

**BEFORE THE ENVIRONMENT COURT
AT CHRISTCHURCH**

ENV-2010-CHC-115, 123, 124 AND 135

IN THE MATTER of Appeals pursuant to Section 120 of the
Resource Management Act 1991

BETWEEN **WEST COAST ENT INC**
Appellant

AND **ROYAL FOREST AND BIRD
PROTECTION SOCIETY OF
NEW ZEALAND INC**
Appellant

AND **WHITE WATER NEW
ZEALAND INC**
Appellant

AND **DIRECTOR GENERAL OF
CONSERVATION**
Appellant

AND **WEST COAST REGIONAL
COUNCIL AND BULLER
DISTRICT COUNCIL**
Respondents

....Continued over leaf

**STATEMENT OF EVIDENCE OF
TERENCE JOHN FARRELL
FOR DIRECTOR GENERAL OF CONSERVATION**
Dated: 9 May 2012

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AND **MERIDIAN ENERGY LIMITED**
Applicant

AND **FRIDA INTA**
Section 274 Party

AND **WHANAU PIHAWAI WEST –**
RICHARD WAYNE BARBER AND IRI
MAY BARBER MILNER
Section 274 Party

AND **J MacTAGGART**
Section 274 Party

AND **ORION ENERGY NZ LTD,**
ALPINE ENERGY LTD, MAIN
POWER NZ LTD AND
ELECTRICITY ASHBURTON
LTD
Section 274 Party

AND **NZ RAFTING INC**
Section 274 Party

AND **ANN SHERIDAN**
Section 274 Party

AND **BULLER ELECTRICITY**
Section 274 Party

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1. QUALIFICATIONS AND EXPERIENCE

- 1.1. My full name is Terence John Farrell
- 1.2. I have worked for the Department of Conservation (the Department), since 1987 in a number of roles involving the conservation of New Zealand's native flora and fauna. I am currently employed by the Department as the Technical Support advisor on animal pests for West Coast Conservancy. I have had this role since April 1987. Prior to working for the Department I had positions in the New Zealand Forest Service in both environmental and production forest management. My qualifications include a NZ certificate in Forestry.
- 1.3. I am familiar with the physical area in the Mokihinui catchment to which these proceedings relate and with the West Coast pest and predator programmes the Department is involved with.
- 1.4. I have read the Environment Court's Code of Conduct for Expert Witnesses, and I agree to comply with it. I confirm that the issues addressed in this brief of evidence are within my area of expertise.
- 1.5. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed. I have specified where my opinion is based on limited or partial information and identified any assumptions I have made in forming my opinions.

2. SCOPE OF EVIDENCE

- 2.1. My evidence will deal with the following:
 - Explanation of recent pest control programmes undertaken by the Department and other agencies within the Mokihinui catchment.

- Explanation of recent pest control programmes undertaken by the Department and other agencies in the wider Buller area and West Coast region.

3. MOKIHINUI CATCHMENT PEST CONTROL HISTORY

3.1. Animal pest control programmes for feral goats, possums and rats have been undertaken by the Department and Solid Energy New Zealand (SENZ) in the Mokihinui catchment over the past 17 years to provide ecosystem and species protection. The programmes are:

- Aerial and ground feral goat control by the Department was started in 1995. These operations initially focused on the Mokihinui Forks Ecological Area but were extended to cover the entire South Branch Mokihinui including additional areas outside the catchment to minimise goat dispersal back into the Mokihinui. These operations have been undertaken annually or biennially.
- Aerial and ground feral goat and deer control was started by SENZ in 2008 across the entire North Mokihinui catchment and has been maintained annually since then.
- Ground and aerial possum/rat control has been undertaken in two parts of the Mokihinui catchment by the Department since 1994. These operations were initiated to reduce possum and rat predation of two species of land snails endemic to the sites; *Powelliphanta ruforadiata* and *P. unicolorata*. At Maori Gully 1100 ha has received either ground or aerial possum control every two years since 1999. At South Mokihinui a 300ha area received ground or aerial possum control every two years since 1995. In 2010 the area treated was extended downstream to cover 1865ha.

4. BULLER PEST CONTROL PROGRAMME

4.1. In addition to the Mokihinui valley pest control programmes other pest control programmes are extensive and widespread throughout the wider Buller region. Regular programmes are undertaken by the Department of Conservation, the Animal Health Board (AHB) and SENZ. These programmes target feral goats, possums, ship rats and stoats and have been initiated to provide protection for native species, ecosystems or for animal health (reduction of bovine Tb) reasons. The programme location and scale (summarised) are:

- Feral goat control by the Department of Conservation at Karamea, Okari, Charleston, Whitecliffs, Paparoa and Fox River – there are 59,326 ha under sustained goat control.
- Possum and ship rat control by the Department of Conservation at Heaphy, St Andrews, Charming Creek and Paparoa – there are 45,845 ha under sustained pest control.
- Possum and ship rat control by the AHB at Karamea, Seddonville, North Buller, South Buller, Charleston, Buller Valley – there are 162,858 ha under sustained possum control.
- Possum, rat and stoat control by SENZ at Mt Rochfort, Mt Frederick and Mt Augusta – there are 585 ha under sustained pest control.
- Stoat control using kill traps for whio protection at Heaphy, Oparara and Ugly. There are 112 km of kill trap lines established.

5. WEST COAST PEST CONTROL PROGRAMMES

5.1. In addition to the Buller Area, pest control programmes are extensive and widespread throughout the West Coast outside of the Buller Area. Regular programmes are undertaken by the Department of

Conservation, the Animal Health Board (AHB) and mining companies. These programmes target feral goats, possums, ship rats and stoats and have been initiated to provide protection for native species, ecosystems or for animal health reasons. The programme locations and scale (summarised) are:

- Feral goat control by the Department of Conservation in the Greymouth, Hokitika, Franz Josef and South Westland Areas. There are 92,607 ha under sustained goat control.
- Possum and ship rat control by the Department of Conservation in the Greymouth, Hokitika, Franz Josef and South Westland Areas. There are 249,349 ha under sustained pest control.
- Possum control by the AHB throughout the West Coast excluding Buller. There are 418,201 ha under sustained possum control on public conservation managed land.
- Possum, rat and stoat control by SENZ at Mt Rochfort, Mt Frederick and Mt Augusta – there are 585 ha under sustained pest control.
- Stoat control using kill traps for kiwi, whio, kaka and mohua protection at Maruia, Styx, Arahura, Haast and Landsborough. There are 159 km of kill trap lines established protecting a nominal area of 21,000 ha.

6. PEST CONTROL METHODS

- 6.1. Best practice for pest control has been developed and refined over many years throughout New Zealand and is widely referred to as “the toolbox” of options. Each operation is assessed thoroughly before selecting the best method(s) to use. The decision framework includes

considering ecological outcome goal(s), threat pressures, level of threat management required to achieve the ecological goals and site characteristics such as the suite of target pests, pest densities, urgency for pest control, terrain, landforms, forest cover and spatial relationships with neighbouring areas.

6.2. The common best practices for pest control used throughout the West Coast are:

- Goat sustained control or eradication is applied using two methods; aerial hunting open areas using a helicopter and ground hunting with and without dog support in forested areas.
- Possum control at large scale or in remote areas is applied using aerial sown cereal baits laced with 1080 toxin at up to 2kg of bait per hectare of forest.
- Possum control on small areas or areas close to communities or water supplies or where access is easy is applied using hand laid toxic baits (various options) or trap devices.
- Rat control at large scale or in remote areas is applied using aerial sown cereal baits laced with 1080 toxin at 1 or 2kg of bait per hectare of forest.
- Stoat control is achieved through either i) kill trap lines with traps at 200m intervals along cut lines or ii) as a by-kill from rat and possum control when stoats eat 1080 poisoned rats or possums.

APPENDIX 1

Tables

Explanation of tables

1. Table 1 summarises Department of Conservation possum, rat and stoat control Operational Areas within the area that is the responsibility of the Buller Area office.
2. Table 2 provides equivalent information for the Greymouth, Hokitika, Franz Josef and South Westland Area offices
3. Table 3 provides a summary of goat control operational areas throughout the West Coast.
4. Table 4 provides a summary of Animal Health Board possum operations undertaken on public conservation lands throughout the West Coast listed by the Area Office responsible.
5. Tables 1 and 2 indicate when possum/rat or stoat control operations were started in each unit and lists the more recent operations. Trend monitoring and minor activities associated with the larger pest control activities are not listed.
6. The target pest and benefit species of possum/rat and stoat control operations are listed. Initially operations were focused on possum control for a limited range of benefit species. As knowledge of the effects of rats and stoats has increased and the effectiveness of aerial 1080 in controlling these has been recognised and improved, the focus of large scale operational areas has broadened to include a

wider range of pests for a wider range of benefit species; working toward ecosystem protection. This evolution is clear in the Tables as the primary (1⁰) and secondary (2⁰) targets and the changing shape and type of operations.

7. The frequency of animal pest control varies according to the pest being targeted, the level of suppression required to achieve protection for the benefit species, and the size and shape of the Operational Area that may influence the potential for reinvasion by the pest. Most large scale cyclic possum control operations are on a 3 to 7 year repeat cycle which is adequate to protect ecosystem values. More frequent control may be necessary to achieve a possum Trap Catch Index (TCI) of under 5% that is required for protection of pest sensitive species such as mistletoe (*Peraxilla spp.*) or *Powelliphanta spp.* Rat targeted control aerial 1080 operations are generally triggered by significant mast seeding events which occur on variable cycles. Where sustained or annual control of rats and stoats is required then trap and toxin networks are required and these are serviced on a 1-2 month basis. Goat control is generally undertaken annually.

Table 1: Department of Conservation possum, rat and stoat control operational Areas, within the area that is the responsibility of the DOC Buller Area Office.

Operational Area			Target benefit Species / systems	Target pest species	Recent pest control history
Name	Size	Map			
Maori Gully / North branch Mokihinui	1095ha	P5	1 ⁰ <i>P. I. ruforadiata</i> 2 ⁰ Mixed beech / podocarp Forest birds.	1 ⁰ <i>Possum</i> 2 ⁰ Rat / Stoat	<ul style="list-style-type: none"> • Possum control started 1999 • 2008; aerial 1080 (1100ha) pre-feed at 2 kg/@ 3 kg/ha, toxic bait at 3 kg/ha. Mid Maori Gully from Hemphill River upstream to between Mount Webb and Mount O'Connor. • 2010; aerial 1080 (1095ha), prefeed 6g cereal pellets sown @ 1kg/ha RS5 cereal pellets (0.15% w/w 1080) sown @ 1.5kg/ha • 2012; 1080 (1095ha), prefeed 6g cereal pellets sown @ 1kg/ha RS5 cereal pellets (0.15% w/w 1080) sown @ 1.5kg/ha
South branch Mokihinui	1865ha	P5	1 ⁰ <i>P. I. unicolorata</i> 2 ⁰ Mixed podocarp beech Forest birds. avifauna incl. kaka, robin, kereru + LTB	1 ⁰ <i>Possum</i> 2 ⁰ Rat / Stos at	<ul style="list-style-type: none"> • Possum control started 1997 • 2008; aerial 1080 (300ha) pre-feed @ 2 kg/ha c. one month prior to toxic @ 3 kg/ha. Between Silver and Mountain Cks. Sown at the same time as Maori Gully. • 2010; aerial 1080 (1865ha), prefeed 6g cereal pellets sown @ 1kg/ha (Dec 09) RS5 cereal pellets (0.15% w/w 1080) sown @ 1.5kg/ha (Feb 2010). • 2012; 1080 (1865ha), prefeed 6g cereal pellets sown @ 1kg/ha RS5 cereal pellets (0.15% w/w 1080) sown @ 1.5kg/ha

Mackay Downs	4817ha.	P1	<p>1⁰</p> <p><i>P. s. proseorum</i> <i>P. s. harveyi</i></p> <p>2⁰</p> <p>Upland pakahi. Threatened plant spp. GSK, fernbird and other bird sp.</p>	<p>1⁰</p> <p><i>Possum</i></p> <p>2⁰</p> <p>Rat / Stoat</p>	<ul style="list-style-type: none"> • Possum control started 1994 • 2005; set up / maintain ground control (665 ha) on core <i>P. s. harveyi</i> habitat • 2007; aerial 1080 1kg 6g RS5 prefeed and 2kg 12g RS5 toxic (4818ha). • 2012; aerial 1080 1kg 6g RS5 prefeed and 2kg 12g RS5 toxic (4818ha).
Ryan Creek (Map 1, part of Kahurangi OA)	4884ha	P1	<p>1⁰</p> <p><i>P. g. "Heaphy"</i> <i>P. "Gunner River"</i></p> <p>Southern Rata / hard beech.</p> <p>2⁰</p> <p>GSK, kaka and other forest birds.</p>	<p>1⁰</p> <p><i>Possum</i></p> <p>2⁰</p> <p>Rat / Stoat</p>	<ul style="list-style-type: none"> • Possum control started 1996 • 2004; aerial 1080 (c.6,830ha) @ 3kg/ha. • 2007, aerial 1080 (5,200 ha) pre-feed 12g pellets at 2 kg/ha and toxin @ 3kg/ha 12g cereal pellets (0.15% w/w 1080). • 2012; aerial 1080 1kg 6g RS5 prefeed and 2kg 12g RS5
Wekakura	8516ha	P1	<p>1⁰</p> <p><i>P. s. proseorum</i> <i>P. s. harveyi</i> <i>P. gilliesi</i></p> <p>Coastal Northern rata / Nikau.</p>	<p>1⁰</p> <p><i>Possum</i></p> <p>2⁰</p> <p>Rat / Stoat</p>	<ul style="list-style-type: none"> • Possum control started 2004 • 2004; aerial 1080 (c.10,284ha) @ 3- 4kg/ha. Wekakura from Heaphy Bluff to Kahurangi Point, inland to western edge of Mackay Downs & Lewis River inland to the edge of Mackey Downs. • 2007; aerial 1080 (8,873 ha) pre-feed 12g pellets at 2 kg/ha, toxin @ 3kg/ha 12g cereal pellets (0.15% w/w 1080). Wekakura coast from the Heaphy River north to Kahurangi Point inland to Mackay Downs. • 2012; aerial 1080 1kg 6g RS5 prefeed and 2kg 12g RS5

			<p>2⁰ Th plant sp eg lepidium GSK, LTB, and other forest birds.</p>		
Heaphy	7506ha	P1	<p>1⁰ <i>P. annectans</i> <i>P. gilliesi</i> "Heaphy" limestone canopy dominants - Northern rata / Kahikatea 2⁰ GSK, forest birds, Karst ecosystem (incl. invertebrates)</p>	<p>1⁰ <i>Possum</i> 2⁰ Rat / Stoat</p>	<ul style="list-style-type: none"> • Possum control started 1994 • 2003; aerial 1080 (6234 ha), @ 3kg/ha, pre-feed @ 2kg/ha. May - North of Gunner River @ 3kg/ha, no pre-feed. • 2006; ground control (300 ha), using cholecalciferol cereal pellets in bait bags. • 2007; ground control (302ha), cholecalciferol in bait stations (feracol defenders) and raised set victor no.1 leg-hold traps. Nov 2007; aerial 1080 (5896ha), trial to compare pre-feed sowing rates and cereal bait type effectiveness for rat control.. • 2008; ground control (570 ha) using cholecalciferol gel (8g/kg) and Feracol Defender (8g/kg) in bait stations. • 2011; aerial 1080 1kg 6g RS5 prefeed and 2kg 12g RS5
Oparara	3096ha	P2	<p>1⁰ <i>P. annectans</i> Northern / sth rata mixed podocarp Whio, STB 2⁰ GSK and other</p>	<p>1⁰ <i>Possum</i> <i>Rat / Stoat</i></p>	<ul style="list-style-type: none"> • Possum control started 2008 • 2008; aerial 1080 (3126ha), prefeed 12g cereal pellets sown @ 2kg/ha and 12g cereal pellets (0.15% w/w 1080) sown at 3kg/ha. • 2009; ground control (333ha), 'No possum' prefeed gel bait (18th May), 'No Possum' Gel bait (Cholecalciferol 8g/kg) in Kiwicare bait stations, (15th June).. • 2010; aerial 1080 rat control (10176ha), prefeed 6g cereal pellets sown @ 1kg/ha (Dec 09) 6g cereal pellets (0.15% w/w 1080) sown @ 2kg/ha (4/2/10).

			forest birds.		
Oparara / Ugly Map	4640ha	P3	1 ⁰ Whio 2 ⁰ Other stoat vulnerable species (kaka, robin).	1 ⁰ <i>Stoat</i>	<ul style="list-style-type: none"> • Stoat control programme started 2002. • Trapping network grown to include 112km of whio river bed habitat (Oparara 82 / Ugly 30) protected from stoats by network of stoat kill traps. The network comprises DOC150s in 1120 wooden tunnels at 100 metre intervals checked eight times during the breeding season
Karamea Bluffs	3936ha	P4	1 ⁰ <i>P. I. lignaria</i> P.I. lusca Coastal Nth Rata / podocarp 2 ⁰ Forest birds,	1 ⁰ <i>Possum</i> 2 ⁰ Rat / Stoat	<ul style="list-style-type: none"> • Possum control started 1995 • 2005; aerial 1080 (3,939 ha) @ 3 kg/ha. • 2008; aerial 1080 (3,855ha) prefeed 12g cereal pellets at 2kg/ha over the control area, toxin 12g cereal pellets (0.15% w/w 1080) at 3 kg/ha • Most of the area previously treated by this operation is now treated by the AHB.
St Andrews / Ngakawau/ Charming Creek	728ha	P6 P7	1 ⁰ <i>P. I. rotella</i> <i>P. I. johnstoni</i> 2 ⁰ Beech forest. avifauna incl. GSK kaka, etc	1 ⁰ <i>Possum</i> 2 ⁰ Rat / Stoat	<ul style="list-style-type: none"> • Possum control started 1992 • 2005; aerial 1080 (2,916ha) pre-feed @ 2kg/ha, toxin @ 3kg/ha. • 2006; ground control (405 ha) warrior kill traps set around the perimeter and raised set victor no. 1 leg-hold traps within the blk. • 2006; ground control (405ha) warrior kill traps around the perimeter of the block and cholecalciferol in bait stations (feracol defenders) within control area. • 2008; ground control (405ha), 'No Possum pre-feed gel', 'No possum' Gel bait (Cholecalciferol 8g/kg) in Kiwicare 'No possum' Bait stations. • 2010; aerial 1080 (1000ha) prefeed 6 grm at 1kg/ha toxin 2 kg of 6 grm RS5, 0.15% toxic loading on 26/2/10. @ 1 kg 65 days prior to toxic

Millerton	49ha	P8	1 ⁰ <i>P. I. "Millertoni"</i>	1 ⁰ Rat	<ul style="list-style-type: none"> Initiated 2008/09. 100 x 50m kill trapping grid network (49ha). Traps checked and re-baited monthly.
Paparoa	3751ha	P9	1 ⁰ <i>Westland petrel</i> <i>Coastal Nthn Rata / podocarp</i> <i>Limestone veg associations</i> <i>GSK</i> <i>Kaka</i> 2 ⁰	1 ⁰ <i>Possum</i> 2 ⁰ Rat / Stoat	<ul style="list-style-type: none"> Possum control started 1991 2001; aerial 1080 (1200ha) @ 3kg/ha over Dilemma Creek 2002; ground control (770ha) traps & feratox in baitbags. Paparoa coastal (north) between Bullock Creek and Fox River 2003; ground control (400ha) raised traps & feratox in baitbags. Paparoa coastal (south) between Pororari and Punakaiki rivers 2005; aerial 1080 (3,346 ha) @ 3kg/ha. Fox to Punakaiki Rivers, plus ground control (1,087 ha) exterminator 1080 paste in bait stations and hand laid 1080 pellets. 2011; aerial 1080 over 4000ha. Prefed strip swath and toxic 6g bait @ 0.5kg/ha sown in a cluster pattern 2011; ground control along Paparoa coastal forests.

Table 2: Department of Conservation possum, rat and stoat control operational Areas within the West Coast region that are the responsibility of the Greymouth, Hokitika, Franz Josef and South Westland Area Office.

Operational Area			Target benefit Species / systems	Target pest species	Recent Pest control history
Name	Size	Map			
Maruia	20,635ha		1 ⁰ <i>LTB P.gagei</i> Kaka Kakariki 2 ⁰ Mixed beech forest; mistletoe Forest birds.	1 ⁰ <i>Rat/stoat</i> 2 ⁰ Possum	<ul style="list-style-type: none"> • Possum control started 2002 • 2002; aerial 1080 @ 3kg/ha Lewis Pass National Reserve • 2009; aerial 1080 from Station Creek to Maruia. 2kg/ha RS5 prefeed followed by 2kg/ha RS5 toxic bait • Kill trap lines for stoat control established
Otira	8840ha		1 ⁰ <i>Metrosiderous umbellata</i> 2 ⁰ Mixed hardwood beech forest; forest birds, kiwi,	1 ⁰ <i>Possum</i> 2 ⁰ Rat / Stoat	<ul style="list-style-type: none"> • Possum control started 1971 • 2005; aerial 1080 @ 3.3 kg/ha over 7,333 ha Otira-Deception catchments • 2008; trickle fed aerial 1080 of forest margins (1519ha) • 2011; trickle fed aerial 1080 of forest margins (1519ha) • 2012; aerial 1080 over entire operational area planned for winter 2012

			whio, kaka		
Whataroa	6850ha.		1 ⁰ <i>Metrosiderous umbellata</i> 2 ⁰ Mixed hardwood beech forest; forest birds, whio, kaka.	1 ⁰ <i>Possum</i> 1 ⁰ <i>Possum</i> 2 ⁰ Rat / Stoat	<ul style="list-style-type: none"> • Possum control started 1996 • 2004: aerial 1080 @ 3kg/ha over 7,119 ha of the Whataroa and Perth • 2007: aerial 1080 @ 4kg/ha over 6,497 ha of the Whataroa and Perth • 2012; aerial 1080 over entire operational area planned winter 2012.
Copland	6950ha		1 ⁰ <i>Metrosiderous umbellata</i> 2 ⁰ Mixed hardwood beech forest; forest birds, whio, kaka hard beech. 2 ⁰ kaka and other forest birds.	1 ⁰ <i>Possum</i> 2 ⁰ Rat / Stoat	<ul style="list-style-type: none"> • Possum control started 1986 • 2003: aerial 1080 @ 3kg/ha over 6303ha of the Copland and Karangarua • 2007: aerial 1080 @ 3 & 4 kg/ha over the Copland catchment • 2012; aerial 1080 over entire operational area planned winter 2012.
Abbey Rocks/ Windbag	14,500h a		1 ⁰ Mixed beech forest ecosystem,	1 ⁰ <i>Rat/stoat</i> 2 ⁰	<ul style="list-style-type: none"> • Possum control started 1992 • 2004; aerial 1080 @ 3kg/ha from Panel Creek the eastern slopes of Mount Kinnard • 2007; aerial 1080 @ 2 kg/ha over the Abbey Rocks block

			kaka, <i>P. colensoi</i> 2 ⁰ forest birds.	Possum	<ul style="list-style-type: none"> • 2009; aerial 1080 over Abbey Rocks and Windbag blocks. 12 gram cereal pellets (0.15% w/w 1080) sown at 3kg/ha • 2011; aerial 1080 over Abbey Rocks and Windbag blocks. 500g/ha RS5 prefeed and 1-2kg/ha RS5 toxic.
Moeraki	5345ha		1 ⁰ Mixed beech forest ecosystem, kaka, <i>P. colensoi</i> 2 ⁰ forest birds, whio	1 ⁰ <i>Possum</i> 2 ⁰ Rat / Stoat	<ul style="list-style-type: none"> • Possum control started 1991 • 2004) Aerial 1080 @ 3kg/ha from Panel Creek to the head of Moeraki Valley (approx. 5,545 ha • 2010; aerial 1080 @ 1kg/ha prefeed RS5 6g bait and 2kg/ha RS5 12g bait from Panel Creek to the head of Moeraki Valley (approx. 5,545 ha
Whakapohai	16,269ha		1 ⁰ Mixed beech forest ecosystem, kaka, <i>P. colensoi</i> 2 ⁰ forest birds, whio	1 ⁰ <i>Possum</i> Rat / Stoat	<ul style="list-style-type: none"> • Possum control started 2001. • 2003; aerial 1080 @ 3kg/ha Whakapohai I • 2007; aerial 1080 @ 2 kg/ha between the Moeraki to Waita rivers • 2010; aerial 1080 @ 1kg per/ha 6 gram 0.15% toxic
Mataketake	7650ha		1 ⁰ Mixed beech forest ecosystem, kaka, <i>P. colensoi</i> 2 ⁰	1 ⁰ <i>Stoat</i>	<ul style="list-style-type: none"> • Possum control started 2007 • 2007; aerial 1080 @ 2kg/ha • 2010: aerial 1080 @ between 1 and 4 kg/ha between the Waita and Haast

			forest birds, whio (kaka, robin).		
Thomas	9490ha		1 ⁰ Mixed beech forest ecosystem, kaka, <i>P. colensoi</i> 2 ⁰ forest birds, whio (kaka, robin).	1 ⁰ <i>Possum</i> 2 ⁰ Rat / Stoat	<ul style="list-style-type: none"> • Possum control started 2007 • 2007; aerial 1080 @ 3 kg/ha over the Thomas Valley catchment • 2011; aerial 1080 @ 1kg/ha prefeed RS5 6g bait and 2kg/ha RS5 12g bait
Billy - Macfarlane	9746ha		1 ⁰ Mixed beech forest ecosystem, kaka, <i>P. colensoi</i> 2 ⁰ forest birds, whio (kaka, robin).	1 ⁰ <i>Possum</i> 2 ⁰ Rat / Stoat	<ul style="list-style-type: none"> • Possum control started 1997 • 2006) Aerial 1080 @ 3 kg/ha true right Haast Valley from the Macfarlane River to Porridge Flat including side catchments • 2011; aerial 1080 @ 1kg/ha prefeed RS5 6g bait and 2kg/ha RS5 12g bait
Clarke	9263ha		1 ⁰ Mixed beech forest ecosystem, kaka, <i>P. colensoi</i> 2 ⁰ forest birds, whio (kaka, mohua).	1 ⁰ <i>Rat/stoat</i> 2 ⁰ Possum	<ul style="list-style-type: none"> • Possum control started 1995 • 2000; aerial 1080 @ 2kg/ha over 5,956 ha of the both sides of the Clarke • 2004; aerial 1080 @ 2kg/ha over the Clarke Valley from the Macfarlane • 2011; aerial 1080 @ 1kg/ha prefeed RS5 6g bait and 2kg/ha RS5 12g bait

Landsborough	16200h a	1 ⁰ Mixed beech forest ecosystem, mohua, kaka, <i>P. colensoi</i> 2 ⁰ forest birds, whio	1 ⁰ <i>Rat/stoat</i> 2 ⁰ Possum	<ul style="list-style-type: none"> • Possum control started 1994 • 2004; aerial 1080 @ 2kg/ha, true left Landsborough • 2009; aerial 1080 @ 2kg/ha prefeed and 2kg/ha toxic • Kill trap line for stoat control - continuous
Haast Valley	10636h a	1 ⁰ Mixed beech forest ecosystem, kaka, <i>P. colensoi</i> 2 ⁰ forest birds	1 ⁰ <i>Possum</i> 2 ⁰ Rat / Stoat	<ul style="list-style-type: none"> • Possum control started 1994 • 2006) Aerial 1080 over 10,437 ha of the true left Haast Valley • 2006; ground control over 1,351 ha of unsown bush buffers • 2009; aerial 1080 @ 2kg prefeed/ha and 2kg/ha toxic
Okuru - Turnbull	12900h a	1 ⁰ Mixed beech forest ecosystem, kaka, <i>P. colensoi</i> 2 ⁰ forest birds	1 ⁰ <i>Possum</i> 2 ⁰ Rat / Stoat	<ul style="list-style-type: none"> • Possum control started 1993 • 2005; aerial 1080 @ 3kg/ha from the Boil Hole to the Ngatau River • 2005) Aerial 1080 @ 3 kg/ha over 6,360 ha of the “Turnbull” • 2009; aerial 1080 @ 1kg/ha prefeed and 4kg/ha toxic •
Hindley	10589h a	1 ⁰ Mixed beech forest ecosystem, tokoeka, kaka	1 ⁰ <i>Stoat/ rat</i> 2 ⁰ Possum	<ul style="list-style-type: none"> • Possum control started 1995 • 2001; aerial 1080 @ 3kg/ha over 3789ha of the Hindley faces • 2001; ground control over 1311ha of the flats from Haast-Jackson Bay Road road to the coast • Kill trap lines for stoat control continuous

			2 ⁰ forest birds		
Arawhata	30960		1 ⁰ Mixed beech forest ecosystem, kaka 2 ⁰ forest birds, tokoeka	1 ⁰ <i>Possum</i> 2 ⁰ Rat / Stoat	<ul style="list-style-type: none"> • Possum control started 1997 • 2003; aerial 1080 @ 3kg/ha entire operational area • 2007; Aerial 1080 over 30,994 ha of the Arawhata and Waipara valleys
Cascade	5668ha		1 ⁰ Mixed beech forest ecosystem, kaka, <i>P. colensoi</i> 2 ⁰ forest birds	1 ⁰ <i>Possum</i> 2 ⁰ Rat / Stoat	<ul style="list-style-type: none"> • Possum control started 1998 • 2005; aerial 1080 @ 2 kg/ha • 2010; aerial 1080 @ 1kg/ha prefeed and 2kg/ha toxic
Hope	7045ha		1 ⁰ Mixed beech forest ecosystem, kaka, <i>P. colensoi</i> 2 ⁰ forest birds	1 ⁰ <i>Possum</i> 2 ⁰ Rat / Stoat	<ul style="list-style-type: none"> • Possum control started 2005 • 2005; kill trap line established around entire valley • 2005; aerial 1080 @ 2 kg/ha over the entire Hope catchment • 2010; aerial 1080 @ 500g/ha prefeed and 1kg/ha toxic over entire Hope catchment
Gorge	5000ha		1 ⁰ Mixed beech	1 ⁰ <i>Possum</i>	<ul style="list-style-type: none"> • Possum control started 2005 • 2005; aerial 1080 @ 2 kg/ha over part of Gorge and Spoon

			forest ecosystem, kaka, <i>P. colensoi</i> 2 ⁰ forest birds	2 ⁰ Rat / Stoat	• 2010; aerial 1080 @ 500g/ha prefeed and 1kg/ha toxic over part Gorge and Spoon
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Table 3: Department of Conservation goat control Operational Areas. All operational areas are listed by Area Office responsible.

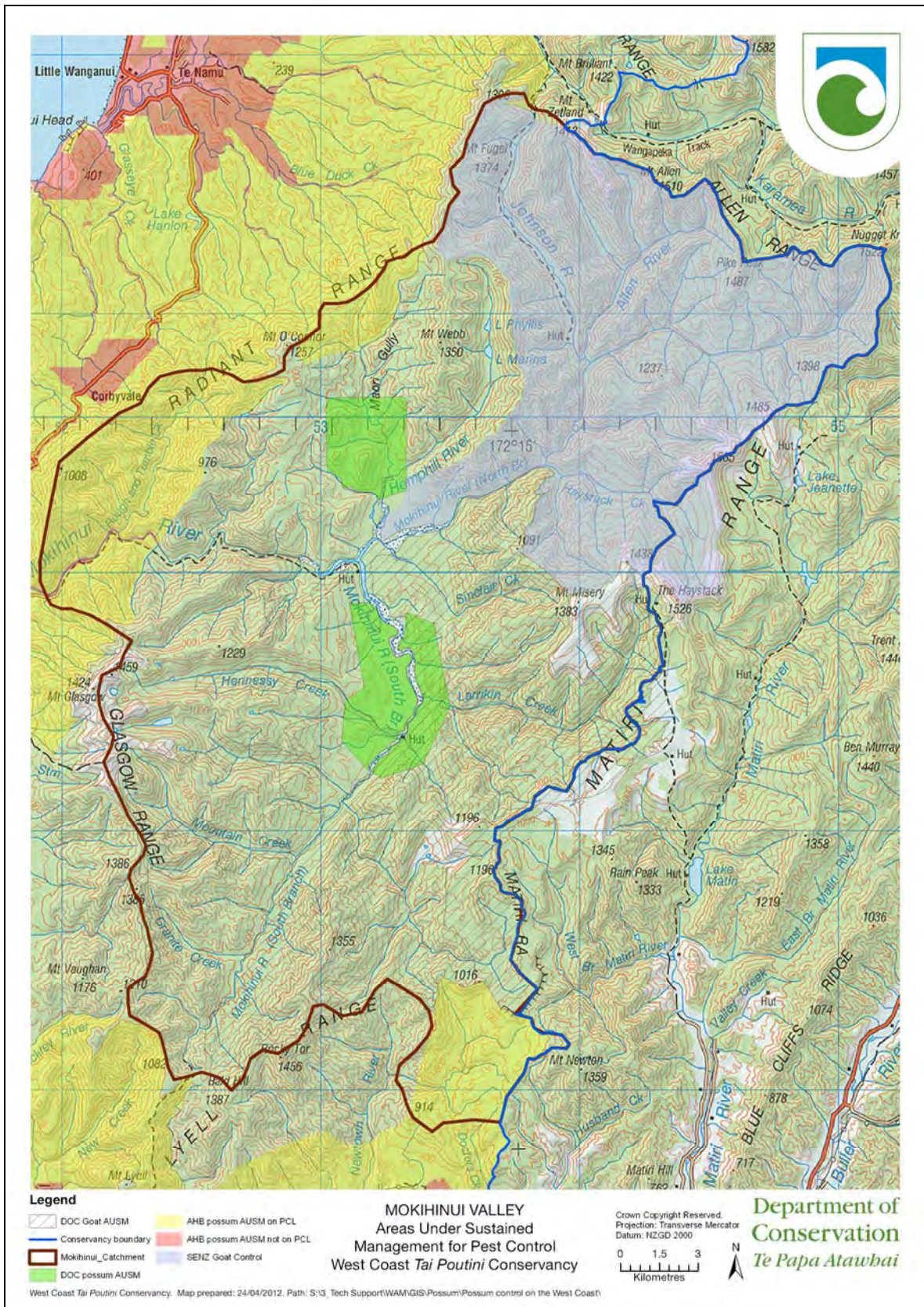
Operational area				Management objective	
Area Office	Operation name	Size (ha)	Map #	Sustained control	Eradication
Buller Area	Mokihinui South	35,802	G2	√	
	Mokihinui North SENZ	18,609	G2	√	
	Karamea	13,287	G1		√
	Whitecliffs	1,741	G3	√	
	Fox / Paparoa	25,862	G4	√	
	Okari / Charleston	391	G5		√
Greymouth Area	Lewis / West Maruia	39,161	G6	√	
	Mt Elliot	5,944	G7	√	
	Rotomanu	6,278	G8	√	
	Adamstown	379	G9		√
	Ahaura Gorge	2,595	G10	√	
Hokitika Area	Vine Creek and Kaniere Forest	19,312			√
Franz Josef Area	Te Taho and Waitangitoana	14,957		√	
South Westland Area	Turnbull and Cascade	3,947			√

Table 4: Animal Health Board possum control operations on public conservation land listed by DOC Area responsible

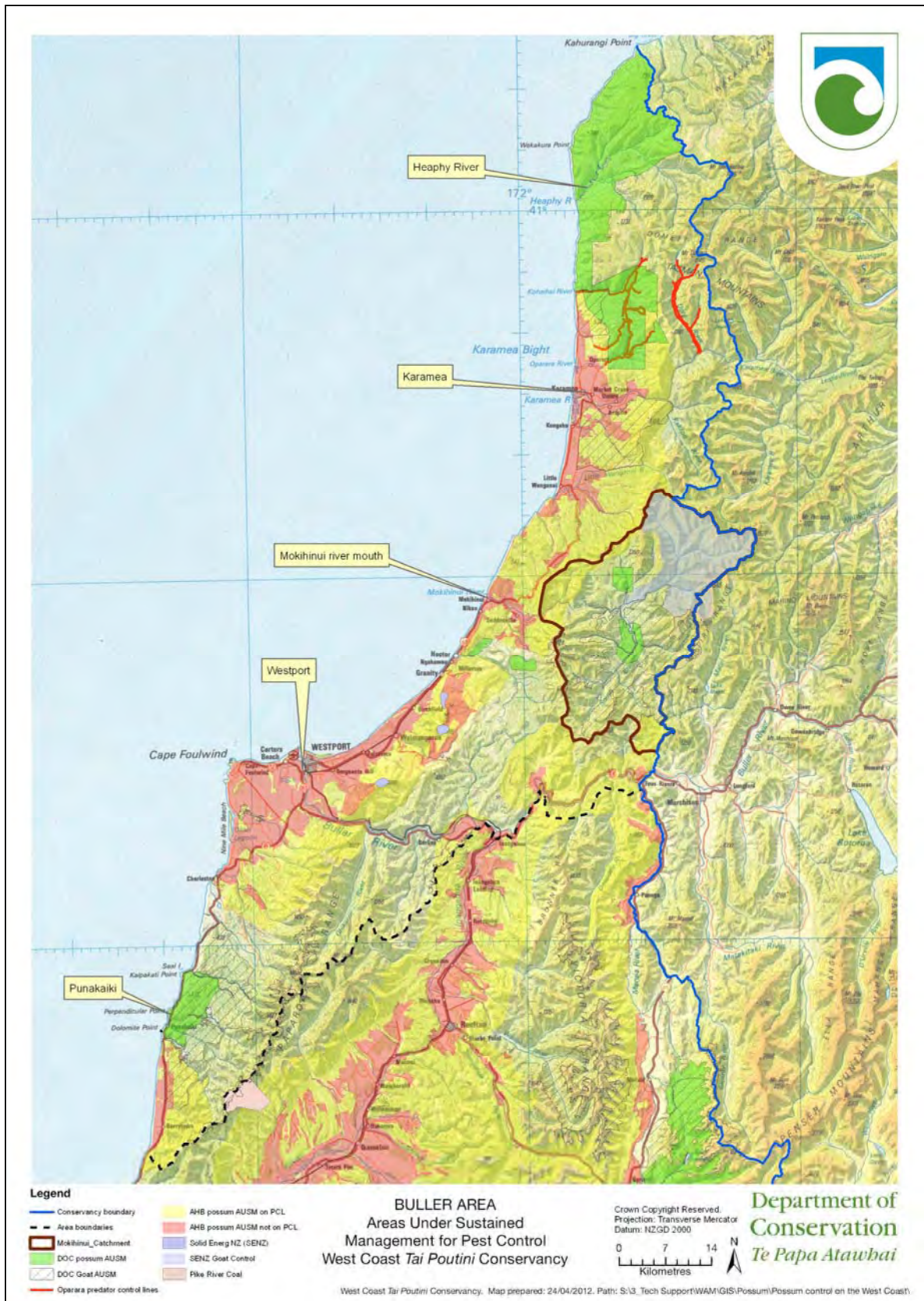
Operational area			Management objective		
Area Office	Treatment area (ha)	Map #	To achieve and maintain Tb infected herds at less than 0.2%		
Buller	104,855				
Greymouth	247,802				
Hokitika	96,604				
Franz Josef	78,787				
South Westland	16,397				
Total	544,445				

APPENDIX 2

Maps



Map 1: Mokihinui Valley operational area



Map 2: Buller Area operational area



- Legend**
- Conservancy boundary
 - AHB possum AUSM on PCL
 - AHB possum AUSM not on PCL
 - Area boundaries
 - SENZ Goat Control
 - Māhīhīni Catchment
 - DOC possum AUSM
 - DOC Goat AUSM

WEST COAST CONSERVANCY
Areas Under Sustained
Management for Pest Control
West Coast *Tai Poutini* Conservancy

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 Projection: Transverse Mercator
 Datum: NZGD 2000

0 20 40 N
 Kilometres

Department of Conservation
Te Papa Atawhai

West Coast *Tai Poutini* Conservancy. Map prepared: 24/04/2012. Path: S:\3_Tech Support\WAM\GIS\Possum\Possum control on the West Coast\

Map 3: West Coast Conservancy operational area