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

Chapter 12
Stuart Creek Sub Basin

November 2009

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12. Stuart Creek Sub Basin

The Stuart Creek Sub Basin includes the Stuart Creek and Sandfly Creek catchments. There are also a number of smaller waterways that have been included in the catchments of these larger creeks (see Figure 12.1 and Figure 12.2).

Figure 12.1 Stuart Creek Sub Basin and Drainage

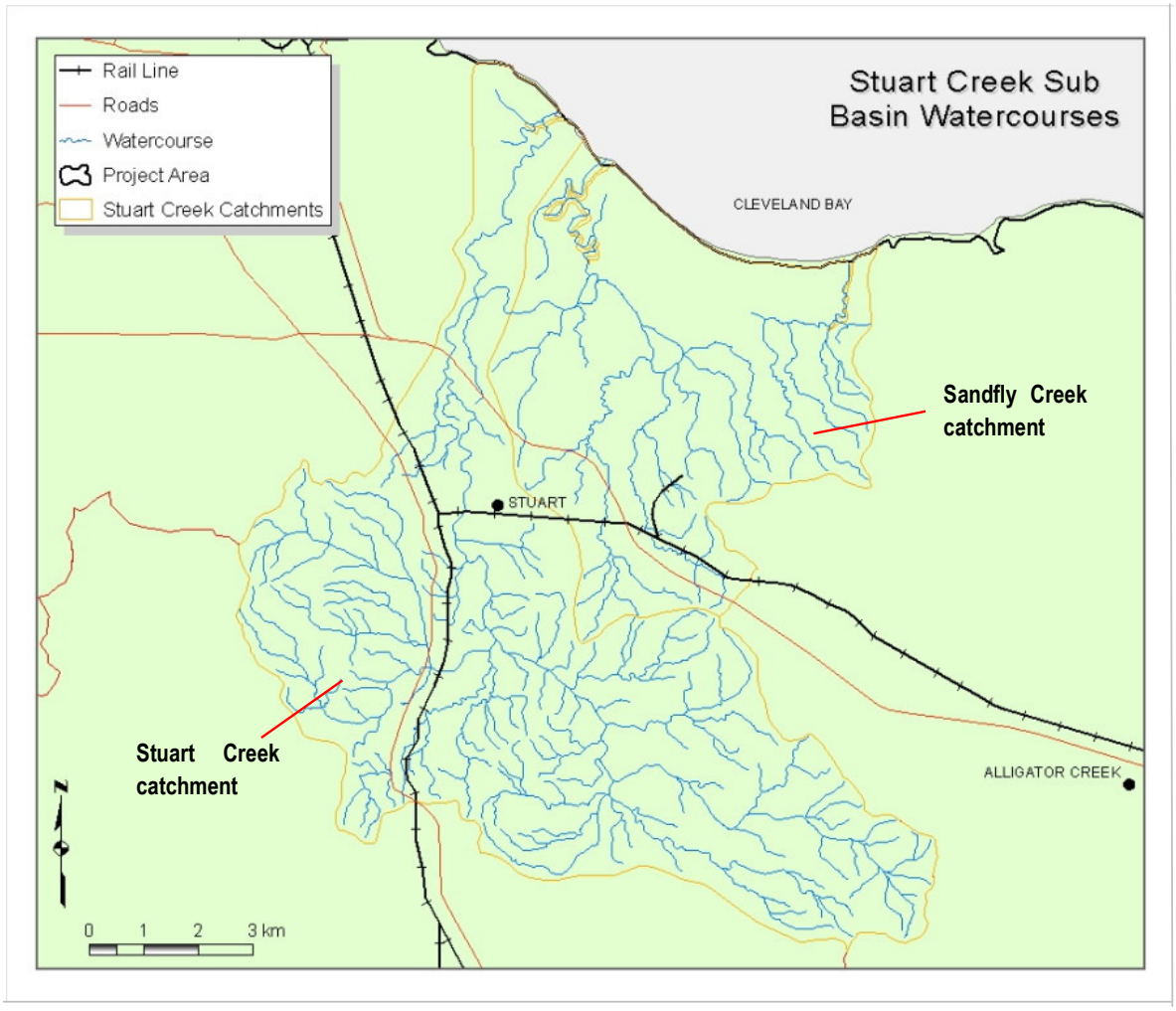
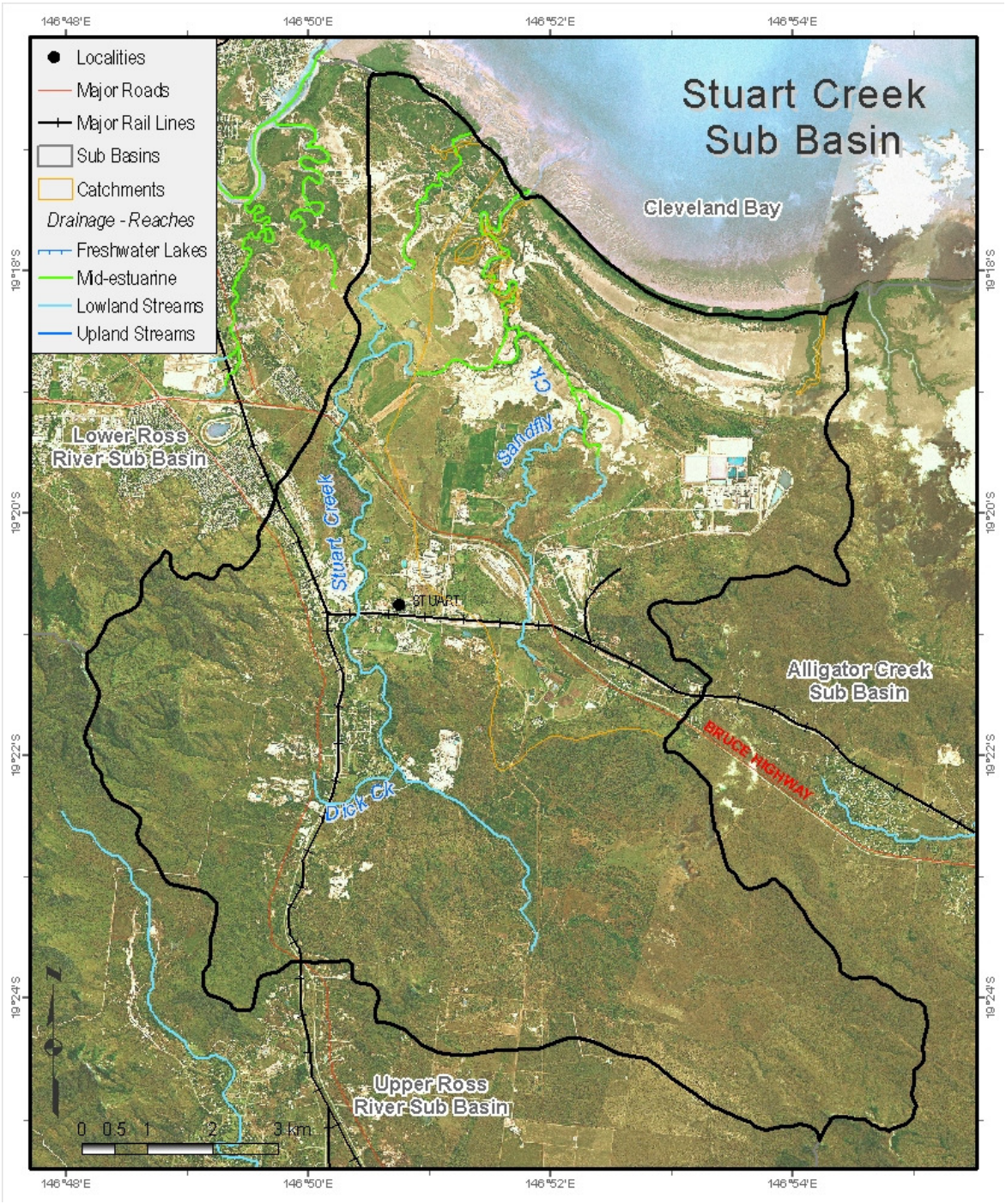


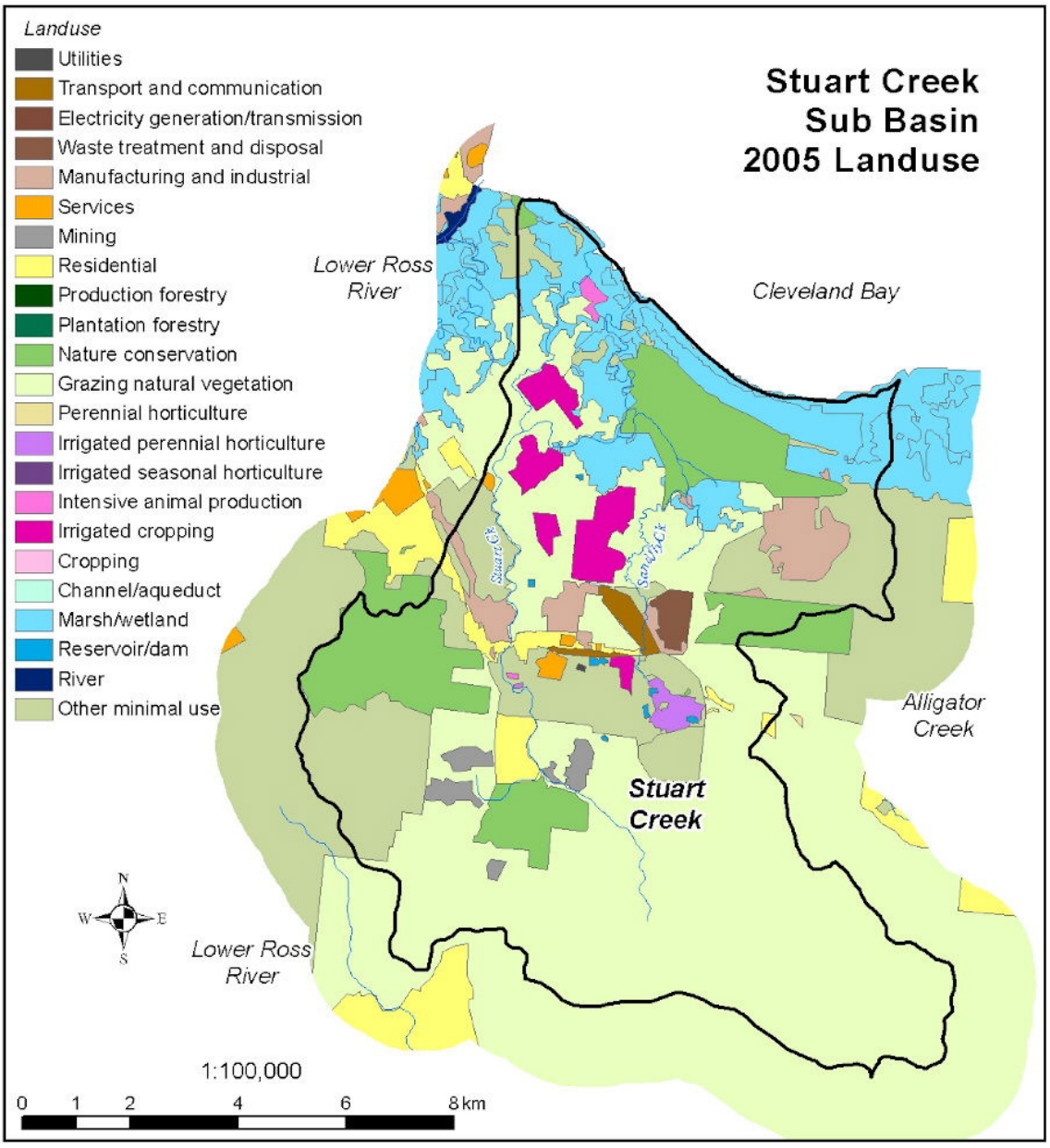
Figure 12.2 Stuart Creek Sub Basin Imagery



12.1 Stuart Creek Sub Basin Land Use

The Stuart Creek Sub Basin is approximately 104 square kilometres in size (~10,400 hectares). Grazing (49%) is the main land use in the Stuart Creek Sub Basin followed by other minimal use (including Defence land) (16%) and nature conservation (13%). While being a significant economic driver for Townsville, and concentrated in the Stuart Creek Sub Basin, the manufacturing and industrial sector accounts for less than 4% of the land use in the Stuart Creek Sub Basin (see Figure 12.3 and Table 12.1).

Figure 12.3 Stuart Creek 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 12.1 Stuart Creek Sub Basin Land Use

Land Use	QLUMP 1999		2005 Update	
	Area (ha)	Area (%)	Area (ha)	Area (%)
Grazing natural vegetation	5,203	50.2	5,054	48.7
Intensive animal production	23	0.2	23	0.2
Irrigated cropping	234	2.3	299	2.9
Irrigated perennial horticulture	56	0.5	56	0.5
Manufacturing and industrial	359	3.5	353	3.4
Marsh/Wetland	1,033	10.0	1,033	10.0
Mining	109	1.1	116	1.1

Nature conservation	1,366	13.2	1,366	13.2
Other minimal use	1,753	16.9	1,704	16.4
Reservoir/Dam	16	0.2	14	0.1
Residential	173	1.7	191	1.8
Services	33	0.3	32	0.3
Transport and communication	14	0.1	68	0.7
Utilities	2	<0.1	2	<0.1
Waste treatment and disposal			62	0.6
	10,374	100	10,371	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.

12.2 Stuart Creek Sub Basin Demographics

The 2006 Census counted 1,230 people resident within the Stuart Creek Sub Basin. Limited residential use occurs at Stuart and Roseneath.

Housing in the Stuart Creek Sub Basin is predominantly single-family dwellings with 212 separate houses out of a total 229 dwellings in the area (see Table 12.3). The Stuart detention centre is excluded from these figures.

The median age of the Stuart Creek Sub Basin population is reported at 34 years (2006 Census). Of the 162 families usually resident in the sub basin at the 2006 Census, 49 were couples without children and 76 were couples with children. 27.5% of total households in the sub basin report only one person usually resident.

Average household size at 2.7 people per household is slightly below the average occupancy of 2.8 people for the Townsville local government area. Overall, 23.7% of Stuart Creek Sub Basin households have four people, or more usually resident.[1]

Selected medians and averages from the 2006 Census for the Stuart Creek Sub Basin are presented in Table 12.2

Table 12.2 Selected Medians and Averages [2]

Description	Stuart Creek	Townsville
Median age of persons	34	33
Median individual income ($/weekly)	460	531
Median family income ($/weekly)	1,170	1,237
Median household income ($/weekly)	944	1,101
Median housing loan repayment ($/monthly)	869	1,231
Median rent ($/weekly)	141	190
Average household size	2.7	2.8

Source: ABS 2006 Census of Population and Housing

[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

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

Table 12.3 Count of Occupied Private Dwellings(a) and Persons in Occupied Private Dwellings

Dwelling Type	Dwellings		Resident Persons	
	Count	%	Count	%
Separate house	212		575	
Semi-detached, row or terrace house, townhouse etc:				
Semi-detached, etc Total	0		0	
Flat, unit or apartment:				
In one or two storey block	0		3	
Flat, unit or apartment Total	0		3	
Other dwelling:				
Caravan, cabin, houseboat	9		18	
Improvised home, tent, sleepers out	8		9	
House or flat attached to a shop, office, etc.	0		0	
Other dwelling Total	17		27	
Totals	**229**		**605**	

Source: ABS 2006 Census of Population and Housing

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

12.3 Stuart Creek Sub Basin Land Use by Catchment

Land use summaries for the main catchments of the Stuart Creek 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.

12.3.1 8-1 Stuart Creek

The Stuart Creek catchment is approximately 6,700 hectares in area (~67 square kilometres) with the main land use being grazing in native pasture (61%). Catchment boundaries were relocated to more closely match drainage patterns and the Stuart Creek boundary may need to be relocated again to include the connecting creek that flows to Ross River. Drainage patterns have been altered over time through human influence and the flow paths are uncertain.

Table 12.4 Stuart 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	714	10.6
	Other minimal use		514	7.6
		Defence	515	7.7
		Remnant native cover	65	1.0
Production from relatively natural environments	Grazing natural vegetation		4,130	61.4
Production from irrigated agriculture and plantations	Irrigated cropping		106	1.6
	Irrigated perennial horticulture		1	<0.1
Intensive uses	Intensive animal production	Poultry	2	<0.1
		Aquaculture	19	0.3
	Manufacturing and industrial		99	1.5

	Residential		84	1.2
		Rural residential	87	1.3
	Services		21	0.3
		Recreation and culture	10	0.2
	Utilities	Electricity generation/transmission	2	<0.1
	Transport and communication	Railways	12	0.2
	Mining		116	1.7
Water	Reservoir/dam		6	0.1
	Marsh/wetland		87	1.3
		Marsh/W Conservation	135	2.0
		Total	6,727	

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.

12.3.2 8-2 Sandfly Creek

The Sandfly Creek catchment is approximately 3,640 hectares in area (~36 square kilometres) with the main land use being nature conservation and other minimal use. Grazing accounts for 25% of the catchment.

Table 12.5 Sandfly 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	651	17.9
	Other minimal use		519	14.3
		Remnant native cover	90	2.5
Production from relatively natural environments	Grazing natural vegetation		923	25.3
Production from irrigated agriculture and plantations	Irrigated cropping		193	5.3
	Irrigated perennial horticulture		55	1.5
Intensive uses	Intensive animal production	Aquaculture	1	0.0
	Manufacturing and industrial		254	7.0
	Residential		7	0.2
		Rural residential	14	0.4
	Services	Commercial services	0	0.0
	Transport and communication	Railways	57	1.6
	Waste treatment and disposal	Landfill	62	1.7
Water	Reservoir/dam		7	0.2
	Marsh/wetland		628	17.2
		Marsh/W Conservation	182	5.0
		Total	3,644	

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 12.6 Catchments Land Use Summary

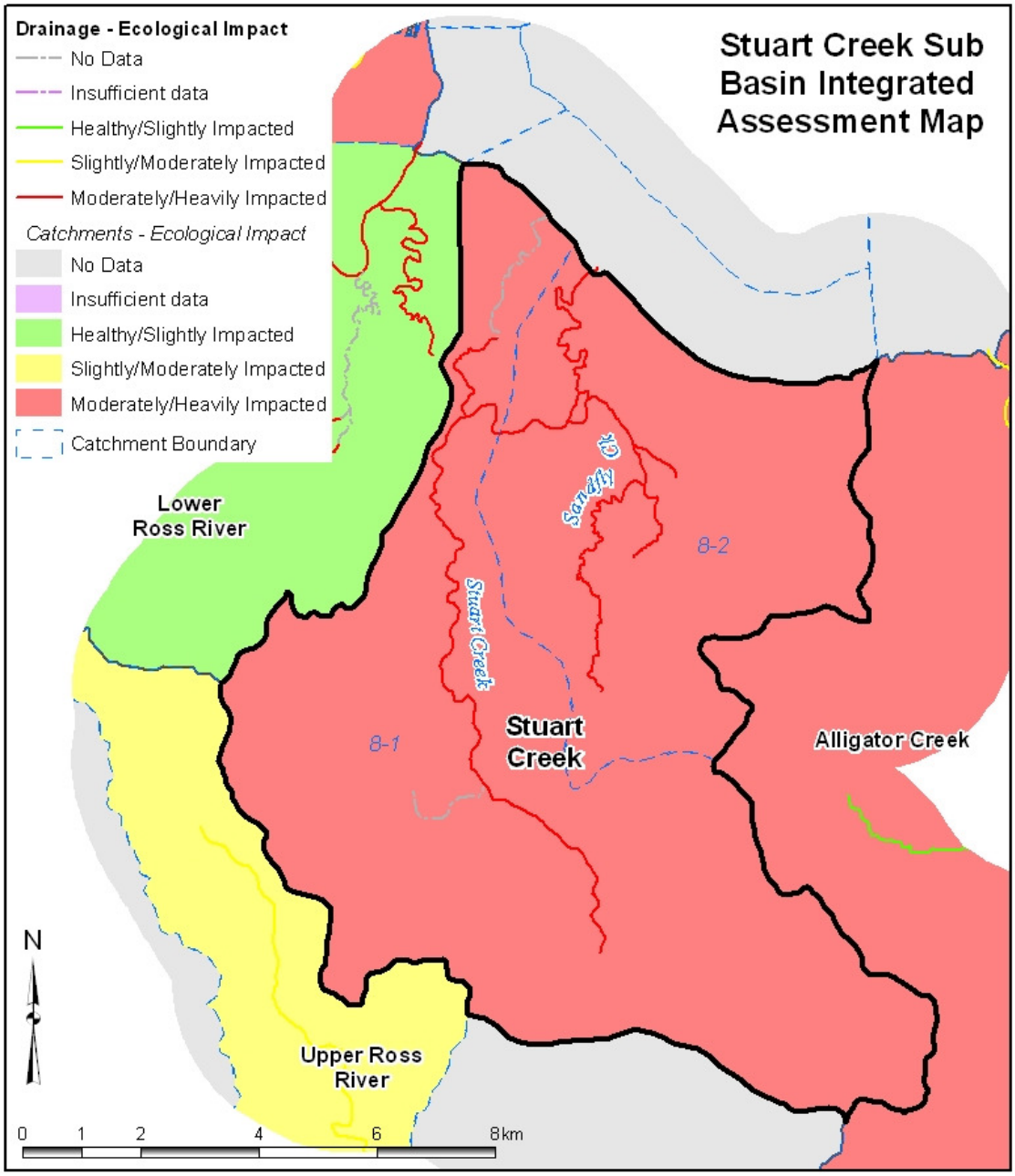
Land Use	Stuart Creek (8-1)		Sandfly Creek (8-2)	
	Ha	%	Ha	%
Conservation and natural areas	1,808	27	1,261	35
Grazing	4,130	61	923	25
Rural residential	87	1	14	0
Intensive agriculture	107	2	247	7
Urban	365	5	381	10
Water and wetlands	229	3	818	22
Totals	6,727	100	3,644	100

12.4 Stuart Creek Sub Basin Resource Condition

The Black Ross WQIP area water quality condition assessment (Connell Wagner 2008) indicated that the water quality of this sub basin was heavily impacted (see Figure 12.4), with high levels of nutrients and suspended solids.

However this data is unlikely to be representative of the entire sub basin as the main data source for this area is the water quality monitoring associated with the Cleveland Bay sewage treatment plant, at the lower end of the catchment.

Figure 12.4 Stuart Creek 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)

12.5 Water Quality and Water Quality Objectives (WQOs)

In general, the water quality condition data for the sub basin does not meet the WQOs for most of the water quality indicators (see Table 12.7). It should be noted that the water quality data for Sandfly Creek is not up to date and may not be a true reflection of current water quality condition of the catchment.

The water quality data from Stuart Creek indicates above average concentrations of all water quality indicators, with the exception of dissolved inorganic nitrogen (DIN), and shows the need for more rigorous analysis of the water quality data for this catchment.

Table 12.7 Comparing WQOs with Water Quality

Stuart Creek Sub Basin	DIN	Org N	TN	FRP	TP	TSS
Stuart Creek 8-1	√* 50%	X 19%	X 42%	X 295%	X 160%	X 420%
[1]Sandfly Creek 8-2	X 875%	X 233%	X 308%	ND	X 820%	X 150%

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)]