Hawke's Bay Regional Investment Company Limited

Ruataniwha Water

Storage Scheme

Department of Conservation Managed Land - Description of Ecological Effects

KesselsEcology
SURVEY, ASSESSMENT AND RESTORATION

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Version: Final 190613

Document Ref: PWF No.: HBRIC.00023

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1 Introduction

This report is an Addendum to the "Terrestrial Ecology Study – Assessment of Ecological Effects May 2013" report (TER), which has been prepared for the Hawke's Bay Regional Investment Company Limited (HBRIC Ltd) by Kessels & Associates Limited (KAL) in relation to the proposed Ruataniwha Water Storage Scheme ("the Scheme").

The aim of this report is to provide a summary of the flora and fauna survey results as well as of the ecological assessments contained within the TER that are specific to land within the reservoir footprint administered by the Department of Conservation (DOC).

Reference should be made to the TER and the project description by Tonkin & Taylor "Ruataniwha Water Storage Scheme Project Description report for Hawke's Bay Regional Investment Company Limited. May 2013" for further details on the proposed Scheme. Part of the Scheme is formed by a dam and reservoir that are proposed to be located at the upper part of the Waipawa catchment on the Makaroro River, and in accordance with the TER will be referred to as "the dam" and "the reservoir" within this report.

As described in section 3.4 of the TER the reservoir footprint encompasses approximately 22.231ha of the Ruahine Forest Park, which is managed by the DOC (Figure 1). A small section of this land is a multi-part Stewardship Area (parcels C (1.140ha) & D (0.437ha)) that is contiguous with the Ruahine Forest Park (parcels A (7.896ha), E (1.978ha), B (10.780ha)).

Sections 4 to 9 of the TER outline the methodology and results of the different fauna and flora surveys undertaken as part of this project, and the reader should refer to specific sections of the TER for a full description of the methodology and results for each of the surveys.

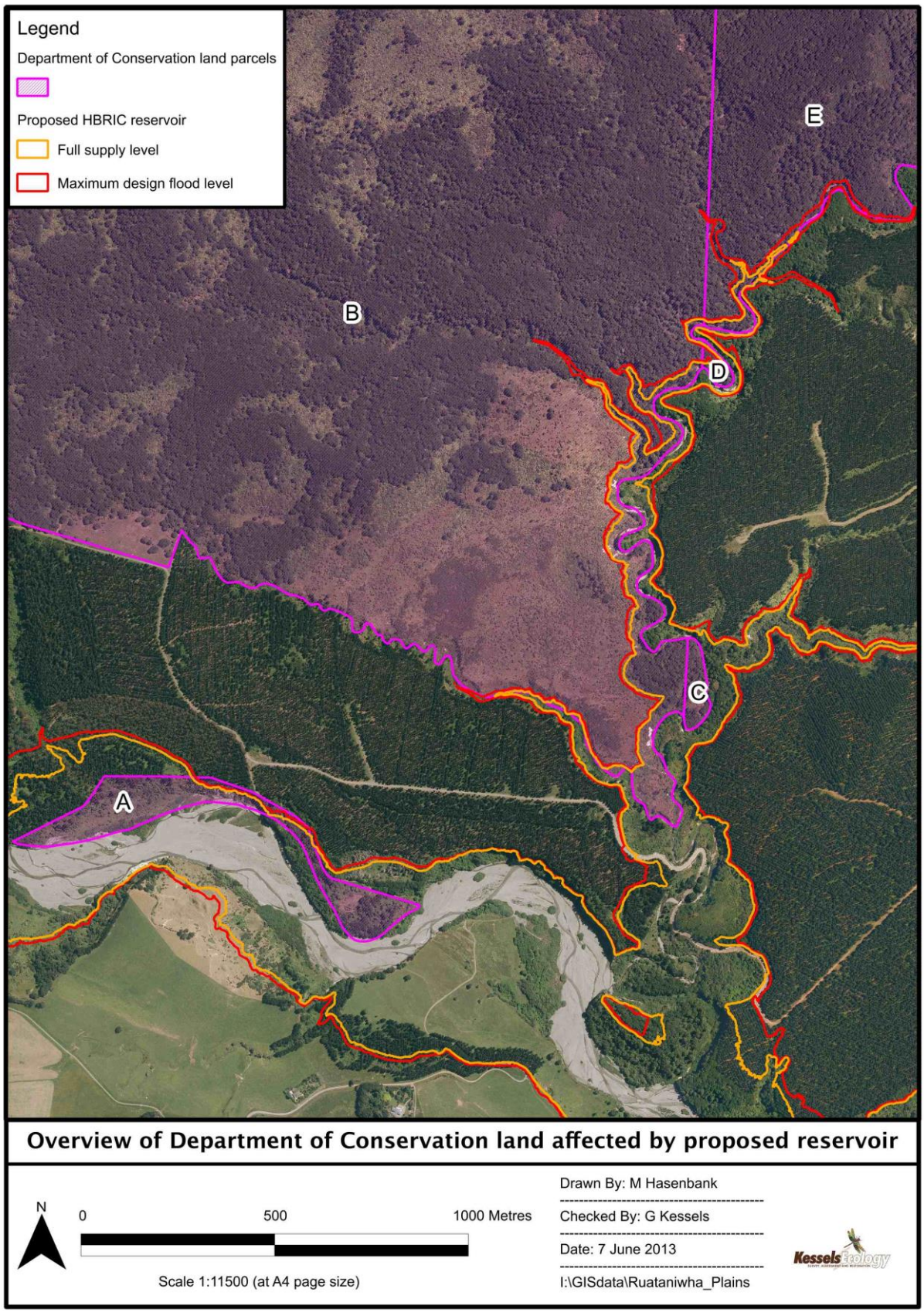

Figure 1 Overview of DOC land affected by proposed HBRIC reservoir. Numbers in opaque boxes indicate land parcel IDs used within this report.

2 Description of Ecological Effects

2.1 Terrestrial vegetation and habitat

A full description of vegetation and habitat types can be found in Section 5 of the TER. The main indigenous forest vegetation type found on the DOC managed land that would be affected by the proposed reservoir is black beech forest (Figures 2 to 6) encompassing 10.529ha (1.556ha of which are within Stewardship Area, Figures 4 & 5). A summary of vegetation and habitat types by land parcel is provided in Table 1 below. A further 1.938ha of broadleaf forest would also be lost due to flooding (Figure 2). Approximately 8.186ha of DOC managed land that would be affected by flooding is covered by indigenous shrub/treeland (Table 1), of which 5.570ha is covered by broadleaf-small-leaved-monocot scrub/treeland (see also Figures 2, 3 & 4). Exotic forest and grassland covers make up approximately 0.856ha, while braided river and wetland habitats cover approximately 0.424ha and 0.293ha of DOC managed land respectively (Table 1, see also Figures 2 & 3). In addition, during the botanical survey a single red mistletoe plant was discovered on land managed by DOC (in parcel C Figure 7).

Table 1 Summary of vegetation and habitat type areas (in hectares) on land managed by DOC that would be affected by the proposed reservoir

Parcel ID/Habitat Type	A	B	C	D	E	*Total*	*% of total area*
Indigenous forest	***3.584***	***5.354***	***1.119***	***0.437***	***1.978***	***12.472***	***56***
black beech forest	1.646	5.349	1.119	0.437	1.978	10.529	
broadleaf forest	1.938	0.005				1.943	
Indigenous shrub/treeland	***3.032***	***5.133***	***0.021***			***8.186***	***37***
podocarp/broadleaf treeland	0.338					0.338	
broadleaf treeland	1.544					1.544	
black beech treeland	0.581					0.581	
broadleaf-small-leaved-monocot scrub/treeland	0.416	5.133	0.021			5.570	
manuka and/or kanuka shrubland	0.153					0.153	
Wetland vegetation		***0.293***				***0.293***	***1***
Wetland		0.293				0.293	
Exotic vegetation	***0.856***					***0.856***	***4***
exotic forest (eucalypt)	0.565					0.565	
exotic forest (larch)	0.001					0.001	
exotic forest (willow)	0.002					0.002	
rank grass	0.288					0.288	
Braided riverbed	***0.424***					***0.424***	***2***
stable gravel bank	0.112					0.112	
gravel riverbed	0.312					0.312	
Total	***7.896***	***10.780***	***1.140***	***0.437***	***1.978***	***22.231***	***100***

2.2 Fauna surveys

A range of fauna specific surveys have been conducted as part of the TER (see Sections 6 to 9 therein). The survey methods for birds (Section 6 in TER) encompassed the use of bird count stations, bioacoustic recorders, as well as walk-through surveys. The population of long-tailed bats in the reservoir area and wider region was surveyed using bioacoustic recorders (Section 7 in TER), while artificial cover objects (ACOs), as well as tracking tunnels and hand searches were applied as methods for surveying for reptiles in the reservoir area (Section 8 in TER). Surveys conducted for terrestrial invertebrates included, weta boxes,

hand searches and Malaise traps (Section 9 in TER), whereby only weta boxes were deployed in the relevant DOC managed areas. Figures 2 to 6 indicate the locations of bird count and listening stations, bioacoustic recorders, ACOs, tracking tunnels, weta boxes, as well as lines taken during walk-through surveys in relation to the affected DOC managed land and the different habitat and vegetation types thereon.

While a more detailed outline of the results can be found in the relevant sections of the TER, significant fauna observations on the relevant land parcels included fernbirds (two observations of one bird each near wetland area in parcel B) and long-tailed bats (multiple passes recorded along border of black beech forest near Dutch Creek, as well as near wetland area in parcel B). The locations where these observations were made are indicated in Figure 7.

2.3 Threatened and At Risk species

A full description of species classified as Threatened or At Risk found within the reservoir and dam footprint as well as the relevant methodology is provided in section 4 of the TER. In total eleven nationally classified Threatened and At Risk flora and fauna species have been recorded to be present within the proposed reservoir footprint. Of these one Threatened (Table 2) species and two At Risk (Table 3) species were discovered on DOC managed land within the reservoir during the different fauna and flora surveys (see also Figure 7).

Table 2 Threatened species observed on DOC land within the reservoir footprint; Reference: KAL = Kessels & Associates' observation.

Group	Common name	Scientific name	Threat classification	Reference
Mammals	Long-tailed bat 'North Island'	*Chalinolobus tuberculatus*	Nationally Vulnerable	KAL

Table 3 At Risk species observed on DOC land within the reservoir footprint; Reference: KAL = Kessels & Associates' observation, BW = BioWeb 2011.

Group	Common name	Scientific name	Threat classification	Reference
Birds	North Island fernbird	*Bowdleria punctata vealeae*	Declining	BW, KAL
Plants	Red mistletoe	*Peraxilla tetrapetala*	Declining	KAL

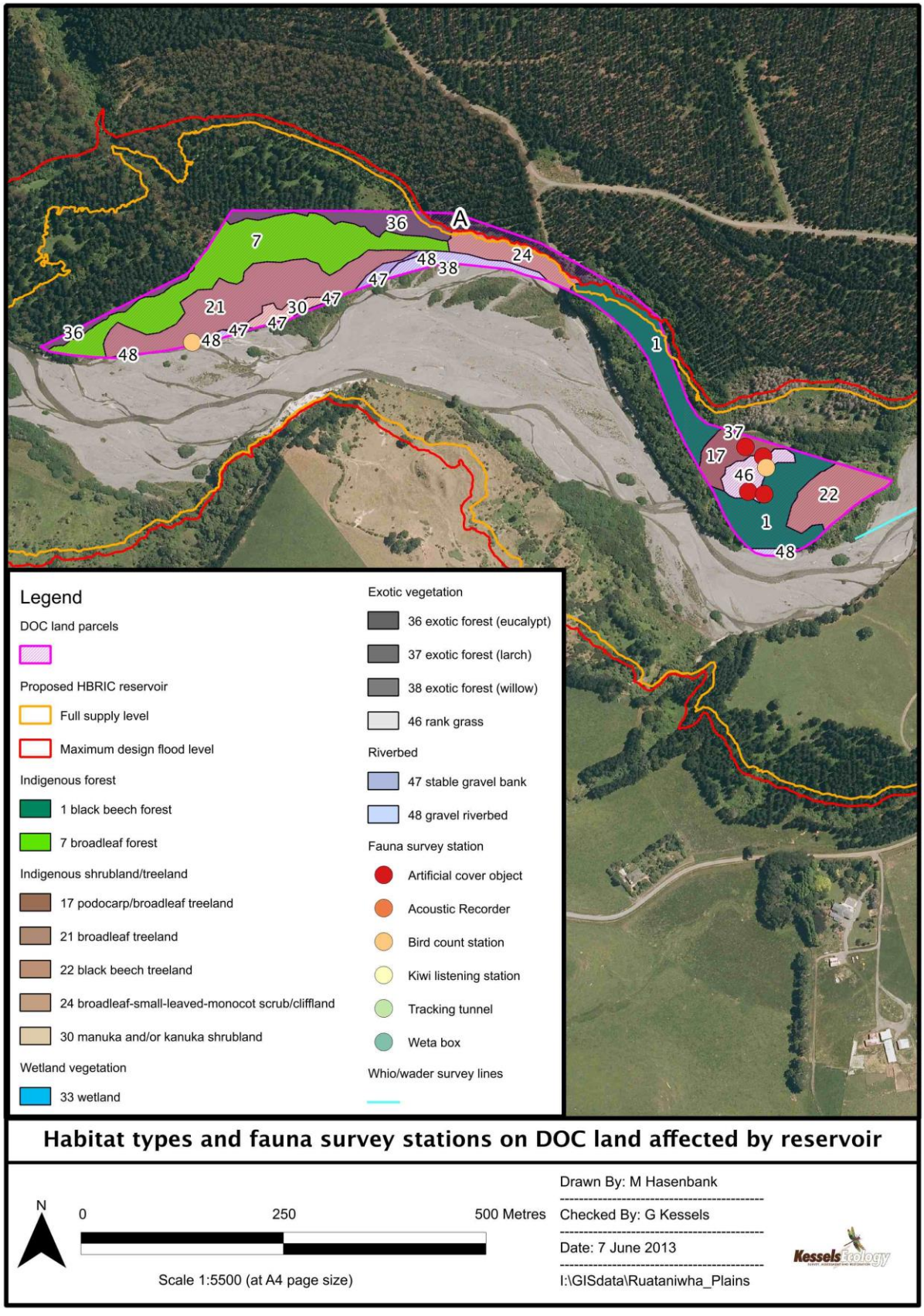

Figure 2 Overview of significant habitat, as well as fauna survey stations on DOC land affected by reservoir, in particular for parcel A.

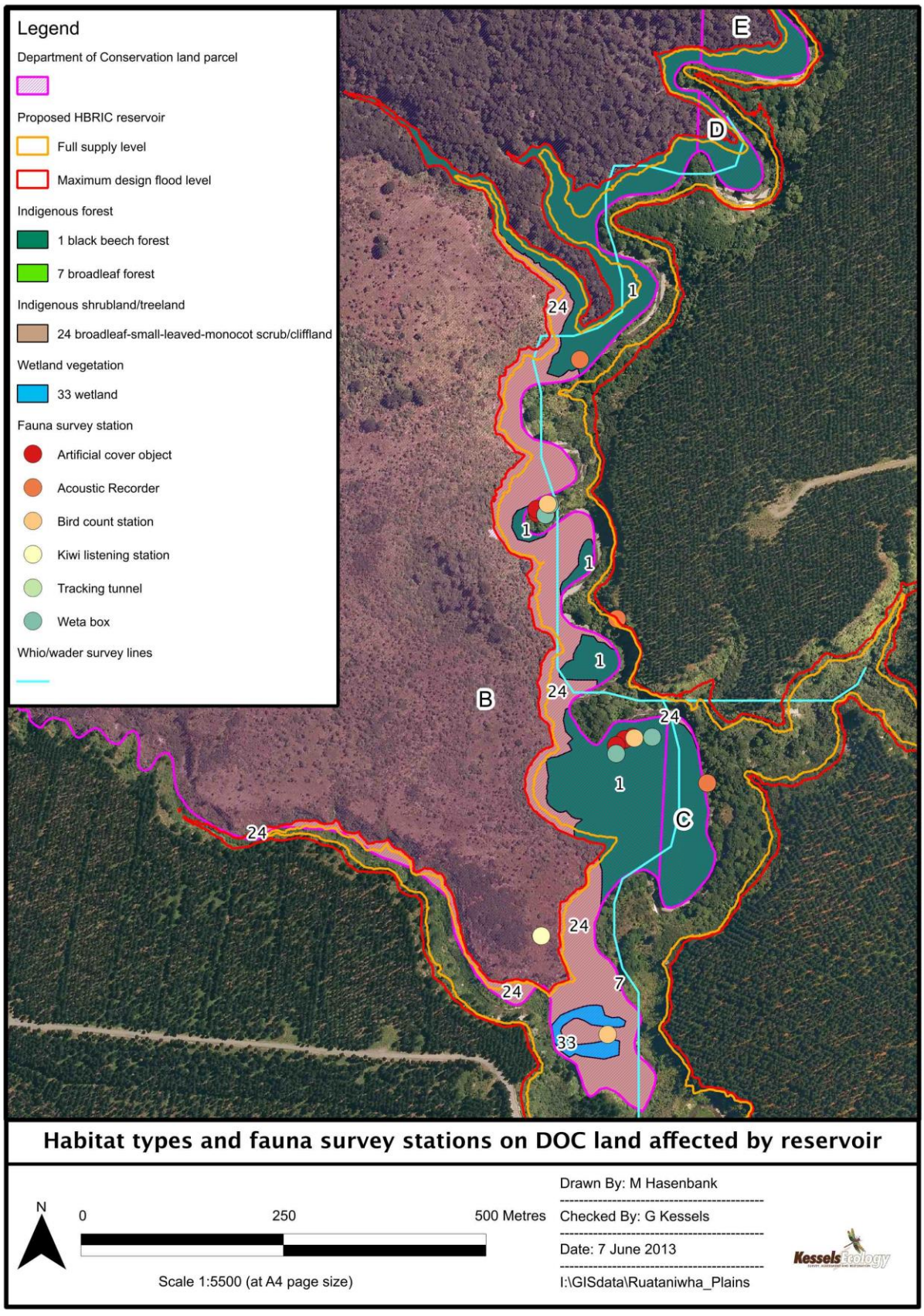

Figure 3 Overview of significant habitat, as well as fauna survey stations on DOC land affected by reservoir, in particular for parcel B.

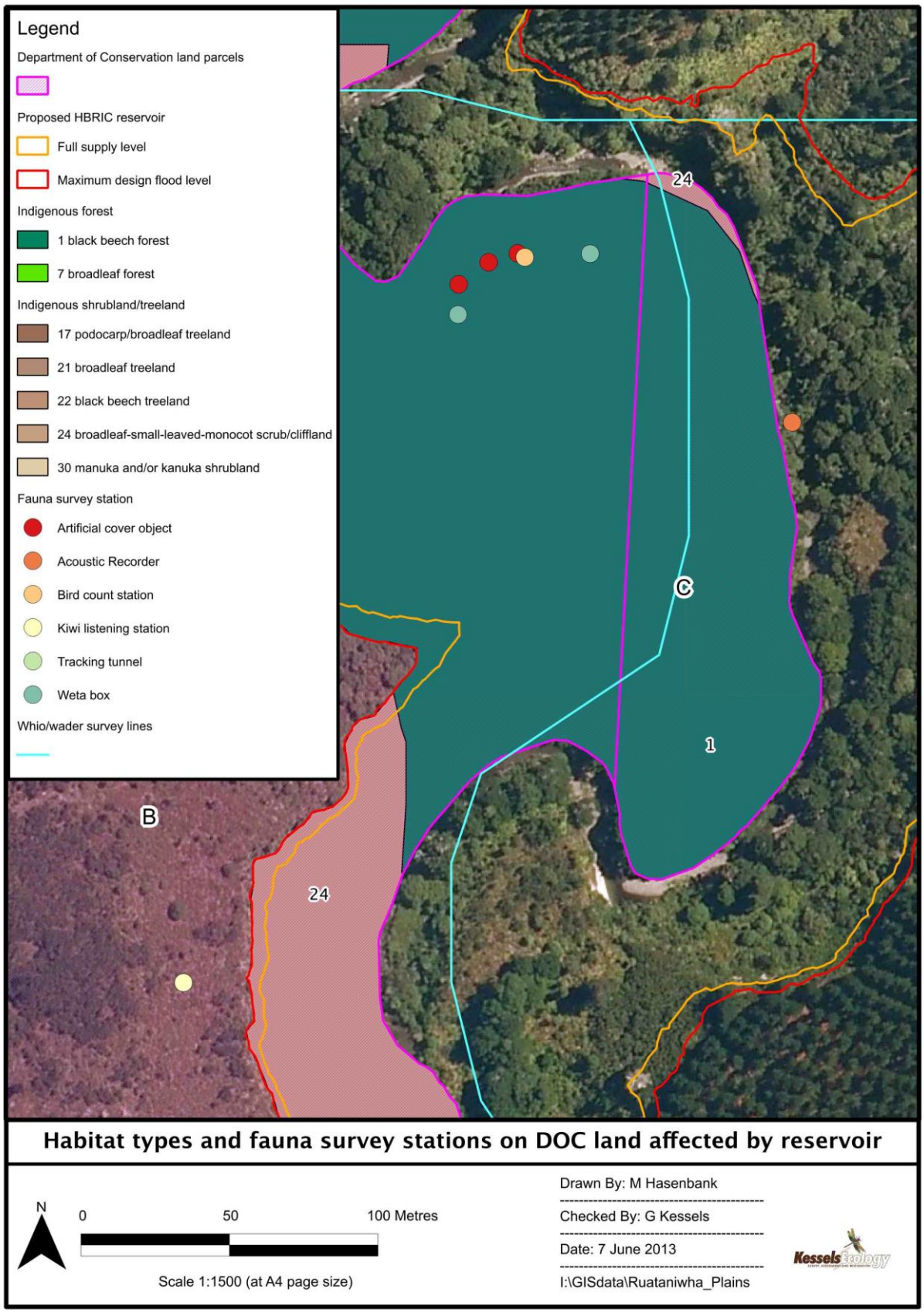

Figure 4 Overview of significant habitat, as well as fauna survey stations on DOC land affected by reservoir, in particular for parcel C.

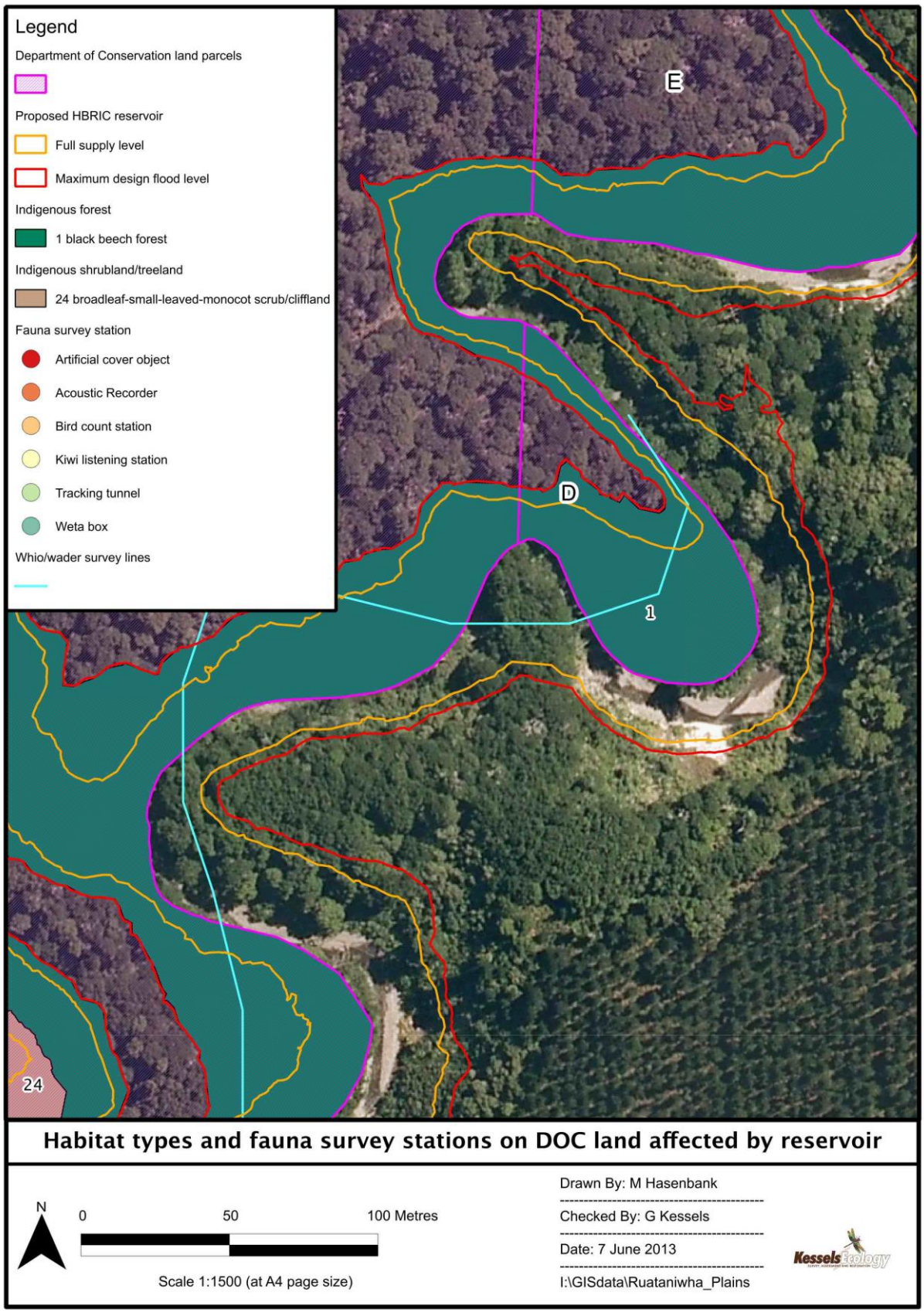

Figure 5 Overview of significant habitat, as well as fauna survey stations on DOC land affected by reservoir, in particular for parcel D.

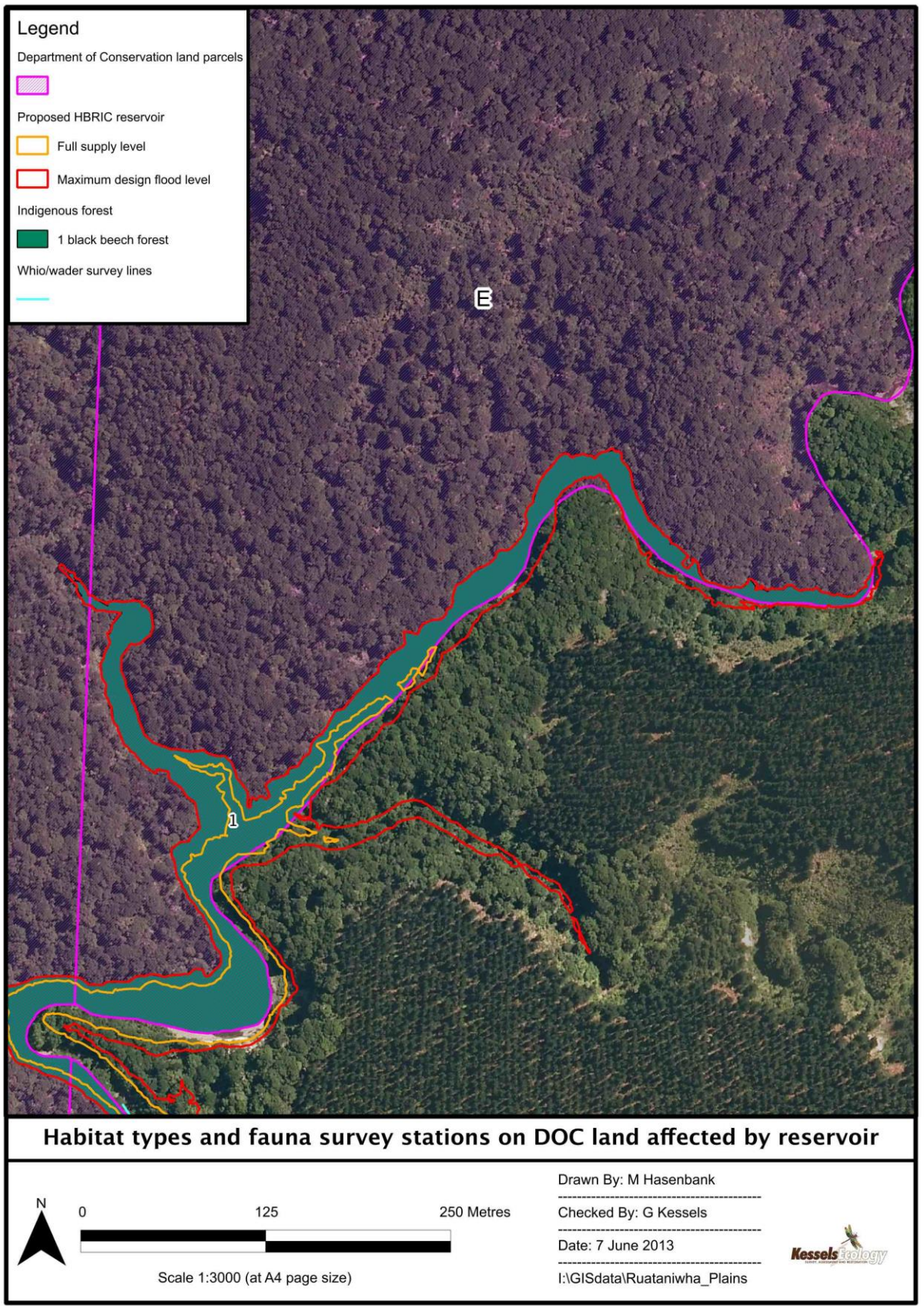

Figure 6 Overview of significant habitat, as well as fauna survey stations on DOC land affected by reservoir, in particular for parcel E.

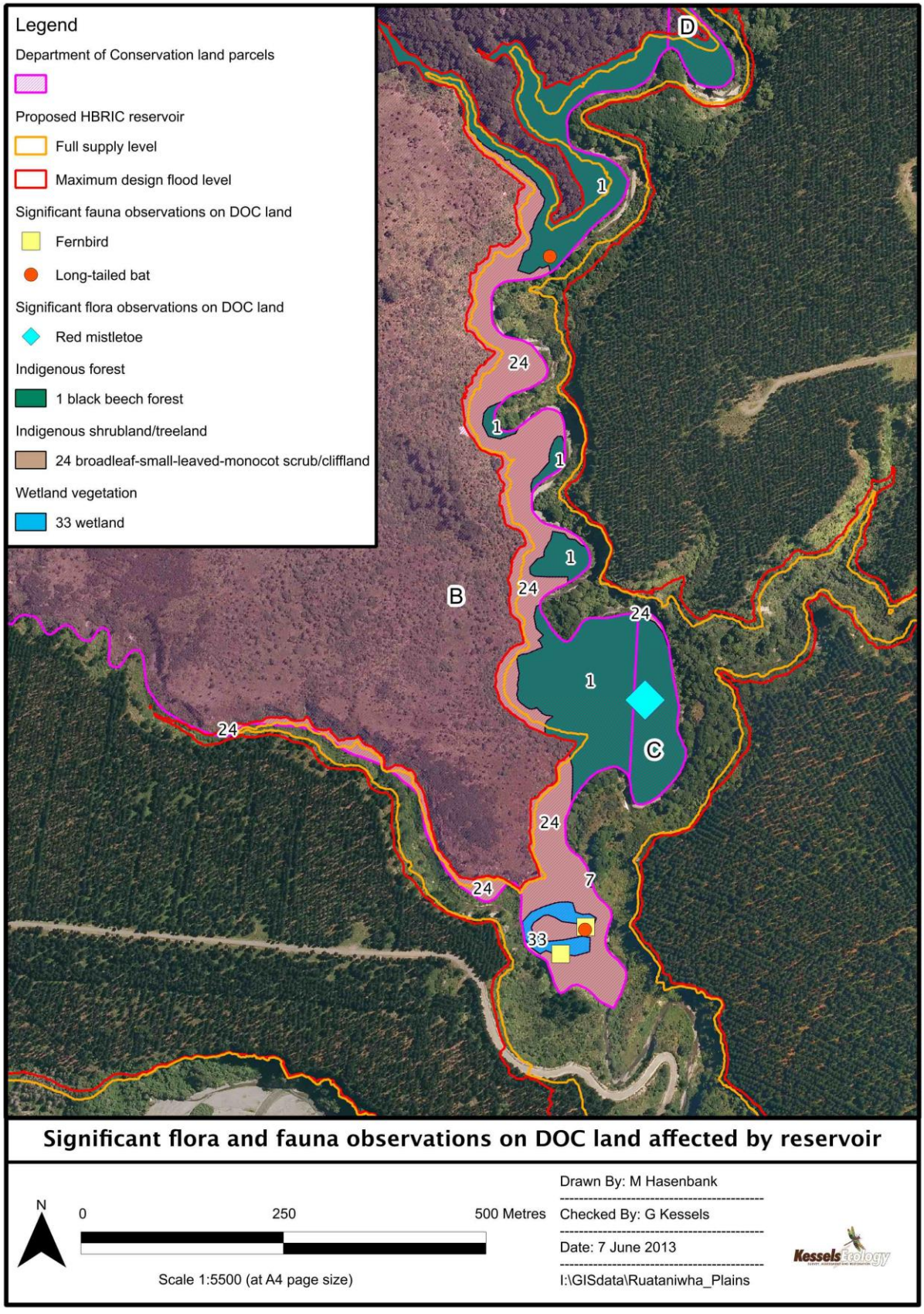

Figure 7 Overview of significant flora and fauna observations on DOC land affected by reservoir

2.4 Edge effects

Edge effects have been calculated in relation to partial loss of significant vegetation, and section 12 in the TER describes the rationale and methodology for how this was calculated. The total area of edge effects calculated in the TER is 15.6ha. Using a value of 20m (edge effect width value taken from TER) the area where edge effects would occur along land managed by the DOC was calculated to be 6.18ha (based on a calculated edge length of 3089.78m as shown in Figure 8).

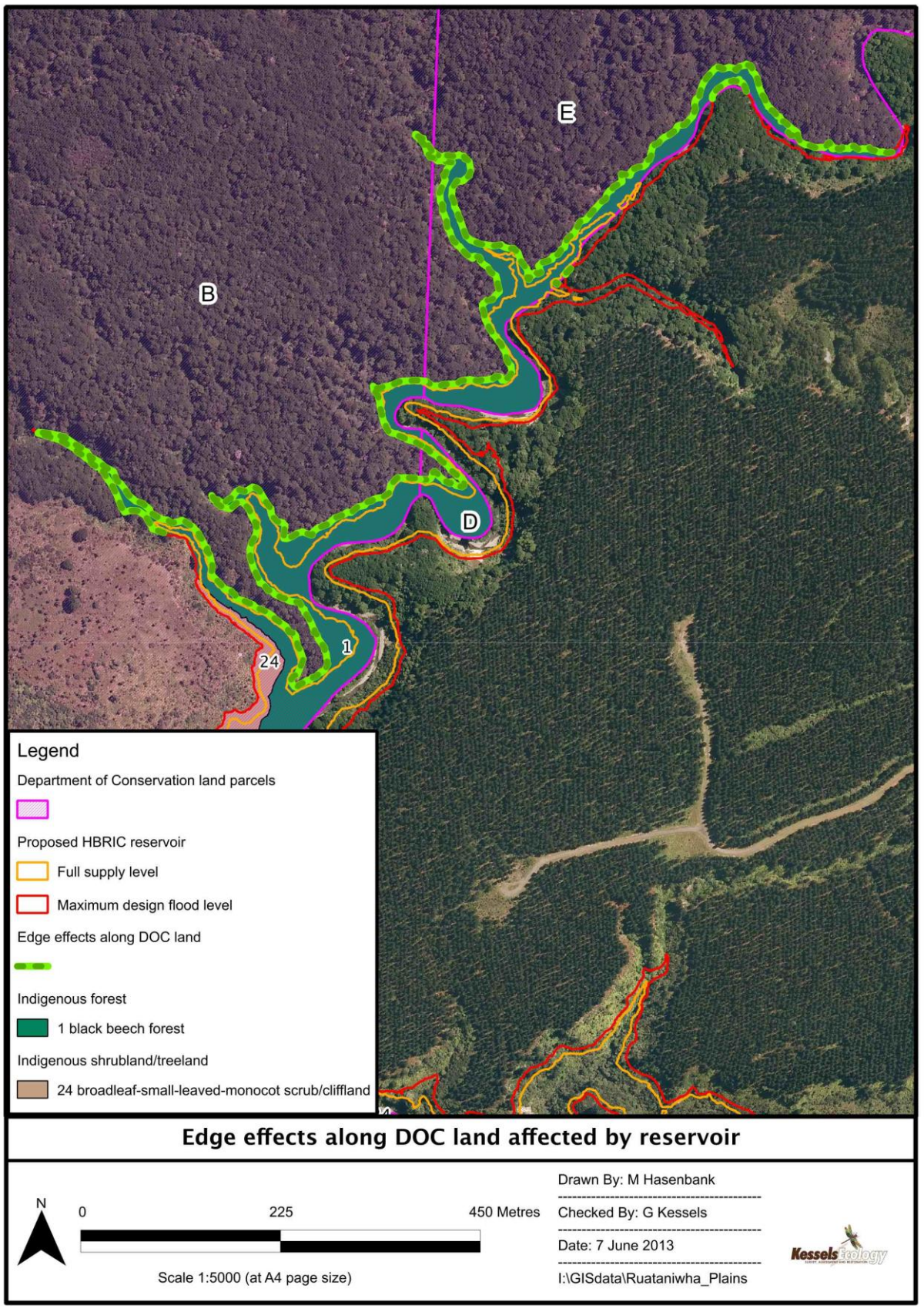

Figure 8 Overview of locations were significant edge effects would occur along DOC land affected by proposed reservoir.

3 Concluding remarks

The total area of land managed by the DOC that would be affected by the Scheme makes up about 5% of the total reservoir and dam footprint – some 22.2 ha. This land is covered to 56% by indigenous forest types and to 37% by indigenous shrub/treeland vegetation. The affected area also contains 3% of wetland and braided river habitat, while exotic vegetation covers around 4%.

The indigenous vegetation found on the DOC managed land provides habitat to a range of indigenous and introduced fauna species, among which fernbird (At Risk) and long-tailed bats (Threatened) were, from a conservation point of view, the more significant fauna observations that were made during the KAL surveys within this area. One At Risk plant, red mistletoe, was also discovered during these surveys on the DOC managed land. While fernbirds and long-tailed bats were also observed outside the DOC managed land, the observation of red mistletoe currently remains the only record for this species within the reservoir area. In relative terms, of all At Risk or Threatened species observed within the reservoir footprint, about 30% of species detected were observed on land currently managed by the Department of Conservation, and about 10% of these species were not observed anywhere else within the reservoir and dam footprint.

As a consequence of the flooding and associated loss of indigenous habitats it was calculated that approximately 40% of the total Scheme area expected to suffer from edge effects would fall along the boundary of the black beech forest found on the DOC managed land in the upper Dutch Creek area.

A detailed assessment of effects on terrestrial indigenous flora and fauna is provided in section 12 of the TER, while mitigation and offsetting recommendations are outlined in section 13. These mitigation and offsetting recommendations cover terrestrial habitat and biodiversity loss that would occur as a consequence of the Scheme, including any loss occuring on Department of Conservation managed land.