above: Left: A section of stonefield which provides river bird habitat (note the pied stilt nest with eggs in foreground). Right: View above Hanging Rock bridge showing typical river berm vegetation structure of willow and poplar forest fringed by exotic grasses and shrubs. Approximate location of image: NZTM 1440436, 5105685.

Below: Grassland and herb field; a common occurrence within less recently disturbed riverbed areas (Image: Upper Opihi riverbed).


Above: Occasional cabbage trees occur within the exotic river berm forests. Below: Occasional male fern and common Ivy (both as groundcover and climber) alongside blackberry and ground ivy (*Lamiaceae*).
General location of images: NZTM 1445818, 5103602 (Upper Opihi river site, south bank).



Above: Willow & poplar river protection vegetation; occasional native trees and shrubs; and extensive exotic groundcovers and climbers (blackberry, ivy, old man's beard, pohuehue) along the Opihi river.

Below: Discrete native riverine wetland vegetation, ferns and shrubs within the river berm forests. Approximate location of images: NZTM 1467011, 5096741 (Lower Opihi river site, north bank near river mouth).

Above: Limestone outcrop on the Upper Opihi river site adjacent to Hanging Rock road bridge.

Below: Indigenous vegetation associated with the limestone outcrop above including *Kunzea ericoides, Olearia avicenniifolia, Helichrysum lanceolatum* and *Pittosporum tenuifolium. Corokia contoneaster, Rubus* sp. and *Coprosma linariifolia* were observed on the rock faces and overhang.

Above: Limestone outcrops within the riparian margin of the Upper Opihi river site, approximately 1.5KM upstream of the Hanging Rock road bridge.

Below: As above. Note pair of South Island pied oystercatchers atop the boulder.

Attachment 4: River bird survey data for the lower Opihi River (DOC)

Below – Lower Opihi DOC bird survey data.

			1983	1984	1985	1986	1987	1989	1994	2006	2008	2009	2010	2011	2012	2013	2015
Opihi	Lower Opi	Australian coot	0	0	0					0				1		0	
		Banded dotterel	14	29	14		41		6	11				0		16	
		Black shag	2	0	34		6		15	27				10		12	
		Black stilt	0	0	0					9				1		0	
		Black swan	0	0	0					0				0		0	
		Black-billed gull	432	908	2085		6300		1608	56				332		1621	
		Black-fronted dotterel	6	19	39		32		4	4				3		20	
		Black-fronted tern	133	133	79		127		50	51				165		82	
		Canada goose	0	0	0		0		1	8				6		6	
		Caspian tern	11	0	1		2		1	0				0		0	
		Common tern	0	0	0					0				0		0	
		Duck species	0	0	0					0				161		106	
		Eastern bar-tailed godwit	10	0	0					0				0		0	
		Grey duck	0	0	0					18				0		0	
		Grey teal	2	0	0					52				8		0	
		Kingfisher	1	0	14		7		11	6				13		7	
		Little shag	0	0	3		4		7	9				8		4	
		Mallard duck	37	0	111		107		59	153				56		16	
		New Zealand pipit	0	0	0					0				6		1	
		New Zealand scaup	0	0	0					2				0		0	
		New Zealand shoveler	5	0	2		10		1	8				0		0	
		Paradise shelduck	1	0	16		39		31	59				41		40	
		Pied shag	0	0	0					0				0		0	
		Pied stilt	78	73	164		165		37	117				135		113	
		Pukeko	0	0	7					2				2		7	
		Red-billed gull	0	0	0					0				2		0	
		South Island pied oysterc	23	1	70		68		49	9				28		49	
		Southern black-backed gu	17	0	72		312		915	133				115		12	
		Spur-winged plover	6	0	35		76		105	14				40		33	
		Swamp harrier	4	0	0					26				1		5	
		Welcome swallow	0	0	0		52		133	0				0		0	
		White-faced heron	7	0	27		20		17	23				7		25	
		White-fronted tern	5	0	50		3		0	0				16		0	
		Wrybill					2		0								

Below: Threatened species observed on Lower Opihi River during surveys from 1983 to 2015.

Hold	1983	1984	1985	1986	1987	1989	1994	2006	2008	2009	2010	2011	2012	2013	2015
Banded dotterel	14	29	14		41		6	11				0		16	
Black stilt	0	0	0					9				1		0	
Black-billed gull	432	908	2085		6300		1608	56				332		1621	
Black-fronted dotterel	6	19	39		32		4	4				3		20	
Black-fronted tern	133	133	79		127		50	51				165		82	
Caspian tern	11	0	1		2		1	0				0		0	
Common tern	0	0	0					0				0		0	
Eastern bar-tailed godwit	10	0	0					0				0		0	
New Zealand pipit	0	0	0					0				6		1	
Red-billed gull	0	0	0					0				2		0	
South Island pied oysterc	23	1	70		68		49	9				28		49	
White-fronted tern	5	0	50		3		0	0				16		0	
Wrybill					2		0								
Banded dotterel												0			
Black stilt												0			
Black-billed gull				1								0			
Black-fronted dotterel												0			
Black-fronted tern												0			
Caspian tern												0			
Common tern												0			
Eastern bar-tailed godwit												0			
New Zealand pipit												0			
Red-billed gull												0			
South Island pied oystercatcher				2								8			
White-fronted tern												0			

Attachment 5: Known long-tailed bat roosting trees of Opihi river and surrounds (Source: Department of Conservation, 2019).