



Takaka FLAG – Key Sites

(choke points, canaries in the mine, points of obligation, trigger sites)

23 January 2015

Where are we at?

Values

Management
Objectives

Important
characteristics

Attributes

Key Sites

Waterwheel

SOE
Monitoring

Limit
Setting

Attribute	Ecosystem Health (compulsory)
Key: YES-NOF = given in NOF, YES-KS1 = considered 'keystone' by staff, YES = identified in table as important to value	
Phosphorus	YES-NOF-LAKES
Phytoplankton	YES-NOF-LAKES
Nitrates / Nitrogen (TWS maintain levels)	YES-NOF
Periphyton (% Bed Cover - visual assessment/NOF chlorophyll-a)	YES-NOF
Dissolved Oxygen	YES-NOF
Ammonia	YES-NOF
Flow allocation regime	YES-KS1
Flow regime (with specific minimum flow)	YES-KS1
Stream Habitat Score (eg Multi-Value Assessment)	YES-KS1
Macro-invertebrate indices (eg MCI)	YES-KS1
water temperature	YES-KS1
Low flow (may be estimated) (% of MALF allocated)	YES
Low flow (may be estimated) (% of MALF allocated)	YES
Low flow (may be estimated) (% of MALF allocated)	YES
Turbidity	YES
Visual contaminant assessment - Films, scums, floatables.	YES
Visual Water Clarity (black or secchi disc)	YES
% cover of fine sediment on bed	YES
Visual Colour (qualitative colour charts)	YES
Cyanobacteria (% cover of bed - visual assessment/NOF biovolume)	YES
Assessment of Mauri (eg Cultural Health Index)	YES
Riparian Vegetation Assessment (lowland perennial)	YES
% natural flood plains	YES
% natural wetlands	YES
Freshwater fish abundance and diversity (eg Index of Biological Integrity, observed/over expected)	YES
Freshwater fish abundance and diversity (observed/over expected for specific species, eg whitebait, eel)	YES
Nitrate:Phosphorus Ratio	YES
Ecosystem Metabolism(Ecosystem Respiration)	YES
Ecosystem Metabolism(Gross Primary Production)	YES
Imbeddedness	YES
pH	YES
Suspendable Benthic Sediment volume (cobble beds)	YES
Chemical/physical/microbiological parameters used based on risk associated with various land uses or pollution events.	YES
Number of direct sewage discharges to water	NO (via Mauri?)
E.coli	NO
E.coli (breaches of recreation standards)	NO
Security of supply	NO



State of the Environment Monitoring
Tracking state and trends and identifying changes of concern



Limit Setting
Creating improvement or retaining current levels



Water Wheel
Comparing scenarios to understand tradeoffs between values and visually communicating outcomes
'canaries in the coal mine'



Key sites – what are they?

- **Sites where there are problems we want to improve**
 - Motupipi River
- **Sites where there are important characteristics we want to protect or maintain**
 - Te Waikoropupu Springs
- **Existing trigger site**
 - Takaka River at Harwoods which is the current trigger site for water rationing in the three water take permits



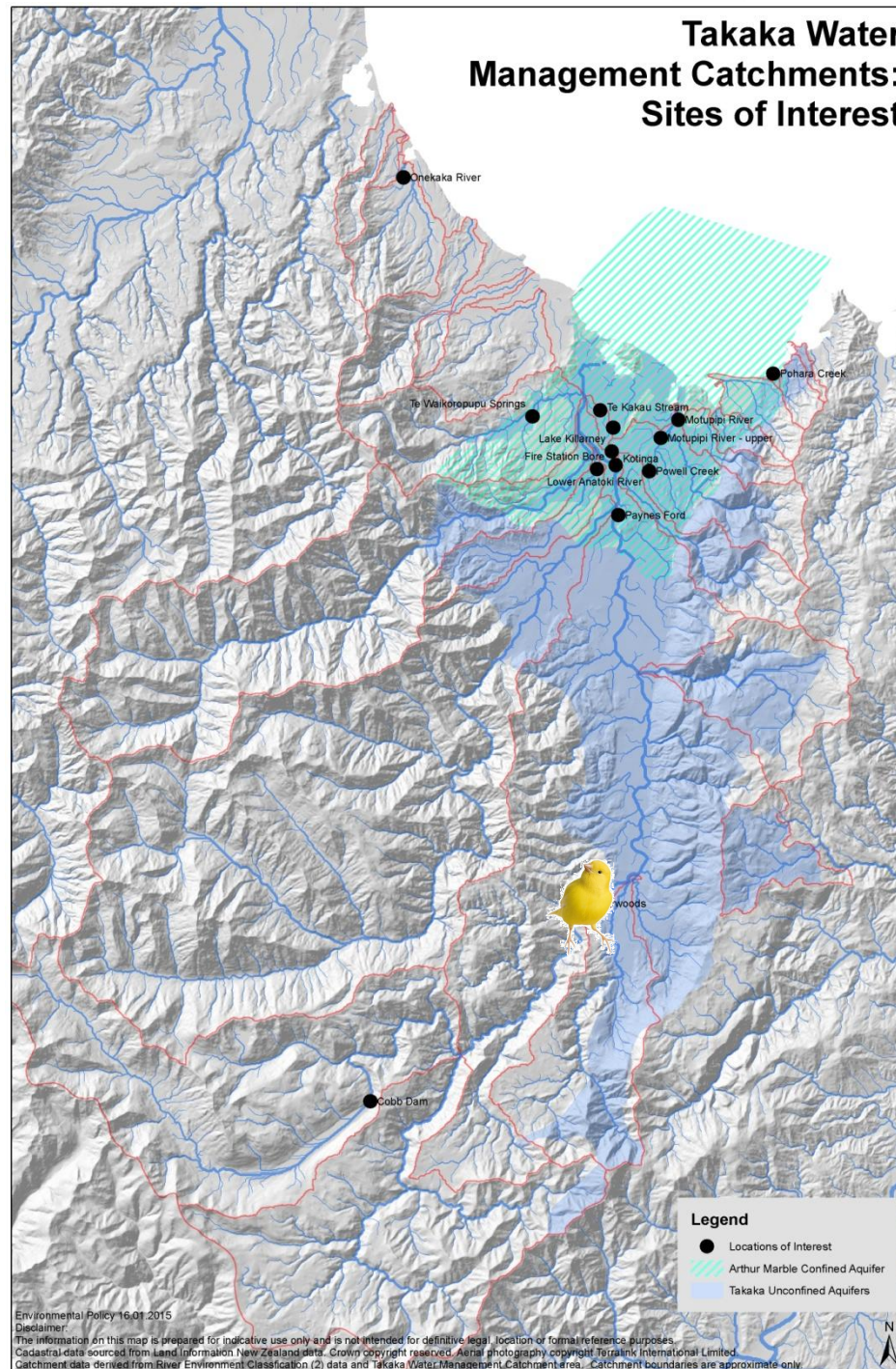
Key sites – other considerations

- **Sites where we already have data for specific attributes**
 - Takaka at Kotinga for Macro-invertebrates
- **Ownership of sites and ease of access for safe and easy monitoring**

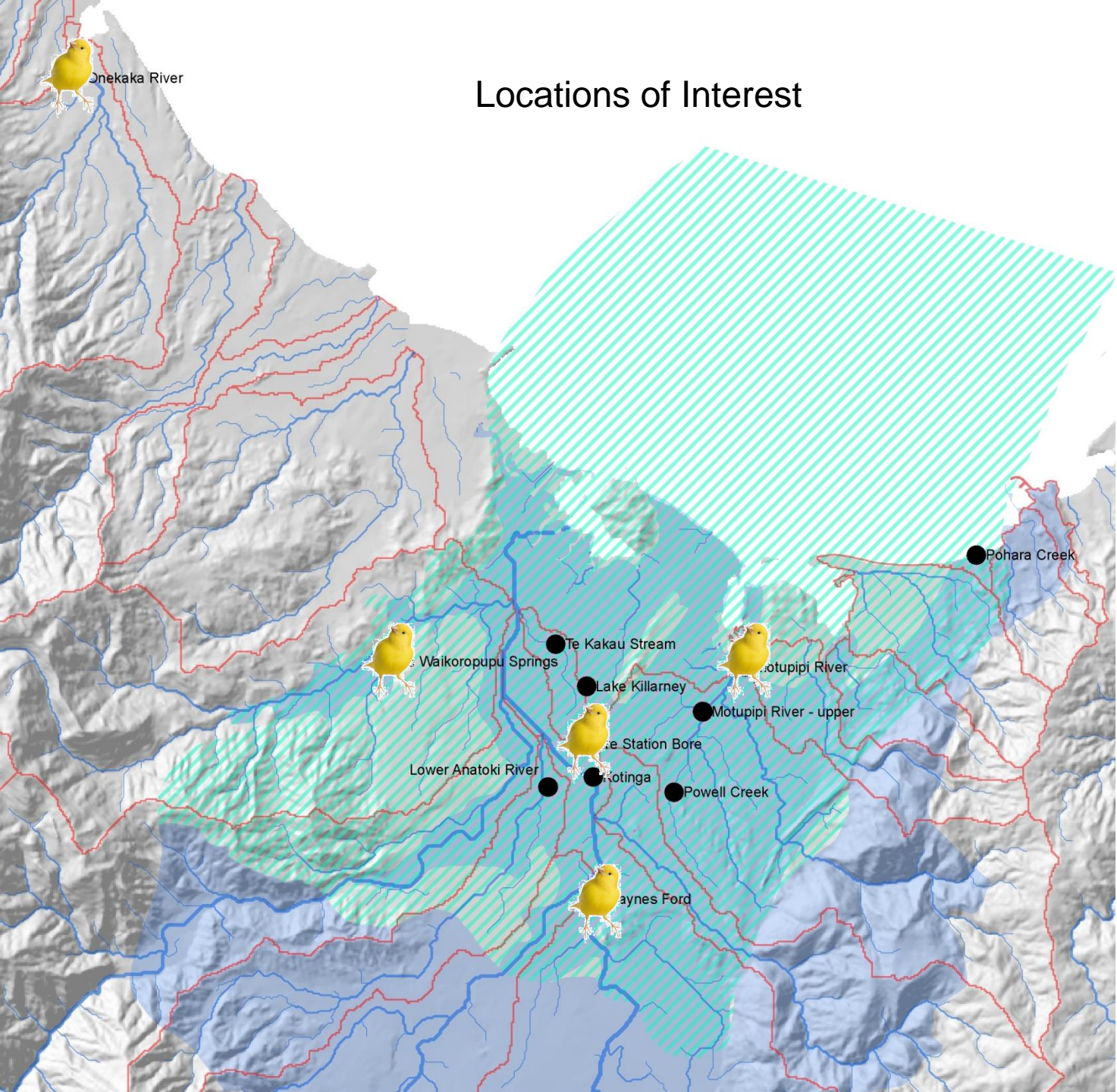
Key Site	Reasons for interest
Te Waikoropupu Springs	Iconic site, excellent visual water clarity
Takaka at Harwoods	Water quantity- consent trigger site
Takaka at Paynes Ford	Popular swimming spot, issues with periphyton
Takaka at Kotinga	Has historic macro-invertebrate data
Motupipi at Abel Tasman Drive	Publically accessible (complaints), issues with phytoplankton, dissolved oxygen, nutrients (N), used for whitebaiting
Motupipi at Reillys Bridge	Issues with periphyton, macrophytes, dissolved oxygen, nutrients (N), MCI, habitat. Also has continuous monitoring data
Powell Creek (Motupipi tributary)	Example of lowland perennial stream with habitat issues, nutrients (N) and historically sediment
Te Kakau Stream	Issues with dissolved oxygen, macrophytes and riparian cover
Lake Killarney	Issues with visual water clarity (due to phytoplankton)
Onekaka at Shambala	Very high fish diversity observed, some historic issues with sediment
Lower Anatoki River	Popular swimming spot
Fire Station Bore	Accesses gravel aquifer used for town bores, supplies tank refills to region
Pohara Creek	Potential to effect Pohara Beach swimming
Takaka Water Management Catchments (whole of area)	Some attributes best considered at catchment wide scale

Locations of Interest

Takaka Water Management Catchments: Sites of Interest



Locations of Interest



Attribute [Key: Blue=LOEF suggestion, yellow=Flag suggestion, green = full flag/LOEF suggestion] [?]=suggested by F&G, [S]=Suggested by	Ecological Health [complexity]	Cultural and Spiritual Value	Fishing and Food Gathering	Natural Form & Character	Recreation [recreation quality complexity]	Municipal/Downstream Water Supply [Source Water]	Livelihood and Economic Use	Hydro-electric Power Potential	Comments	
Regularity - sum of days per year			Takaka River [popular for local fishing] [S]							
Disrupted Oxygen	Malapiji River [issue problems] [S]									
Equal [presence of recreation standards]					Takaka River at Pagers Ford [S/F], TwMC [S/F], Lauro Raakaki River [S], Malapiji River [F], Pakara Yellow/Water Creek [F] [popular for boaters and freshwater affected swimming sites]		TwMC [S], Pakara Valley/Water Creek [F] [issue - default in that need under Recreation]		Duplication and overlap -Water/Wheel is default in recreation water, but acknowledge this aspect also of importance in tourism industry.	
Equal [issue assumptions]			Waterways [local issue] [??] [Issue General location - risk to human health]			Alluvial Gravel/stone [S] [used for water-aid water take]				Duplication and overlap -Water/Wheel is default in most recreation situations.
Flow allocation regime [e.g change of low flow statistic]								TwMC [S/F], Takaka at Horowaki [S], Takaka River at Pagers Ford [F]		
Flow regime [with specific minimum flow]	Takaka River at Pagers Ford [F]	T/Waikaregapa Springs [issue - for protection of spring flow] [S]		Takaka River at Pagers Ford [F]						Flow statistics will differ between water bodies.
Freshwater fish [food species abundance and diversity] [abundance/issue reported for specific species, e.g. whilakoi, eel, trout]			Waikaregapa [S], Malapiji River [abundance] [S/F], Takaka at Pagers Ford [F], TwMC [F] [Issue making kai]							
Freshwater fish [native abundance and diversity] [abundance/Issue Reported]	Otakaka River [req high diversity abundance] [S]									
Invasive area - X irrigated							TwMC [S]			
Kilowatts generated								TwMC, Cokk, Waikaregapa, Otakaka [S]		
Low flow for recreation use [X of MRLP allocated, change in MRLP in TWMCs with general change - below lakes]							TwMC [S]			
Low flow for recreation health [X of MRLP allocated]	Otakaka River [req for protecting high fish diversity] [S]									
Low flow for water supply [X of MRLP allocated, change in MRLP averaged across the named creeks - below lakes]										
Maori-invested/active indicators [eq MCI]	Takaka River at Kaitiaki [low MCI data record] [S], Takaka River at Pagers Ford [S/F] [no appropriate difference in kaitiaki], Malapiji River [F]									
Mileage	Malapiji River [F]	T/Waikaregapa Springs [issue - for retention of low nitrate levels] [S]								Duplication and overlap -Water/Wheel is default in most recreation situations
Number [density] of human-made structures in or adjacent to water body				TwMC [S]						
Number and spread of sites with safe public access			TwMC [S] [with default in most recreation water]		TwMC [S] [with default in most recreation water]		[TwMC [S] [issue with default in most recreation water]			Duplication and overlap -Water/Wheel is default in most recreation situations
Number of days any part of Takaka River main stream in dry [change in dry days per year]							Takaka River [S] [default waterless water lakes??]	Cokk Dam [??] [S]		
Periphyton [X Bed Cover, number of occurrences of epiphytes]	Malapiji River, Pagers Ford [issue problems] [S]				Takaka River at Pagers Ford [S/F], Lauro Raakaki River [S], Malapiji River [F], TwMC [S] [popular swimming sites]					Duplication and overlap -Water/Wheel is default in most recreation situations
Riparian Vegetation Assessment [isolated perennial rivers/streams]	Powell Creek [S], TwMC [S] [issue problems suggested by gear skidder]			TwMC [S], Malapiji River [F]						Duplication and overlap -Water/Wheel is default in most recreation situations
Stability of supply - S05 [change in S05 in WH2 with 3 Inuvial S05]						TwMC [S/F]	TwMC [S/F], Malapiji River [F], Takaka River at Pagers Ford [F]			Duplication and overlap -Water/Wheel is default in most recreation situations
Stream Habitat Score [eq Multi-Water Assessment]	Malapiji River [S] [issue problems] TwMC [F]			Malapiji River [F], Takaka River at Pagers Ford [F], TwMC [F]						Duplication and overlap -Water/Wheel is default in most recreation situations
Visual/Water Clarity [change in blank river]		TwMC [F]			Pagers Ford [S], Lauro Raakaki River [S], TwMC [F]					Duplication and overlap -Water/Wheel is default in most recreation situations
Number of people [FTE] employed in primary production and related industries							TwMC [S]			
Public participation and satisfaction index for Takaka Water resources							TwMC [S]			This would be applicable across other social related waters
Assessment of Maori [eq Cultural Health Index]		Takaka River at Pagers Ford [F], TwMC [F]	Malapiji River [F], Takaka River at Pagers Ford [F]							Duplication and overlap -Water/Wheel is default in most recreation situations
Social Indicator[s] [to be confirmed]		Malapiji River [F], Takaka River at Pagers Ford [F]								
Economic Indicator[s] [to be confirmed]										
Groundwater Level						Malapiji River [F], Takaka River at Pagers Ford [F], TwMC [F]	Malapiji River [F], Takaka River at Pagers Ford [F], TwMC			