Basins, Catchments and Receiving Waters of the Black Ross Water Quality Improvement Plan Area

Chapter 11
Upper Ross River Sub Basin

November 2009

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11. Upper Ross River Sub Basin

The Upper Ross River Sub Basin includes the Ross river (above the dam), Six Mile Creek, Toonpan Lagoon, Antill Plains, Sachs Creek and Mt Stuart catchments. There are also a number of smaller waterways that have been included in the catchments of these larger waterways (see Figure 11.1 and Figure 11.2).

Figure 11.1 Upper Ross River Sub Basin and Drainage

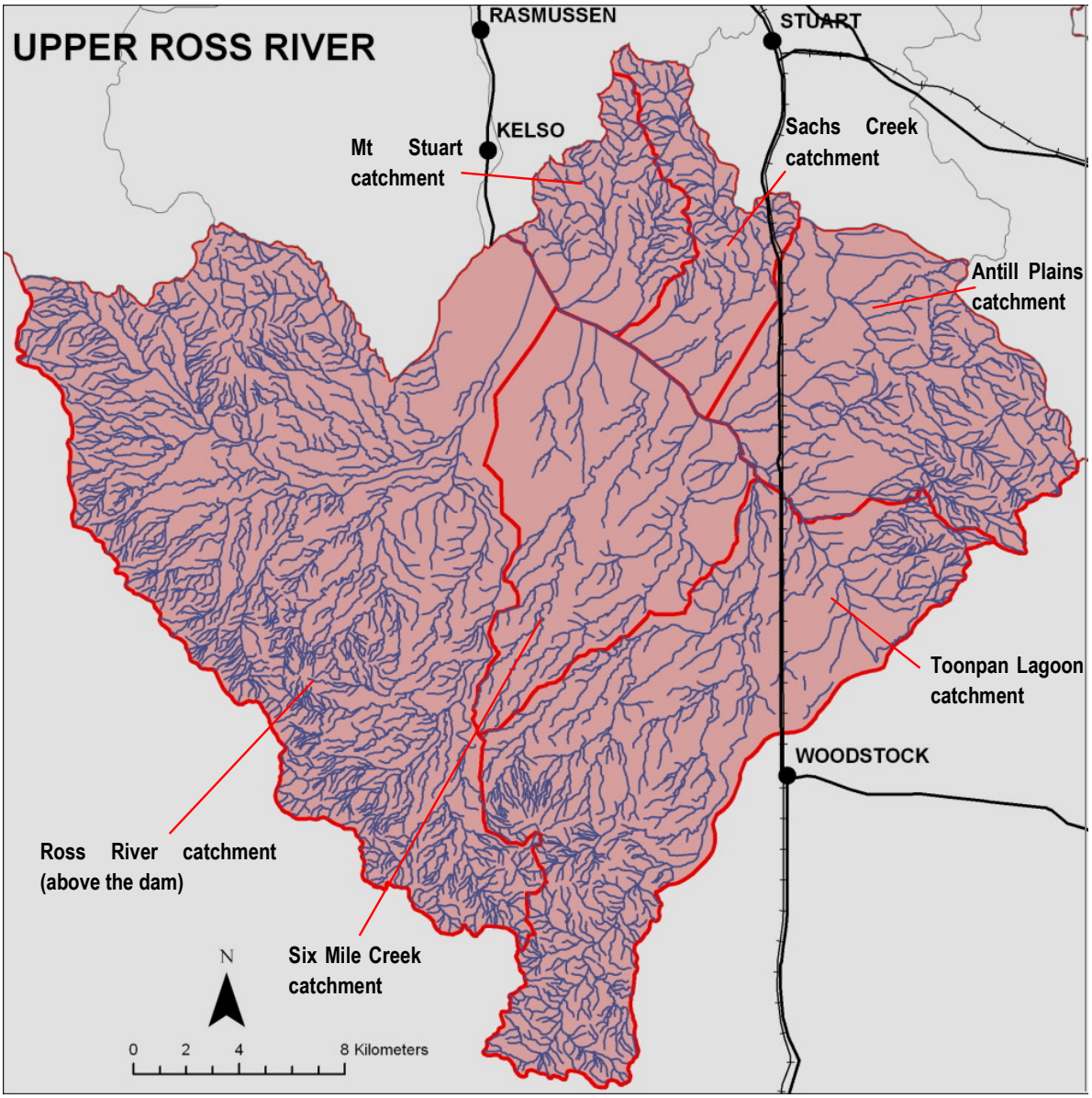
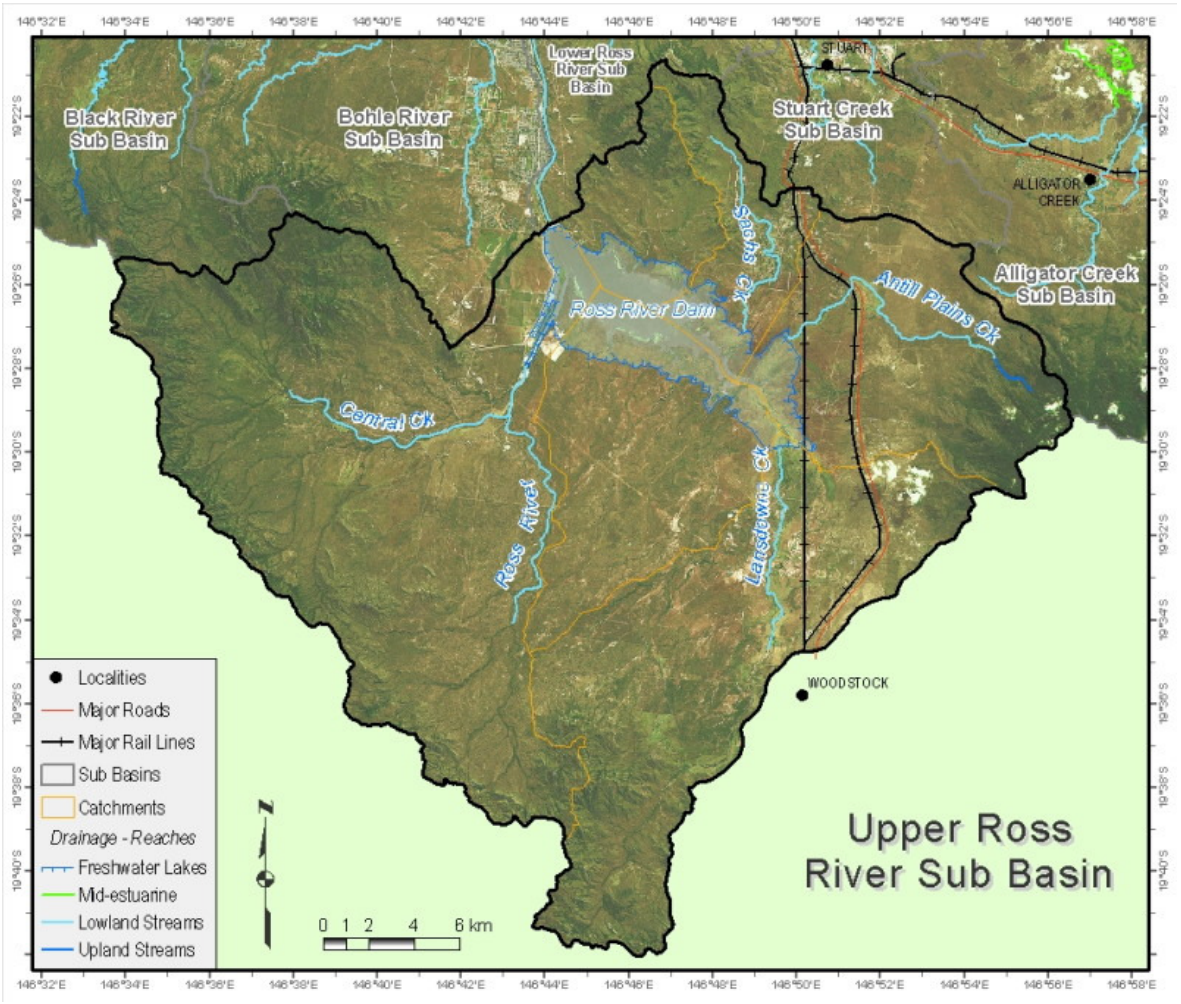


Figure 11.2 Upper Ross River Sub Basin Imagery

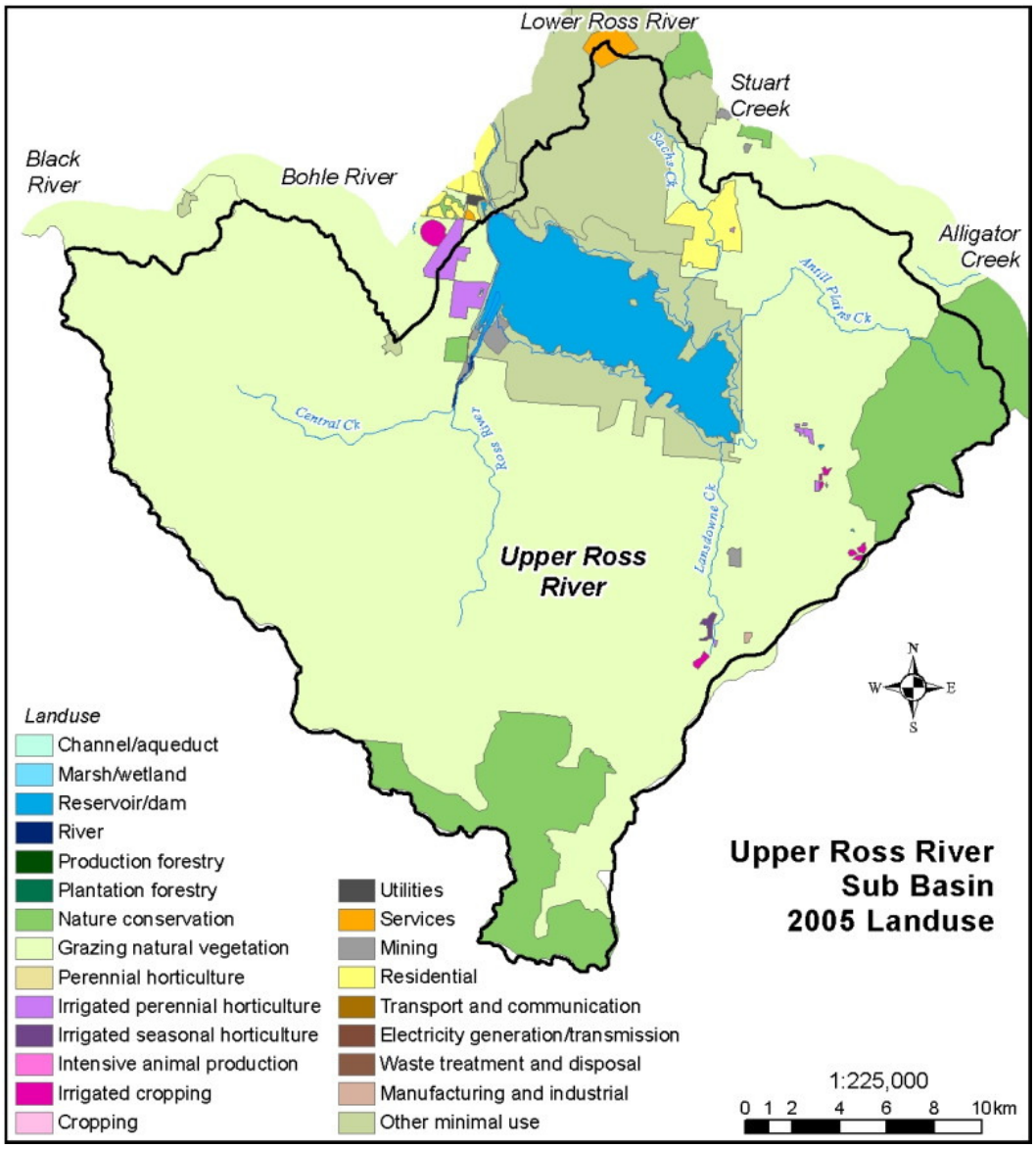


11.1 Upper Ross River Sub Basin Land Use

The Upper Ross River Sub Basin is 755 square kilometres in size (~75,500 hectares). The Upper Ross River Sub Basin is the catchment for the Ross River Dam, Townsville's main drinking water supply.

Land use in the Upper Ross Sub Basin is dominated by grazing (72%) and nature conservation/minimal use (22%). The Ross River Dam occupies approximately 6% of the sub basin area (see Figure 11.3 and Table 11.1).

Figure 11.3 Upper Ross River Sub Basin Land Use



Source: 2005 land use update generated by Connell Wagner using QLUMP 1999 data (DNRW), 2005 aerial photography (Townsville City Council) and SPOT imagery (NQ Dry Tropics).

Table 11.1 Upper Ross River Sub Basin Land Use

Land Use	QLUMP 1999		2005 Update	
	Area (ha)	Area (%)	Area (ha)	Area (%)
Grazing natural vegetation	54,437	71.67	54,082	71.7
Irrigated cropping	63	<0.1	63	<0.1
Irrigated perennial horticulture	323	0.4	323	0.4
Irrigated seasonal horticulture	35	<0.1	35	<0.1
Manufacturing and industrial	11	<0.1	11	<0.1
Marsh/Wetland			12	<0.1
Mining	53	<0.1	173	0.2
Nature conservation	8,367	11.0	8,218	10.9
Other minimal use	7,580	10.0	7,461	10.0

Reservoir/Dam	4,335	5.7	4,332	5.7
Residential	647	0.9	647	0.9
River	27	<0.1	27	<0.1
Services	75	0.1	75	0.1
	75,953	100	75,460	100

Source: QLUMP 1999 calculations from CSIRO and 2005 update figures generated by Connell Wagner using QLUMP 1999 data (DNRW), 2005 aerial photography (Townsville City Council) and SPOT imagery (NQ Dry Tropics). Figures have been rounded to the nearest hectare

11.2 Upper Ross River Sub Basin Demographics

The 2006 Census counted 1,357 people resident within the Upper Ross River Sub Basin. The sub basin includes the catchments of the Ross River Dam, incorporating areas to the west of Mount Stuart and rural lands towards Woodstock. Woodstock township is not included in the Upper Ross River Sub Basin.

Housing in Upper Ross River Sub Basin is predominantly single family dwellings with 410 separate houses out of a total 443 dwellings in the area (see Table 11.3).

The median age of the Upper Ross River Sub Basin population is reported at 38 years (2006 Census). Of the 375 families usually resident in the sub basin at the 2006 Census, 142 were couples without children and 189 were couples with children.

16% of total households in the sub basin report only one person usually resident. This may reflect the median age profile, which is greater than that of the Townsville LGA.

Average household size at 3.0 people per household is above the average occupancy for the Townsville local government area (2.8 people). Overall, 33.7% of Upper Ross River households have four people, or more usually resident.[1] Selected medians and averages from the 2006 Census for the Upper Ross River Sub Basin are presented in Table 11.2.

Table 11.2 Selected Medians and Averages [2]

Description	Upper Ross River	Townsville
Median age of persons	38	33
Median individual income ($/weekly)	471	531
Median family income ($/weekly)	1,167	1,237
Median household income ($/weekly)	1,080	1,101
Median housing loan repayment ($/monthly)	1,171	1,231
Median rent ($/weekly)	134	190
Average household size	3.0	2.8

Source: ABS 2006 Census of Population and Housing

Notes: Figures are based on place of usual residence. Upper Ross River is the Upper Ross River Customised Region and Townsville is Townsville City Council local government area.

[1] All Dwelling, Household, and Median data is sourced from the 2006 Census Population and Housing Customised Basic Community Profile

[2] **Median calculations - PLEASE NOTE -** For this customised Basic Community Profile, medians have been calculated from confidentialised and pertebated Census data. Medians have been calculated based on the assumption of a uniform distribution between ranges. Care should be taken when using these figures.
Median age of persons excludes overseas visitors.
Median individual income is applicable to persons aged 15 years and over.
Median household income is applicable to occupied private dwellings. It excludes households where at least one member aged 15 years and over did not state an income and households.
Median housing loan repayment is applicable to occupied private dwellings being purchased and includes dwellings being purchased under a rent/buy scheme. It excludes 'Visitors only' and 'Other not classifiable' households.
Median rent is applicable to occupied private dwellings being rented. It excludes 'Visitors only' and 'Other not classifiable' households.
Average number of persons per bedroom is applicable to occupied private dwellings. It excludes 'Visitors only' and 'Other not classifiable' households

Table 11.3 Count of Occupied Private Dwellings(a) and Persons in Occupied Private Dwellings

Dwelling Type	Dwellings		Resident Persons	
	Count	%	Count	%
Separate house	410		1,255	
Semi-detached, row or terrace house, townhouse etc:				
Semi-detached, etc Total	0		0	
Flat, unit or apartment:				
Flat, unit or apartment Total	0		0	
Other dwelling:				
Caravan, cabin, houseboat	20		26	
Improvised home, tent, sleepers out	13		18	
House or flat attached to a shop, office, etc.	0		0	
Other dwelling Total	33		44	
Totals	**443**		**1,305**	

Source: ABS 2006 Census of Population and Housing

Notes: (a) Excludes 'Visitors only' and 'Other not classifiable' households. Figures are for the Upper Ross River Customised Region.

11.3 Upper Ross River Sub Basin Land Use by Catchment

Land use summaries of the main catchments of the Upper Ross River Sub Basin are provided below. Where the 1999 and 2005 land use information is unchanged only the 2005 land use is provided. Additional catchment profile information, kindly provided by DERM/EPA Townsville, is included in Appendix E.

11.3.1 7-1 Ross River (above the dam)

The Ross River catchment above the dam is approximately 30,250 hectares in area (~300 square kilometres) with the main land use being grazing in native pasture (91%).

Table 11.4 Ross River (upper) Catchment Land Use 1999 and 2005

Secondary Land Use - Tertiary Land Use		QLUMP 1999		2005 Update	
		Area (ha)	%	Area (ha)	%
Nature conservation	Other conserved area	1,443	4.7	1,419	4.7
Other minimal use		240	0.8	147	0.5
	Remnant native cover	60	0.2	60	0.2
Grazing natural vegetation		27,737	90.9	27,488	90.9
Irrigated perennial horticulture	Irrigated tree fruits	279	0.9	279	0.9
Residential		<1	<0.1	<1	<0.1
Mining		13	<0.1	109	0.4
Reservoir/dam		722	2.4	719	2.4
River		27	0.1	27	0.1
	Totals	30,520		30,247	

Source: QLUMP 1999 calculations from CSIRO and 2005 update figures generated by Connell Wagner using QLUMP 1999 data (DNRW), 2005 aerial photography (Townsville City Council) and SPOT imagery (NQ Dry Tropics). Figures have been rounded to the nearest hectare

11.3.2 7-2 Six Mile Creek

The Six Mile Creek catchment is approximately 9,625 hectares in area (~96 square kilometres) with the main land use being grazing in native pasture (63%). Ross River Dam also takes up a considerable amount of this catchment (18%), as does minimal use (19%).

Table 11.5 Six Mile Creek Catchment Land Use 2005

Primary Land Use	Secondary Land Use	Area (ha)	%
Conservation and natural environments	Other minimal use	1,847	19.2
Production from relatively natural environments	Grazing natural vegetation	6,077	63.1
Water	Reservoir/dam	1,701	17.7
	Total	9,625	

Source: 2005 land use figures generated by Connell Wagner using QLUMP 1999 data (DNRW), 2005 aerial photography (Townsville City Council) and SPOT imagery (NQ Dry Tropics). Figures have been rounded to the nearest hectare.

11.3.3 7-3 Toonpan Lagoon

The Toonpan Lagoon catchment is approximately 16,900 hectares in area (~170 square kilometres) with the main land use being grazing in native pasture (75%).

Table 11.6 Toonpan Lagoon Catchment Land Use 2005

Primary Land Use	Secondary Land Use	Tertiary Land Use	Area (ha)	%
Conservation and natural environments	Nature conservation	Other conserved area	721	4.3
	Other minimal use		3,174	18.7
		Remnant native cover	88	0.5
Production from relatively natural environments	Grazing natural vegetation		12,757	75.3
Production from irrigated agriculture and plantations	Irrigated cropping		63	0.4
	Irrigated perennial horticulture	Irrigated tree fruits	13	0.1
		Irrigated vegetables & herbs	35	0.2
Intensive uses	Manufacturing and industrial		11	0.1
	Mining		38	0.2
Water	Reservoir/dam		22	0.1
	Marsh/wetland	Marsh/wetland conserve	12	0.1
		Total	16,935	

Source: 2005 land use figures generated by Connell Wagner using QLUMP 1999 data (DNRW), 2005 aerial photography (Townsville City Council) and SPOT imagery (NQ Dry Tropics). Figures have been rounded to the nearest hectare.

11.3.4 7-4 Antill Plains Creek

The Antill Plains Creek catchment is approximately 10,730 hectares in area (~107 square kilometres) with the main land use being grazing in native pasture (64%).

Table 11.7 Antill Plains Creek Catchment Land use 2005

Primary Land Use	Secondary Land Use	Tertiary Land Use	Area (ha)	%
Conservation and natural environments	Nature conservation	National Park	2,904	27.1
	Other minimal use		410	3.8
Production from relatively natural environments	Grazing natural vegetation		6,888	64.0
Production from irrigated agriculture and plantations	Irrigated perennial horticulture	Irrigated tree fruits	29	0.3
Intensive uses	Residential	Rural residential	11	0.1

Water	Reservoir/dam		484	4.5
		Total	10,726	

Source: 2005 land use figures generated by Connell Wagner using QLUMP 1999 data (DNRW), 2005 aerial photography (Townsville City Council) and SPOT imagery (NQ Dry Tropics). Figures have been rounded to the nearest hectare

11.3.5 7-5 Sachs Creek

The Sachs Creek catchment is approximately 4,130 hectares in area (~41 square kilometres) with the main land use being minimal use (Defence). Minimal use (18%), rural residential (15%) and Ross River Dam (16%) are also significant land uses in the catchment.

Table 11.8 Sachs Creek Catchment Land Use 2005

Primary Land Use	Secondary Land Use	Tertiary Land Use	Area (ha)	%
Conservation and natural environments	Nature conservation	Other conserved area	<1	<0.1
	Other minimal use		721	17.5
		Defence	1,152	27.9
Production from relatively natural environments	Grazing natural vegetation		872	21.1
Production from irrigated agriculture and plantations	Irrigated perennial horticulture	Irrigated tree fruits	3	0.1
Intensive uses	Residential	Rural residential	634	15.4
	Services		75	1.8
Water	Reservoir/dam		673	16.3
		Total	4,130	

Source2005 land use figures generated by Connell Wagner using QLUMP 1999 data (DNRW), 2005 aerial photography (Townsville City Council) and SPOT imagery (NQ Dry Tropics). Figures have been rounded to the nearest hectare

11.3.6 7-6 Mt Stuart

The Mt Stuart catchment is approximately 3,800 hectares in area (~38 square kilometres) with the main land use being grazing in native pasture. The Ross River Dam also takes up a significant portion of the catchment (19%).

Table 11.9 Mt Stuart Catchment land Use 2005

Primary Land Use	Secondary Land Use	Tertiary Land Use	Area (ha)	%
Conservation and natural environments	Other minimal use		501	13.2
		Defence	2562	67.4
Production from relatively natural environments	Grazing natural vegetation		1	<0.1
Intensive uses	Residential	Rural residential	2	<0.1
Water	Reservoir/dam		733	19.3
		Total	3,798	

Source: 2005 land use figures generated by Connell Wagner using QLUMP 1999 data (DNRW), 2005 aerial photography (Townsville City Council) and SPOT imagery (NQ Dry Tropics). Figures have been rounded to the nearest hectare

Table 11.10 Catchments Land Use Summary

Land Use	Ross River (atd) (7-1)		Six Mile Creek (7-2)		Toonpan Lagoon (7-3)	
	Ha	%	Ha	%	Ha	%
Conservation and natural areas	1,626	5.4	1,821	18.9	3,983	23.5
Grazing	27,487	90.9	6,077	63.1	12,757	75.3
Rural residential	0		0		0	
Intensive agriculture	279	0.9	0		112	0.7
Urban	109	0.4	26	0.3	49	0.3
Water and wetlands	747	2.5	1,701	17.7	34	0.2
Totals	30,247	100.0	9,625	100.0	16,935	100.0
Land Use	**Antill Plains Creek (6-4)**		**Sachs Creek (7-5)**		**Mt Stuart (7-6)**	
	Ha	Ha	%	Ha	%	%
Conservation and natural areas	3,315	30.9	1,873	45.3	3,062	80.6
Grazing	6,888	64.2	872	21.1	1	0.0
Rural residential	11	0.1	634	15.4	2	0.0
Intensive agriculture	29	0.3	3	0.1	0	
Urban	0		75	1.8	0	
Water and wetlands	484	4.5	673	16.3	733	19.3
Totals	10,726	100.0	4,130	100.0	3,798	100.0

Note: atd is above the dam

11.4 Upper Ross River Sub Basin Resource Condition

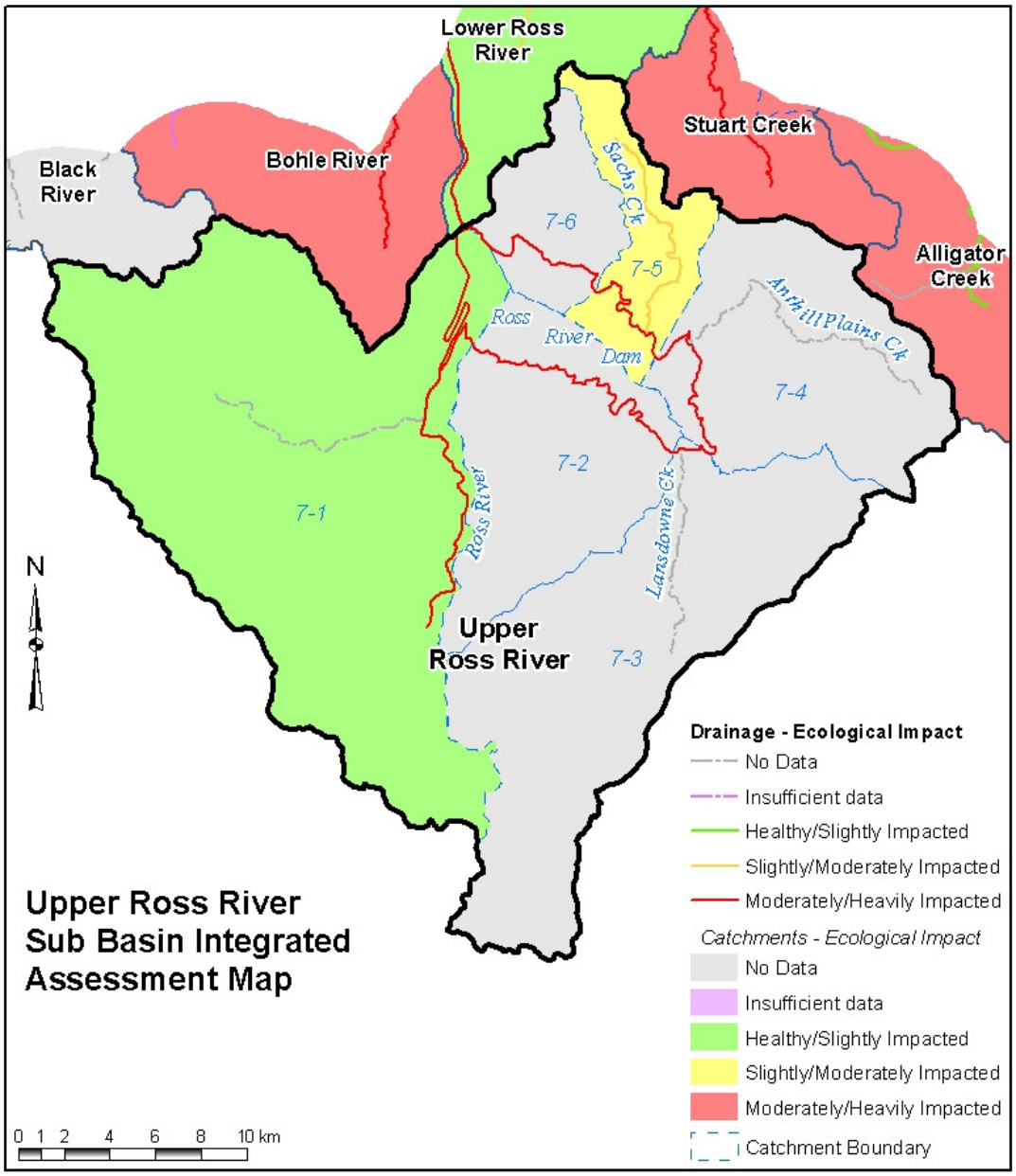
Despite a very limited dataset, the water quality condition assessment for Black Ross WQIP area (Connell Wagner 2008) indicated that the water quality of this sub basin was most likely to be slightly to moderately impacted (see Figure 11.4). The data associated with the Ross Dam catchment was all taken from within the Ross River Dam so it was not considered to be representative of the various catchments feeding into the dam. Recent data from Sachs Creek generally confirms the rating for this sub basin i.e. slightly to moderately impacted. However this may only be indicative of the land use and management activities of the Sachs Creek catchment and not of the whole sub basin.

11.5 Water Quality and Water Quality Objectives (WQOs)

The water quality condition data does not match the WQOs for many of the water quality indicators in the Upper Ross River sub basin (see Table 11.11). It should be noted that the water quality data for Lake Ross has been compared to the WQOs for lakes, which are more stringent than the WQOs for lowland streams.

The water quality data from Sachs Creek indicates above average concentrations of nutrients, which also have the potential to impact water quality in Lake Ross.

Figure 11.4 Upper Ross River Sub Basin Ecological Condition



(Note: Water quality data was assessed against water quality objectives (WQOs) derived from the Queensland Water Quality Guidelines (EPA 2006) for the Central Coast region for lowland streams)

Table 11.11 Comparing WQOs with Water Quality

Upper Ross River Sub Basin	DIN	Org N	TN	FRP	TP	TSS
Lake Ross (Ross Dam) 7-1	X 100%	X 52%	X 60%	X 200%	X 200%	√* 80%
Sachs Creek 7-5	ND	√ 41%	X 13%	X 45%	√	√* 30%

Notes: Tick/cross denotes if the WQO is met (√) or not (X) for the waterway based on the median value for the water quality indicator. The percentage indicates the amount by which the WQO is met or not met (the difference between the WQO and water quality condition median as a percentage of the WQO). No % is listed if the water quality condition is the same as the WQO. ND is no data.

DIN is dissolved inorganic nitrogen, Org N is organic nitrogen, TN is total nitrogen, FRP is filterable reactive phosphorus, TP is total phosphorus and TSS is total suspended solids (sediment).

* indicates inconsistency or a wide variation in the data, or insufficient data to calculate percentiles.

[1] indicates data is dated and may not reflect current condition.

[More information about water quality conditions and WQOs can be found in; *Environmental Values, Water Quality Objectives and Targets for the Black Ross Water Quality Improvement Plan* (Gunn, Manning, and McHarg 2009), and *Water Quality Condition of the Black and Ross River Basins* (Connell Wagner 2008)]