TABLE 5.4

RIVER REHABILITATION PLAN

REACH PRIORITISATION, STRATEGIES AND OBJECTIVES

REACH	DESCRIPTION OF REACH	PROBLEMS (In Priority Order)	POSSIBLE STRATEGIES	MEASURABLE OBJECTIVES
PRIORITY 1 – PROTECTED REACHES IN GOOD CONDITION THROUGHOUT (Preserve and Restore)				
Booloumba 1 Scrub(by) 1	Peters, Bundaroo and Booloumba Creek Catchments in the Conondale Range National Park (NP) and Scientific Area in State Forest (SF)	1. Slight blockage to fish passage and turbidity associated with road and track crossings 2. Need to manage/preclude recreation vehicle use to protect banks esp. motorcycle in Gheerulla	FA WD VA (recreational areas)	1. To protect and maintain the catchment in intact condition of national conservation significance 2. No loss of endangered species 3. Reduce turbidity to ambient levels and ensure adequate fish passage on all road/track crossings by 2005. 4. Ensure controlled safe access points to waterways near moderate to high intensity recreational locations, with exclusion fencing and revegetation of any previously disturbed banks, by 2005.
Gheerulla 1	Gheerulla Creek Headwaters, section in State Forest protected under RFA process			
Belli & Cedar 1	Belli & Cedar Creek Catchment Headwaters, Sate Forest protected under RFA process			
Kandanga 1	Kandanaga Creek Headwaters, section in State Forest protected under RFA process			
"Lagoons" Wetlands	This is an "Remnant" in Scrubber Ck.-Tinana 2 and is protected as a Scientific Area in State Forest			
#Wide Bay 1 (pt)	Headwaters of Wide Bay Ck, State Forest protected under RFA process			
#Munna West	Headwaters of Running, Sandy, Thunder and Joseph Creeks protected in NP and under RFA.			
#Munna 1 (pt)	Some tributaries in headwaters of Munna and Eel Creeks protected by RFA process.			
PRIORITY 2– UNPROTECTED REACHES OF REGIONAL CONSERVATION SIGNIFICANCE (Protect and Reclaim)				
Geraghty's 1	Entire length of headwater stream from Witta to where it meets Mary 1 at the head of the valley.	1. Impact of un-managed cattle access 2. Small to moderate understorey disturbance and environmental weed problems of limited spatial distribution. 3. Occasional clearing of riparian zone	VA VB VC (understorey & >diversity)VD VE (Stock & recreation areas) FA FC WD	1. All existing habitats of species of regional significance to be conserved and restored by the year 2005. 2. Incentive programs will have resulted in 75% of regional conservation assets in private ownership being covered by voluntary conservation agreements by the year 2011. 3. All potential habitats of species of regional significance to be rehabilitated and populations of target species present by the year 2011. 4. Action to reduce the threat from invasive environmental weeds commenced by 2001, invasion minimised throughout target reaches by the year 2005 and completely controlled by the year 2011. 5. Development of Environmental Flow Strategies on all dams and major weirs commenced by 2001 and implemented by 2004. 6. Water quality in terms of physico-chemical parameters and biological indicators to meet relevant standards for unimpacted streams by the year 2011 (eg. SIGNAL score =>6), with gradual improvements recorded every two years. Turbidity increases in first flush after storms to increase less than 10%. 7. Riparian zones on all grazed land fenced by the year 2011, at a rate of 10% of the required length achieved each year.
#Scrub Turkey 1	Tributary of Tinana linking to Mt Bauple NP			
#Oaky	Tributary of Gutchy in Regional Ecosystem			
#Benarige	Tributary of Mary 12 in Regional Ecosystem, includes part of Myrtle Creek			
#Munna 1 (pt)	Headwater Tributary of Munna in Regional Ecosystem			
Obi Obi 3	Baroon Pocket Gorge starting at Gardners Falls NP breaking at Dam and ending at Gorge.	Above plus 4. Large hydrologic impact below dams, may threaten remnant cod populations. 5. Low DO possibly linked to abstraction during late summer. 6. Minor nutrient enrichment problems	Above plus FB FD FE FF FG WE WF WH PC	
Belli & Cedar 2	From base of Steep headwaters in State Forest to confluence with Mary 6 at Tuchekoi.			
Six Mile 2 Six Mile 3 Six Mile 4	From just below Lake Macdonald dam to the confluence of the small tributary at Woondum.			
Tinana 2	From Mt Tagigan to Teddington Weir the creek flows through State Forest for a large part.			

REACH	DESCRIPTION OF REACH	PROBLEMS (In Priority Order)	POSSIBLE STRATEGIES	MEASURABLE OBJECTIVES
PRIORITY 2– UNPROTECTED REACHES OF REGIONAL CONSERVATION SIGNIFICANCE (Protect and Reclaim) Continued.				
Mary 14 Including Susan River and adjacent tidal tributaries	Tidal estuary from Saltwater Creek to River Heads.	1. Impacts from upstream catchment including sedimentation and nutrient enrichment. 2. Potential reduction in estuarine productivity through lack of specific environmental flow regimes and fish ladders on dams. 3. Potential instability if extraction rates are not sustainable, and local water quality impacts if management practices inappropriate 4. Hazards associated with mismanagement of Potential Acid Sulfate Soils 5. Minor riparian disturbance	VA VB VD VE FB FE WA WB WC WG PB G2 G3	1. Quality of flushing flows improved by 5% per annum. 2. Development of Environmental Flow Strategies on all dams and major weirs commenced by 2001 and implemented by 2004 3. Fish ladders installed on tidal barrages by 2005. 4. All urban and rural point source pollution sources to meet EPA limits by 2005, all urban pollution treatment systems to achieve tertiary standard for water re-entering waterways by 2011. 5. No incidence of disturbance of Potential Acid Sulphate Soils without appropriate management protocols in accordance with DNR standards. 6. Riparian zones on all grazed land (where cattle access is likely) fenced by the year 2011. At a rate of 10% per annum. 7. Increased spatial distribution of sea grasses, wader bird habitat to restore habitat values to 100% of available niche by the year 2011. 8. Audit of state forest management practice revealing 100% compliance with code – ongoing.
PRIORITY 3 - REACHES OF LOCAL CONSERVATION VALUE (Protect and Rehabilitate)				
Mary 1	Headwaters of the Mary River from Near Reesville to the valley floor at Bellthorpe.	1. Impact of un-managed cattle access 2. Small to moderate understorey disturbance and environmental weed problems of limited spatial distribution. 3. Water quality problems which may be exacerbated by inappropriate abstraction (eg. Tinana C. low DO in late Summer, Gutchy Ck and others in lower Mary with high salinity) 4. Bank instability and turbidity from disturbance of dispersive soils (eg.Gheerulla Ck and Gutchy Ck) 5. Forest Practice on steep lands may be leading to siltation of waterways (esp. Little Yabba).	VA VB VC VD VE FA FD FC FE FF FG WE WF WH PC	1. All existing/potential habitats of species of regional/local significance to be rehabilitated by the year 2011 and populations of target species present by the year 2015. 2. Incentive programs will have resulted in 75% of regional and 50% of local conservation assets in private ownership being covered by voluntary conservation agreements by the year 2011. 3. Riparian zones on all grazed land (where stock access is likely) is protected through management controls on use by the year 2011. At a rate of 10% per annum. 4. Action to reduce the threat from invasive environmental weeds commenced by 2001, invasion minimised throughout target reaches by the year 2011 and completely controlled by the year 2015. 5. Water quality in terms of physico-chemical parameters and biological indicators to meet relevant standards for unimpacted streams by the year 2011 (eg. SIGNAL score =>6), with gradual improvements recorded every two years. Turbidity increases in first flush after storms to increase less than 10%, no fish kills from low dissolved oxygen, and no increase in salinity of streams. 6. All banks stabilised and all gaps in canopy closed vegetated by 2011, at a rate of 10% per year. 7. All primary producers to comply with Environmental Codes of Practice with respect to wastewater and erosion control by the year 2005. 8. Audit of state forest management practice revealing 100% compliance with code – ongoing.
Mary 3	Mary River from Kilocy Creek Confluence to Conondale township.			
Elam 1	Elaman Creek - entire length			
Lit Yab 1 Lit Yab 2	From headwaters to the the Mary R. near the Kenilworth Forest Station.			
Gheer 2	Gheerulla Ck headwaters in State Forest to the confluence with the Mary below Kenilworth			
Scrubby Gymp	Scrubby Creek west of Gympiefrom headwaters to confluence with Mary 10.			
Tinan 1	The headwaters of Tinana Creek from the various range escarpments through to Mt Tagigan.			
Gutchy 1,2,3	The entire length of Gutchy Creek			
#Tinan 2 Tribs	Eastern Tributaries of Tinana Creek from near Oaky Creek north to Mt Bauple area.			
#Myrtle	From Headwaters to just upstream of confluence with Benagerie Creek			
#Munna 1 (pt) &	From end of protected headwaters to above confluence of Eel Creek Creek (incl. Tributaries)			
#Munna 3 Tribs	Running, Sandy & Thunder Creeks from end of protected headwaters to confluence with Munna 3			
#Saltwater	From headwaters to confluence with Mary 14			
#Bunya 1	From headwaters to beginning of Regional Ecosystem			

REACH	DESCRIPTION OF REACH	PROBLEMS (In Priority Order)	POSSIBLE STRATEGIES	MEASURABLE OBJECTIVES
PRIORITY 4 - DETIORATING STRATEGIC REACHES (Rehabilitate and Stabilise) (Strategic in terms of being in water supply catchments, have the potential to trigger off-site impacts, and having active Catchment Care programs)				
Obi 1, Obi 2	From the headwaters of the Obi Obi Ck near Witta, through Maleny to the Gardner's Falls NP, above Baroon Pocket Dam.	1. Elevated nutrients levels from catchment land-use, stock access and fragmented poor riparian buffers leading to poor water quality, blue-green algae blooms and colonisation of aquatic weeds. 2. Bank instability resulting from riparian clearance, cattle tracking (and other reasons) potentially increasing sedimentation of waterways. 3. Invasion of woody and viny environmental weeds eg. Camphor laurel, cat's claw and privet impacting on aquatic ecology. 4. Loss of endangered turtle habitat in Mary 12 reach with little evidence of new cohorts in past 3 years. 5. Boat wash may accelerate bank erosion in Mary 12 dispersive soils. 5. In Amamoor 2 and 1st and 2nd order streams aggradation and infilling from sediment transport over eroding hillslopes and cultivations.	VA VB VC VD VE FD (in good remnants or 10yrs after rehabilitation as trial) FG WA (Obi 2 only) WB (Obi 2 only) WC WE WG PC PH PI G1 G2 G3	1. Riparian zones on all grazed land (where stock access is likely) is protected through management controls on use by the year 2011. At a rate of 10% per annum. 2. Action to reduce the threat from invasive environmental weeds commenced by 2001, invasion minimised throughout target reaches by the year 2011 and completely controlled by the year 2015. 3. Water quality in terms of physico-chemical parameters and biological indicators to meet relevant standards for unimpacted streams by the year 2011 (eg. SIGNAL score =>6), with gradual improvements recorded every two years. Turbidity increases in first flush after storms to increase less than 10%, no fish kills from low dissolved oxygen, and no increase in salinity of streams. 4. All banks stabilised and all gaps in canopy closed vegetated by 2011, at a rate of 10% per year. 5. All primary producers to comply with Environmental Codes of Practice with respect to wastewater and erosion control by the year 2005. 6. Rivercare Plans and subcatchment management plans completed by the year 2006 at a minimum rate of 1 per year. 7. All urban point source pollution sources and stormwater management systems to meet EPA guidelines by 2005, all urban pollution treatment systems to achieve tertiary standard for water re-entering waterways by 2011. 8. No additional allocation of water outside of the attachment over that which has currently been agreed to, unless a WAMP identifies that this can be achieved in a sustainable fashion. 9. Mary River Turtle resident and breeding in Mary 12 reach by the year 2005. 10. Input of sediment from hillslopes and cultivation in aggrading lower order streams and Amamoor 2 will have been minimised by 2015.
Yabba 1 Yabba 2	Yabba Ck From headwaters near Kilcoy through to Borumba Dam wall.			
Six 1	From the headwaters of Six Mile Ck at Mt Cooroy to just below Lake MacDonald .			
Deep 1	Headwaters of Deep Creek in Beenham/ Mothar Mtn Range to just below Cedar Pocket Dam.			
#Wide Bay 1 (pt) & #Wide Bay 2 (pt)	From protected headwaters to Kilkivan town water supply weir			
#Munna 2	From above confluence of Eel Creek to confluence of Thunder Creek .			
Mary 12	The ponded area just upstream of Tiaro to the tidal barrage at Tinana.			
Amamoor 2	From end of steep Headwaters to just above Amamoor Township			
Degrading 1st & 2nd Order Streams	Degrading creeks (with 1 or no tributaries coming from them) throughout the catchment.			
PRIORITY 5 – LINKING REACHES AND SIGNIFICANT REMNANT SECTIONS (Rehabilitate) (Linking reaches include those linking good tributary cod habitat to the river for migration)				
Mary 2	Mary River from Geraghty's Ck to just below Kilcoy Ck linking local conservation reaches.	1. Invasion of woody and viny environmental weeds eg. Camphor laurel, cat's claw, madeira vine and lantana impacting on aquatic ecology. 2. Highly regulated flow regimes below dams (Obi 4, Yabba 3,4). 3. Bank slumping and instability resulting from riparian clearance stock access and removal of LWD. 4. Elevated nutrient levels resulting form intense agricultural activities on floodplain.	VA VB VC VD VE FA FB FC FD FE FF FG PC WE	1. Riparian zones on all grazed land (where stock access is likely) is protected through management controls on use by the year 2020. At a rate of 5% per annum. 2. Action to reduce the threat from invasive environmental weeds commenced by 2001, invasion minimised throughout target reaches by the year 2015 and completely controlled by the year 2020. 3. All banks stabilised and all gaps in canopy closed vegetated by 2020, at a rate of 5% per year. 4. All primary producers to comply with Environmental Codes of Practice with respect to wastewater and erosion control by the year 2005 5. Rivercare Plans for each reach completed by the year 2011 at a minimum rate of 1 per year commencing from 2006. 6. Incentive programs will have resulted in 50% of local conservation assets in private ownership being covered by voluntary conservation agreements by the year 2020. 7. Water quality in terms of physico-chemical parameters and biological indicators to meet relevant standards for streams with minor impacts by the year 2011 (eg. SIGNAL score =>5), with gradual improvements recorded every two years.
Obi 4	Obi Obi Ck starting at the valley floor below the Baroon Pocket escarpment to the Mary River.			
Yabba 3 Yabba 4	Yabba Creek below Borumba Dam through town and linking turtle/lungfish habitat to Mary River.			
Kand 3	Kandanga Ck starting at Happy valley linking the narrow forest valley to the Mary River at reach 9.			
Amam 3	Amamoor Ck from Red gully above township linking cod habitat to the Mary River at reach 9.			
Six Mile 5	Six Mile Creek from confluence of small tributary at Woondum to Mary River.			
#Glastonbury 4	From just downstream of Glastonbury township to confluence with Mary 11			
#Widgee 3	From just upstream of confluence of Station and Little Widgee Creek to confluence with Mary11.			
#Munna 3	From confluence with Thunder Creek to confluence with Mary 11 at Miva.			
'Remnant' in Mary 5	Narrow section of remnant channel in Mary River just above confluence of Walli Creek.	1. Isolated remnants which represent an Asset in otherwise degraded reaches, which hold the key to previous riparian species mix etc, but which are subject to large edge effects., including weed invasion, stock access etc. 2. Bed instability, channel widening increases stream power causing bank instability below remnants	VA VB VC VD VE FD PB PD PE PF PH	Objectives 1,2 and 6 above.
'Remnants' in Mary 7	Remnant pool and vegetation upstream and just downstream of Walker's & Pickerings Bridges.			
'Remnant' in Mary 9	Remnant rainforest plot at 'The Dawn' between Traveston Crossing and Gympie on the Mary R.			
'Remnant' in Mary 10	Mary River adjacent to the Fisherman's Pocket State Forest upstream of Bell's Bridge.			
'Remnant' in Mary 11	Good remnant vegetation around the confluence of Gutchy Creek with the Mary River near Tiaro.			

PRIORITY 6 - REACHES WITH MODERATE RECOVERY POTENTIAL (Stabilise)

Mary 5	Mary River from Cambroon to just upstream of Walli Ck confluence.	1. Moderate riparian due to historic practices and stock access 2. Moderate bank instability due to 1. and 2. above. and accelerated meander migration. 3. Moderate water quality problems with respect to turbidity and nutrient levels. 4. Bed instability due to historic influences and over extraction of sand & gravel (Mary5,8). 5. Hydrologic and sediment changes as a result of barrages including increased tidal amplitude and reduction in environmental flows (Mary 13, Tinan 4)	VA VB VC VD VE FB FD FG WE WF PA PB PD PE PF PG G1	1. Riparian zones on all grazed land (where stock access is likely) is protected through management controls on use by the year 2030. At a rate of 3% per annum. 2. Action to reduce the threat from invasive environmental weeds commenced by 2001, invasion minimised throughout target reaches by the year 2020 and completely controlled by the year 2030. 3. All banks stabilised and all gaps in canopy closed vegetated by 2030, at a rate of 3% per year. 4. All primary producers to comply with Environmental Codes of Practice with respect to wastewater and erosion control by the year 2005 5. Rivercare Plans for each reach completed by the year 2017 at a minimum rate of 1 per year commencing from 2011. 6. Incentive programs will have resulted in 50% of local conservation assets in private ownership being covered by voluntary conservation agreements by the year 2030. 7. Water quality in terms of physico-chemical parameters and biological indicators to meet relevant standards for streams with minor impacts by the year 2025 (eg. SIGNAL score =>5), with gradual improvements recorded every two years.
Mary 8	Mary River from one meander downstream of Walker's Bridge to upstream of Tuchekoi Bridge.			
Mary 13	Mary river from the tidal barrage to the estuarine inlet at the confluence of Saltwater Creek.			
Deep 2	Deep Ck from Cedar Pocket Dam to the confluence of North Deep Creek.			
Tinan 4	Tinana Ck from the tidal barrage to the Mary River downstream of Maryborough.			
Kand 2	Kandanga Ck from the headwaters the forestry to Hygait where the valley opens up.	1. Invasion of woody and viny environmental weeds eg. Camphor laurel, cat's claw, madeira vine and lantana impacting on aquatic ecology. Plus 2,3,4 above	As above	
#Glastonbury 1,2,3	From headwaters to just downstream of township			
#Station Ck	Entire length			
#Little Widgee	Entire length			
#Wide Bay 2,3,4	From Kilkivan town weir to Mary 11 confluence			
#Teebar Ck	Entire length			

PRIORITY 7 REACHES WITH LITTLE CHANCE OF NATURAL RECOVERY (Stabilise)

Mary 4	Mary River from Conondale township to just upstream of Cambroon.	1. Bed instability and channel widening due to historic influences and over extraction of sand and gravel resources. 2. Severe riparian disturbance as a result of historic practices and stock access 3. Severe bank instability due to 1. and 2. above accelerated meander migration., regressive erosion, rapid drawn down etc. 4. Moderate water quality problems with respect to a range of parameters and major problems with turbidity after storms. 5. Significant depletion of aquatic habitats due to all of above , and removal of LWD, regulation of flow, construction of weirs etc.	VA VB VC (start with high visibility VD sites & next to good VE remnant patches) FB FE FF FG WA WB WC WE WF WG PA PB PD PE PF PG PH G1 G2 G3	1. Riparian zones on all grazed land (where stock access is likely) is protected through management controls on use by the year 2050. At a rate of 2% per annum. 2. Action to reduce the threat from invasive environmental weeds commenced by 2001, invasion minimised throughout target reaches by the year 2030 and completely controlled by the year 2050. 3. All banks stabilised and all gaps in canopy closed vegetated by 2050, at a rate of 2% per year. 4. All primary producers to comply with Environmental Codes of Practice with respect to wastewater and erosion control by the year 2005 5. Rivercare Plans for each reach completed by the year 2026 at a minimum rate of 1 per year commencing from 2018. 6. Incentive programs will have resulted in 50% of local conservation assets in private ownership being covered by voluntary conservation agreements by the year 2050. 7. Water quality in terms of physico-chemical parameters and biological indicators to meet relevant standards for streams with minor impacts by the year 2050 (eg. SIGNAL score =>5), with gradual improvements recorded every two years. 8. All urban point source pollution sources and stormwater management systems to meet EPA guidelines by 2005, all urban pollution treatment systems to achieve tertiary standard for water re-entering waterways by 2011. 9. No additional allocation of water outside of the attachment over that which has currently been agreed to, unless a WAMP identifies that this can be achieved in a sustainable fashion. 10. Mary River Turtle no longer endangered by 2025 and resident and breeding throughout the Mary by 2050. 11. . Mary River Cod no longer endangered by 2011 and resident and breeding throughout the Mary by 2050.
Mary 6	Mary River from Walli Creek to near confluence of Beattie Ck below Kenilworth near Gheerulla.			
Mary 7	Mary River Kenilworht-Gheerulla to Moy Pocket one meander downstream of Walkers Rd. Bridge.			
Mary 9	Mary River just upstream of Tuchekoi Bridge to Normanby Bridge at Gympie			
Mary 10	Mary river from Gympie to the confluence of Glastonbury Ck upstream of Bells Bridge.			
Mary 11	From Bell's Bridge to the beginning of the ponded area upstream of Tiaro.			
Deep 3	Deep Ck from the junction of east and north branches to the confluence with the Mary River.			
Tinan 3	Tinana Creek between the Teddington Weir and the Tidal Barrage.			
All of above categories			G4 G5 G6 G7 G8	

NOTE: Reaches Marked thus #, have been given provisional priorities based on previous research and limited field investigation, and may be subject to change pursuant to more detailed survey.