Table for Workshop – What are the main impacts / vulnerability in your sector / area / ecosystem and adaptation options?

Sector	**Area**	**Ecosystem**	**Impacts**	**Ideas to manage**	**Adaptation Research**	**Impediment**
Local Government	• West of the Dividing Range • Veg protection • Highly productive agricultural land	• Highly fragmented • 5 EPBC listed communities ➢ many more species • Bio-corridors • 23% veg left • Brigalow Belt, SEQ, New England, Tablelands Bioregions • Escarpment	• Urbanisation ➢ balance • Managing for extreme events • Good quality Agricultural Land • Strategic Cropping Land Legislation • Mining	• Planning Scheme • Local Law • Non-stat means • Partnerships Enhancement	• What options do we have? • Have to conserve biodiversity and road reserves • Better mapping in particular species • How to get the best out of enhancement options	• Community views • Politics • Costs vs Benefits • Effectiveness of enhancement • Effectiveness of regulatory means • Enhancement • Should local govt be involved in state govt business ➢ Duplication • Allowing development
National Park	• Mitchell Grass	• Grassland	• Pastoral grass invasion ➢ Feedback loop • Changed fire	• Regulate introduced species • Manage spread • Manage burning	• Burning regime • “Acceptable” introduced species list	• Park neighbour relationships • Agricultural drive to

			regimes	• Holistic management plan • Rehabilitation	• Rehabilitation research	introduced species • Lack of regional parks staff
Conservation WWF	• National	• All	• Loss of critical habitat needed to survive/adjust to climate change	• Tighten laws to protect critical habitats • Bring critical habitats into protected areas • Increase resourcing and target to critical habitat protection	• Identify future critical habitats and refugia • Identify species not yet protected by law that are threatened by global warming	• Opposition from agriculture driven sector
NGO	• Queensland	• Wetland/coastal habitat	• Coastal development • Marine developments • Sea level rise	• Strengthen the Queensland Coastal Plan which is in draft, address the excessive number of Maritime Development Areas in the Plan	• Movement of wetlands work similar to work from Lovelock	• Development industry lobby •Political will • Roads • Injurisons??? affection Local government need power to address compensation claims

Science Academic	• Coastal wetlands	• Wallam	• Change hydroperiod • Sea level rise • Coastal Development	• Protect large areas • Expand protected areas on coastline • Roads and highways	• What areas will they move to? • What are the physiological and physical constraints	• Urban and rural development controls • Roads • $ for research for management
Science	• Karawatha	• SEQ lowland eucalyptus	• Change hydroperiods • Change fire frequency	• Pond manipulation • Public education • Fire management	• Which ponds and where physiological needs monitoring	• $ for research • $ for education • $ for reserve management
Science	• Carrawinga	• Mulga	• Ferals & Bilby's •Lack of water	• Feral control • Bore closure in entire Artesian Basin		• $ for QPWS managers • Political will in rural landscape
Science	• Lake Broadwater • Dalby	• Brigalow • Pilliga forest	• Fragmentation • LNG mining • Coal Seam Gas	• Connect with adjacent forested areas • Protect the above	• PVA of threatened species	• $ to buy land

				• Block cane toads corrridors		
Local Government	• SE Qld	• All	• Fragmentation x Climate Change • Extreme events • Declining Resilience	• Improved Planning • Increased strategies • rehab/acquisition • Community awareness	• Offset values • Role of natural ecosystems mitigating extreme event risk • Baseline/system tolerance • Refugia ➢ Where ➢ How big ➢ Resilience to weeds, etc.	• Resources for management • Development planning focus at present (DA processes) • Inju-ious affection • State-local govt planning interactions, conflicts • Lack of Public Awareness
Mining	• Central Qld ➢ Surat ?? ➢ Bowen ➢ Gallee ??	• Ground water dependent systems • R & T Ecosystems	• Climate Change x clearing interactions • Increased rainfall variability • Decreasing water availability	• Improved Risk Management approach • More efficient resource sharing (land & water) • Improved TBL Integration	• Integration research • Climate Change impact on biodiversity on top of exiting pressure ➢ Priorities R.E. for	• Historical arrangements • Benefit/cost sharing arrangements • Global climate change >> social >> Env.

					protection/ critical habitat	
Conservation Reserves	• SE Qld	• Fire prone ecosystems	• Climate Change x Management of Fire Risk	• Explicit identification of biological burning vs asset protection property • Integration at landscape level (beyond reserves) • Integrated Planning • Central Data Management	• Improved monitoring of fire management ➢ Evaluation	• Information on Planning • Lack of cross sector coordination • Resources
Regional NRM Fire Management	• SW Qld	• Woodlands/ grasslands • Mulga/ Brigalow	• Understory changes • Release of Climate Change species composition • Fire Intensity	• Establish desired Fire Regime • Develop principles for fire management • Defining management objectives	• Regionally specific fire research at the right scale with a monitoring regime • Best Practice Techniques	• Lack of knowledge base/ research • Education of landholders • Diversity of values • Resources • Systems understanding/ species

						requirements
Urban Habitat Fragmentation	• SE Qld	• All ecosystems – Forest to wetlands	• Population isolation/ restriction • Loss of genetic diversity • Edge effects • Inability to disperse • Direct loss of species	• Land Use Planning/Design • Control of introduced species • Veg clearing legislation • Strategic acquisition • Restoration management • Improved private land • Duty of care management • Replace connectivity	• What conservation network do we need to mitigate against climate change? • Community/ social engagement/ understanding	• Time frames urgency • Priority of development • Housing affordability • Money for acquisition/ rehabilitation • Political will
Landscape Coal Seam Gas	• Western Qld	• All groundwater dependent ecosystems, rivers, marine	• Subsidence • Salinity • Lower groundwater • Aquifer contamination • Changed hydrology • Habitat	• Conservation Zoning • Buffer zones • Offsets no habitat loss • Water management • Water quality guidelines	• Regional conservation planning • New methods of extraction • Beneficial use of water • Social impacts • Ecosystem	• Too big as a global issue • Royalties not returned • Toothless legislation, weak EIS • Jobs/economy more imperative

			fragmentation • Port infrastructure	• Ecosystem services • Polluter pays	service valuation	than environment • Valuing ecosystem services • National economic security • Historical mindset/greed
City Council	• SE Qld	• Eucalyptus woodland	• Koala/greater glider • change in diet quality	• Target refuge areas	• Feeding ecology • Tree physiology • (Koala Foundation ??)	• Money/time urgency
NGO	• All Qld	• All	• Exacerbation of Habitat loss	• Corridor establishment • Removal of perverse incentives For clearing	• Decision making tools for land use • Conservation decisions – which land to be added	• Money -$300K • Expertise
NGO	• All Qld	• All	• Exacerbation of invasive species problems	• Increase surveillance • Increase assessment “commercial	• Native pasture plant assessment • Cons effectiveness of containments vs	• Bottomless pit for $$ • Communication of results to public

				pests" – where one man's pest is another man's crop • Reconcile introd. philosophies • Protected industries eg. aquarium fishes	exclusion • Weed response to climate change	
Science	• Qld	• Agr. ecosystems	• Cropping • New exotic crops • Change in irrigation abandonment marginalised belt • Grazing • Short d__??, higher intensity • Impacts of mistakes • Changes in landscapes > biodiversity • Rapid shifts in grazing impacts	• More perennial cropping • Sow native species • Manage abandoned pastures • Landscape water > env. flows • Dryland planting intensity	• Cropping trials • Biodiversity/ agriculture interactions	• Lack of effective communication • Media polarisation/ simplification
Resources	QLD	RF	• High elevations at	• Reduce other	• Widescale	• State boundaries

			risks	stressors • Translocation • Latitudinal	comp_____?? > monitoring	moving
Research	• SE Qld	• Eucalypt woodland • Wetlands • Frogs	• Rainfall variability affecting reproductive success	• Increasing diversity and amount of habitat with reserve systems • Active management of hydroperiod within existing breeding areas (adding water, restructuring depth of ponds)	• Develop frog breeding habitat index at local scale to rand importance of new reserves • Develop understanding of influence of hydroperiod across frog species	• Money • Lack of knowledge of appropriate GIS tools
Conservation Planning	• SE Qld • Local government	• All within local government jurisdiction	• How can we come up with a conservation reserve system that will adequately represent regional ecosystems under future climate change scenarios. i.e. Will	• Acquire areas that are likely to be suitable habitat for ecosystems in future (regardless of their current state) • Establish how the existing reserve	• Development of predictive models to establish where ecosystems will move or change • Cost benefit analysis of decision making about which land	• Money • Political and social opposition to selling off unviable expensive and underproductive reserves • Scale of

			"ecosystems" shift in the future and what do we need to preserve now?	system will change under climate change – will reg. ecosystems be adequately conserved in the future	to acquire and which reserves to drop due to them becoming unsuitable in the future	knowledge need (i.e. number of species, number of interactions) • Uptake of new knowledge
Policy and Planning	• SE Qld	• All urban Rfst.??	• Invasive species impacts on biodiversity – exclude natural regeneration and growth. Some increase density, some decrease, new invasive species	• Increased active control methods • Identification (early) of new threats	• Interactions between species – community flow on effects • Disease spread research (vectors?) • Climate modelling for existing invasive species • Id most likely threats from overseas species	• Sheer scale of exercise
Fisheries Management	• East Coast	• Estuaries	• Cyclones • Floods > flow regime changes • Over-harvesting	• Water quality improvement ➢ Agricultural ➢ Urban	• Research – polluter & run-off • Socio-ecological	• Attitudes • Impacted stakeholders

			• Run-off	• Protection areas	impacts of management change	
Local Council	• SE Qld • Logan Council	• All within SE Qld	• Habitat fragmentation • Water quality • Drought > fire regimes/ management	• Changed of behaviour • Water tanks • Population caps • Climate Change policy	• Vulnerable species & habitats & keystone species • Translocations • Banners to behavioural change	• Attitudes • Institutional limitations
NRM Body	• Condamine Catchment	• Waterways • Grazing land • Cropping • Intensive rainforest • Eucalypt • Grasslands	• Drought • Land use • Secondary Miners?? • Water regime shifts • Increasing/per urban grazing/ development ➢ Changes in availability of nectar ➢ Monitoring	• Change in landuse • GM crops • Rehabilitation	• Changes in invasive species • Resilience and response of threatened communities • Relative significance of invasive species	• Funding Attitudes • Incentive schemes for biodiversity?

Research	• SE Qld	• Rainforest	• Rainfall • temperature • Distribution shifts • Habitat change	• Vulnerability assessment to determine which species at risk of Climate Change ➢ Priority species to manage	• In situ habitat management • Cool refugia mapping • Assisted distribution (translocations)	• Funding • Landholders • Politics
Research	• SE Qld	• All urban	• Rainfall • temperature • Distribution shifts • Habitat change • Human response built env.	• Decision tool for planning and policy re. reserve/ urban design under Climate Change	• Develop predictive process for identifying habitat shifts and designing cost efficient reserve networks which protect future habitats	• Funding • Landholders • Politics • Species knowledge/data • Climate data
Data Management	• National	• All	• Lack of knowledge sharing and incorporation	• Strategy for collaboration between stakeholders	• Communicate ANDS ➢ Systems & processes • Raise awareness	• Resources • Policy

Local government	• Redlands	• Coastal	• Sea level rise • temperature • Flooding, storm surge • Distinction changes in coastal vegetation • Human impacts	• Urban planning through buffers • Stronger legislation ➢ State planning policy	• Landscape design research • Monitoring • Current action effectiveness • Hard science • Communicating science	• Budget • Legislation • Lack of research • Science-Policy gaps • Politics & community
Local government	• Brisbane	• Mixed urban dom.	• Sea level rise • temperature • Flooding, storm surge • Distinction changes in coastal vegetation • Human impacts • Extreme events, fire and drought, storms • Weeds and ferals • loss of biodiversity terrestrial & aquatic	• Retain wildlife corridors & extend • Habitat management (weeds, fire & feral) • Increase resilience • Strategies & legislation • Consolidated approach for management • Community education and engagement • Greater internal	• Priority areas for management • Connectivity options • Social research for effective community education • Local species monitoring	• Policy • Communication • Large organisations/ depts. working separately with smaller scope. Time to actually make change before tipping points • Political will • Community apathy

				collaboration to extend & strengthen env. programmes		
Government	• SE Qld	• All	• Temperature impacts on resilience • Rainfall • Sea level rise impacts on resilience	• Improve connectivity • Habitat protection & restoration • Human behavioural change • Adaptive management	• Governance/ institutional change • Predictive models of ecological & social systems • How to drive behavioural change - incentives • Risk assessment	• Money/ funding structure (short term research) not strategic • Institutional failure • Rewards at universities • Skills shortage
Local government	• SE Qld	• Coastal systems	• Sea level rise • Extreme events	• Allowing landward migration • Restricting developments	• Identifying vegetation responses to sea level rise • Socio-economic responses • Horizon scanning	• Competing priorities • Govt constraints • Cost • Social values