Integrated Catchment Management and Natural Resource Management:

A case study of the Little Swanport

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Declaration

This thesis contains no material which has been accepted for the award of any other degree or diploma in any tertiary institution, and to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference is made in the text of the thesis.

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Abstract

In Tasmania's Little Swanport catchment there has been 12 years of diverse effort in research, planning and implementation to progress integrated catchment management (ICM), and natural resource management (NRM). Those labours provide an opportunity to reflect upon how to improve prospects for success in the application of ICM in that catchment; the lessons gained may have wider application given the national governance framework for NRM in Australia. The present study has four aims. The *first aim* is to present a critical analysis of the impacts of changes in the legislative, policy and administrative frameworks of NRM at national, state and local government levels. That analysis is informed by and sympathetic to the literature on adaptive management. The *second aim* is to elaborate upon a case study of on-ground initiatives at catchment and property scales in the Little Swanport catchment that embrace specific ICM and more general NRM strategies. That case study was based on qualitative research methods and especially those indebted to my ethnographic and action-research interventions as a participant researcher working in both the catchment and broader NRM policy circles in southern Tasmania. The *third aim* was to take insights from the critical analysis and fold them through those gained from the empirical work to gain an appreciation of how ICM is translated from policy to ground and with what effects for those involved in the process. The rationale for this three-step approach is that the Catchment Committee I have worked with was funded by the Australian Government through one of three regional NRM organisations, NRM South, to develop a whole-of-catchment and whole-of-ecosystem planning model for the Little Swanport that could be applied more widely throughout the region. Therefore, I am both a subject in and student of the process reported here. Qualitative research methods allow for this dual status. Findings suggest that stakeholders – federal and state governments, local councils and community members alike – did not fully consider a number of cultural and governance parameters and practices that are imperative to multilateral land management – among them trust, commitment and communication. Without such qualities being consciously present and maintained, evidence suggests that ICM processes were doomed to fail. To counteract such an outcome, my *fourth aim* was to identify what qualities might be necessary for the successful delivery of ICM in

southern Tasmania. These include genuine commitment to ICM for a determined length of time by key stakeholders, adequate resourcing to ensure the ongoing engagement of skilled locally based professional extension staff, and on occasion independent facilitators, a clearly articulated purpose for bringing stakeholders together, the creation of a framework and culture to facilitate trust, the development of a communication strategy and processes for conflict resolution. Additionally, ICM must be informed by research efforts identified by and involving local stakeholders. Realistic actions and expectations are essential – ones that recognise and respect the commitment and capacity for volunteers and paid staff. Finally, successful ICM requires a conscious adaptive management approach to enable a positive collaborative process, which results in behavioural change that maintains and improves the ecological, social and economic condition of the catchment in question.

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Finally I dedicate this work to my wonderful mother Juliane Kelly. Mum died in June 2006. She was determined to assist me in everyway to complete my studies and to fulfil all my dreams. I miss you mum.

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List of Acronyms

ALGA	Australian Local Government Association
CEO	Catchments Extension Officer
CfOC	Caring for Our Country
CMA	Catchment Management Authorities
CTC	Catchments to Coast
DPIW	Department of Primary Industries and Water
DPIWE	Department of Primary Industries, Water and Environment
DPIPWE	Department of Primary Industries, Parks, Water and Environment
ECDLMC	East Coast Drought Landcare Management Committee
EMPCA	Environmental Management and Pollution Control Act 1994
EMS	Environmental Management System
GSB	Glamorgan Spring Bay
GSBC	Glamorgan Spring Bay Council
GSBLMC	Glamorgan Spring Bay Landcare Management Committee
ICM	Integrated Catchment Management
LGAT	Local Government Association of Tasmania
LSC	Little Swanport Catchment
LSCC	Little Swanport Catchment Committee
LSCMPIC	Little Swanport Catchment Management Plan Implementation
LSCP	Little Swanport Catchment Plan
LSCPIC	Little Swanport Catchment Plan Implementation Committee
LSCWMP	Little Swanport Catchment Water Management Plan
MTC	Midlands Tree Committee

NAP	National Action Plan for Water Quality and Salinity
NHT 1	Natural Heritage Trust 1
NHT 2	Natural Heritage Trust 2
NRM	Natural Resource Management
NRMC	Glamorgan Spring Bay Natural Resource Management Committee
NRMMC	Natural Resource Management Ministerial Council
NRM South	Southern Natural Resource Management Regional Committee
PAR	Participatory Action Research
RMPS	Tasmanian Resource Management and Planning System
RPDC	Resource Planning and Development Commission
SGSL	Sustainable Grazing on Saline Lands
SMC	Southern Midlands Council
TAFI	Tasmanian Aquaculture and Fisheries Institute
TEFF	Tasmanian Environmental Flows Framework
TEFlows	Tasmanian Environmental Flows Project
TIAR	Tasmanian Institute of Agricultural Research
TLWMC	Tasmanian Land and Water Management Council
WMA 1999	(Tasmanian) Water Management Act 1999
WMP	Water Management Plan
WMPCG	Water Management Plan Consultative Group

Chapter 1 Introduction

Across Australia, people are recognising the costs of environmental degradation such as the loss of biodiversity, declining water quality and quantity, highly affected coasts and estuaries, reductions in agricultural productivity and climate change (Australian Greenhouse Office, 2007; Hay, 2008; Turner et al., 2004). Over many years, significant investment in environmental science and management at all levels of government, industry and community has generated large amounts of data and information about the ecological functioning of systems. Some of the knowledge gained has been directed to the production of tools and technologies to address problems. Despite these advances in our practical skills and knowledge, the rate of change in behaviours and actions is insufficient to ameliorate the problems (McKenzie-Mohr and Smith, 1999). Environmental management often presents many 'wicked problems' (Allison et al., 2006; Davidson et al., 2006; Rittel and Webber, 1973). Such problems are characterised by high levels of uncertainty, conflicting values and interests, and no right answers (Jackman, 2009).

In Australia, natural resource management (NRM), one way of addressing these 'wicked problems', is defined as the '*management of any activity that uses, develops or conserves our 'natural resources': the air, water, land (including soils), plants, animals and micro-organisms; and the systems that they form*' (DPIWE, 2002, p.11). Various outcomes are desired of NRM, among them the long term protection of ecosystem goods and services for their intrinsic and instrumental values. Numerous investigations have been conducted on NRM and NRM governance, asking how people in communities are working with diverse public and private stakeholders to improve NRM outcomes. Much effort has been spent on trying to understand the effect – and indeed effectiveness – of various techniques from on-ground work backed by science to community engagement

projects founded on bilateral or multilateral partnerships (e.g. Curtis & Lockwood, 2000; Griffith et al., 2009; Lockwood et al., 2008a, 2008b, 2009, 2010)[1].

Integrated Catchment Management (ICM) is an approach in NRM that attempts to deal with the 'wicked problems' using a collaborative partnership approach based on the hydrological boundaries of a catchment (Batchelor, 1999; Bidwell and Ryan, 2006; Ferreyra, 2006; Seymour and Ridley, 2005). ICM has been evolving over many years across Australia and the world and is also known in the literature as Integrated Environmental Management (IEM) (Margerum, 1999), Integrated Natural Resource Management (INRM) (Hagmann, 2002), Integrated Resource Management (IRM) (Bellamy, 2000) or adaptive co-management systems (Olsson, 2004), where the boundary happens to be a drainage divide.

ICM focuses upon the process (the means) as much as on the outcome (the ends) (Allison and Hobbs, 2006). An integrated approach recognises that the environmental, social and economic elements of natural resource management particularly on a hydrological basis are interdependent (Broderick, 2005; Ferreyra, 2006). ICM is not a new concept and reflects the 'new governance' trends that encourage decentralized, participatory, and consensus-based problem-solving arrangements in conjunction with traditional bureaucratic institutions (Kenney, 2000). However, its development and implementation are complex and challenging (Bellamy, 2000; Mitchell et al., 1993).

[1] The literature is vast, and includes relevant works by Alisons & Hobbs, (2006), Australian Government, (2002b), Baland & Platteau, (1996), Bellamy & Johnson, (2000), Bellamy et al., (2001 & 2003), Born & Sonzogni, (1995), Broderick, (2005, 2007 & 2008), Coastal Cooperative Research Centre, (2007), Davidson & Stratford, (2001), Dovers, (2001), Farrelly, (2006), Farrelly & Conacher, (2007), Fidelman et al., (2005), Flora et al., 2000; Gilfedder, (2006), Hagmann et al., (2002), Hall et al., (2005), Hamstead et al., (2008), Harrington et al., (2001), Head & Neal, (2004), Jakeman, (2009), Kendrick, (2003), Kilpatrick, (2007), Korfmacher, (2000), Lee, (2004), Lejanoa et al., (2007), Local Government Association of Australia, (2005), Love et al., (2006), Margerum, (1999), Marshall, (2008). Mitchell & Hollick, (1993), Moore & Koontz, (2003), Moore, (2006), Natural Resource Management Ministerial Committee, (2006), Olsson et al., (2004), Pasquero, (1991), Paton et al., (2004), Peton et al., (2005), Probst et al., (2003), Robins & Dover, (2007a & b), Sayre, (2005), Seymour, & Ridley, (2005), Sherwill et al., (2007), Steelman & Carmin, (2002), Whelan & Oliver, (2005), Woolcock & Brown, (date unknown).

Official processes to embed and advance ICM in the Little Swanport Catchment (LSC) in Australia's southernmost state of Tasmania began in 1998 with a public meeting and catchment tour attended by 46 catchment stakeholders. Around that time the estimated resident rural population in this east coast catchment was 750, with that number swelling up to 1000 during the summer months (LSCC, 2003, p.6). State and local government public servants initiated and facilitated the event, and were mostly funded by the Australian Government. It appeared that three tiers of government were working in partnership and leading the way.

Substantial resident turnout and levels of interest indicated that there were people in the local community with enthusiasm and willingness to develop an ICM plan (Little Swanport Catchment Management Plan Implementation Committee (LSCMPIC), 2008). The Little Swanport Catchment Committee (LSCC) was established and in August 1998 commenced the development of the Little Swanport Catchment Management Plan (LSCP). The engagement of the catchment community in an ICM process over the intervening 12 years provides a case study for this research.

In this work, qualitative methodologies, and NRM and ICM principles and theories are reviewed, and case studies using the former to understand the latter are highlighted. This work is shaped by the aims of this research, which are as follows. First, I present a critical analysis of the impacts of changes in the legislative, policy and administrative frameworks of NRM in Australia at national, state and local government levels. Second, I elaborate upon a case study of on-ground initiatives at catchment and property scales in the LSC that embrace specific ICM and more general NRM strategies. Third, I take insights from the critical analysis and the case studies to gain an appreciation of how ICM is translated from policy to ground and with what effect for those involved in the process. Fourth, I identify what qualities might be necessary for the successful delivery of ICM and NRM in southern Tasmania.

The significance of this work is fourfold. First, it contributes to a small but emerging collection of research using autoethnographic methods to understand stories about NRM

in Australia (Oliver, 2004; Tattersall, 2010; Wooltorton, 2007). Second, it documents a number of interwoven NRM processes using a single case study over a period of time that is relatively long in relation to most such projects. Third, it provides an opportunity to synthesise, trial and reflect upon fundamental theoretical concepts to enable NRM and ICM programs to be based on continual improvement. Finally the research attempts to get to the core of *why* achieving successful NRM outcomes in southern Tasmania has and continues to be a challenge, and to ask *what* can be done to improve this situation.

Autoethnographic methods enable stories to be heard: in this instance, of those who work both voluntarily and professionally in the field of NRM at a grass roots level[2]. Both overseas and in Australia, many of those working professionally in this area are often on short term contracts and, along with the many volunteers that they support, they '*tend to have heavy work loads and time demands'*, and '*in Australia … many noted that burnout and turnover rates are high*' (Margerum, 1999, p.157; Oliver 2004). Consequently, if captured at all, the opportunity to hear their stories is limited to snippets. They might be interviewed for others' research (Bellamy & Johnson, 2000; Broderick, 2005 & 2007; Oliver, 2004) but rarely have the opportunity to tell their own story. There is little time for those who actually '*do the work – the implementers*' to be informed by the vast academic theory of NRM (Whitaker, pers.comm., 2010). Why? Because they are too busy doing the work.

The more that we can hear and appreciate the voices of those at the coal face the more we can devise practical means to move from concept to implementation, from rhetoric to practice (Bellamy & Johnson, 2000; Born & Sonzogni, 1995; Harrington et al., 2001; Mitchell & Hollick, 1993). In similar research Oliver (2004, p. 329) stated that it:

> *had a strong critical intent … in that it sought to advocate for, and give voice too … As such the research has been guided by the three strategic questions…What is happening? Is it desirable? What should be done?*

[2] I refer to professional coordinators and facilitators, and the individuals and groups they support in developing and implementing NRM and ICM programs.

Where Oliver uses critical ethnography over nineteen collective case studies, the present research is a detailed review of one case study over a long period. , My research has provided an opportunity to document my interpretation of the story of ICM in the Little Swanport, whilst a story in which I have been a participant. A conscious and active process of reflection, informed by review of NRM academic literature (amongst other influences and variables), has greatly influenced my own and others' professional practice: this has had implications for the unfolding story and will undoubtedly continue to do so into the future. It is this linkage between theory and practice that is of greatest significance in this research: through it I have constantly reflected upon the following questions. Which elements of a broad and sometime conflicting body of academic and policy literature on NRM and ICM might be key? How do we distil complex theory and technical jargon so it is useful and practical to those who do not have the time or inclination to wade through it all? How can NRM organisations be learning organisations? As a consequence of these reflections this research is significant simply because one group in one part of the world managed to make a positive difference[3] to NRM and ICM, and that I have had the opportunity to tell that group's story. In the words of Jimmy the Shearer[4] it is hoped that there will be '*something in that for all of us'*.

The rest of this chapter sets the context for the research. It provides a broad description of the physical landscape of the LSC, and describes generally the social and economic characteristics of the community who live and work there. It also provides a summary of some of the research undertaken in the catchment over 12 years from 1998 until 2010, elaborating upon the political and personal context to explain 'why this research' and 'why this catchment', and finally provides a synopsis of each chapter.

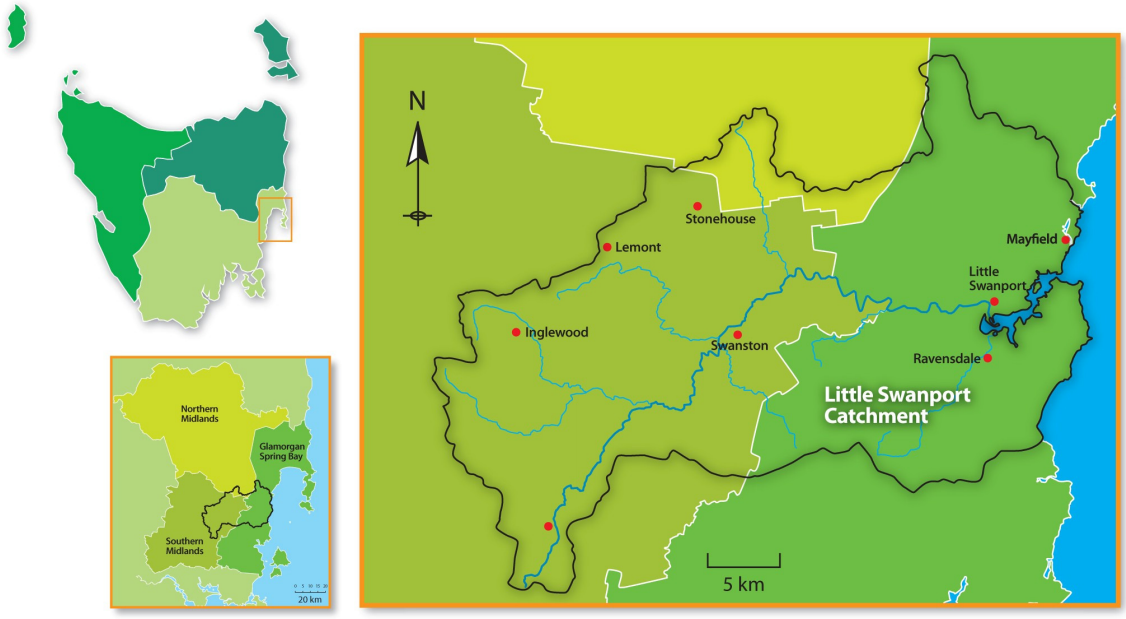
[3] The LSCC won the Landcare Catchment Award at the Tasmanian Landcare Awards in 2001/2002 (LSCMPIC, 2008, p.9). The Little Swanport Catchment Plan Implementation Committee was the winner of the Toshiba Community Group Award at the National Landcare Awards held in Parliament House in August 2010. '*The National Landcare Awards celebrate the work of individuals and groups from around Australia who are making a significant contribution to the environment'* http://svc009.wic050p.server-web.com/nationalawards2010/?page_id=4 (accessed 16th October, 2010).

[4] Tasmanian east coast rural identity.

1.1 The Little Swanport Catchment

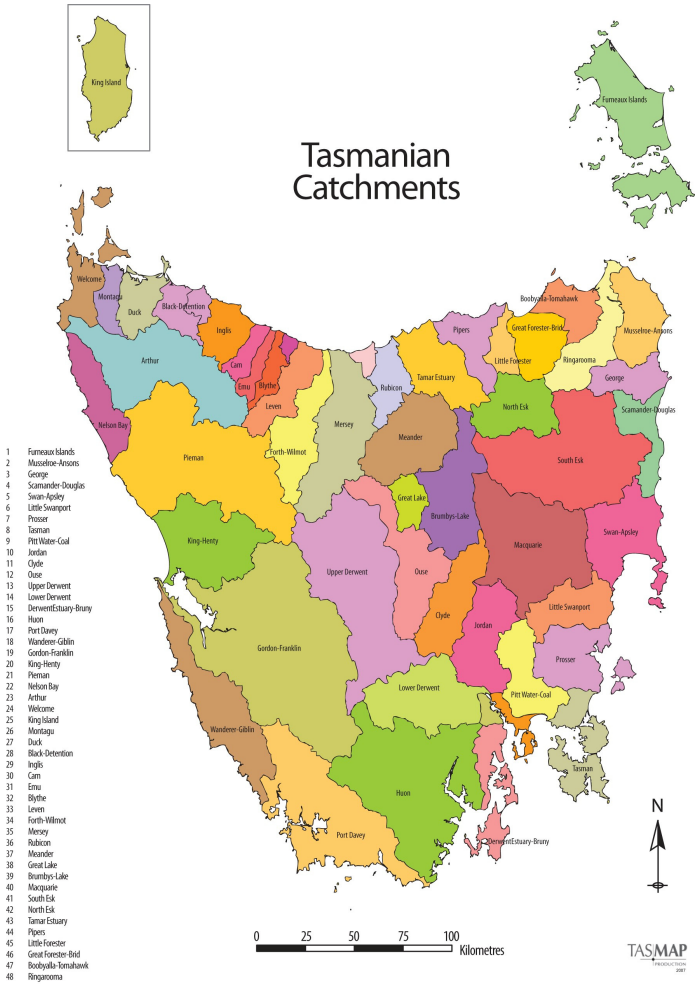
The LSC is located on the east coast of Tasmania. The catchment lies within the boundaries of two municipalities, with the upper catchment being in the Southern Midlands Municipality and lower catchment being in the Glamorgan Spring Bay Municipality (Figure 1).

FIGURE 1: The Little Swanport Catchment



The total catchment area is 898 km^2. This statistic is based upon the administrative catchment boundary as defined by the Tasmanian Department of Primary Industries and Water (DPIW) for the purposes of water management planning (Figure 2). The boundary includes the watershed areas of the Buxton River, Lisdillon Rivulet, the Little Swanport River and the Ravensdale Rivulet (LSCC, 2003).

FIGURE 2: Tasmanian DPIW water management planning catchment boundaries



The catchment is unusual in having neither town nor urban population nor associated infrastructure, such as reticulated water or sewerage systems (LSCC, 2003). The closest towns with any shops are Oatlands (population 764[5]), outside of the upper catchment, and Swansea (population 840[5]), north and Triabunna (population 959[5]), south of the lower catchment.

The catchment can be divided into three broad-scale landscapes with different land uses and different communities (Crawford, Hundloe, & Ross, in press; LSCC, 2003; Little

[5] Reference: Australian Bureau of Statistics 2006 Census QuickStats http://www.censusdata.abs.gov.au

Swanport Catchment Plan Implementation Committee (LSCPIC), 2010a). The upper catchment, a plateau interposed with hills largely cleared of native vegetation, is used for fine wool production and mixed farming. Timber plantation establishment on private land has increased in the last five to 10 years. This trend is not unique to the LSC and reflects the significant increase in the establishment of the private plantation estate across Tasmania since 2001 (Private Forests Tasmania, 2007). The township of Woodsdale to the southwest of the upper catchment has an estimated population of 349[5] people with many landholders involved in some type of mixed farming enterprise (Crawford, Hundloe, & Ross, in press). Plantation forestry establishment is also increasing in this area.

The mid-catchment, which is primarily forested, is also mountainous, with most of the land being State Forest managed by Forestry Tasmania[6], or leased and owned by the Australian Department of Defence. There are also large tracts of private land and a number of private conservation reserves (LSCPIC, 2010a, p.9). Much of the forested area has been used for commercial forestry over many years, providing both sawlogs for local sawmills and woodchips for the export woodchip plant located in Triabunna.

The lower catchment is relatively flat, mostly low-lying cleared agricultural land. Among larger fine wool grazing properties, there are a few hobby-farms (for example, with olives, sheep, cattle, and horses). Vineyards are being established in the lower catchment on properties traditionally engaged in wool production. There are also two residential and holiday settlements known as Pontypool and Saltworks. Pontypool is located on the Little Swanport estuary, while Saltworks is at the mouth of the estuary with a public boat ramp that is popular for recreational fishing access to both the estuary and ocean.

Two tourism businesses operate in the lower catchment, with the long established 'Gum Leaves' being a popular destination for outdoor education type of camps for many

[6] '*Forestry Tasmania has the statutory responsibility for the management of 1.5 million hectares of State forest land. This land contains 39% of the Tasmania's forests.*' http://www.forestrytas.com.au/about-us accessed 16th October 2010.

school groups from southern Tasmania all year round. The more recently established 'Windsong' is a bed and breakfast business that also holds workshops and other community activities (http://www.windsongbnb.com.au/ accessed 16th October 2010).

Three oyster leases operate in the estuary in the lower Little Swanport. They are identified within the Great Oyster Bay and Mercury Passage Marine Farming Development Plan (1998) (Department of Primary Industries Water and Environment (DPIWE), 1998). There is also a facility producing oyster spat for aquaculture operations in Tasmania and South Australia (Crawford, 2001; Crawford, Hundloe, & Ross, in press).

Apart from agriculture, forestry, aquaculture and limited tourism many people living in the catchment are likely to work in the adjoining townships. Surveys and interviews undertaken by Crawford, Hundloe, & Ross (in press) indicate that popular recreational pursuits in the catchment including walking, fishing, bird watching, swimming, boating and sailing.

The catchment of the Little Swanport River and its tributaries drains an area of approximately 609 km^2. The river flows east from its source in the Inglewood Hills approximately 600 m above sea level (Australian Height Datum) for over 60 km to the estuary and then the ocean. The major tributaries of the river are Crichton Creek, Nutting Garden Rivulet, Eastern Marshes Rivulet, Pine Rivulet, Green Tier Creek, Ravensdale Rivulet and Pepper Creek (DPIWE, 2003; LSCC, 2003).

The Buxton and Lisdillon Rivulets are also within the broader administrative water management planning boundary of the LSC. These rivers run through grazing properties to the Tasman Sea north of the actual Little Swanport river catchment. Available data on the environmental variables of these smaller catchments are limited.

Broad descriptions of the environmental elements of the Little Swanport river catchment landscape, including land-use, hydrology, vegetation, climate and rainfall have been

compiled in a number of studies and reports including Crawford, Hundloe, & Ross (in press), DPIWE (2003), LSCC (2003), Wintle (2002) and Wintle & Kirkpatrick (2007).

The *LSCP 2010 – 2015* provides a succinct overview of the various environmental aspects of the catchment. Each of these overviews was prepared by a technical specialist with experience and knowledge of their field and / or the catchment (LSCPIC, 2010a). Investigations of specific environmental elements of the catchment have been and continue to be undertaken. Details about the ecological research summarised below, including key outcomes, are not relevant to this investigation unless pertaining to the processes used by researchers in obtaining data and communicating results to the catchment community which is discussed in Chapter 5.

Some examples of ecological research undertaken on the catchment include investigations into riparian vegetation by Wintle (2002), the environmental water requirements of the Little Swanport River, including the outcomes of a fish survey (Pinto, 2001) and a study of the movement of Black Bream *Acanthopagrus butcheri* in the estuary (Sakabe & Lyle, 2008).

Extensive data on water quality and quantity information exist for the catchment, perhaps surprising for a catchment of this size and with such a small population. Much water quality data have been collected in the last ten years, with an intensive period of monitoring by DPIWE occurring during the development of the water management plan (WMP)[7] between 2003 and 2005. A consistent record of stream flow data was obtained from a gauge in the lower catchment over the period from 1971 to 1990 (DPIWE, 2005b). That gauge was removed in 1991. A new gauge was installed in 2004 close to the same site and, for the first time, a second gauge was installed in the upper catchment (LSCMPIC, 2008). Detailed water balance modelling was undertaken for the catchment by consultants on behalf of DPIWE during the water management planning process (Sinclair Knight Mertz, 2004). The DPIWE (2003, 2006a) also prepared reports on water quantity and quality for the catchment.

[7] A water management plan is a document developed under the Tasmanian Water Management Act 1999 to address water allocation.

A project funded from the National Action Plan for Water Quality and Salinity[8] to develop an improved methodology for environmental water requirements commenced in 2003 (LSCMPIC, 2008, p.16). The outcome of that project was the *Tasmanian Environmental Flows Framework* (TEFF). It was followed by another project, entitled the *Tasmanian Environmental Flows Project* (TEFlows), which was jointly funded by the three Tasmanian NRM Regions[9] and was managed by DPIW, Water Resources. The project aimed to build upon the TEFF, by characterising the ecology of six rivers across Tasmania, including the Little Swanport, under different regimes of flow variability. Ecological information across a breadth of subject areas including water quantity and quality, geomorphology, riparian and aquatic flora and fauna, food webs and ecosystem processes, was collected from the river and estuary for this project (http://www.dpiw.tas.gov.au/inter.nsf/WebPages/JMUY-6W787P?open accessed 8 August 2010).

A third project entitled *Water use across a catchment and effect on estuarine health and productivity* started in the catchment in 2005. That project attempts to integrate social, economic and ecological investigations in the development of effective water management plans and build upon a number of smaller projects (collection of water quality data, fish sampling and habitat mapping in the estuary) already underway in the catchment (Crawford, Hundloe, & Ross, in press). It was developed by the Tasmanian Aquaculture and Fisheries Institute (TAFI), and the Tasmanian Department of Marine Resources in 2003, and funded by the Fisheries Research and Development Corporation

[8] The National Action Plan for Water Quality and Salinity (NAP) was a commitment by the Australian, state and territory governments to jointly fund actions to tackle these two major natural resource management issues facing Australia's rural industries, regional communities and the environment. The Plan committed $1.4 billion over seven years to June 2008.

[9] The three Tasmanian NRM regional organisations (NRM South, NRM North and Cradle Coast NRM) were established under the Tasmanian Natural Resource Management Act 2002. The role of the regions is to develop and implement regional NRM strategies.

(FRDC)[10], and Land and Water Australia (LWA)[11]. The project also provides a useful case study of NRM governance which is considered in greater depth in Chapter 4.

The estuarine research builds upon earlier work which, according to a classification system for Tasmania estuaries developed by Edgar et al., (1999), determined that the Little Swanport estuary was of moderate conservation significance. That estimation arises from the observation that the estuary and associated catchment area are affected by human habitation and land clearance, but have not been too badly degraded. The estuary is considered suitable for various recreational and commercial purposes.

The outcomes of some of the water quality and quantity research undertaken in the catchment has already informed the development of the LSC WMP and more recent work is considered likely to '*underpin more informed management of freshwater environmental flows, especially to estuaries, by government managers involved in water allocation*' (Crawford, Hundloe, & Ross, in press, p.141). This assumption is more closely examined in Chapter 5.

Vegetation in the catchment is known to be highly diverse in structure and species composition with many rare and threatened plant communities (LSCPIC, 2010a, p.28).

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10 The Fisheries Research and Development Corporation (FRDC) is Australia's leading agency concerned with planning, investing in, and managing fisheries research, development and extension. The FRDC is a statutory corporation founded in 1991 under the Primary Industries and Energy Research and Development (PIERD) Act 1989. It is responsible to the Minister for Agriculture Fisheries and Forestry. The FRDC mission is to maximise economic, environmental and social benefits for its stakeholders through effective investment and partnership in research, development and extension (www.frdc.com.au accessed 8 August 2010).

11 Land & Water Australia was a statutory research and development corporation within the Australian Government Agriculture, Fisheries and Forestry portfolio, established as the Land and Water Resources Research and Development Corporation in 1990 under the Primary Industries & Energy Research & Development (PIERD) Act 1989. Land & Water Australia's core business was as a research investor, with the aim of achieving the sustainable management and use of Australia's natural resources. We also acted as a leading research broker, organising collaborative research and development programs (http://lwa.gov.au/programs/land-and-water-australia accessed 13 November 2010).

Information on vegetation and threatened species in the catchment is publicly available through the *Land Information Systems Tasmania (The LIST)* http://www.thelist.tas.gov.au and the Tasmanian *Natural Values Atlas* http://www.naturalvaluesatlas.tas.gov.au . More detailed mapping and survey work has been done for many properties within the catchment, particularly those with private conservation reserves; however this information in not necessarily in the public domain.

The Southern Midlands and Glamorgan Spring Bay Weed Management Plans resulted in the mapping of priority weeds throughout the catchment (Hall & Kelly, 1999; Kelly & Andrewartha, 2002). The LSC Plan identifies that more current weed mapping is necessary (LSCPIC, 2010a, p.35). An example of more recent weed mapping includes that undertaken to determine the extent of Serrated Tussock (*Nasella trichotoma),* a 'weeds of national significance' which was only identified in the catchment in 2007 (Vercoe & Strutt, 2009).

The *LSCP 2010 – 2015* identifies gaps in knowledge about specific environmental aspects of the catchment, such as soil type and capability. The need for the development of a comprehensive fire management plan for the catchment is also a recommended action in the catchment plan (LSCPIC, 2010a).

1.2 Why the LSC?

Over the last 12 years the landholders living and working in the LSC have been experiencing significant changes in the legislative, environmental, economic and social climate in which they strive to make a living and make a home.

Despite the complex changes occurring around them, including ongoing difficulties with drought, there has been significant engagement of the catchment community in NRM initiatives. Many in the community have put significant time and energy into a variety of NRM activities over many years. These labours include strategic fencing activities, revegetation and weed control initiatives, and participation in property management

planning and sustainable farming research and trials (East Coast Drought Landcare Management Committee (ECDLMC); LSCMPIC, 2008, p.17; LSCPIC, 2010a, p.6).

A strategic ICM approach has been advanced in the catchment since 1998 supported by the Glamorgan Spring Bay (GSB) and Southern Midlands Councils. The development of a catchment plan was initiated through a federally funded project of the Southern Midlands Council (SMC) and the Midlands Tree Committee, one of the leading farmer groups in southern Tasmania. The Glamorgan Spring Bay Landcare Management Committee (GSBLMC), a Section 24 special committee[12] of the Glamorgan Spring Bay Council (GSBC) strongly encouraged integrated catchment management and had also received funding to develop catchment management plans. Both committees provided support and direction to the Landcare officers in the respective Councils. These officers worked closely with the LSCC and officers from the State government to develop a LSCP (LSCMPIC, 2008, p.5).

On the 23rd October 2001 the GSBLMC convened a public meeting to discuss the proposed development of in-stream dams in the LSC. At that meeting the *draft LSCP 2001* was also presented. A representative from the Tasmanian Government discussed the planning and approval process for dam construction, including the requirements for environmental flows. Key outcomes of this meeting included releasing the draft catchment plan for public review and comment, for the community to lobby the state government to prioritise the development of a WMP for the catchment, and for the WMP to be integrated into the catchment management plan (LSCMPIC, 2008, p.9).

The Southern Midlands and Glamorgan Spring Bay Councils held another public meeting in the Woodsdale Hall on the 29th November 2001 to discuss natural resource management in Tasmania. Presentations were given on the Tasmanian Natural Resource Management Framework, water management plans, Council planning processes and the draft *Little Swanport Catchment Plan 2001* (LSCMPIC, 2008, p.115). That meeting

[12] Special committees of Council can be established under Section 24 of the Tasmanian *Local Government Act* 1993. A Council can establish a special committee on such terms and for such purposes that it thinks fit (Tasmanian Government, 1993).

provided an opportunity for members of the community to make comment on the draft catchment plan and ask questions. It was emphasised that here was a '*visionary document that gave the community a voice. It was not an enforceable mandatory document, and did not have statutory powers*' (LSCMPIC, 2008, p.10). The meeting was held during a public consultation period in which feedback on the draft plan was invited. Upon completion of the consultation period members of the LSCC met to discuss and resolve any outstanding issues required to finalise the plan. The final ICM plan was completed by the LSCC, and adopted by the SMC in May 2002 (LSCMPIC, 2008, p.11).

The Department of Primary Industries, Water and Environment (DPIWE) initiated the development of a WMP under the *Water Management Act 1999* (WMA 1999) for the LSC at a public meeting in November 2002; this was the result of discussions between *'various community representatives'* (DPIWE, 2005b, p.3) and the Minister for Primary Industries, Water and Environment. A LSC Water Management Plan Consultative Group (WMPCG) was established to develop a WMP for the catchment in line with the requirements stipulated in the WMA 1999 (DPIWE, 2005b, p.4). Community representatives on that group were nominated at the public meeting. The Little Swanport WMP was Tasmania's fifth WMP.

The LSC Management Plan Implementation Committee (LSCMPIC) was elected at a public meeting at the Woodsdale Hall on the 13th February 2003. The committee was composed of volunteers representing '*farming / landcare; forestry; aquaculture/fishing; recreation/tourism; small landholders/rural residential (non primary producers); local government; the army; bushcare/landcare'* (LSCMPIC, 2008, p.110). The roles and responsibility of the LSCMPIC are:

> *to facilitate the implementation of the LSCP;*
> *to source funding for implementation of the LSCP;*
> *to continue to liaise with the local community re opportunities to participate in natural resource management, as outlined in the LSCP;*

> *to continue to liaise with the two local councils on issues relevant to the LSCP.* (LSCC, 2003, p.39).

The first meeting of the LSCMPIC was held on the 8th May 2003. By that stage the WMPCG had already met five times (LSCMPIC, 2008, pp.12-14). The DPIWE facilitated matters such that the WMPCG would meet another five times prior to the completion of the draft Little Swanport Catchment Water Management Plan (LSCWMP) (DPIWE, 2005b). A number of individuals were representatives on both the LSCMPIC and the WMPCG.

In mid 2003, Australian Government funding for the GSBC Landcare officer position came to an end and consequently the GSBLMC folded. Paid coordinator support for the newly formed LSCMPIC was now limited to what could be provided by the Southern Midlands Landcare officer who continued to be employed by the SMC in a part time capacity. Despite the impending future of limited support, the voluntary committee began the task of implementing the plan (LSCMPIC, 2008, p.14).

The development of the WMP and the implementation of the *LSCP* unfolded in parallel. Many of the same people were involved and mostly in a voluntary capacity.

The development of the WMP resulted in a number of scientific and monitoring projects being initiated in the catchment by DPIWE. This work included the

> *installation of stream flow measurement gauges and associated water quality data loggers and flood samplers, a "State of Rivers" study to assess water quality and riverine health, and a research project using the catchment as a "pilot" to develop a holistic environmental flows assessment framework for eventual application to other Tasmanian catchments. The Department has also contributed $55,000 for estuarine mapping and algal and fish community monitoring by the Tasmanian Aquaculture and Fisheries Institute (TAFI), and has supported Honours research in fluvial*

geomorphology conducted by the University of Tasmania (DPIWE, 2005b, p.4).

The LSCMPIC was involved in a number of projects during the same period, including riparian fencing and sourcing funds to undertake a salinity trial and to develop and implement a community water quality monitoring program (LSCMPIC, 2008, pp.15-19). Members of the committee actively sought assistance from local and State government officers to assist in activities.

On the 29th September 2004, a public notice was placed in the Tasmanian Government Gazette advising that the draft LSCWMP had been placed on public exhibition. During the statutory 60-day consultation period two public meetings were held to present and discuss the draft plan. Fifteen representations were received. A comprehensive report summarising and responding to the representations, and recommending modifications to the plan, was prepared in July 2005 for the Resource Planning and Development Commission (RPDC) by the Water Assessment and Planning Branch of the Department (DPIWE, 2005b).

DPIWE made a comprehensive effort to interpret and respond to all relevant issues and concerns expressed by the representations. A review of the report provides a snapshot of the contention between different stakeholders regarding the outcomes of the water management planning process. Additionally, it provides examples of how the content of the *LSCP 2002* and the role of the implementation committee had been interpreted by some stakeholders and also by the Department (DPIWE, 2005b, pp.28, 34, 62).

The LSCWMP was approved by RPDC and formally released in June 2006. The foreword to the plan succinctly provides the context for all the detail within:

The purpose of the Plan is to provide a framework for managing the catchment's water resources in accordance with the objectives of the Water Management Act 1999, and the State Policy on Water Quality Management

1997. The Plan is a statutory Plan that affects everyone who uses water in, or from the catchment (DPIW, 2006b, p.1).

1.3 The autoethnographic voice – an 'immersed' researcher

It is in this temporal and political context that my research has been undertaken. In early 2002, I bought land in the LSC, having stayed in both the upper and lower catchments on and off since I moved to Tasmania in 1998, and having lived in the lower catchment for two years prior to the purchase of the land.

Not long after arriving in Tasmania, I spent a year working part time for the Southern Midlands Landcare Committee, mapping weeds with landholders on over fifty properties in the Midlands. A number of these properties were in the upper LSC. I continued on to develop a weed management plan for the Southern Midlands Council. On occasion I stayed with the Landcare Coordinator and her husband on their grazing property in the upper LSC.

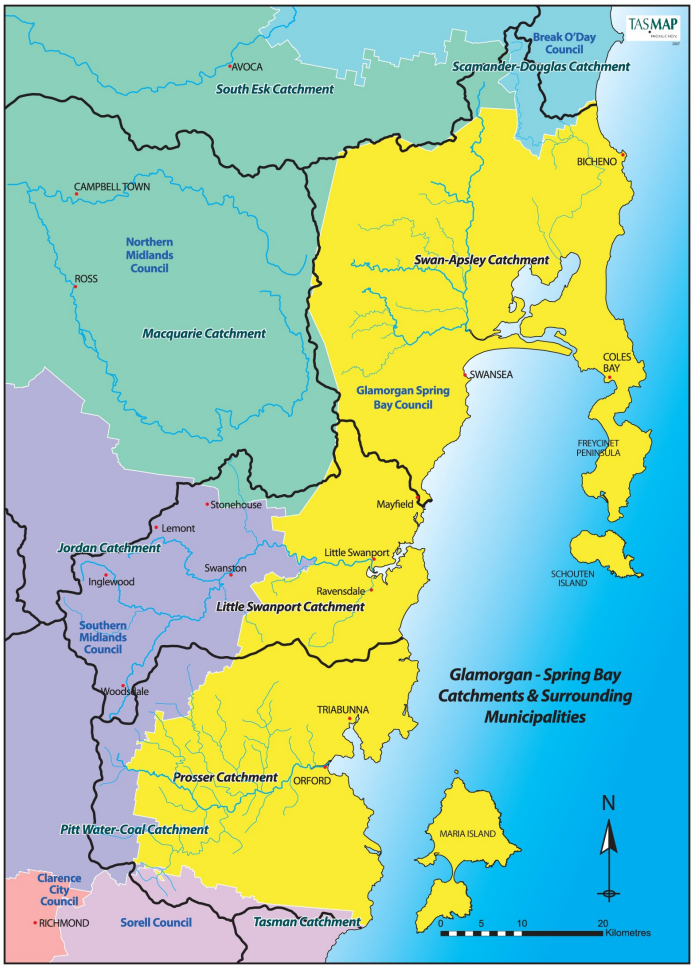
After finishing the weed plan I was asked by the GSB Landcare Coordinator if I would develop a similar plan on behalf of the GSBLMC for the Municipality. Over the 18 months it took to develop the plan I would often stay with the GSB Landcare Coordinator at his family property in the lower LSC.

The process of mapping weeds and developing the plans resulted in gaining an early understanding of the landscape and some of the issues, as well as meeting many landholders throughout both Municipalities, including both the upper and lower LSC. After completing the GSB Weed Management Plan I worked for another two years on contract to the GSBLMC as the Waterwatch Coordinator[13] in the Municipality. During that period I was renting a farmhouse in the lower catchment close to the coast.

[13] Waterwatch was a national community water quality monitoring network that encouraged all Australians to become active in the protection of their waterways.

As the coordinator of a community water quality monitoring program I was on a steep learning curve with regard to the complexity of water and catchment management issues in the three administrative catchments of the GSB Municipality – the Prosser, Little Swanport and Swan-Apsley (Figure 3).

FIGURE 3: Three administrative catchments in GSB and surrounding Municipal boundaries



I also became aware of, and intermittently and indirectly involved in, the development of the LSCP which the Landcare Coordinators from both Councils and the recently established LSCC were working hard to complete.

Preparation of the plan was one of many NRM projects managed by the Landcare officers, who were housed and supported by the two Councils. In 2001, there was much talk of the cessation of the Australian Government funding program, the Natural Heritage Trust 1 (NHT 1)[14] and concern about an uncertain future for the NRM activities that involved many landholders and community members. I had decided to go back to study so it seemed an appropriate time to stand back and see how things worked out. In 2003, I returned to various kinds of work in the local area, enrolled in part-time masters by research at the University of Tasmania and became immersed in NRM again as a volunteer. The demise of NHT 1 and a national policy shift to create strategic regional NRM under a second round of Natural Heritage Trust (NHT 2)[15] funding meant that coordination and facilitation support for community engagement in NRM disappeared almost overnight. Although the need was still evident in the LSC there was no funding available to pay for coordinators or project officers. The national policy and funding context is discussed in greater detail in Chapter 3.

In December 2002, still standing back from all this change, I was nominated as the 'Research / Waterwatch' representative on the LSC WMPCG (DPIW, 2005b p. 4; LSCMPIC, 2008, p.12). Then, in February 2003 I was nominated and accepted as a

14 The Natural Heritage Trust Act 1997 (the Trust) was set up by the Australian Government to help restore and conserve Australia's environment and natural resources which included a number of programs including the Waterwatch program. The Trust had three overarching objectives; (i) Biodiversity, (ii) Conservation and the Sustainable Use of Natural Resources, (iii) Community Capacity Building and Institutional Change. The Trust provided funding for environmental activities at three levels: 1. National investment, delivered in accordance with the National Strategic Plan. 2. Regional investment, delivered in conjunction with the National Action Plan for Salinity and Water Quality and, 3. local action, delivered through the Australian Government Envirofund (http://www.nht.gov.au/nht/index.html accessed 8 August 2010).

[15] In 2001, the Australian Government extended the Trust for a further five years, from 2002-03 to 2006-07. The 2004 Budget boosted the Trust with a further $300 million, extending the funding until 2007-08. The Framework for the Extension of the Trust in 2002, based on lessons learnt from the first phase of the Trust and the establishment of the National Action Plan for Salinity and Water Quality (the NAP), brought about a fundamental shift towards a more targeted approach to environmental and natural resource management in Australia under the second phase of the Trust. This resulted in a regional approach to NRM nationally. The model for regional investment under the extension of The Trust was based on that used for the NAP, including: bilateral and regional partnership agreements, investment against accredited regional plans, the provision of foundation and priority funding (http://www.nht.gov.au/nht/index.html accessed 8 August 2010).

member on the newly established LSCMPIC. At the inaugural meeting I was nominated and accepted the position of Secretary (LSCMPIC, 2008, p.14).

This autobiographical material is included here because these experiences were instrumental in my decision to use qualitative and largely ethnographic methods to examine what was happening in my own community. It is in such experiences that one finds the roots of many interesting discussions and many challenges, as the LSCMPIC began the difficult task of implementing the catchment plan in what would prove to be increasingly difficult climate. The Little Swanport 'water wars' were already well underway. As a member of both the LSCMPIC and the WMPCG, and as a community member living and working within the catchment and surrounding towns, it turned out I was right in the midst of it.

The 'water wars' form a complex and ongoing struggle. They are the perceived conflicts of water management such as the construction of water storage versus environmental flows, agricultural cropping versus aquaculture production, and health of aquatic ecosystems versus pesticide use in the catchment. For me, these conflicts provided an opportunity to dig deeper in order to understand what appeared to be a range of incompatible objectives for a finite resource.

From 2003 to 2005, as well as waitressing, rousabouting and volunteering, I was also engaged in consultancy work. Among other contracts I was employed by the LSCMPIC as a project officer to progress the development of a Sustainable Grazing on Saline Lands (SGSL) trial, and asked to assist the Little Swanport Environmental Management System (EMS) Committee to develop an EMS for the three oyster companies operating in the estuary. Some of the projects that I was involved with are discussed in greater depth in Chapter 4.

In May 2005 I successfully applied for the position of NRM Officer for the GSB Council. I formally resigned from the LSCMPIC in my voluntary capacity as Secretary and instead become Council's NRM support for the committee in a paid capacity. I was

doing the same job but now being paid and had the legitimacy and positional authority to do what was necessary to implement the plan.

After many hours of work and much negotiation, in early 2007 NRM South, the regional natural resource management body in southern Tasmania, funded a catchment extension officer (CEO) to work in partnership with both Councils and the LSCMPIC to identify a way forward for integrated catchment management in the Southern NRM Region. The CEO was also given the task of supporting the LSCMPIC in implementing the catchment plan. At last the LSCMPIC had the support necessary to make progress in achieving the task at hand.

It is in this physical, political and personal context that the research has been undertaken. It was a difficult period for many of those involved in these ICM and NRM processes. I was a participant in both the physical and intellectual landscape, wearing many hats over a long period of time, and here that necessitates a qualitative methodology: a weaving of description, interpretation, reflection and participatory action to get to the core of what has been happening and to understand how, perhaps, the processes of NRM and ICM could have been more positive for those involved. Furthermore as an applied researcher continuing to work closely with the LSCPIC and as an NRM professional I have the unique opportunity to review how the outcomes of this research have been applied and to what degree of success.

1.4 Chapter synopsis

Chapter Two details the qualitative research methodology that has been employed in the conduct of this research. It outlines the ontological and epistemological perspectives that have informed my activities and explains how those perspectives have influenced the sourcing, categorising and interpretation of the data. The ethical implications of the research process and the outcomes are discussed both in context of the research design, methods used and my ongoing involvement as a researcher in the catchment community.

Chapter Three provides a comprehensive contextual background to the evolution of the concepts of NRM and integrated catchment management at national, state, regional and local levels and outlines some of the key theoretical underpinnings. The implications of NRM legislation and policy are discussed in light of the experiences at a local government level in southern Tasmania.

Chapter Four provides a detailed case study of the ICM process in the LSC over the last ten years. It details specific examples of activities initiated by the LSCP Implementation Committee as well as other activities and research that they have been involved in or affected by the ICM and NRM process.

Chapter Five reflects upon the ICM experiences in the LSC outlined in the previous chapter in light of the current literature and the evolving NRM governance processes in Tasmania and Australia. These discussions serve to identify what qualities might be necessary for the successful delivery of ICM and NRM.

Chapter Six synthesises the qualities identified above into a whole of catchment and whole of ecosystem planning model to guide ICM or NRM at any stage of development.

Chapter 2 Research Design

The last ten years has seen concentrated research, water management planning and efforts to progress natural resource management initiatives within an integrated catchment management framework in the Little Swanport catchment. I have lived and worked in the catchment for much of that time and been an active participant in a number of these initiatives. Through reflection and action, this immersion in the life of the community has provided opportunities to influence some of the outcomes of those initiatives. Such engagement has been useful in considering integrated catchment management in the context of the evolution of regional NRM in Tasmania and Australia.

This research evolved from a thesis proposal in which I sought to examine the opportunities for multiple use production systems in riparian zones on waterways on the Tasmanian east coast. The focus of the project as originally conceived was to investigate opportunities for landholders to revegetate degraded riparian verges and floodplains using a mixture of indigenous and native species with a woody species component designed for a production outcome. Initially, I considered an approach to the research involving the use of qualitative and quantitative methods (Johnson et al., 2007, p.115). My location on the east coast of Tasmania meant I could ask for participation from two landholders who were prepared to engage with the research which, in addition, to the trials being considered would also involve multiple interviews and participant observation. As I became more involved in other NRM activities on the coast and my knowledge and experiences developed, the shape of the research also evolved; some of this change may also have been influenced by the part time status of my candidature as a research student, something which afforded me time to consider my choices and priorities. In the end, I needed to tell a different story and it would require a different methodology and suite of methods.

It has taken me a long while to understand *why* my experiences and investigations are valid and valuable qualitative research and gauge *how* to articulate this understanding in a coherent and convincing way that brings together various sources of data. Through

weaving observation, experience, discourse and story, the work I was doing became a case study, with a series of thematic sub-cases underpinning it. Stake (2003, p.134) states that: '*Case studies have become one of the most common ways to do qualitative inquiry, but they are neither new nor essentially qualitative. Case study is not a methodological choice but a choice of what is to be studied*'. In like vein, Mason (2002, p.22) observes that '*in qualitative research, decisions about design and strategy are ongoing and are grounded in the practice, process and context of the research itself*'. She also provides the following contingent definition of qualitative research:

1. *Grounded in a philosophical position which is broadly 'interpretivist' in the sense that it is concerned with how the social world is interpreted, understood, experience, produced or constituted. While different versions of qualitative research might understand or approach these elements in different ways (for example, focusing on social meanings, or interpretations, or practices, or discourses, or processes, or constructions), all will see at least some of these as meaningful elements in a complex – possibly multi-layered and textured – social world.*

2. *Based on methods of data generation which are both flexible and sensitive to the social context in which data are produced (rather than rigidly standardized or structured, or entirely abstracted from 'real-life' contexts).*

3. *Based on methods of analysis, explanation and argument building which involve understandings of complexity, detail and context. Qualitative research aims to produce rounded and contextual understandings on the basis of rich, nuanced and detailed data. There is more emphasis on 'holistic' forms of analysis and explanation in this sense, than on charting surface patterns trends and correlations. Qualitative research often does use some form of quantification, but statistical forms of analysis are not seen as central* (2002, p.3).

These descriptions touch upon my own philosophical groundings and '*methods of analysis, explanation and argument building which involve understandings of complexity, detail and context*' (Mason 2002, p.3).

Due to the complex and multidimensional aims of this research qualitative research methodologies have been most appropriate (Mason, 2002). Denzin and Lincoln (2003a, p.13) posit that '*qualitative researchers stress the socially constructed nature of reality, the intimate relationship between the researcher and what is studied, and the situational constraints that shape inquiry*'. My immersion in the physical and social landscapes of the Little Swanport meant there was no better way for this story to be told. The complex social, political and environmental variables that characterise NRM in the region would have been limited by quantitative or positivist[16] approaches that '*emphasize the measurement and analysis of causal relationships between variables, not processes'* (Denzin and Lincoln, 2003a, p.13).

Apt in such circumstances is the analogy of a qualitative researcher as a *bricoleur* (Denzin and Lincoln, 2003a, p.5). When living in a small, rural community, it is often necessary to wear many hats, play many roles, flex, evolve and patch together ideas, skills and knowledge just to get by. This adaptability fits with a definition of a *bricoleur* in Denzin and Lincoln (quoting Levi-Strauss, 2003a, p.5) as '*a "Jack of all trades" or a kind of professional do-it-yourself person*'.

My professional training is in forest science, a course of study broad in coverage and clearly recognising the environmental, economic and social elements of managing forests. However, on reflection my experience was that the overall content of my undergraduate degree and the culture of the institution from whence it was gained emphasised and valued the role of science, and positivist traditions in academia and broader policy. My personal experiences over the years since then are that such an

[16] Travers (2001, p.10) encapsulates positivism as an approach with '*the central assumption .. that it is possible to describe the world objectively, from a scientific vantage point. Qualitative researchers who share this assumption often favour building technique into studies modelled on the procedures used by natural scientists or quantitative researchers'.*

approach is only ever partial. In contrast, my early exposure to qualitative research at an undergraduate level had limited focus on the use of interviews and questionnaires. The purpose of such tools was to enable data to be collected for analysis using statistics and other such quantifiable and rigorous techniques. My initial research proposal strongly reflected this academic training in the translation of qualitative data to quantitative format. I naively believed that this approach can work when attempting to operate and survive in a relatively isolated, and politically and culturally complex, landscape. When one is an 'insider', quantification does not always translate very readily into practice; conversations, participant observation, and respectful reflection of deep narratives may.

It has been the need to outline my methodological strategy, '*the logic by which you go about answering your research questions*' (Mason, 2002, p.30), that has led to a more in-depth appreciation of how a combination of qualitative research methods would be necessary to answer the questions that have been posed in Chapter One.

Given my multiple roles as researcher, community member, consultant, Council employee, neighbour and friend, it is vital to consider and reconsider the ethics of my work. The ethical dilemmas of research are faced not only by ethnographers. Goodwin et al. (2003) cite extensive literature (for example, Fetterman, 1989; Hammersley & Atkinson, 1995; Holloway & Jefferson, 2000; Punch, 1994; Wolcott, 1995) in which are discussed issues that arise when undertaking any type of research, among them informed consent, privacy, harm, exploitation, confidentiality, trust, deception and betrayal.

The second incarnation of my research was to work closely with (same) two landholders in case studies identifying what, if any, impact the NRM and ICM processes were having at a farm scale. That work required ethics approval from the University of Tasmania following clear demonstration that the participants understood the purpose of the research and agreed to contribute in light of clear reciprocal conditions.

Discussions with the landholders about the project had been ongoing over 18 months before a formal request for participation in the research was made. As the project evolved, the situations for all of us changed. The focus shifted and it was decided to

abandon the case studies but not abandon the relationships that had emerged over the period. Instead, the focus turned to the consideration of the NRM and ICM processes in the ICM more broadly.

Although a formal process has been followed to ensure that ethical considerations are incorporated into the research, Dingwall (1980) argues that a researcher may inevitably face difficulty in interpreting whether he or she has acted ethically. When an ethnographer is engaged in action research over a long period the '*ethical dilemmas are so diverse and inextricably bound to the specific context in which they arise that often they are difficult to anticipate*' (Goodwin et al. 2003, p.568).

Thus, the activities of the LSCMPIC have provided the primary data for this research. The LSCMPIC is aware that I am undertaking the study. Members have provided detailed feedback and input into the three major documents (LSCMPIC 2008, 2010a, 2010b) that serve both as data and pivotal elements in the critical analysis process.

Throughout the years of living, working, playing and researching in the LSC it has been necessary to reflect regularly upon personal and professional principles and values, and to consider the political and ethical dimensions of my actions. There are no illusions that in some instances I got it right, while at other times the balance between participant and observer was heavily skewed to the former. I am also aware that in some instances in the eyes of some I have behaved ethically whilst others may disagree. My experience reflects that reported by Goodwin et al. (2003) that '*ethical dilemmas hinge on the unique and personal dimensions they incorporate… therefore following this line of reasoning, ethical issues must be resolved individually, taking account of the specific research context*'.

Perhaps the greatest test in ethnographic work of the kind I describe is that which requires one to step back and review a situation objectively; perhaps it is not truly possible to do this when one becomes so immersed in a landscape and its people. Goodwin et al. (2003, p.570) refers to the work of Peshkin (1993) and Peberdy (1993), arguing that a researcher's identity will have both '*enabling and disabling*' elements and

can both '*facilitate and encumber'*. It was certainly my experience that my 'identity' served as both positive and negative, sometimes both at the same time depending upon with whom I was interacting and in what situation I was placed.

My identity and actions were also influenced by which 'hat' I happened to wearing or simply by how well I was coping at the time. At times I wearied of considering every conversation in light of an evolving academic and professional knowledge and understanding of ICM and NRM. Wolcott (1995, p.140) succinctly summarised this dilemma with the observation that

> *there is no way we can do this work without uncovering additional information, complexity, and linkages; no way we can claim to be in the business of finding things out without finding things out; no way we can report what we have understood without the risk of being misunderstood.*

Of course, when engaging in ethnography the research process is not entirely shaped by the researcher (Goodwin et al 2003). The objectives and outcomes of this research have been shaped significantly by many other 'agents' with whom I have engaged throughout my participation and observation of activities in the LSC. These 'agents' include landholders and catchment community members whom I see on a regular basis; members of the catchment committee; many professionals (particularly those from the Tasmanian Government and NRM South); researchers who have had an involvement in the catchment or in the work as supervisors; my colleagues at the GSBC; and my friends, peers and family. All these 'agents' have affected whether, how and to what extent I had data access and even whether or not I collected and reviewed various types of data. It was they who provided or denied opportunities for conversation, reflection and context.

In light of this assemblage of inputs from diverse sources, Mason's (2002, pp.14-16) challenge to articulate one's ontological perspective and epistemological position in relation to one's '*intellectual puzzle'* forced me to think deeply about why I have been

driven to complete my research, albeit in a character and tone wildly different from that which I had expected.

My ontological perspective, what '*I see as the very nature and essence of things in the social world*' (Mason, 2002, p.14), informs my research questions. I believe that fundamental to achieving positive change in NRM learning and behaviour is an understanding of humans and their relationships (including social networks, which concern me later in this work). That ontology informs my epistemological position, which is the '*theory of knowledge, and should therefore concern the principles and rules by which you decide whether and how social phenomena can be known, and how knowledge can be demonstrated*' (Mason, 2002, p.16). Those principles and rules, expressed as a methodology, can be considered the research design or strategy, which provides the '*linkage between the methods and the research questions'* or aims: it is informed by and informs one's ontology and epistemology (Denzin & Lincoln, 1998, p.23).

It will be clear that, at the core of my research methodology, is ethnography, a practice that '*is both a process and a product*', and that '*involves an ongoing attempt to place specific encounters, events, and understandings into a fuller, more meaningful context*' (Tedlock, 2003a, p.165). Chambers' (2003, p.390) definition of ethnography provides only a provocation which will be expanded upon through the body of the thesis: Ethnography refers '*to those varieties of inquiry that aim to describe or interpret the place of culture in human affairs* [such that] *culture is composed of those understandings and ways of understanding that are judged to be characteristic of a discernible group*'.

The nature of ICM and NRM processes requires various 'discernible groups' to engage; at a superficial level one might identify among them large acreage graziers, hobby farmers, sea-changers and tree-changers. Yet a homogeneous approach based on stereotypes will not endear all (Harrington et al., 2001; Love et al., 2006; Penton et al., 2005; Smith., date unknown; Vanclay et al. 1998). Deeper and more considered

observation, experience and broad understandings are necessary to engage strategically a complex community in activities designed for the betterment of all, over and above the betterment of one particular group which may not, in fact, represent a 'unity' in any case (Bellamy et al. 2002; Boxelaar 2007; Onyx 2007; Sayre 2005). How can depth be achieved when there are many different cultures, and subcultures, even in a relatively small catchment with less than one thousand residents, such as Little Swanport? An orientation to applied research is helpful (Thomson 2001; Vanclay et al. 1998). Chambers (2003 pp.389-9) defines applied research as that which

> *helps people make decisions and is generally directed toward informing others of the possible consequences of policy options or of programs of directed change. These consequences may be anticipated … or they may be determined in retrospect … I reserve the term applied research for inquiry that is intentionally developed within a context of decision making and that is directed towards the interest of one or more clients.*

In the case of this research, in most instances clients are also participants; this is due to the different roles that I have had and continue to have within the LSC and the broader community. For example, given my current role as NRM Officer it could be seen that the members of the LSCPIC are my clients; however, given that I am undertaking a research project it could also be that they are participants in my study. Since I live and play in the catchment, and since the work of the committee is on behalf of the broader catchment community and my involvement was initially in a voluntary capacity, I would also consider myself one of the clients for whom this applied work informs and assists in making decisions.

In a very real sense, then, this work is more than ethnographic because it involves participatory action research (PAR). PAR is normally associated with hands-on small-scale research projects, addressing '*practical issues that arise in the real world'* (Denscombe 1998, p.57). It is a type of social research which contrasts with what

Whyte (1999, p.368) calls the '*professional expert*' model, where researchers are called upon, or take it upon themselves, to answer particular questions.

In the professional expert model a given answer to a given question may or may not be provided to decision makers or, in the case of catchment management, to land managers. With PAR, a researcher becomes an active participant alongside a group, community or organisation in a social process that facilitates learning, generally to provide insight or a way forward to address an issue or answer a question. A number of players become collaborators in the research process.

Participatory research complements ethnography in that it seeks to change rather than to study social behaviour. Denscombe (1998, p.57) further describes participatory research as having always been about '*changing matters*'. Consequently, it is used to gain a better understanding of a particular problem and address the problem as '*part and parcel of the research process rather than tagging it on as an afterthought*'. In addition, is a commitment to processes of research that involve in research design and implementation those affected by a problem, and engage them in applying findings to change and then evaluate practice. Therefore PAR is about an ongoing '*cycle of research*' where findings result in implementation, evaluation and further research.

Denscombe (1998, pp.57-8) defines the characteristics of action research thus:

> *Practical. It is aimed at dealing with real-world problems and issues, typically at work and in organisational settings.*
>
> [Oriented to] *Change. Both as a way of dealing with practical problems and as a means of discovering more about phenomena, change is regarded as an integral part of research.*
>
> [Involving a] *Cyclical process. Research involves a feedback loop in which initial findings generate possibilities for change which are then implemented and evaluated as a prelude to further investigation.*

> [Requiring] *Participation. Practitioners are the crucial people in the research process. Their participation is active, not passive*.

Note, too, Somekh's (1995, p.340) statement about the integrative quality of action research:

> *Action research (rejects) the concept of a two-stage process in which research is carried out first by researchers and then in a separate second stage the knowledge generated from the research is applied by practitioners. Instead, the two processes of research and action are integrated.*

So, significant effort has gone into working through how my positioning insists that this work be ethnographic and involve participatory action research. Significant effort has also been made to answer the question '*what might constitute knowledge or evidence relevant to your particular puzzle?*' (Mason, 2002, p.25), and how such knowledge or evidence might be generated. Following extensive work on research design, a mixed method approach was settled upon as appropriate for this research. Johnson et al. (2007, p.112) consider that:

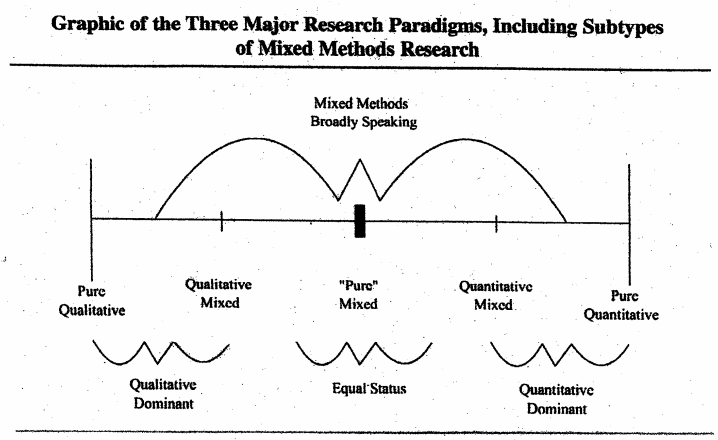
> *mixed methods research is becoming increasing articulated, attached to research practice, and recognized as the third major research approach or research paradigm, along with qualitative research and quantitative research.*

They asked many leaders in mixed methods research how they would define that approach to scholarship. Following a discussion and analysis of the responses they generated the following:

> *Mixed methods research is an intellectual and practical synthesis based on qualitative and quantitative research …. that often will provide the most informative, complete, balanced, and useful research results* (Johnson et al., 2007, p.129).

Such research gains expression along a continuum, which is shown in Figure 4.

FIGURE 4:



Source: Johnson et al., 2007, p.124

Johnson et al. (2007, p.128) conclude that mixed methods are:

> *cognizant, appreciative, and inclusive of local and broader sociopolitical realities, resources, and needs. Furthermore, the mixed methods research paradigm offers an important approach for generating important research questions and providing warranted answers to those questions.*

Importantly, the mixed research approach is driven both by the '*research question*' and by the '*researcher's quest to conduct research that is emancipatory, antidiscriminatory, participatory, and the like'* (Johnson et al., 2007, p.123). A mixed research approach enables different qualitative methods to be used to collect data of breath and depth; and as varied and appropriate lenses for analysis.

At the same time, there is an expectation among practitioners that qualitative research is systematically and rigorously conducted (Mason, 2002; Tobin & Begley, 2004). The use of different methods is sometimes known as *triangulation* or as *crystallisation* - metaphors through which we recognise the need to *'include incorporation of various*

disciplines as part of multifaceted qualitative research design' (Janesick, 2003, p.67). The suitability and success of using either of these conceptual frameworks are subject to discussion and conjecture, particularly for the purpose of achieving rigour, validity and reliability of the research (Janesick, 2003; Morse et al., 2002; Rolfe, 2006; Tobin & Begley, 2004). These matters are considered in greater depth following an overview of each method deployed in this study.

Crystallisation has been deployed in this research in four ways. First, the 'excavated' data were cross-referenced with the academic and general literature. Second, regular 'member checks' of the relevant outputs of the action research by participants was requested. Third, external scrutiny of the research by the supervision team and other key peer reviewers was actively sought. Last, there have been multiple sources of data on which to draw. Among other things, participant observation involves experiential learning, which occurs when engaging in daily life and social relationships. This learning provides a contextual understanding of cultural realities that cannot be captured by formal research methods (Roncoli, 2006, p.82), such as surveys and interviews.

Among hundreds, perhaps even thousands, of people there are many conversations, spoken, written, implied, and yet unsaid about NRM in the LSC. These maybe casual conversations held at a barbeque in the lower catchment about the number of bream in the estuary and their movements, or an official presentation at an overseas conference about the very same thing. I will only ever be privy to a tiny number of these conversations although that number will likely be more than others who do not both live in the catchment and work in the NRM field.

There are also many documents about NRM in the catchment, and I have been able to systematically collate and document these for a period of ten years from 1998 to 2008: these include the outcomes of the workshops; general and public meetings of the LSCMPIC and the WMPCG; emails, letters, faxes, reports, grant applications and newspaper articles. My access to these data was only possible given my long

involvement with the LSCMPIC. Unbeknownst to me, I had been excavating data for many years (see Mason, 2002, p.110).

It was only as I systematically sifted through the paperwork that I became aware of how much data I had amassed. But there were gaps, so access to 'missing' data was requested from members of the LSCMPIC and others involved in work in the catchment over the time period of interest. A summary of this consolidated data resulted in a booklet titled '*A Decade of Catchment Management in the Little Swanport Catchment*'. This publication was initially produced in draft form and reviewed by members of the LSCMPIC and others to address omissions and inaccuracies (LSCMPIC, 2008). The use of 'member's resources'[17] (Fairclough, 1993) provides reliability for the use of these data for analysis (Morse et al, 2003; Rolfe, 2006; Wainwright, 1997).

All such data may be viewed under the rubric of discourse. Hajer and Versteeg (2005, p.175) define:

> *discourse ... as an ensemble of ideas, concepts and categories through which meaning is given to social and physical phenomena, and which is produced and reproduced through an identifiable set of practices. The 'discussion', in other words, is the object of analysis; discourse analysis sets out to trace a particular linguistic regularity that can be found in discussions or debates.*

To make sense of the data obtained from sustained observation and active participation in the catchment community I undertook a secondary discourse analysis of literature that

[17] Fairclough (1995, pp.10-11) introduces the concept of *members resources* with the following: *the most important result of work on comprehension is the stress which has been placed upon its active nature: you do not simply 'decode' an utterance, you arrive at an interpretation through an active process of matching features of the utterance at various levels with representations you have stored in your long-term memory. These representations are prototypes for a very diverse collection of things – the shapes of words, the grammatical forms of sentences, the typical structure of a narrative, the properties in a particular situation types, and so forth. Some of these are linguistic, and some of them are not. Anticipating later discussion, let us refer to these prototypes collectively as 'members' resources', MR for short. The main point is that comprehension is the outcome of interactions between the utterance being interpreted, and MR.*

allows me to understand the broader context of the work. There have been two parts to this process.

A first discourse analysis involved examining reviews of the academic literature defining, analysing and evaluating the political, environmental, social and economic elements of ICM and NRM in Australia and overseas. In Australia, more recently, this output has focused upon the regional approach to NRM and provides a valuable opportunity to compare the similarities and differences of the experiences within and between regions (Farrelly, 2006; Farrelly et al., 2007; Hall et al., 2005; Head & Neal, 2004; Lockwood et al., 2007a; Moors, 2006; Paton et al., 2004; Robins & Dover, 2007a; Robins & Dover, 2007b).

Ryan et al. (2010, p.22) note that *'it is important to have a clear understanding of who makes decisions about natural resources*'; this required a broader investigation into the world of those who clearly are NRM managers. As the *'distribution of land use points to one of the governance challenges: some 62% of Australia's land area is used for agriculture*' (Ryan et al., 2010, p.22) it is important to have a general understanding of the interests and concerns of the agricultural land managers in Tasmania. Weekly reading of the *Tasmanian Country* newspaper continues to provide a broad overview of the Tasmanian farming community as well as regular articles, letters and editorials on water / catchment management and NRM. Other publications of interest to the Tasmanian and broader agricultural community are reviewed whenever possible: for example, *Tas Regions*, a quarterly magazine, focusing on rural and regional issues, published by the DPIPWE, which includes news and features about farmers, rural and regional projects and innovations in agriculture. Living on a large grazing property and working in a rural area provides many opportunities to further learn about and discuss topics of interest to the agricultural community giving further context to written secondary data.

Additional documentation, as well as experiences and discussions, provide insight and general knowledge about other natural resource managers, such as those who work in

the forestry, agriculture, wild and farm fishing industries, as well as the many public land managers and the individuals and communities that support them. Ryan et al. (2010, p.22) state that:

> *The people managing country are not necessarily the 'owners' of that land – private, community and government sectors may be working together on lands of any type of ownership. Interactions between land use and marine environments, and the management of the marine resources themselves, adds further challenges. The number of people either singly or in groups who make or influence decisions about NRM in Australia is therefore large.*

Publications regularly reviewed for NRM context include local and state newsletters and newspapers. Although some are entirely focused on NRM issues – for example, *Running Postman* (newsletter for the Tasmanian DPIPWE Private Land Conservation Programs), other have an indirect or intermittent focus in context of the core business of the targeted audience – for instance, *FireGround* (Tasmanian Fire Service magazine) and *FISH* (the official newsletter of the Australian Fisheries Research & Development Corporation). For many years, I have been collecting and collating these data, in bookcases, files and scrapbooks, at work and at home.

A second discourse analysis was undertaken by consideration and grouping of these data in context of the review of the academic literature on ICM and NRM undertaken in Chapter 3. This analysis has been used to develop a framework which has been a means to evaluate and interpret the primary data in the case study and in a series of sub-cases which are elaborated upon in chapters 4 and 5. Common themes identified in the literature and considered fundamental or core attributes necessary for successful ICM and NRM are further reinforced or illustrated by the stories detailed in the case studies as well as in the supporting secondary data in Chapter 5; this is all undertaken in the broader context of my ontological perspective.

The final sub-case study in Chapter 4 details the Catchments to Coast (CTC) program which is developed around the core attributes of the evaluation framework. This final

case study provides an opportunity to critically analyse the effectiveness of these attributes when they are deliberately integrated into the structure of a developing program. The final analysis in Chapter 5 leads to a discussion on what qualities might be necessary for the successful delivery of ICM and NRM in southern Tasmania based upon some of the analysis of the experiences to date of the CTC program, as well as those of the earlier sub-case studies.

There is ongoing debate and discussion about the limitations of qualitative research methodology as well as of methods such as ethnography and participatory action research (Goodwin et al., 2003; Herbert, 2000; Rolfe, 2004; Roncoli, 2006; Wainwright, 1997). Some consider such methods provide a more detailed understanding of the local context and dynamics which can enrich both the breadth and depth of data collected as well as the interpretation and analysis (Roncoli, 2006). There is also always the possibility that as both insider and outsider, the researcher will influence the type, and interpretation of data encountered and that it is impossible to be objective (Goodwin et al., 2003).

Questions of the 'quality' of qualitative research are often raised in the literature (Rolfe, 2004), and often focus on *how* to ensure such research produces credible outcomes, based upon reliable processes of data collection and analysis. Should qualitative research be evaluated with criteria similar to or different from those used for quantitative research (Morse et al, 2002; Rolfe, 2004; Wainwright, 1997)? Chambers (2003, p.863) argues that '*criteria of utility are as vital for effective applied research as might be the more usual and variable criteria for establishing scientific reliability and validity*'. Of five suggested criteria, those of *accessibility* of research finding and the need to be responsive to different claims of the *significance* of a course of action are very relevant to the present research. However, as discussed by Rolfe (2006, p.304) '*if there is not unified qualitative research paradigm, then it makes little sense to attempt to establish a set of generic criteria for making quality judgements about qualitative research studies*'. In light of this Rolfe (2006, p.308) concludes that:

> *Appraisal of research is, therefore, subject to individual judgement based on insight and experience rather than on explicit predetermined criteria …which implies that the methodology and even the research paradigm within which the study is situated is of less relevance to judgements of quality than the way in which the study is written and presented.*

That said, others believe that responsibility for rigour in research lies '*with the investigator rather than external judges of the completed product*' (Morse et al. 2002, p.7). They suggest that without it, '*research is worthless, becomes fiction, and loses its utility*' (p.1), consider that processes of verification are necessary, and provide the following definition, justification and steps to assist qualitative researchers achieve this end:

> *Verification is the process of checking, confirming, making sure, and being certain. In qualitative research, verification refers to the mechanisms used during the process of research to incrementally contribute to ensuring reliability and validity and thus, the rigor of a study ... If the principles of qualitative inquiry are followed, the analysis is self-correcting. In other words, qualitative research is iterative rather than linear, so that a good qualitative researcher moves back and forth between design and implementation to ensure congruence among question formulation, literature, recruitment, data collection strategies and analysis. Data are systematically checked, focus is maintained, and the fit of data and the conceptual work of analysis and interpretation are monitored and confirmed constantly. Verification strategies help the researcher identify when to continue, stop or modify the research process in order to achieve reliability and validity and ensure rigor.*

Morse et al. (2002, p.6) also consider that the following data verification strategies will ensure reliability and validity of the data. First, '*methodological coherence*' aims to ensure congruence between a research question and components of the method. This process is not linear, particularly when one is engaged in action research. The idea of

crystallisation reflects such coherence, which '*demands that the question match the method, which matches the data and the analytic procedures*'.

Second, one case study, supported by sub-case studies of ethnographic and action research, is considered an *appropriate sample* given the depth and the quality of the data collected about a particular case. Related literature reviews and analysis provide a broad but shallower sample of other cases which have contributed to the evaluation framework.

Third, consideration of the evolving CTC program provides an early means of *replication*, using data collection and analysis of a program based upon some of the principal components of the research. This replication process will assist in future verification should systematic monitoring, evaluation and reporting of this program continue.

The process of ongoing action research suggested by Morse et al. (2002, p.6) contributes to the reliability and validity of the research using '*pacing and the iterative interaction between data and analysis*'. Fourth, then, the strategy of '*collecting and analysing data concurrently forms a mutual interaction between what is known and what one needs to know*' and, at the same time and fifth, *thinking theoretically* enables ideas that form from data to be transformed or *reconfirmed* into new data. The use of a case study over a long period of time '*requires macro-micro perspectives, inching forward without making cognitive leaps, constantly checking and rechecking, and building a solid foundation*'.

The final strategy of *theory development* is critical to this research, which has moved '*with deliberation between a micro perspective of the data and macro conceptual / understanding*'. As one of the actors in the catchment, I have found it necessary to undertake research that '*addresses these actors as persons – knowing subjects – who could make wiser and more prudent decisions in the light of a richer understanding of the situations in which they find themselves'* (Kemmis & McTaggart, 2003, p.363).

It is in this context that I use ethnography and PAR to tell stories and attempt to analyse the implications of deliberate interventions, with consideration of my own role in these interventions. Although this research is only another example of the interplay of local and global, specific and generalisable contexts, it is intended that the outcomes of the research will have not only local but also regional implications for decision making.

Chapter 3 Understanding NRM and ICM

This chapter seeks to provide an overview of the NRM and ICM policy and administrative context in Australia during the time of this research. Key theoretical literature that underpins the evolution of NRM and integrated catchment management concepts is also reviewed.

I want to start this discussion by reference to grassroots movements, such as the national landcare movement, which have limited legitimacy, financial resources, professional experience and political clout in Australia. This lack of clout has motivated the development of governance structures and systems. Graham, et al. (2003, p.1) define governance as '*the interactions among structures, processes and traditions that determine how power and responsibilities are exercised, how decisions are taken, and how citizens or other stakeholders have their say*'. New or contemporary governance evolves alongside markets and bureaucracies which are considered the main modes that modern societies rely on to steer towards common purpose. A shift from '*government*[18], to '*new governance*' can be characterised by '*collaborative arrangement such as networks, partnerships, and deliberative forums, used to coordinate and guide decision-making'* (Lockwood, et al. 2006, p.1). The type of arrangements that this '*new governance'* may embody are endless and varied, and may involve formal and informal institutions, businesses and communities at international, national, state, regional and local levels. Internationally, this tendency to participation and integration is reflected in a growing body of literature and reflects emerging '*new governance*' arrangements (Hagmann, 2002; Lemos & Agrawal, 2006; Marshall, 2008; Whelan, 2005).

The Natural Heritage Trust (the Trust) was set up by the Australian Government as a national grant based program in 1997. It was labelled as a '*trust fund for the protection and rehabilitation of Australia's natural environment*' with three broad objectives:

[18] Definition of government (noun) 'the political direction and control exercised over the actions of the members, citizens, or inhabitants of communities, societies, and states; direction of the affairs of state, community etc.' Source: Random House, Inc. http://dictionary.reference.com/browse/government. Available: http://dictionary.reference.com Accessed: October 3rd 2010.

biodiversity conservation, sustainable use of natural resources, and community capacity building and institutional change (Clayton, 2007).

The first phase of the Australian Natural Heritage Trust (NHT 1) furthered early work begun by the Australian landcare movement[19] in participatory NRM. The 1999-2000 federal review of the National Landcare Program (NLP) and the Trust resulted in commitment to regional forms of NRM funding delivery across Australia (Lee, 2004; Youl, 2006).

Phase 2 of the Australian Natural Heritage Trust (NHT 2) began in 2002 and required the establishment of regional NRM bodies and the development of nationally accredited regional strategies and investment plans. Fifty-six NRM regions across the country were established, between 2000 and 2005, overseen by regional committees (boards or councils) (Lee, 2004). There have been many critiques of this regional model (Farrelly, 2006; Head and Neal, 2004; Moore, 2006; Robins and Dover, 2007a; Robins and Dover, 2007b; Pannell, 2009).

Establishing the NRM regions and engaging stakeholders in the development of regional strategies (or regional catchment strategies as they are known in Victoria), and the associated investment proposals was at times difficult for many of the regional committees, especially those that had only been recently established (Farrelly and Conacher, 2007; Hall, et al., 2005).

The Framework for Future NRM Programmes was endorsed by the Natural Resource Management Ministerial Council on the 24th November 2006 (NRMMC, 2006). The

19 The Australian landcare movement arose out of a joint initiative between the Victorian state government and the Victorian Farmers Federation (a federation made up of eight commodity groups representing farmers in the chicken, meat, dairy, eggs, flowers, grains, livestock, pigs and horticulture industries in the state of Victoria, Australia) to establish a community group response to land degradation in the 1980s. The initiative was nationally launched as a 'Decade of Landcare' by the Australian federal government in 1989 following joint lobbying by the Australian Conservation Foundation (an Australian non-profit organization dedicated to the environment) and the Australian National Farmers Federation (the peak national body representing farmers and, more broadly, agriculture across Australia) (Youl, et al., 2006). The federal government committed $30 million of funding a year for 10 years under the banner of the National Landcare Program (Smith, et al., date unknown).

paper proposed a framework for development of NRM programmes across Australia post June 2008. The Working Group of officials from State, Territory and Australian Governments, and the Australian Local Government Association agreed upon a set of objectives and principles as guidelines for future NRM programs which are detailed in Table 1.

TABLE 1: Objectives and Principles to Guide Future Natural Resource Management Programs

Future NRM arrangements should be based on:

1. Maximising investment return, especially in relation to demonstrable, positive and strategic NRM outcomes;
2. Recognising that it is more cost-effective to prevent damage than to repair it;
3. A program architecture that addresses strategic NRM concerns in an integrated manner and that is sufficiently flexible to accommodate regional variability; and
4. Identifying, protecting and rehabilitating high value NRM assets; and
5. Addressing areas of high and emerging demand for NRM action (such as climate change and urban and peri-urban issues); and
6. The establishment of decision-making processes and structures that are informed by the best available scientific and socio-economic information and advice, and that provide for the timely review of this information and advice.

Objectives:

1. The establishment of cost-sharing arrangements that take account of the interests of, and benefits flowing to, all parties;
2. Continued support for a regional investment element that effectively integrates regional, multi-regional, state and national NRM objectives;
3. The establishment of mechanisms to address cross-regional issues, recognising that there are practical limits on the extent to which individual regions can contribute to extra-regional outcomes;
4. Encouraging integrated landscape management, including through removal of barriers to investment in strategic NRM priorities;
5. The development of arrangements that provide for the maximum practicable community engagement in NRM;
6. The development of arrangements that encourage industry, including primary industry, to be involved in private investment in NRM in partnership with all levels of government;
7. The development of arrangements to further engage and encourage participation of Indigenous communities in NRM programs;
8. The development of arrangements that draw on the operational experience of current and previous NRM models.

Endorsed by the Natural Resources Management Ministerial Council April 2006

Source: NRMMC, 2006, p. 9. Annex A

Farrelly and Conacher (2007) report on the development of the regional strategy by the Northern Agricultural Catchments Council of Western Australia. This case study involved interviews, participant observation and document analysis of regional group members, community group members and other key stakeholders, such as representatives from state and local government.

Key outcomes included concerns about increasing bureaucracy through the creation of a regional body, the motives of the Council members, and the need for more local involvement and on-ground action instead of more planning. A stakeholder interview respondent sums up the concerns by stating that the region '*was more focused on developing the regional strategy than ensuring local groups were still active and contributing*' (Farrelly and Conacher, 2007, p.325). The research indicated that although the communication with regional stakeholders was extensive during the preparation of the regional strategy, it was lacking during the development of the investment plan. Despite the determination of the regional group that the process of developing the strategy and the investment plan would take a 'bottom-up' approach, restrictive timing and delays in receiving information and guidance from the Federal Government were seen to make a grass roots process difficult.

Individuals and organisations that knew and understood the process and had the capacity to be proactive were in a better position to input into the investment plan. More recent research by Prager (2010, p.11) indicates that some members of local 'landcare' type groups felt alienated from the decision making processes of the regional NRM boards. Work by Robins and Dover (2007a) indicates that there are external factors that may influence the capacity of NRM regions to attract resources. Factors include; regional setting and complexity, physical remoteness, access to political and bureaucratic decision-making processes, access to information, profile of regional NRM issues, and proximity to learning and research centres (Robins and Dover, 2007a, p.275). External factors may also impact on the capacity of communities within regions to attract resources for NRM activities, a concept perhaps worthy of further investigation.

Respondents to research in the Northern Agricultural Catchments Council of Western Australia recognised that the regional approach *'would encourage more strategic and coordinated management and better integrations with stakeholders, as well as providing a more holistic view of the region*' (Farrelly and Conacher, 2007, p.317). Yet work by Prager (2010, p.721) concludes that local groups and regional NRM organisations have '*different priorities for action, different language (leading to a lack of mutual understanding), and different approaches to implementing change'* and therefore '*an intermediary for communication is required to link local groups enthusiasm and knowledge to the regional planning and management process'*.

Prager (2010, p.721) also highlights '*the role of an intermediary or 'mediating structures' for facilitating communication'* and thus emphasises the potential role of sub-regional groups, such as local NRM and ICM groups, in providing strong links between the local community and regional organisations. This observation leads to the concept of '*nesting'* which is discussed in depth by Marshall (2008, 2009) in the broader context of the principle of '*subsidiarity*' for community based natural resource management. Marshall (2009, p.46) notes '*that although various definitions of this principle exist, they share the implication that any particular responsibility should be assigned to the lowest level of governance with the capacity to discharge it effectively'*.

'Nesting' is a means of decentralising decision making by enabling lower level units of operations, such as local farmer groups or community groups, to be autonomous in decision making in areas where they have the capacity and jurisdiction to do so, as long as they '*do not effect anyone in another subunit'* (Marshall, 2009, p.46). They can be supported by strategic linkages to higher level units of operation, such as representative local government NRM groups or catchment groups, which are further linked with and supported by regional NRM organisations, and other levels of government.

For nesting to be effective it is necessary '*to account for all relevant aspects of capacity'*; that is the '*physical, financial, human and social capacities'* that enable any

particular unit of operation '*to fulfil a particular responsibility without imposing negative effects on other units*' (Marshall, 2009, p.46).

The subsidiarity principle and the corresponding concept of nesting in NRM governance are only components of a much broader discussion around rescaling environmental management and planning. A shift to regional planning in NRM is considered by Lane et al. (2009, p.3) to be one of '*the four major trends and trajectories in environmental policy as we see them from an international and Australian perspective'*. In Australia this shift is one from an earlier focus on community NRM programs of a more localised nature or catchment basis.

Across Australia the implementation of an ICM approach to NRM has been evolving over the last twenty years. Bellamy and Johnson (2000) consider that among the main reasons for this approach are the degradation of land and water resources, community concerns about coordination of natural resource management, market opportunities, a trend of government devolving responsibility of NRM to community groups, and increasing community expectations for accountability and transparency in environmental protection.

In some instances, the boundary for an ICM process may be the actual hydrological catchment boundary such as the Denison River Catchment on the east coast of Tasmania (Boughey, 1998). In other instances it may include a number of hydrological catchment boundaries within a broader region such as those catchments managed by the Victorian Catchment Management Authorities (Figure 5).

FIGURE 5: Boundaries of Victorian Catchment Management Authorities

Source: http://www.dpi.vic.gov.au/dpi/vro/map_documents.nsf/pages/vic_cmas#page-top accessed 10th March 2009

The essence of ICM – the need to manage holistically - is just as relevant with multiple catchments as with one as long as the boundaries are clearly defined and agreed too (Margerum, 1999).

Combined with the ramifications of various government programs and policies, by the year 2006 the number of watershed initiatives in the western states of the United States of America alone was up to 400 (Bidwell and Ryan, 2006). Seymour and Ridley (2005) record that in Ontario, Canada, 38 catchment based conservation authorities were involved in catchment planning and management. In some Australian states certain larger catchment based organisations were:

> *supported by State-level legislation (South Australia, Victoria and New South Wales) and some were not. This latter group of regions in the States of Queensland, Tasmania, Western Australia and, initially, the Northern Territory were left to operate in an uneasy middle ground between being an instrument of government funding and a product of local organisation and even self determination* (Lane et al., 2009, p.6).

A report providing an overview of ICM across Australia was commissioned by the Murray-Darling Basin Commission and completed in 2002. The report was to achieve the following objectives using the available literature, including recent reviews of ICM completed in each state of Australia:

> *(a) to identify key characteristics of ICM in each state and their effectiveness;*
>
> *(b) to identify social or institutional arrangements, trends or issues relevant to the further development of ICM in the Murray-Darling Basin;*
>
> *(c) to identify the core characteristics of 'best practice' ICM for the Murray-Darling Basin;*
>
> *(d) to identify the implications and potential opportunities for ICM implementation in the Basin to:*
>
> > *(i) improve participation of local government;*
> > *(ii) provide better integration across jurisdictional boundaries;*
> > *(iii) increase the participation of Basin people in ICM processes*
> > (Bellamy et al., 2002, p.1).

This report provides a valuable summary of the characteristics of ICM in each state including its historical evolution. ICM governance in each State, including policy frameworks and other institutional arrangements, has been strongly influenced by historical trends. In all States the evolution of ICM governance has been motivated by the protection and enhancement of agricultural activity, with issues such as water

management, soil erosion, salinity, and vegetation management being strong drivers of an integrated approach as all these issues require collaboration and cooperation for resolution (Bellamy et al., 2002).

It was recognised that catchment bodies in all Australian states were often inadequately resourced to carry out what is expected of them and many were heavily reliant on volunteers (Bellamy et al., 2002). There have also been difficulties in engaging local government in ICM and NRM processes (Bellamy et al., 2002; Pini & Mckenzie, 2006; Shepherd, 2005). A review of ICM in Western Australia in 1992 identified problems encountered during its initial implementation, perhaps because '*some government ministers and officials considered it a threat to traditional areas of responsibility and ways of conducting business, because it implies greater sharing, and sometimes a redefinition of role*' (Mitchell et al. 1993, p.739). Research by Pini & Mckenzie (2006) indicates that such may sometime also be the case in local government. Semi structured interviews with senior staff and elected members of 16 rural local councils in Victoria and Tasmania identified '*three key discourses deployed by participants',* namely '*that community engagement for sustainability in rural local governments is unnecessary, unwanted and unproductive'* (Pini & Mckenzie, 2006, p.28).

The evolution of ICM has been strongly influenced in each State by federal policy changes and their subsequent impacts upon funding sources over the last ten years. Those States with ICM legislation such as Victoria, New South Wales and South Australia needed to consider if and how the existing arrangements could be integrated into the federal government requirement for a regional approach to NRM.

In some instances, such as in Victoria, the existence of catchment management authorities (CMAs) provided a structure that could be relatively easily melded into the evolving regional framework. In fact the well established administrative structure of the CMAs in Victoria proved to be advantageous in accessing funding through NHT 2 and the National Action Plan for Water Quality and Salinity (NAP). Victoria received an

average of $14.24 million per region compared to $2.86 million per region in Tasmania (Robins and Dover 2007a).

Unlike in other States, in Tasmania there is no legislation or policy that specifically addresses ICM. Elements of ICM and NRM are considered in a range of existing legislation and policy, including the *Public Health Act 1997*, the *Water Management Act 1999*, the *Environmental Management and Pollution Control Act 1994* (EMPCA), the *Weed Management Act 1999*, *Agricultural and Veterinary Chemicals (Control of Use) Act 1995*, *Forest Practice Act 1985*, *Wildlife Regulations 1999*, *Nature Conservation Act 2002*, *Threatened Species Protection Act 1995* and the *State Policy on Water Quality Management 1997* (see Appendix 2: Tasmanian NRM Framework for a full list of policy instruments relevant to NRM, DPIWE, 2002, p.31). The focus tends to be on addressing specific elements of ICM, such as water quality or quantity, or point source pollution, or control of Declared Weeds. For example the process of developing a WMP under the WMA 1999 can be done on a catchment scale. However, the scope of the plan only addresses water sharing and allocation, and to a limited extent the impacts of the plan on water quality (DPIWE, 2005b; Hamstead, et al. 2008).

ICM was defined in Tasmania by the Tasmanian Land and Water Management Council (TLWMC) as:

> *the coordinated and sustainable use and management of land, water, vegetation and other natural resources on a regional water catchment basis so as to balance resource utilisation and conservation. It is a philosophy, a process and a product* (TLWMC, 1997, p.2).

The TLWMC was established in the 1990s as a coordinating body for NRM, as well as having an oversight function for ICM in Tasmania through the Catchment Management Working Group. The Council was a 12 member body with equal government and non-government representation although it was considered that the Council '*was not effective and was disbanded in 1997*' (Bellamy et al., 2002, p.223).

The TLWMC outlined principles to clarify the philosophy underpinning the approach to ICM in Tasmania in 1997. The emphasis was on voluntary actions, cooperation and consultation:

> *ICM is based on voluntary response through community action;*
> *The ICM framework will apply to all land users in the catchment;*
> *Decisions will be made in a democratic and open process;*
> *The cost of ICM and associated plans will be shared by all stakeholders;*
> *Management arrangements for all land tenures are to remain the responsibility of each owner / manager;*
> *There should be no extra level of governance;*
> *There is no duplication of catchment planning processes;*
> *Existing legislation and processes are to be used for development control;*
> *There should be consistency between ICM and other resource management systems and plans;*
> *The administrative boundaries for catchment management are to be agreed to by all players;*
> *Social and economic factors and impacts should be taken into account*
> (TLWMC, 1997, p.4).

In Tasmania, ICM initiatives often occurred at a local government and community level. Catchment and rivercare plans[20] were developed for many water bodies across Tasmania (NRM South, 2005a). Much of this work was progressed through accessing external federal funding such as NHT 1 and was often supported through local government (Bellamy et al., 2002; LSCMPIC, 2008).

A review of ICM in Tasmania was undertaken by Bellamy et al. (2002). Although a number of years old now this review provides an excellent overview of the evolution of

[20] A *rivercare plan* aims to achieve a number of objectives including improved outcomes for any work undertaking or adjacent to a river, fostering community spirit and cohesion in managing the river and encouraging groups to maintain and continue to improve their river once their project has been completed. *Rivercare plans* aim to ensure that funds spent on works in rivers are strategic and fit in with wider catchment management activities (DPIWE, 2000).

ICM in Tasmania and identifies some key elements, especially the expectation that the (then) only recently passed WMA 1999 would significantly modify existing approaches to catchment management.

The review makes a key observation reflecting governance arrangements relevant to ICM in Tasmania:

> *while catchments are recognised as boundaries suitable for managing resource systems, and sometimes reflect other boundaries, such as those of local government, the issues they are required to deal with, such as problem vegetation, water quality and salinity straddle jurisdictions and therefore require institutional support at a more regional and state based level for management*

and

> *there is strong evidence from the extent of catchment oriented plans and strategies generated within local government regions, that community participation and ownership of issues is not poor. Rather, the overarching direction that can be provided through the state to identify and prioritise issues and implementation may be lacking or obscured at this point* (Bellamy et al., 2002, p.219).

Despite such observations, ICM has often developed through partnerships formed between the community and local government. A number of catchment planning processes were initiated and progressed with funding through NHT 1 (GSBC 2002a, 2002b; Hobart City Council, 2002; LSCC, 2003).

The Australian Natural Resources Atlas identified a '*clear and consistent approach to integrated catchment management'* as being a key water resource management issue facing Tasmania (http://www.anra.gov.au/topics/water/management/tas/index.html accessed on the 6th April 2009). The need for some type of formal structure that addressed the integrated nature of ICM and NRM was identified in a review of options for enhancing the effectiveness of catchment management planning as far back as 1995

(AACM International, 1995). The Tasmanian NRM Framework (the framework) and the subsequent passing of the *Tasmanian Natural Resource Management Act 2002* signalled the beginning of regional NRM, and also a way for existing ICM initiatives to receive both regional and state support.

The Tasmanian NRM Steering Committee (the committee) was established by the Tasmanian Government in 2001. The committee was given the task of developing the framework in which:

> *natural resource management is the management of all activities that use, develop and/or conserve our air, water, land, plants, animals and microorganisms, and the systems they form* (DPIWE, 2002, p.11).

The framework recognises the many policies and processes in place to deal with NRM at international, national, state, regional and local levels. It aims to build upon these policies and processes and not to replace them. More specifically it aims to further integrate and coordinate current and future policies and procedures, as well as identifying and filling gaps. The framework provides an excellent overview of existing state policy instruments of relevance to natural resource management.

The framework specifically recognises that the key means of '*promoting sustainable development in Tasmania'* is the Tasmanian Resource Management and Planning System (RMPS) (DPIWE, 2002, p.13). *The Land Use Planning and Approvals Act 1993* provide the mechanism for integrating planning approvals and resource management through the development approvals system. Given the significant role of local government in land-use planning, waste management and community engagement it is highlighted that engagement of local government is a critical component of successful NRM (DPIWE, 2002).

The following Principles of Natural Resource Management outlined in Table 2 have set the scene for all subsequent outcomes of the framework.

TABLE 2: Principles of Natural Resource Management

The following set of principles will inform decision making under the Natural Resources Management Framework. They are not in priority order.
Ecosystem approach **-** natural resource management should be based on an understanding of the relationship between natural resources and the ecosystems they support, and upon careful monitoring of change over time.
Balanced decisions **-** natural resource management decisions should take proper account of the range of environmental, social and economic benefits, values and costs in accordance with the objectives of the Tasmanian Resource Management and Planning System.
Integrated management **–** The management of natural resources should be integrated within regions and catchments, as well as across industry sectors, government agencies and specific issues.
Priority based **-** natural resource management actions are to be undertaken according to priorities that are based on the best available science and information, and relevant experience, as well as on assessment of the relative cost-effectiveness of various options.
Prevention is better than cure **–** it is often more efficient to prevent damage rather than repair it. Therefore, where there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.
Partnerships **–** To be effective, natural resource management requires the establishment of partnerships between all levels of government and the community, including the Aboriginal community, industry, land holders and individuals, with agreed roles and responsibilities.
We are all responsible **–** All Tasmanians receive benefits from the use, development and conservation of natural resources; they share responsibility for managing natural resources sustainably, and for providing economic resources to do so.

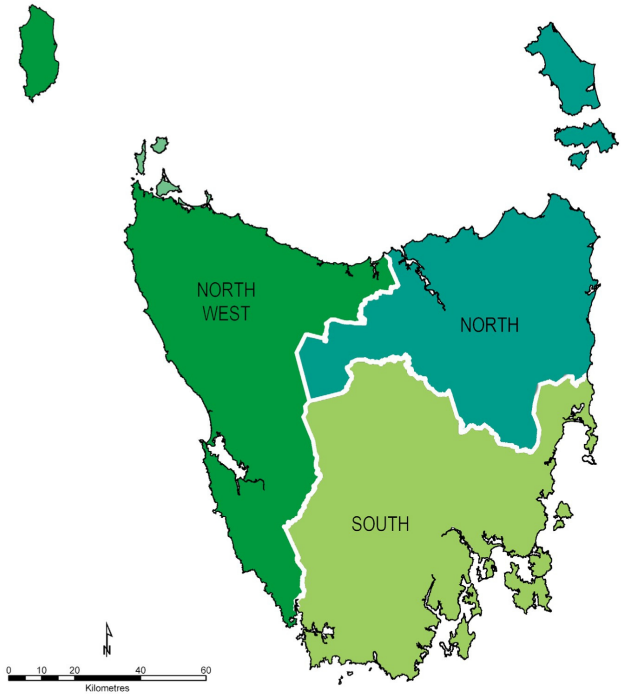
Source: DPIWE, 2002, p.15

The framework identified interim state NRM priorities – recognising that priorities change with time, circumstances and depending upon the scale. The priorities are capacity building, education / communication, research, water management, vegetation management (forest and non-forest), soil management, management of weeds, pest and diseases, and the management of the coastal / marine environment.

Of all these priorities it was identified that '*capacity building, communication / education and research are key priority areas for the future of natural resource management in Tasmania'* (DPIWE, 2002, p.16).

The key recommendations of the framework included establishing a Tasmanian NRM Council with stakeholder representatives chosen for their skills, knowledge and interests. The framework also recommended establishing NRM committees in three regions, using the boundaries of the local government regional bodies; the Cradle Coast Authority, the Northern Tasmanian Municipal Organisation and the Southern Tasmanian Councils Authority (Figure 6).

FIGURE 6: NRM Regions in Tasmania



The three NRM Committees were required to identify and set regional priorities within 12 months of their establishment which formed the basis of regional NRM strategies. The regional strategies needed to be accredited and include an appropriate structure of standards and targets to ensure consistency and quality control. National accreditation criteria would be developed by the Commonwealth and state governments through the NRMMC. Finally, the framework recommended the development of legislation to enable the roles and functions of the Tasmanian NRM Council, to establish the Regional Natural Resource Management Committees, and determine the accreditation processes for the regional strategies (DPIWE, 2002).

The *Tasmanian Natural Resource Management Act 2002* (the Act) was enacted by His Excellency the Governor of Tasmania on the 14th November 2002. The purpose of the Act was to establish the Tasmanian NRM Council and three regional committees. The powers, functions and requirements for membership of the regional committees are set out in the Act. The legislation also describes the inter-relationship of the regional committees with the Tasmanian NRM Council and each other.

The Southern NRM Regional Committee (NRM South) was established in 2003 as an independent non-statutory body constituted under the provisions of the *Tasmanian Natural Resource Management Act 2002* and incorporated and operated in accordance with the *Tasmanian Incorporated Associations Act 1964*.

The southern NRM region incorporates the area managed by the 12 Southern Tasmanian Councils: Brighton, Central Highlands, Clarence, Derwent Valley, Glamorgan Spring Bay, Glenorchy, Hobart, Huon Valley, Kingborough, Sorell, Southern Midlands and Tasman. The Region also includes the adjacent state waters (Figure 7).

FIGURE 7: Southern NRM Region and the 12 southern Municipalities

Source: Tasmanian Government Tasmaps

Key NRM stakeholders in the southern region agreed to establish NRM South as the managing body of the Southern Regional NRM Association (the Association), which comprises all interested stakeholders members. The Committee has significant autonomy and freedom to act within the general set of functions and powers as determined under the Act.

NRM South represents state and local governments, public land managers, community interests, conservation interests, industry and Aboriginal community interests. The

inaugural Committee was made up of representatives from local and state government, forestry, private industry and business with broad experiences in all aspects of NRM. In 2009, a Special General Meeting held by the Association endorsed that the Committee proceed to a skills based (as opposed to representative based) board with the number of members reduced from 15 to nine.

Upon establishment in 2003 NRM South commissioned a 'Southern Regional Natural Resource Management Situation Paper' '*to provide advice to the Regional Committee (the Committee) as the current situation of natural resource management in Southern Tasmania and potential directions for the preparation of a Regional NRM Strategy'* (Southern Regional NRM Technical Reference Group, 2002, p.1). Four hundred and seventy-four NRM related documents relevant to the Southern Region were identified and catalogued. The LSCP was one of these documents.

DPIW also prepared a number of Issues Papers to inform the development of the strategy. The following topics were covered; air quality, coastal habitat and processes, cultural heritage assets, fauna assets, freshwater ecosystems, fresh water quantity (surface and ground water), geoconservation and geodiversity, rocks, karst, coasts and rivers, marine and estuarine habitat, marine and estuarine water quality, marine farming assets, pests and diseases (excluding weeds), salinity, soil assets, threatened species, vegetation assets, waste management, water quality, weeds, and wild fisheries. The issues papers informed the development of discussion papers, which along with a scoping and information paper, and stakeholder forums assisted NRM South in the development of the strategy (accessed via the internet http://www.nrmtas.org/library/south/strategiesProposals.shtml 6th April 2009).

The vision for the NRM Strategy for Southern Tasmania 2005-2010 (the strategy) is that *'the Southern Region's natural resources will be protected, sustainably managed and improved for the shared environmental, social and economic benefit of our Region by a well-informed, well-resourced and actively committed community'* (NRM South, 2005, p.15). The strategy was reviewed over 2009 / 10. The vision and guiding principles (as

outlined in the framework) remain the same. A summary of achievements throughout the region was prepared, followed by a strategic background paper, which provided a scan of NRM issues and emerging concerns. These documents informed the community consultation process which enabled broad input into the draft 2010-2015 strategy.

The following five strategies have been developed alongside corresponding actions and performance indicators.

> *Strategy 1: Maximise return for natural resource management investment*
> *Strategy 2: Increase community awareness of the Region's natural resource assets*
> *Strategy 3: Manage current and emerging threats to the Region's natural assets*
> *Strategy 4: Measure and report changes in natural resource condition*
> *Strategy 5: Increase stakeholders' capacity to use the Region's natural assets wisely, including conversion of new opportunities associated with the sustainable use of these assets* (NRM South, 2010, pp.22-25).

The review of the Strategy was undertaken in context of an earlier review of the NRM Framework and the NRM Act 2002, undertaken in 2007. This process involved significant stakeholder and public consultation about the performance of the framework and legislation over the previous five years and ways in which it might be improved. The Tasmanian Government committed to implementing all the recommendations (accessed via the internet http://www.dpiw.tas.gov.au/inter.nsf/WebPages/HBAW-7FS37B?open on 6th April 2009).

In Tasmania and across the nation, it would appear that NRM and ICM are supported to varying degrees by a range of different and evolving legislative and policy frameworks (Bellamy, et al. 2002; Mitchell and Hollick, 1993). How this support transfers to changes in behaviour and actions on the ground varies greatly in each State (Bellamy, et al. 2002; Dover, 2001; Mitchell and Hollick, 1993).

There has been a significant focus on how to evaluate the processes, initiatives and outcomes of NRM and ICM to ensure that stakeholder investments are in the best interests of all (Bellamy, 2001; Pannell et al., 2007). There has been extensive evaluation and review of the NHT, the first phase NHT 1 (1996/97-2001/02), second phase NHT 2(2002-2008), and the NAP (http://www.nht.gov.au/publications.html accessed 20th October, 2010). These programs finished in July 2008 and the evaluation of their effectiveness and consideration of lessons learnt and the implications for future NRM and ICM programs is ongoing (Alexander et al., 2010; Marshall, 2009). Of particular interest for this research is that work which focuses on NRM governance.

One such work was the Land and Water Australia (LWA) project *Pathways to good practice in regional NRM governance*, funded between 2006 and 2008, and which assessed the effectiveness of nine NRM regions across Australia and developed a standard for good practice in regional NRM governance (Lockwood, et al. 2006, 2007a, 2007b, 2007c, 2008a, 2008b, 2009, 2010). The project involved undertaking a review of NRM governance arrangements in Australia based on the (then) new regional delivery model. The review details the varying frameworks for NRM in NSW, Tasmania and Victoria. It also details varying NRM issues, governance and funding arrangements for nine regional NRM organisations. The detailed case studies include NRM South in Tasmania, encompassing the LSC. Key conclusions of the review included that the type and widespread nature of NRM issues are common across all nine regions, although there is a considerable variation in structure between and within states and Territories and a significant factor influencing structural variation is the degree of legislative standing and statutory functioning of a regional organisation. It was observed that the maturity of the organisations varied and is influenced by the previous existence of similar catchment or regional type arrangements such as existed in Victoria[21]. The also

[21] Victorian Catchment Managements Authorities (CMAs) are statutory authorities established to coordinate land, water and biodiversity management and were originally established under the *Catchment and Land Protection Act 1994.* In Tasmania no such arrangement existed. The three regions established were based upon the boundaries of the local government regional bodies – the Cradle Coast Authority, the Northern Tasmanian Municipal Organisation and the Southern Tasmanian Councils Association (DPIWE 2002). Coincidently these almost match the Telstra phone book regions (Kirkpatrick 2007).

noted that the regional boards are generally skills based although some also have a mix between skills and representation. Finally, the evolution of the NRM governance arrangements was considered to be ongoing and will need to remain so in the ever changing political, social and environmental Australian landscape.

The shift to regional NRM reinforced the observation by Pannell et al. (2007, p.1) that '*there have been rapid and frequent changes in the arrangements and structures surrounding catchment management bodies in Australia'*. Is there any theme or consistency to the different and emerging forms of environmental and natural resource governance? Lemos and Agrawal (2006, p.298) believe that the key lies in the political and economic relationships that institutions embody, and how these relationships shape identities, actions and outcomes.

The evolution of NRM governance is likely to have been influenced by what Moore (2006) reflected upon as a national trend in Australia towards a 'third way' in governance. The third way implies a 'self help' approach whereby communities are encouraged to develop and drive action agendas, often on a voluntary basis, with the aid of funding. Lockwood et al. (2007c) elaborates upon the influence on this 'third way' based on the ideological paradigm of neoliberalism, '*that which comprises a range of philosophical and practical developments upon the liberal agenda'* (p.20), with a range of goals:

> *To optimise (economic) efficiency and competition;*
> *To ensure regulation, but has taken two guises- first, the deregulation of government and second, the trend to reregulation via the mechanisms of governance; and*
> *To reconstitute the (social) contract – a new contractualism to foster active citizenship, prudentialism and risk minimization, and thus to foster a flourishing civil society and sustainable communities'* (p.24).

Amongst a number of institutional capacities believed to be required by a neoliberal ideology, of relevance to current NRM governance is '*the idea of responsible autonomy; that citizens do not depend simply on the operations of government for their welfare, but are accountable, dependable, conscientious and act in their own (enlightened) self-interest'* (p.22). The objective to create an '*active citizenship'* is necessary if government is '*to be minimal and relies upon individual responsibility and enlightened self-interest'* (p.23).

The regional approach to NRM perhaps is an example of the neoliberalist interpretation of this 'third way'. The rhetoric espouses participation, engagement and community ownership. However, stringent requirements for funding and short term funding cycles often determine the types of projects, the participants, and the 'outcomes' that are to be 'purchased', reflecting a bureaucratic top down approach, despite the objective to reduce the role of government.

Opportunities for effective NRM activity may arise from the collaborative partnerships that develop through seeking and or obtaining the resources available through the evolving NRM governance arrangements in Australia, such as the funding available through the current Australian Government policy and program 'Caring for Our Country' (CfOC), which commenced in 2008. CfOC aims to integrate delivery of the Commonwealth's previous natural resource management programs, the Natural Heritage Trust, the National Action Plan for Salinity and Water Quality, the National Landcare Program, the Environmental Stewardship Program and the Working on Country Indigenous land and environmental program (http://www.nrm.gov.au/ accessed the 10th March 2009). The Australian Government claims that CfOC is an integrated package with one clear goal, a business approach to investment, clearly articulated outcomes, priorities and improved accountability. Pannell (2009, p.4) evaluates the early differences between CfOC and the previous programs with the following observations of particular relevance to this discussion:

> *it is … structured around six theme areas, or "national priorities": national reserve system; biodiversity and natural icons; coastal environments and critical aquatic habitats; sustainable farm practices; natural resource management in remote and northern Australia; and community skills, knowledge and engagement. Strikingly, salinity is not a priority issue – a major departure from having a major program devoted to it. For the new priority issues, spatially explicit priority regions are specified.*
> *A much smaller share of the budget is allocated directly to CMOs* (regions*).*
> *Larger projects are encouraged.*
> *There is an emphasis on achievement on outcomes within the five-year time frame of the program.*
> *Bodies other than CMOs* (regions) *have more scope to submit proposals for funding under the program.*

Across Australia individuals, community groups of various sizes and scales, business, industry, regional NRM bodies, and state government departments all awaited the release of the first business plan outlining the priorities and process for accessing funding from the CfOC initiative. Different and creative partnerships began to develop in anticipation of future NRM funding opportunities. Internationally, the emerging new scenarios are examples of the suppositions by Lemos and Agrawal (2006) that political and economic relationships can directly influence environmental governance arrangements, of which NRM is arguably a part. Although funding programs such as CfOC may provide the impetus for such relationships, the implications for NRM often extend far beyond the achievements directly relating to the funding expenditure.

If it is the political and economic relationships that determine the type of governance that emerges then it would seem appropriate that the development of broad principles to guide these arrangements as they evolve would be of value. Principles based on a sound review of best practice NRM would enable some possibility of consistency and also of success.

Lockwood et al. (2006) presented a set of good governance principles that were designed to meet the needs of regional NRM governance in Australia (Table 3).

TABLE 3: Regional NRM governance principles

Principle	**How the principle applies to regional NRM governance**
1. *Legitimate* in the exercise of authority	Legitimacy refers to the popular acceptance of a regime's authority to govern. It implies accountability and transparency in decisions and actions; appropriate regulation through relevant policies and procedures; compliance with legislative and contractual obligations; and principled exercise of shared and individual power
2. *Inclusive* in engagement of people involved or affected by decision-making policies and procedures	Governance is inclusive when all those with a stake in governance processes can engage with them on an equal basis
3. *Fair and equitable* in recognition and distribution of costs, benefits and responsibilities	Actors and institutions are expected to be fair and equitable in the exercise of the authority conferred on them, in the distribution of power, creation of opportunities for engagement, treatment of participants, recognition of diverse values, consideration of current and future generations, sharing of cost, benefits and responsibilities of decision-making and action
4. *Connected* functionally across governance institutions	Functional connectivity implies systematic coordination across different scales of government, policy sectors, and regions
5. *Consistent* in direction across governance institutions and instruments	Consistency implies formulation of a long-term vision with short-to-medium term measurable objectives; strategic direction vertically consistent with arrangements at other governmental levels; and horizontally consistent policy and management instruments
6. *Competent and effective* in delivering	This principle refers to effectiveness in improving resource condition, efficiency of resource use, and the skills and capacities available to NRM participants

outcomes	
7. *Well-informed*	Good quality information and communication, and diverse inputs of knowledge are needed in solving NRM problems
8. *Responsive and self-reflexive* with respect to changing circumstances, knowledge and performance	Responsiveness and self-reflexiveness involve conscious self-observation and self-reflection about institutions and organisations performance and operations conditions in order to be alert to and respond to changes as they occur
9. *Durable* in ability to account for varying temporal scales in social, institutional and biophysical processes	Persistence of policy and institutional settings is necessary to provide sufficient longevity for policy and institutional learning

Source: Lockwood et al., 2006, p.7

These principles are a key element of a Governance Standard and an associated Assessment Framework for the multi-level system of Australian natural resource management (Lockwood et al., 2008b). The Standard and Framework are intended for use by national and state NRM agencies and regional NRM governing bodies in Australia. The Australian Regional NRM Chairs have built upon this work in a paper that '*outlines the structure and mechanisms of Australia's NRM governance system'* (Ryan et al., 2010, p.iv).

Critical to any analysis of governance is a clear understanding of who makes decisions, and the scale and potential impact of those decisions. It has been long recognised that irrespective of size or location, local government in Australia makes a significant contribution to the management and protection of Australia's natural resources. Local governments are managers of public land and land use planners, responsible for policy development and implementation of land use planning as well as regulating a wide range of activities that may impact upon natural resource management (Binning et al., 1999).

Local government is often considered '*the most accessible sphere of government to ordinary citizens*' (Pini & Mckenzie, 2006, p.31). Although local government:

> *is considered the fundamental 'third' sphere* (of the Australian three-tiered system of government) *next to state and federal governments, it does not have independent constitutional status. Rather, the 700 local government authorities that exist are created by legislation in each of the eight states and territories* (Pini & Mckenzie, 2006, p.30).

Local government plays a key role in translating the policies of Commonwealth and state governments into on-ground projects, often in partnership with the community. There is broad agreement that local government should be involved in regional NRM and it has been long recognised that for some local government the involvement in NRM has been ongoing for many years (REDA, 2005). However a survey undertaken in 2005 by the Australian Local Government Association (ALGA) found that the engagement by councils in regional NRM planning processes was limited (Shepherd, 2005).

The ALGA identifies the range of functions, powers and responsibilities that local government can use to influence natural resource management on both private and public land. These include:

> *strategic planning through land use zoning and statutory controls on all freehold land and locally managed public open space;*
> *development control of nearly all activities and works on freehold land and crown land (except national parks and state forests) through development consent powers (e.g. setbacks, density restrictions, clearing controls, erosion and sediment management, waste disposal (including pollution control);*
> *enforcement powers for development consent conditions, waste management and unauthorised land uses e.g. land clearing, drainage, filling, unauthorised construction and some pollutant (including sediment) discharges;*
> *administrative responsibility for state agency coordination through integrated planning, licensing and development concurrence;*

stormwater management and control; sewerage and drainage works and flood control and planning in many jurisdictions;
pest, plant and animal risk control measures;
influence over land clearance patterns through incentive programs (planning amendments, rate differentials, levies, rural fire management and developer contributions);
management of local open space to restore remnant vegetation and recreate habitat;
tourism development;
advocate for and coordinator of local community groups and interests.
Source: http://www.alga.asn.au/policy/environment/nrm (accessed 10th March 2009)

The Australian Government NHT 2 program funded local government NRM facilitators who were housed in local government associations in each state and Territory. These facilitators have played a role in creating a greater understanding of the role of local government in regional NRM. The funding of these positions ceased with the roll out of the CfOC program in July 2008. The work of the NRM facilitator position in the Local Government Association of Tasmania (LGAT) lent a degree of legitimacy to the incremental creation of professional NRM positions within local government in southern Tasmania. These positions are still mostly part time and in some councils they are partly funded through external funding and are therefore only on a contract basis. The GSBC has only more recently recognised that the NRM position is critical in meeting core NRM legislative obligations, as well as supporting community and council initiatives. It is in this local, regional, state and national context that the following case studies are examined.

Chapter 4 Case studies of processes in NRM and ICM in the Little Swanport Catchment

4.1 The beginning of ICM in the LSC

> *A meeting at 'Stonehenge' on 5th July 1998,* (was) *held to discuss the major issues facing the Little Swanport Catchment and to form a committee to begin the process of developing a catchment management plan, was attended by 43 people. An additional 17 people extended their apologises* (Little Swanport Catchment Committee (LSCC), 2003, p.9).

So it was that a mid-winter meeting 'officially' heralded the beginning of ICM in the LSC. This chapter addresses the second aim of this research to document a number of interwoven NRM processes using the ICM experience in the LSC as a detailed case study. It builds on the previous chapters providing details about the NRM activities in the LSC since the inception of the catchment plan in 1998.

Prior to a discussion of the work undertaken by the LSCMPIC it is important to gain a more detailed understanding of the role of local government in this particular catchment. This context is useful because as discussed in the previous chapter, although the role of local government in NRM is considered significant across Australia, I would argue that it is particularly so in rural Tasmania where the natural resource assets are high and the currently available support from state government is limited.

The Glamorgan Spring Bay Municipality (the area) encompasses the former municipalities of Spring Bay and Glamorgan (the oldest local government area in Australia). These two Councils amalgamated in 1993. The GSBC has had a long involvement in NRM predating the Natural Heritage Trust. The involvement of GSBC in community driven NRM initiatives has been incrementally increasing over many years. From this base, a greater commitment by the GSBC to NRM reflects recognition of NRM legislative responsibilities and increasing community expectations that

Councils should support community driven NRM initiatives such as ICM. Over a number of years the response to community expectations has resulted in changes to strategic planning, policy and management as well as increased resources and support for NRM initiatives, which involve many sectors of the community. Of significance to this research has been the incorporation of catchment management planning into the current GSB Strategic Plan (GSBC, 2006, p.21).

The main industries in GSB are farming (grazing, cropping), fishing, forestry, aquaculture, viticulture and horticulture (olives and walnuts). Downstream processing includes saw milling operations and woodchips, fish as well as limited olive and wine production facilities. The combination of stunning scenery, natural beauty and extremely mild weather ensures that a stream of holiday makers from Tasmania, Australia and the rest of the world visit the area. Three national parks, including the world renowned Freycinet National Park, warrant nature based tourism as an increasingly significant contributor to the local economy (Attwater, 1993).

The Municipality consists of six towns, Buckland on the south western edge of the Municipality in the Prosser Valley, Orford and Triabunna on the coast in the south, and Coles Bay, Swansea and Bicheno on the coast in the north. Smaller settlements within the area include Swanwick, Dolphin Sands, and Cranbrook. The communities of Pontypool and Saltworks are on the edges of the Little Swanport estuary. Many of the coastal settlements consist of holiday shacks and accommodation that fill over the summer months.

In 1992 the Spring Bay Landcare Group (SBLG) was formed. The SBLG held a strategic planning workshop which, a number of years later, resulted in the development of the Spring Bay Landcare Strategic Plan *Will you care? Before it is too late!* The plan covers the area of the former Spring Bay Municipality which includes the entire southern end of the GSB Municipality north until the Little Swanport River (SBLG, 1995, p.10).

In February 1995, the GSBC convened a public meeting to discuss with the community funding opportunities available through the national Drought Landcare Program. They invited the community to identify Landcare issues and potential solutions that may require funding to succeed (East Coast Drought Landcare Management Committee, 1997).

A steering committee with broad community representation was elected to develop projects to tackle the issues identified and to access funding for the same ends. The steering committee was successful in obtaining funding from the National Landcare Program, and in August 1995 the East Coast Drought Landcare Management Committee (ECDLMC) was elected at a public meeting, charged with the responsibility of implementing the projects (ECDLMC, 1997, p.8).

The ECDLMC comprised representatives of the SBLG, the Spring Bay Farmers Association, the East Coast Primary Producers, the East Coast Regional Development Association, the Bicheno Community Development Association, the Tasmanian Farmers and Graziers Association and other interested community members (ECDLMC, 1997, p.48). The ECDLMC was appointed a special committee of Council under Section 24 of the Tasmanian *Local Government Act 1993.*

The funding from the national Drought Landcare Program enabled a coordinator to be employed to work with landholders throughout the Municipality over two stages from July 1995 until June 1999. A labour market program of three work teams of long term unemployed and supervisors enabled on ground works to be completed in the first stage, and contractors were engaged to assist in the second stage (ECDLMC, 1997; Glamorgan Spring Bay Landcare Management Committee, 2002a). The objectives of the project included fencing remnant vegetation, degraded areas (such as north facing slopes), dams and riparian areas to improve water quality, establishing shelter belts, and strategic weed control (ECDLMC, 1997, p.13).

Over 1997 - 1999 the ECDLMC obtained further funding through NHT 1 for the GSB Catchments Program which included a wide range of NRM initiatives building on

Drought Landcare activities. The objectives of these projects also included the development of catchment management plans for the Prosser, Little Swanport and Swan-Apsley catchments. With a change in program funding the ECDLMC evolved to become the Glamorgan Spring Bay Landcare Management Committee (GSBLMC), which continued as a special committee of Council.

The program complemented and worked in partnership with a range of other state government and NHT 1 funded initiatives; this included the Rivercare program, Land For Wildlife[22] scheme, and various different conservation covenanting[23] programs including the Protected Areas on Private Land program.

The catchment program was complemented by a community Waterwatch program also funded by NHT 1. Community volunteers were involved in monitoring fresh, estuarine and groundwater quality in the Prosser, Little Swanport and Swan-Apsley Catchments. All the schools in the Municipality were also involved, including Levendale Primary School which (although it is in the Southern Midlands Municipality) is located close to the headwaters of the Prosser River.

The development of the LSCP was guided by the LSC Committee (LSCC), a voluntary committee that was established following the inaugural catchment tour in 1998. The LSCC represented the following broad stakeholders: *farming/landcare, forestry, aquaculture/fishing, recreation/tourism, small landholders/rural residential (non*

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22 '*The Land for Wildlife scheme (LFW) was established in Tasmania in 1998. Participation in this conservation scheme is voluntary, free, and non-binding. The LFW scheme aims to encourage, support and recognise landowners who are taking a positive approach to the integration of property land management with nature conservation on private land.*' http://www.dpiw.tas.gov.au/inter.nsf/WebPages/DRAR-7T8VRQ?open accessed 13th November 2011.

23 The following definition of a conservation covenant is from the Australian Government Department Water, Heritage and the Arts website http://www.environment.gov.au/biodiversity/incentives/covenants.html accessed 6th April *2009 'A conservation covenant is a voluntary agreement made between a landholder and an authorised body (such as a Covenant Scheme Provider) that aims to protect and enhance the natural, cultural and/or scientific values of certain land. The owner continues to own, use and live on the land while the natural values of an area are conserved by the landholder in partnership with the Covenant Scheme Provider. Covenant Scheme Providers can be not-for-profit organisations, government agencies or local Councils that can enter into conservation covenants with landholders to protect land with conservation values*'.

primary producers), the army, bushcare/landcare (LSCMPIC, 2008, p.5). The actual plan was written by the Southern Midlands and GSB Landcare Coordinators who were funded by NHT 1 with in kind support from both Councils. The GSBLMC also developed catchment plans for the Swan Apsley and Prosser catchments. Although these plans initially involved stakeholder input they were completed by a consultant. Unlike the LSCP, implementation committees for the Prosser and Swan Apsley Catchment Plans were not established which resulted in limited community involvement and ownership.

The GSBC also received significant funding through NHT 1 to upgrade the Bicheno, Swansea, Orford and Triabunna townships sewerage treatment systems. This work involved developing effluent reuse schemes for each system with the funding received from NHT 1 of almost $800,000 over the period of 1998 – 2000 (Australian Government 1999, 2000, 2001).

Additionally, the GSBC provided both financial and in-kind support to numerous NRM activities initiated by community organisations such as the East Coast Regional Development Organisation, and the Triabunna District High School. GSBC co-hosted a Coastcare[24] Facilitator with Break O Day Council, who worked with many individuals, community groups, and the Parks and Wildlife Service to improve the management of coastal reserves throughout the Municipality.

Over the duration of NHT 1 from 1998 until 2002 the GSBC directly received funding of over $1 million dollars (Australian Government 1999, 2000, 2001, 2002, 2003). The

[24] '*Coastcare is a community of volunteers caring for their coast. Coastcare volunteers identify local environmental problems and work together to achieve practical solutions. There are currently 2,000 Coastcare groups all around the country. Coastcare groups tackle problems like dune erosion, loss of native plants and animals, storm water pollution, weeds and control of human access to sensitive areas. The Coastcare program provides opportunities for governments, community, business and interest groups to become actively involved in on ground works to protect and manage our coastal and marine environments.*' http://www.coastcare.com.au/about accessed 13th November 2011.

amount of NHT 1 funding that resulted in NRM activity in GSB is likely to be at least double the amount (received by GSBC) due to many other projects managed by a variety of other government and community organisations occurring or impacting upon the Municipality.

With the end of the first phase of the NHT looming and in anticipation of the new world of regional NRM, it was recommended to Council by the Councillor representative on the GSBLMC that they approach Tasman and Sorell Councils (the two municipalities south of GSB) to jointly employ a professional NRM Officer. It was suggested that Council had been contributing $32,000 - $33,000 per annum to NRM by providing a vehicle and other supporting measures in the past. It was also recommended that Council would need to 'reconstruct' the GSBLMC (GSBC, 2003).

Various on-ground works such as fencing and managing weeds in conservation covenanted areas were still in progress and project management was necessary for their completion. The jointly-funded NRM position never eventuated. With no federal funding the position of Landcare coordinator ended and the demise of the GSBLMC followed. Instead of employing a part time facilitator independently, the Council offered to host an NRM South facilitator, several of whom were employed at the commencement of the regional NRM process through NHT 2. Council anticipated that the facilitator would be able to work with the community and advance regional NRM within the Municipality; this did not eventuate either. At this early stage of regional NRM planning, the role of the federally funded facilitators was to engage with and encourage input and involvement in developing the regional NRM strategies. Facilitation and support of local community actions in NRM were not key parts of these facilitator positions.

From 2002 to 2004 the GSBC did not have any staff available to participate in the evolving regional NRM process, nor staff with the time or skills to assist the community to complete existing NHT 1 projects or to support or assist in any existing or new

initiatives. This constraint caused significant anguish and concern for many in the community who had been active in NRM activities and initiatives since the early 1990s.

In late 2004, the GSBC created a part time position for an NRM Officer in response to pressure from various individuals and groups in the community. Supporting the LSCMPIC was only one among many tasks required of the officer to reengage the GSBC with the NRM process.

The upper LSC is the Southern Midlands Municipality. The Southern Midlands Council (SMC) has supported and initiated diverse local, regional, and state-wide strategic NRM initiatives over many years. This engagement is partly a result of a strong partnership between the SMC and The Midlands Tree Committee (MTC).

The MTC was formed in 1981 by rural landowners from the central Midlands area who were concerned about tree decline and resulting problems of soil degradation. The group formed to discuss ways of overcoming these problems (http://members.ozemail.com.au/~sdgeard/mtc-h.html accessed 10th November 2008 but no longer available). This engagement happened long before the start of the Australian landcare movement, which did not commence until the mid 1980s.

With support from the SMC, the MTC has been involved in an extensive number of NRM programs and initiatives ranging from protecting remnant vegetation to scientific research and community engagement and training. The MTC has established many partnerships with a variety of government and non government organisations. In 1996/97, with support from the SMC, the MTC was successful in obtaining funding from the NHT 1 for the LSC Project (Australian Government, 1997). The aims of that project were to address the problems of: *riverbank weeds (especially gorse); riverbank erosion; wind erosion; remnant bush decline; pasture decline; and to encourage the involvement of other landholders in catchment management.* http://members.ozemail.com.au/~sdgeard/mtc-h.html (accessed 10th November 2008 but no longer available). The ultimate outcome was to develop an integrated catchment management plan for the Little Swanport River.

In late 1999/2000 the SMC and MTC formed an upper LSC Committee who successfully secured NHT 1 funding for the *Little Swanport Catchment– On Ground Action Program* (Australian Government, 2001). This success enabled landholders in the upper catchment to undertake on-ground works at the same time as the catchment plan was being developed (a process that started in mid 1998 but was not completed until 2002).

In partnership with the MTC, the SMC and other local community groups have also successfully secured significant amounts of NHT 1 funding for a wide variety of NRM projects throughout the Municipality. The SMC and the MTC have received a number of awards for their achievements (http://members.ozemail.com.au/~sdgeard/mtc-h.html accessed 10th August 2008 accessed 10th November 2008 but no longer available).

The Southern Midlands Landcare Coordinator resigned from a full time position at the completion of the NHT 1 funded projects. However the SMC continued to support NRM activities within the Municipality by creating a permanent part-time NRM Officer position which sits within the Landcare Unit (http://www.southernmidlands.tas.gov.au/site/page.cfm?u=285 accessed 12th November 2010). The SMC NRM Officer continues to support the activities of the LSCMPIC in cooperation with the GSBC NRM Officer. Many Landcare and NRM initiatives in the Southern Midlands have been driven and supported by the Landcare Unit Manager, who is in turn supported by the General Manager.

Upon their election in early 2003, the members of the LSCMPIC have worked towards implementing the plan by initiating a number of projects. They have also become key players in other projects initiated by other organisations. The following subsidiary case studies detail five of these projects that have being undertaken within the catchment over the last seven years. A montage of additional smaller projects are scattered amongst these case studies. The final subsidiary case study provides an overview of the *Catchment to Coasts* program which is based upon the principles of the *whole-of-*

catchment and whole-of-ecosystem planning model developed by the LSCMPIC in partnership with the GSBC, the SMC and NRM South.

4.2 Sustainable grazing on saline lands trial

The LSCP identifies soil salinity as a key management issue within the catchment and recommended that the LSCMPIC *seek appropriate testing and take remedial action* (LSCC 2003 p.37). Surface soil salinity first became noticeable in the catchment in the mid 1990's. While salinity occurs naturally across many agricultural regions of Tasmania, local clearing of native vegetation in the mid 1980s is believed to have changed the natural water balance, increasing the rate of groundwater recharge and salinisation (Finnagan, 2009).

The LSC had been identified as a catchment within the National Action Plan for Water Quality and Salinity (Australian Government, 2001). Consequently, the LSCMPIC was approached by the Land Management Officer from DPIWE requesting participation in setting up a saline grazing trial as a part of the Sustainable Grazing on Saline Lands Program (SGSL), a sub-program of the National *Land, Water and Wool Program.* SGSL was an initiative of Australian Wool Innovation[25] (AWI) in partnership with Land & Water Australia. The LSCMPIC expressed a strong interest in being involved given the recommended action for addressing salinity in the LSCP.

Members of the LSCMPIC, the Land Management Officer from DPIWE and the SGSL program manager investigated a number of saline sites in the upper and lower catchment. A severe salt scald within the lower catchment, close to the estuary, was selected as the best location for a trial. This salt scald had increased substantially in the past 10 years and was approximately 5 hectares (ha) in size (Plate 1). The landholder, also a member of the LSCMPIC, was keen to be involved. The trial was within a sub-catchment of approximately 250 ha of which about one third was showing indications of

25 '*Australian Wool Innovation is a not-for-profit company owned by over 29,000 Australian woolgrowers. AWI invests in research, development, innovation and marketing along the global supply chain for Australian wool.*' http://www.wool.com/default.htm accessed 13th November, 2010.

being salt affected. The trial site encompasses an area of 11.26 hectares. The lower western area was previously dominated by salt tolerant vegetation and bare scalded surfaces that were eroding severely.

PLATE 1: Halfway in the trail site looking down slope to the west

Source: M. Kelly 2004

The LSCMPIC prepared a successful Expression of Interest (EOI) to the SGSL program requesting funding to set up a trial to investigate a variety of approaches to managing saline areas to increase productivity. The EOI referred to the Southern Region NRM Strategy Discussion Paper on Managing Soils (November 2003) which identified a number of actions to address salinity issues in southern Tasmania. The discussion paper suggested that research and extension projects were developed to identify and demonstrate current best management of salinity, including productive use of saline land, use of native species for recharge control, rehabilitation of saline areas (NRM South, 2003).

The NRM Strategy for Southern Tasmania subsequently detailed a number of management actions that would assist in addressing salinity issues in southern Tasmania

(NRM South, 2003b). Funding was sought for the materials to establish the trial and to employ a project officer.

The objective of the trial was to *demonstrate practical and cost effective options for the sustainable management of saline sites in grazing landscapes on the east coast of Tasmania* (Kelly and Meadows, 2006, p.4). The site was leased by a sheep grazing operation, and provided an excellent opportunity to trial a variety of management techniques to best improve productivity for grazing purposes.

Extensive soil mapping and site characterization was conducted using electromagnetic induction surveys using automated EM38DD and EM31 technology which identifies the location and severity of stored salts within the soil profile. Combined with down hole soil sampling and analyses, this information aided the development of a salinity map for the area. Four piezometers (groundwater bores) were constructed on the site. The landholders undertook groundwater salinity and depth measurements at the piezometers over a number of years from November 2004. Rainfall data was also collected. Groundwater levels were very shallow during high rainfall periods, often had significant salt loads, with salinity levels peaking at 18dS/m, which is about one third that of seawater (Kelly and Meadows, 2006, p.17).

Five trial plots were established on the site, each designed to assess establishment methods and appropriate species selection. A *best bet* pasture mix was chosen for the trial plots which included Puccinellia, Summer and Winter Active Tall Fescue and Strawberry Clover. Mediterranean Saltbush was also included in the trial design for its salt and drought tolerance. Site preparation included herbicide application and all trial plots were fertilized with 125kg/ha of di-ammonium phosphate (DAP 18N 20P 0K) during establishment. The initial outcomes of the trial indicated that a *best bet* pasture mix and Mediterranean Saltbush established well and were tolerant of the saline site. In October 2006, the best pasture cover was achieved from plots 1 & 2 which were cultivated and had the seed broadcast (Kelly and Meadows, 2006, p.24).

The SGSL program finished in November 2006, which left the project only partly completed, as there had yet to be any grazing trials undertaken at the site. Technical support from the DPIW was also to end, and although the SGSL program provided the LSCMPIC with some funding to continue, without technical support and a project officer to manage the trial, undertake data collection, report and communicate the outcomes, the trial came to a halt (LSCMPIC, 2008, p.27). In early 2007 an NRM South Soils and Salinity Technical Support Officer worked with the LSCMPIC in determining future monitoring management activities for the trial (LSCMPIC, 2008, p.30). However, technical support from the state government and NRM South had completely ceased by late 2007 leaving the LSCMPIC seeking support from elsewhere to enable the trial to be continued.

In early 2008, the site was revisited by the GSB NRM Officer with agronomists working on a statewide salinity project funded by the three NRM regions. Despite grazing pressure the pasture continued to survive and tolerate highly saline and severe drought conditions. Many saltbush plants were struggling, most likely due to moisture stress and high surface salt levels. In mid 2009, a partnership was formed between the LSCMPIC and the Saltland Knowledge Exchange program. This program continued from SGSL and is managed through the Future Farm Industries Cooperative Research Centre.

Through this partnership, it is anticipated that some of the ongoing management strategies recommended in 2006 for the trial will be implemented. These included soil health, pasture assessment and management, grazing strategies, livestock assessment, strategic tree establishment, further saltbush trials and more groundwater monitoring. However, facilitating this partnership, necessary for the continuation of the trial, will be determined by whether the LSCMPIC remains supported by a paid professional catchment coordinator. The broader objective of the trial; to communicate and extend the outcomes of the trial on other properties with emerging salinity problems, is also dependent upon coordinator support.

4.3 Water management planning

In November 2002 a public meeting was held at the Woodsdale Hall with the objective of gaining *community support for the formation of a local Water Management Planning Consultative Group* (LSCMPIC, 2008, p.11). The meeting was well attended with 54 participants and six staff from the Water Resources section of DPIWE. An invitation to nominate representatives on a consultative group resulted in 12 individuals representing the following stakeholder interests: SM and GSB Councils; farmers / irrigators; aquaculture; forestry; contractors; conservation and ecotourism; research and Waterwatch; and catchment management (LSCMPIC, 2008, p.12).

This meeting was the first of 11 of the WMPCG that would be held between late 2002 and mid 2004, when a draft WMP for the catchment would be completed. Over this time many different state government officers and facilitators would work with the group, commencing with a discussion of the requirements for a WMP, and the suggested roles of the group, in the first instance:

> *To assist the DPIWE in preparing a draft WMP for public exhibition;*
> *To seek advice from, and report to their organisation or constituency in relation to preparing the draft plan;*
> *The group could also have an ongoing role to advise the DPIWE on implementation of the plan and local water management issues* (LSCMPIC, 2008, p.12).

It was agreed that other nominated people could attend the meetings in the interests of broad community input and dissemination of information, and the need for a two way flow of information between the group and their stakeholders. DPIWE agreed to provide basic water information for the catchment and in the subsequent months would prepare a water resources package that would be considered a starting point for water information that could be reviewed and added too as more information became available. Discussions about the need to reintroduce gauging facilities for the river commenced early in the process and by late 2003 DPIWE had installed new gauging

stations (for measuring flow and also water quality) in the upper and lower catchment. This was only a component of an extensive monitoring program that commenced including water quality and river health monitoring, hydrological modelling, and the development of an improved method for determining environmental water requirements (LSCMPIC, 2008, p.16). Specialist consultants were engaged to develop a daily water balance model that would provide 100 years of streamflow data at nine sites in the catchment (Sinclair Knight Mertz, 2004), whilst DPIWE would undertake a project on the an economic survey of irrigation water usage in the catchment to gain an estimate of the value of irrigation current and future.

The group was given the opportunity to answer the question: What do they want the plan to achieve? A number of submissions were received from different stakeholders on behalf of their representatives with the following list of indicators of a successful water management planning result being prepared from a discussion of the submissions:

> *Acceptance by the general community and water users;*
> *Examination of what they may be able or not be able to do under the plan;*
> *An understanding of each other's business;*
> *Economic viability (this will drive actions);*
> *Security of the water resource, including quality;*
> *Agreed outcomes should be monitored and measured;*
> *A clear intent from Government on how to implement the Plan;*
> *Sufficient information on how to make appropriate management decisions;*
> *Ongoing recording and reporting;*
> *The ability to appropriately develop the catchment's water resources*
> *(LSCMPIC, 2008, p.13).*

Over subsequent meetings the WMPCG would receive regular feedback in regards to all of the projects initiated to assist in the development of the plan. The early beginnings of the *Tasmanian Environmental Flows Framework (TEFF)* were reported to the group, with an improved methodology for environmental water requirements considered to be

significant for this and future water management plans. The WMPCG received presentations and information on a range of other policies, guidelines and processes of relevance to water management in Tasmania.

At a final workshop of the WMPCG held in July 2004, DPIWE gave an overview of the provisions in the draft plan and the balance that had been sought between provisions to support both the environmental and agricultural objectives. A summary of the forthcoming statutory consultation process was provided. A number of public representations were received by DPIWE following the release of the draft plan. A detailed response to all the issues raised in the representations was prepared including any proposed modifications to the draft plan. The final plan took effect on the 26th July 2006, two and a half years after commencing. The WMPCG has not met again since the last workshop without any follow up having been initiated by the department. The five year review will be due in July 2011.

4.4 Community water quality monitoring

Another key objective and action identified in the LSCP 2002 was to:

> *Establish a regular water quality monitoring program for the Little Swanport River. Options could include: Waterwatch / Health Department / Monitoring River Health Initiative / State of the Rivers Reporting / Monitoring recreational waters by Council*. (LSCC, 2003, p.19)

In May 2003 the LSCMPIC sent letters to all landholders in the catchment asking them to return an EOI form with ideas for NRM activities and projects that they would like to see in the catchment or would like to be involved with. A *number of landholders who returned the EOI requested interest in being involved in a strategic water quality and salinity monitoring program* (LSCMPIC, 2008, p.15), which would complement and continue the monitoring that was at the time being undertaken by the Water Assessment Branch of the DPIWE, as well as contribute to implementing and later reviewing the WMP once it was developed (LSCMPIC, 2008, p.15).

The LSCMPIC was successful in applying for money from the Australian Government Envirofund (a funding program under NHT 1) to obtaining water quality monitoring equipment. It organised a public meeting to inform the catchment community and any other interested parties of its activities over the 12 months since its formation, and to invite participation in a community based water quality monitoring throughout the catchment.

An enormous amount of work is required to obtain funding, and then develop and implement a catchment wide community water quality monitoring program. The committee members commenced these tasks on a voluntary basis, as there was no local Landcare or Waterwatch coordinator from whom to gain support. Structural changes during the transition from NHT 1 to NHT 2 meant the long established Tasmanian Waterwatch program was being dismantled. The program had developed over a ten year period, from 1993 until 2003 and included a state coordinator and a network of local facilitators who supported over 150 groups monitoring water quality at up to 650 sites within 70 catchments throughout the State. It was anticipated that NRM South would continue to support the Waterwatch network in southern Tasmania however this only ever happened in a very limited capacity during 2005 (Plate 2).

With limited support from technical staff in DPIWE and to a lesser degree NRM South, the LSCMPIC developed a monitoring plan, purchased equipment and trained interested volunteers. However, only limited monitoring has ever occurred, as a coordinated community monitoring program at a catchment scale needs ongoing committed professional support at a local, regional and state level. There is still interest by committee members and others in the catchment in being involved in monitoring. Progress towards this end is discussed later in this chapter.

PLATE 2: NRM South Water Facilitator delivering training on monitoring water quality with landholders in the LSC

Source: M. Kelly 2005

4.5 'Implementing a whole-of-catchment and whole-of-ecosystem planning model'

In early 2005 the LSCMPIC became aware that NRM South was holding a meeting for 'custodians of catchment plans' (LSCMPIC, 2008, p.21). As the GSBC had only recently engaged a part time NRM Officer who was away at the time, the LSCMPIC was not informed in a timely manner and did not have representation. The committee was subsequently informed by an NRM South facilitator that a proposal for a project titled *Managing upper catchment impacts on marine, coastal and estuarine systems in the Little Swanport Catchment* had been submitted via the first round of NHT 2 investment packages to the Australian Government from NRM South.

The LSCMPIC requested that NRM South attend its next meeting and brief members on the project. A representative from TAFI also attended and outlined how the project had been put together by an institute of the University of Tasmania (the Tasmanian Institute of Agricultural Research or TIAR), based upon an earlier proposal developed by a

representative of the oyster industry in the lower catchment, also a member of the committee. The LSCMPIC asked *why they had not been informed about this proposal prior to going to Canberra* (LSCMIC, 2008, p.22). Timing was claimed to be the reason, with the Australian Government putting pressure on the NRM regions to submit investment proposals within very short time frames, preventing adequate consultation. The project that was submitted to Canberra included as a key outcome the: development and implementation of an integrated catchment management plan. As could be expected, this situation cause considerable concern for those from the catchment community who had just spent 5 years developing an integrated catchment management plan, and had experienced two very difficult years in sourcing funding to enable its implementation. Even more concerning was that the LSCP 2003 *was accredited under the Southern NRM strategy and NRM South facilitators had committed to keeping them* (the LSCMPIC) *informed of the process and opportunities for input as the NRM process rolled out* (LSCMPIC, 2008, p.23).

NRM South gave the LSCMPIC the opportunity to have the proposal withdrawn, however the Chair recognised that the proposal *presents an opportunity for the Committee to obtain funding to achieve various objectives of the catchment plan.* The LSCMPIC also agreed that the *wording of the proposal in its current form had the potential to cause conflict; and there are some significant communication issues in this NRM process that need to be addressed* (LSCMPIC, 2008, p.23). To that end a meeting was held with NRM South staff and members of the LSCMPIC on the 21st June, 2005.

> *The (at times) tense discussion reflected the delicate situation that existed within the catchment due to the water management planning processes. It became fairly clear to the representatives from NRM South why the current title of the project 'Managing upper catchment impacts on marine, coastal and estuarine systems' had resulted in significant concern amongst members of the Committee. It was agreed that* (the NRM South Programs Manager) *and* (the Secretary of the LSCMPIC) *would work together to review the name and the objectives of the project. A revised version would be sent to the Committee for input. The project*

> *would only commence should the Committee be satisfied with the revised version* (LSCMPIC, 2008, p.24).

The new name for the project was *implement a whole-of-catchment and whole-of-ecosystem planning model.* NRM South advertised for interested parties to submit an EOI to deliver the project. GSBC submitted a successful EOI to NRM South, proposing to deliver the project, in partnership with the LSCMPIC and the Southern Midlands Council. The GSBC Manager of Development Services attended the LSCMPIC meeting in October, 2005 where he:

> *Emphasised that the Council had agreed to work in partnership with the Committee to deliver this project due to the long history of Council working together with the Little Swanport Catchment community and the potential of many mutual outcomes. He stated that the Council would like to use this model in other catchments within the Municipality* (LSCMPIC, 2008, p.26).

There were many different interpretations on how such a 'model' could be developed and implemented, but the LSCMPIC was clear that they required a catchment coordinator, or extension officer, who had the skills and knowledge to both develop and implement the model and provide the LSCMPIC with support to continue with implementing the plan. A key milestone of the project was to engage a professional facilitator to work with LSCMPIC as required, particularly to *deal with conflict resolution* (LSCMPIC, 2008, p.27).

The first task of the facilitator was to work with the LSCMPIC, which included the two Council NRM Officers, to define and clarify the role of the Catchment Extension Officer (CEO) position. It was recognised that *given the very local nature of the position it would always have been difficult (although not impossible) for the CEO to be someone who did not know the catchment and its people* (LSCMPIC, 2008, p.28).

With only three applications received for the position, the LSCMPIC was fortunate to secure an applicant who was local and:

> *not only knew the catchment and the players very well but also that her teaching and journalism experiences gave her a clear advantage in delivering this complex project. Her understanding and empathy for the rural community was what the position required given the sensitive nature of the project and the challenges that had and would continue to be faced by the community* (LSCMPIC, 2008, p.28).

The CEO would work very closely with the facilitator and the two Council NRM Officers over the next 18 months to deliver the project. An initial brainstorming session clearly outlined the steps and tasks that would be undertaken to deliver the outcomes and actions for the project. Central to all these tasks would be support for the LSCMPIC in managing the administration and completing the projects that were currently underway, including the SGSL trial and community water quality monitoring.

Early into the project the CEO worked closely with staff from DPIW and staff from an agronomy consultancy to put together a funding application for a National Landcare 'Sustainable Agriculture' project that was successful. An upper LSC farmers group, along with two farmer groups from other areas in southern Tasmania, would work with a project officer to investigate grower determined sustainable production issues over a year. The project involved a number of landholders, who own significant areas of land in the upper catchment, in identifying topics to be covered in training workshops, monitoring programs and on-ground trials. The topics included soil water management, soil health, salinity monitoring, effects of farm inputs on biodiversity, animal health and nutrition, pastures and crop rotation (Wadley, 2007). The project continued to be refunded for another three years and served as a pilot for similar projects in other areas in Tasmania. The CEO played a crucial role in supporting the project officer in the early stages of implementing this project.

From 2006 to 2008 NRM South funded an activity called NRM Incentives. This program was managed by Greening Australia[26] (GA) and another agronomy consultancy. This activity was to deliver a targeted package of NRM incentives in the Southern region to facilitate a range of on-ground outcomes including sustainable water and land management practices, protection of threatened species, connectivity and quality of habitat at landscape scale and the control of weeds, pests and diseases.

The CEO facilitated participation in this program by a number of landholders in the catchment. Without that leadership, many of the incentives projects were unlikely to have been funded and implemented. A range of on-ground activities were undertaken in the catchment including fencing of riparian, estuarine, remnant vegetation, revegetation, and planting of salt tolerant pasture species in saline landscapes.

The CEO and the LSCMPIC recognised that the early years of ICM had been very focused upon the 'environmental', with limited recognition of the 'economic' (by sourcing of funding to support landholder engagement) and barely any consideration of the 'social' elements of ICM. It was time to celebrate living in the Little Swanport Catchment. This acknowledgment resulted in two events: a 14 kilometre bushwalk from the property 'Swanston' in the middle of the catchment to Gumleaves outdoor education centre in the lower catchment; and a bush dance at the Woodsdale Hall. Both these events were over subscribed with regular requests they be held again.

Many from the catchment, and surrounding areas, as well as a number of researchers who had worked in the catchment, attended the bushwalk (Plate 3). Officers from the Australian Department of Defence chaperoned the walking group through defence land

[26] *Established in 1982 to mark the Year of the Tree, Greening Australia was formed by the United Nations Association of Australia and the Nursery Industry Association of Australia. Since then, it has developed into the country's largest practical not-for-profit environmental organisation. Greening Australia has grown from a small community based organisation into a highly professional national team of vegetation and community engagement specialists that operates as a Federation with representation in every State and Territory and a national office in Canberra.* Source: http://www.greeningaustralia.org.au/about-us/overview accessed 4th December 2010.

in the middle of the catchment. Afternoon tea was organised by committee members for the walking group upon arrival at Gumleaves.

PLATE 3: Lunch during the bushwalk

Source: S. Dunbabin 2007

The CEO sought funding from the Tasmanian branch of the Country Women's Association (CWA) for the bush dance at the Woodsdale Hall. The catchment was in the midst of a five year drought and the rural community needed some fun, and with no hesitation the CWA provided $2,000 to pay for a band. Buses were organised from Oatlands and from Swansea with over 60 people attending the event. It was a great success (Plate 4).

PLATE 4: Bushdance at the Woodsdale Hall

Source: S. Dunbabin 2007

While not an official project milestone, the five year review of the *LSCP 2003* was an additional outcome of such leadership, and an integral step in the evolution of the ICM process. Two plan review workshops were held; the first at the Woodsdale Hall and the second at the Buckland Military Training Base camp in the middle of the catchment. Committee members brainstormed the changes in political, cultural and natural landscape affecting the catchment community alongside other key stakeholders and technical specialists from Tasmanian government agencies and research institutions.

Along with additional input from specialists their insights shaped a very novel revised plan. The *LSCP 2010-2015* took the form of a risk management approach to determining actions into the medium term, and was focused on the triple bottom line. The new plan recognises a number of the principles of ICM outlined in Chapter 3, including noting up front that *the LSCP is in no way a regulatory or statutory document. Nor is it intended as a comment on past management practices* (LSCPIC, 2010a, p.5). The original plan remains a valuable reference document. In recognising the facilitative rather than managerial role the LSCMPIC agreed to change its name to the LSCP

Implementation Committee (LSCPIC). The revised plan makes it very clear that to enable the plan to be implemented a coordinator needs to be employed which requires commitment and resources from key stakeholder organisations including local government, the NRM regions and state government.

The development of a communications strategy was another achievement. Over the duration of the project this involved reporting and presenting on the work of the LSCPIC and the outcomes of the project to a number of audiences including *NRM South, the two Councils and the Committee. Communication would also involve informing, educating and involving the target groups and assisting researchers and project officers working within the catchment* (LSCMPIC, 2008, p.30). Central to the communication plan was the initiation of an occasional newsletter to communicate NRM activities to all of the catchment community and other interested parties. The three editions of this newsletter were very well received.

A key project milestone was to document the history of catchment management in Little Swanport in the form of a booklet entitled *A Decade of Catchment Management in the Little Swanport Catchment*. The booklet is significant because it details the sequence of formal meetings and the implications of many different events in these early days of ICM. Given the intense interest and activity that has occurred in the catchment it was consider important that an accurate record of the events of this period was produced.

A booklet titled *A whole-of-catchment and whole-of-ecosystem planning model for southern Tasmania* (*the model*) and a DVD with the same title were also produced. These products are based upon insights obtained whilst developing *A Decade of Catchment Management in the Little Swanport Catchment*, and the insights of the CEO and the members of the LSCMPIC over the 18 months of the project.

In the final few months of the project the GSB NRM Committee (NRMC) was developing a concept plan for the CTC program. This program was to be based upon the framework outlined in the model. It was initially to be a co funded program between the GSBC and NRM South, overseen by the NRMC. It would enable a catchment

coordinator to be employed to continue the work of the CEO in the LSC and to expand these activities into the adjoining Prosser and Swan Apsley catchments in GSB.

4.6 Water use across a catchment

The *Water use across a catchment and effects on estuarine health and productivity* project was first initiated by the TAFI, and the Tasmanian Department of Marine Resources in 2003, as a result of concerns regarding the limited information available on the fresh water requirements of estuaries and oyster production. The project finally received funding from FRDC, and LWA in 2005. That project has required considerable input by the LSCMPIC and has impacted upon many in the catchment community over the last five years. The objectives of the project are as follows:

> *To complete an investigation of environmental flow regimes required to maintain the health and production of oysters from the Little Swanport estuary through continued collection of environmental data under different flows and by the development of an estuarine model to predict the effects of different flow regimes.*
>
> *To develop a set of economic accounts and an economic water evaluation framework and associated tools, using the Little Swanport catchment as a case study, to assess the value of freshwater to the various users across the catchment, including upstream agriculture, estuarine shellfish farmers and fishers and for not-market goods and services* (Crawford, Hundloe, & Ross, in press, p.1).

The funding bodies recognised that in order for the research to be successful, particularly the socioeconomic component, it would require cooperation from the catchment community. The principal project leader met with the LSCMPIC in September 2005 to discuss the project and suggested that a steering committee which included community representatives and *mutually agreeable neutral chair be set up* (LSCMPIC, 2008, p.25). The LSCMPIC asked the question that *if the entire community was to be required to be involved in the project then why had not the LSCMPIC, which*

was established as a representative committee of the catchment community, been formally informed of the existence of the project prior to it being funded? (LSCMPIC, 2008, p.25).

Despite these awkward beginnings the LSCMPIC participated in the development and implementation of the project, with the CEO providing support for both the scientific and socioeconomic investigators at different stages during the project particularly with regards to communication of the project. The project contributed financially to the first LSC newsletter, in return for an article about the project which went out to all catchment landholders.

The investigators decided that in addition to the report required for the funding bodies, they would also like to produce a book about the research but in a broader national and international context. Publication of the book entitled *The value of water in a drying climate* is subject to feedback and comment from the LSCMPIC after the report has been finalised and they were clear on the outcomes and implications of the research. Outcomes of the research include:

> *significant new information on estuarine ecology and the impact of changing freshwater flow regimes on the health of an estuary and the commercial production of oysters. This information will underpin improved management of estuaries, including sustainable oyster production, which was an important planned outcome of the project. In particular, it will be used in the five yearly review of the Water Management Plan for the Little Swanport catchment* (Crawford, Hundloe, & Ross, in press, p.4).

A set of water accounts for the catchment was also developed although how or if this is to be incorporated into future water management planning is yet unknown. The project has increased the awareness of some in the community and other stakeholders of the environmental and economic benefits and costs of freshwater flows for primary production and the environment (Crawford, Hundloe, & Ross, in press).

4.7 GSB Catchments to Coasts

After reengaging in the NRM process by employing a part time NRM Officer in 2005, the GSBC called for nominations for a GSB NRMC. The GSB NRMC would be a Section 24 special committee of Council to provide a means to exchange information and progress NRM issues between community and the GSBC. The GSB NRMC has broad stakeholder and community representation with the following list providing a guide for membership:

> *Council, two representatives comprising one Councillor and the NRM Officer / Two representatives from the agricultural sector (from the northern and southern ends of the Municipality) / One representative from the Parks and Wildlife / One person representing the forestry sector / Five community representatives (from Buckland/Orford, Triabunna, Swansea, Bicheno and Coles Bay/Swanwick) / One aquaculture representative / One cultural heritage representative / One tourism representative / One commercial fishing representative.*
>
> *This will ensure the following skills / knowledge base:*
>
> *Primary production / Community on-ground expertise / Conservation management / Forestry expertise / Catchment management / Education and extension / Environmental projects design and implementation (*GSBC, 2007, p.2).

GSB NRMC began developing the concept of the CTC program near its interception in 2005. A number of committee members had been involved in the GSBLMC and had participated in ICM processes in the Prosser, Little Swanport and Swan Apsley catchments during the earlier landcare and NHT 1 days. The initial objective of CTC was to reinvigorate ICM in GSB that had stalled since the transition from NHT 1 to NHT 2, and build on the work that was ongoing in the Little Swanport Catchment.

The model provided the framework for the CTC program. One of the first points outlined in the model is the need for *commitment of government agencies (local and state), the NRM Region and key local stakeholders* (LSCPIC, 2010b, p.11). In this

instance the key local stakeholders are represented by the GSB NRMC. At the instigation of the GSB NRMC the GSBC furthered its commitment to ICM by allocating $50,000 to the CTC program in the 08/09 financial year. This budget more than matched a $40,000 commitment by NRM South, from its Australian Government CfOC base funding. This *commitment and adequate resources for a determined length of time* (LSCPIC, 2010b, p.11) would enable staff to be employed and develop and implement the CTC program for the duration of the financial year.

Although the CTC program covers all three catchments in GSB, NRM South provided an additional annual investment of $30,000 for on-ground work in the Little Swanport and Swan and Apsley Catchments. These two catchments are within five priority areas for CfOC investment in line the NRM South Healthy Catchments and Coasts program[27] which is also based upon the model framework. These priority areas have been chosen in recognition of their significant natural values which correspond with national priorities for investment, including nationally listed threatened species and vegetation communities, and wetlands listed under the Ramsar Convention[28].

In determining priority areas NRM South also recognised the significant time, energy and resources spent in these areas over many years by all levels of government and by many living within the communities there. Strategic and consistent investment in existing programs, networks and partnerships would greatly build upon this work.

Experience in the LSC identified some key considerations critical in the program development phase. First was recognition that a local coordinator is *essential to the*

[27] Healthy Catchments & Coasts is NRM South's sub-regional delivery model that provides local coordination to meet particular local targets. It protects and enhances natural values through working in close partnership with local government in the delivery of natural resource management projects and in actively involving the community in managing the local environment. Source: http://www.nrmsouth.org.au/programs_activities/view_Healthy_Catchments__Coasts_15130682/ accessed 4th December 2010.

28 The Convention on Wetlands of International Importance, called the Ramsar Convention, is an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. Source: http://www.ramsar.org/cda/en/ramsar-ramsar-movie/main/ramsar/1%5E24724_4000_0__ accessed 5th December 2010.

work with stakeholders, particular land managers and volunteer participants, in developing, coordinating and communicating activities. Second was appreciation that *an appropriate level of administration support should be provided to ensure that the necessary tasks of the coordinator can be undertaken in an efficient and timely manner* (LSCPIC, 2010b, p.11). Third, the need for a strategic approach to communication was identified and included:

> *Clear and consistent processes for stakeholder representatives reporting back to their constituents;*
> *Identification of different groups and networks in the catchment community, and of ways to achieve communication and dialogue.*
> *Providing regular information about ICM activities to the general community eg a regular newsletter that may be distributed via the Council networks; and*
> *Developing relationships with research organisations and developing protocols on research undertaken in the catchment that recognises the interests and sensitivities of the local community* (LSCPIC, 2010b, p.16).

In recognising these requirements in late 2008 the GSBC advertised for a CTC coordinator, as well as an administration and communications officer. Attracting suitable applicants in relatively remote locations such as the east coast of Tasmania would not be easy. However two staff were employed: one local with many networks and knowledge of the community, another very experienced NRM facilitator, willing to travel and find local accommodation for a part of each week. The CTC team began despite the very tenuous nature of the positions (funding was only guaranteed for one year) and the challenges in developing the program from (not quite) from its infancy, but with a chequered history.

In the early stages of developing an ICM or NRM program it is important to *enable short term activities to be undertaken to build confidence and momentum* (LSCPIC, 2010b, p.11). Having $30,000 available, and drawing on existing priorities for action (such as those already determined in the LSCP, and the GSB Weed Management Plan) it

was possible for the CTC team to 'hit the ground running'. With funding from a previous CfOC project the GSBC had employed an on ground officer to undertake control of priority weeds in coastal areas. The funding from the CTC project enabled the officer to continue with this work, across land tenure (on Council, Parks and Wildlife / Crown land and private property), often in partnership with community volunteers, and teams of Conservation Volunteers[29]. Along with a range of other projects that developed in the first 12 months of the CTC program, the high profile and popular work of weed control, particularly in public places across the Municipality increased the exposure of the team and contributed to building momentum in the field.

PLATE 5: CVA teams and local volunteers removing weeds at Mayfield Beach, Little Swanport Catchment

Source: M. Kelly 2007

Getting 'runs on the board' was necessary to ensure continuity of the program which received an increased budget from the GSBC in the 09/10 financial year, and ongoing

[29] Conservation Volunteers is a national organisation that has partnered with individuals, businesses and governments in the conservation of our unique environment since 1982. Hundreds of thousands of volunteers from around Australia and across the world have been supported in their participation in a diversity of important projects to protect and enhance the environment. Source: http://www.conservationvolunteers.com.au/aboutus.html accessed 3rd December 2010.

base funding from NRM South of $40,000 plus another $30,000 for on ground works in the priority area. Now *the ball is rolling* it was important to consider other key points outlined in the model. Ensuring that the program is *accountable, transparent and documented* requires regular reporting to investors and other stakeholder groups. The CTC team report to NRM South and the NRMC, which reports to the GSBC. These lines of accountability warrant increasing complex systems. To develop trust between the investors and the stakeholder it is also important to develop operational procedures and protocols. These systems have been critical as the program rapidly developed.

A CTC steering committee was established to approve allocation of the Healthy Catchments and Coasts budget. This small sub-committee of the NRMC has improved accountability, and streamlined project delivery whilst providing a support network for the program staff. As the 'faces' of the program they are daily confronted with many difficulties ranging from technical complexity in program delivery to managing the broad and varied expectations of clients and investors. Providing support to staff remains critical to the success of the program. The steering committee is a key means to ensure success by enabling the CTC program to be *informed by local knowledge, know how and experience* and recognising that *successful ICM requires people with dedication, good will, and mutual trust.* (and) *to achieve and maintain this requires hard work to foster cooperation and team spirit* (LSCPIC, 2010b, p.18).

The CTC team continue to work with LSCPIC in its efforts to implement the plan. Some examples of the achievements since inception of the CTC team include sourcing over $60,000 for control of serrated tussock, a weed of national significance, identified in the lower catchment in 2005. The CTC coordinator provides on going support to landholders who have serrated tussock infestations and continues to seek funding to progress the SGSL in partnership with the CRC for Future Farming Industries. Two Council NRM Officers work closely with the CTC team in making a range of NRM initiatives and incentives available to landholders in the catchment in line with the actions in the plan.

Without the evolution of the CEO role into that of the CTC coordinator and the broader CTC team, it would have again become difficult, if not impossible for the LSCPIC to continue with the implementation of the plan. The GSBC and NRM South continued to support the CTC program in 10/11. Sources of funding additional to the $30,000 from NRM South have been obtained and, although that has increased the number of on ground staff from one to two, and enabled the purchase of a vehicle and chemical spray unit for weed control it has increased the workload for staff, steering committee members and Council NRM Officers. To continue to *ensure success* it remains necessary to use *adaptive management …as the mechanism for continual improvement,* recognising that *nothing will stay the same* and that c*hange should always be anticipated and seen as an opportunity* (LSCPIC, 2010b, p.18).

The following chapter will also use key points from the model developed by the LSCMPIC to provide structure to a discussion reflecting upon the case study of ICM in the LSC, and the literature review on the evolving NRM governance processes in Tasmania and Australia.

Chapter 5 Bringing scholarship, policy and experience together: lessons for future good practice in NRM and ICM

This chapter addresses the third aim of this research; to take insights from a review of the NRM and ICM policy and academic literature, synthesising, and reflecting upon theoretical concepts in light of the case studies in the previous chapter. These case studies assist in identifying key notions from the literature, in an attempt to get to the core of *why* achieving successful NRM outcomes in southern Tasmania has and continues to be a challenge, *what* is being done to improve this situation, and to what effect. It is a discussion of how policy and theory translates to change in behaviour and action at a landscape and property level. The structure for this analysis is provided by the key points identified in the *whole of catchment and whole of ecosystem planning model* (LSCMPIC, 2008) developed by the LSCMPIC.

5.1 Getting started

Genuine Commitment

The LSCC was established 1998 and over the next five years would work with the landcare coordinators from each Council to develop the catchment management plan. Technical input was provided by specialists from state government and research institutions (LSCC, 2003; LSCMPIC, 2008, pp.5-11). Throughout the development of the ICM plan the LSCC was supported by the three tiers of government.

Federal Government

The transition from NHT 1 to NHT 2 resulted in a significant reduction in federal resourcing of NRM activities in Tasmania. Local government no longer received federal funding for coordinator and facilitator positions. At this time very few rural local councils such as GSBC, had the support from their communities to continue these positions without external funding. After the formation the LSCMPIC (from mid 2003

until mid 2005), received only minimal administration and coordination support from the GSBC and Southern Midlands Council (LSCMPIC, 2008, pp.15-23).

The shift to a regional approach to NRM through NHT 2 also resulted in significantly reduced federal funding for NRM coordinator and technical positions in the Tasmanian state government. Some key positions had been providing support for community ICM initiatives including a state based catchment coordinator, Waterwatch coordinator, and a team of technical staff whom had been overseeing and supporting Rivercare projects. The state government was left with few staff to support and guide catchment management in Tasmania.

The LSCMPIC embarked upon the task of implementing the plan with considerable professional support, yet quickly found themselves with almost none within a matter of months. Genuine commitment from the three tiers of government to an ongoing ICM process, important to bring legitimacy and entice others within the community to participate, was obviously lacking. The reduction in facilitator and coordinator positions across the nation following the transition from NHT 1 to NHT 2 rejects recommendations made to past federal Ministers that facilitator and coordinator positions need to be maintained to achieve the capacity building necessary for on ground actions required to improve landscape condition (Australian Government, 2002a; Natural Resource Management Ministerial Committee, 2006).

Politics is the major driver of federal funding programs (Bohensky, 2008; Brooks, 2007; Sherwill et al., 2007). The more recent changes to the national NRM funding structure from NHT 2 to CfOC, with a change of federal government in 2008, reinforces this observation. Funding continues to require significant NRM outcomes to be achieved over time frames of sometimes even less than 12 months. If a neoliberal ideology drives these short term funding arrangements then perhaps they will remain the reality at least for the immediate future. This will require strategic partnerships at a local, regional and state level mature enough to be capable of taking advantage of funding opportunities as they arise to guarantee continuity of personnel and programs at a local level.

The establishment of ICM frameworks, such as the CTC program, seek commitment from the major stakeholders, to a long term ICM process. In this instance the major stakeholders are local and state government, the regional NRM organisation and more recently the regional water and sewerage organisation, Southern Water. Delivery on investment is increasingly essential to obtain funding from the Federal government. The willingness of major stakeholders to commit to an ICM / NRM program is considered fundamental to the success of the program at every level (Margerum, 1999).

The conundrum is that to achieve commitment from the top you need commitment from the bottom and *vice versa*. The resources required from the Federal government, to fund coordinators and facilitators with the skills to work with local communities and build grass roots NRM capacity, are unlikely to be forthcoming unless it is clearly demonstrated that there is the capacity on the ground (that is, a willing and engaged community) to deliver on investment that addresses whatever are the current national priorities. To gain a grass roots commitment, and associated resources from, for example, local government, then local priorities must also be addressed. It takes skill and knowledge at a variety of levels to demonstrate that mutual objectives can be met with the subsequent, sum of invested 'parts' becoming greater than the 'whole'.

The ultimate objective is to put in place formal partnerships and processes to ensure effective accountability arrangements so that 'block funding' of investment from federal sources can be justified based upon robust governance standards, and achieved outputs and outcomes (Natural Resource Management Ministerial Committee, 2006). After a number of years of negotiation and partnership building, NRM South has convinced the Australian Government to commit to the Healthy Catchments and Coast program for four years, subject, of course, to robust accountability. This subsequently enables a commitment from NRM South to the GSB CTC program for four years. In turn, this commitment is incentive for the GSBC to continue its financial support for the program, which enables the CTC team to remain employed to assist the community implement the actions on the ground. None of this progress would be possible without the support of the program from the GSB NRM Committee. Its members not only assist the team in

facilitating action but also provide legitimacy to the program, particularly at a local and regional level.

State Government

The experience in LSC highlighted the need for an ongoing commitment to an ICM process from the state government. The initiation of an ICM process can come about in a variety of ways. As some states and territories of Australia, including Victoria, New South Wales (NSW) and the Australian Capital Territory (ACT), have state-wide ICM policy, legislation and / or frameworks, whilst others do not, the processes, resources and scale will vary considerably across Australia (Environment ACT, 2000; NSW Government, 2003; Victorian Government, 2007). Although ICM in the LSC was jointly initiated and supported by local and state government officers, there was no ongoing commitment and limited support during the implementation stage of the ICM process, which commenced in 2003. This lack reflects not so much a vacuum in NRM and ICM legislation and policy, but more a limited understanding of the linkages between legislation and the critical gaps that emerged with the withdrawal of NHT 1 funding.

At sub-national levels there is no strategic, administrative and coordination support for community driven ICM. The LSCMPIC received technical support from individual state government officers upon request when applying for some grants and in developing and implementing some projects. Any support that was gained reflected the persistence of the committee, and of individual officers, many of whom developed a relationship with committee members over time, rather than any strategic policy directive of the state government. A similar experience was reported by 'watershed' partnership coordinators in Oregon, USA, who had a difficult time maintaining consistent participation from state and federal agency employees, whose jurisdictions frequently spanned several watersheds (Bidwell and Ryan, 2006).

At the time, Bellamy et al. (2002) identified an expectation that the *Water Management Act 1999* would significantly modify existing approaches to catchment management in

Tasmania. The LSC WMP planning process was only able to address issues of water quantity and allocation. Water quality could only be considered in the context of the water use and development objective under the Act '*(d): Ensure that allocations do not significantly impact on the quality of water'*. In the final plan it is considered that:

> *the allocations within the LSC have been designed to meet a low level of risk to the instream and surrounding environments, and therefore the Plan is consistent with the State Policy on Water Quality 1997.*

To that end the Department committed to '*form partnerships with the catchment community and Local Government in working towards integration and co-ordination of monitoring activities consistent with the Tasmanian Surface Water Management Strategy* (DPIW, 2006b, p.16).

To achieve objective (b) requires an integrated catchment management framework. A framework that enables '*intermediary or 'mediating structures''* (Prager, 2010, p.721). Despite the efforts of the LSCMPIC, even with the current level of resourcing through the CTC ICM framework, a coordinated water quality monitoring program is yet to occur. It is anticipated that as the regional NRM structure matures, the necessary facilitation and resourcing required for monitoring can happen. Past grass roots interest in monitoring can hopefully be reignited and combined with the policy and legislative commitment of the state to participate in integrated monitoring, as highlighted not only in the *LSC WMP 2006* (DPIW, 2006b, p.16) but also in the review of the State Policy on Water Quality Management 1997 (SPWQM).

The review of the SPWQM also highlights:

> *that there were problems with its implementation stemming from a poor understanding and/or general lack awareness of the Policy. This has resulted in confusion about the how SPWQM should be implemented and its relationship with other policy frameworks such as the Water Management Act 1999 framework and the Natural Resource Management (NRM) framework*

established under the Natural Resource Management Act 2002 (DPIPWE, 2010, p.10).

The observation that there is confusion regarding the integration between policy frameworks can be extended to confusion regarding the integration between legislative and non-legislative NRM processes. This point is reinforced when reviewing the minutes of a public meeting held in Little Swanport on the 23rd October 2001. A majority of those in attendance at this meeting voted by a show of hands for the following action; that *'the Water Management Plan be integrated with the LSC Management Plan'* (LSCMPIC, 20008, p.9). What remains is the question of how to integrate a State Government legislative process, such as water management planning, with collaborative participatory processes such as integrated catchment management and NRM, is discussed later in the chapter. Recognition that there are relationships between the processes discussed above and that a non-regulatory ICM and NRM framework may play a key role in enabling or improving the necessary integration, is critical to engendering a commitment from the state to programs such as CTC.

Lack of such recognition may be rectified by the development of agreement between the state government and key stakeholders outlining partnership arrangements and demonstrating a willingness to work together to achieve better NRM outcomes. The partnership agreements[30] that already exist between state and local government in Tasmania is one avenue to achieve this. In early 2010, the GSBC signed the second partnership agreement with the Tasmanian State Government. The agreement includes the following brief reference to NRM: *DPIPWE will work with the Council to effectively implement the natural resource management (NRM) framework* (Department of Premier and Cabinet, 2010, p.19). It is important that any agreement also specifies the available

[30] 'Partnership agreements are part of the State Government's broader agenda of developing partnerships with the community to find new opportunities for economic and social development. There are four types of partnership agreements: bilateral, regional, statewide and tripartite. To date, 52 agreements have been signed.' Source http://www.dpac.tas.gov.au/divisions/lgd/partnership_agreements accessed 8th December 2010.

resources and commitment timeframes, including a predetermined review period, to enable state agencies to realistically consider their involvement capacity. Knowing the commitment from the State, in turn will enable other stakeholders to make realistic decisions about what outcomes are possible from their own investments, particularly given that most ICM initiatives require technical support. Technical support if unavailable from state government officers will need to either be sourced from the private sector, or through the regional NRM organisations.

Regional bodies

The LSC Management Plan is an accredited plan under the Southern NRM Strategy as are the other two catchment management plans developed during NHT 1 in the Glamorgan Spring Bay Municipality (NRM South, 2005a).

A key role and function of the LSCMPIC was to '*to liaise with the proposed Regional Natural Resource Management Committee in regard to issues / priorities identified in the LSC Management Plan'* (LSCC, 2003, p.40). To that end the LSCMPIC regularly sought information regarding the evolving NRM process from its inception. They invited NRM South Facilitators to attend their fifth meeting on the 20th November 2003 to update them about the evolving development of the Southern NRM Strategy and the Regional Investment Proposals (RIP). At the request of the LSCMPIC, the NRM South Facilitators agreed to '*keep them informed of the process and opportunities for input*' (LSCMPIC, 20008, p.17).

The lack of any attempt by NRM South to inform and / or involve the LSCMPIC in the development and submission of the *Managing upper catchment impacts on marine, coastal and estuarine systems in the Little Swanport Catchment* project highlights the need for protocols to be developed by regional NRM organisations to make sure that existing community groups, networks and their work, past and present, are recognised and respected. A formal commitment from regional NRM organisations to cooperative partnerships, such as the CTC program, is a step towards not only recognising local stewardship but also commitment to the principles of ICM and NRM.

Local Government

The GSBC and the Southern Midlands Council have now worked in partnership with the catchment community of the Little Swanport for over ten years. This relationship has been challenging and political at times. It has involved a regular renegotiation of commitments and resources. There have been many years of hard work by dedicated Landcare/NRM staff as well as other committed Council employees, Councillors and community members to retain and build on the commitment to ICM.

In the GSB Municipality this hard work finally resulted in formal recognition of this commitment to ICM in the 2005-2010 Strategic Plan, however, it was only in the 2008/09 financial year that this commitment by Council resulted in a specific budget being allocated to ICM through the CTC program (GSBC, 2006, p.21; GSBC, 2008b). The work done by the GSB NRMC, in developing and communicating the concept for CTC was crucial in achieving this outcome.

To strengthen the commitment between local government and the other key stakeholders (state government, NRM South and the local community via the LSCMPIC) again it is important to formalise partnerships. In this instance this would involve developing agreements committing key stakeholders to the implementation of ICM through the CTC program. Clarifying program objectives and outcomes will enable each stakeholder to determine the resources available, and detail timeframes and expectations. A draft Memorandum of Understanding (MOU) between NRM South and the GSBC is the next step towards such a formal commitment.

Local stakeholders

There are many stakeholders in the LSC with an interest in ICM and NRM other than the three tiers of government and the NRM Region. Many local stakeholders, only some of whom are represented on the LSCMPIC, have already made a significant contribution and commitment to the ICM process.

The LSCMPIC has had over 35 general meetings since inception in 2003. Additionally there have been two full day catchment plan review workshops and over seven public meetings (LSCMPIC, 2008). A number of committee members were also involved in the original development of the catchment plan (at least another 11 planning meetings) and also in the development of the WMP (nine meetings and two full day workshops of the consultative committee). All of these meetings have involved reading and review of preparatory documentation.

Given the size and geography of the catchment on average most committee members have to undertake an over 100 km round trip to attend meetings. Estimating an average time of two and half hours per meeting, plus an hour travel each way that is a five hour commitment for each meeting for between five and 10 people. Combined with anything up to fifty plus people attending community meetings a lot of time and energy has gone into NRM and ICM over the last ten years in the LSC. This is an impressive commitment from a catchment with fewer than 350 permanent households.

It is clear from the case studies that in the LSC, as in many other catchments and communities particularly in rural areas across Australia, there is a significant commitment to NRM initiatives. There have been both positive and negative outcomes from these experiences, and many lessons learnt. Nevertheless, a commitment to participate in governance processes that not only request but clearly require community participation has been evident.

As with other key stakeholders the next step is to find a way to move towards a genuine commitment to an ongoing collaborative planning process. Research undertaken by Margerum (1999, p.156) which involved a review of twenty-three case studies from the United States and Australia, and a survey of 285 Australian participants in ICM and integrated NRM processes found that some committee members initially become involved to progress narrow interests and agendas, or even to hinder what they perceived to be the purpose of the planning effort.

The principles and evolving process of ICM and NRM may be perceived as threatening by some individuals and non-government organisations. Some people may have concerns that ICM and NRM are 'top down' processes that will result in imposed regulations and other constraints which might hinder local development (Mitchell et al., 1993). Some participants from the research by Mitchell et al. (1993) stated that the initial stages were often very unproductive until it became recognised that it was a collaborative process. People were either moved to work with the group or they resigned. This observation was experienced by the LSCMPIC particularly during the period when the water management planning process was happening in parallel (LSCMPIC, 2008, p.18).

There are many different reasons why community stakeholders become engaged in group consensus building processes. At the end of the day participants either consciously or unconsciously weigh up the 'cost-benefits' of their involvement and make the appropriate decision to remain involved or otherwise. Genuine commitment to a collaborative process takes time. For some stakeholders it will take longer or perhaps they will never be truly committed. In some instances individual stakeholders are not genuinely committed to the collaborative process but insist on participating, sometimes if only to disrupt proceedings in order to prevent the group achieving outcomes to which they do not subscribe; a result which has the potential to undermine the entire process. Participants in an ICM or NRM process with or without any legislative basis, may not always be entirely clear themselves about what type of process they are involved in. Without a clearly articulated purpose genuine commitment is difficult.

Purpose

Public participation in decision-making may not always have positive outcomes, especially if there is confusion over purpose and potential benefits (Kweit, 1981). Clearly articulating the parameters (that is, what is in and out of scope) of any NRM process that invites community participation will alleviate confusion to some degree, although rarely is it that straightforward, as the experience in Little Swanport attests.

Although the LSCMPIC had clearly articulated roles and responsibilities (LSCC, 2003, p.40) these were sometimes interpreted in different ways by members of the committee.

Ideally the process of local or catchment scale NRM programs should be at the invitation, and ongoing involvement, of well-established and recognised organisations such as local government or regional NRM organisations. Regardless of who initiates the process it is still necessary to define clearly the purpose and parameters of participation. Clear definition of the geographical boundaries of an ICM or NRM process is one parameter, important for a number of reasons, some examples of which are given below in light of the experience in the LSC.

ICM is just an example of integrated NRM where the boundary happens to be a catchment. The catchment boundaries may be strictly hydrological, or determined by administrative, political and practical factors. One reason why administrative catchment boundaries are often used for ICM processes is because small hydrological catchments, such as the Buxton and Lisdillon Rivulet catchments are too small and have too few stakeholders to justify separate ICM or water management planning processes. In some instances the administrative boundaries may also relate to municipal or regional boundaries.

The LSC Management Plan was always based upon the DPIWE administrative catchment boundaries (Figure 2). The boundary includes the hydrological boundary of the Little Swanport River and all tributaries, including those that go directly into the estuary. It also includes the hydrological boundary of the Lisdillon and Buxton Rivulets as well as any minor creeks and drainage lines that go directly into the ocean, north of the Little Swanport River up to Sandy Creek, and south of the Little Swanport River to the Ravensdale Rivulet.

The LSP CMP identified a need to protect and restore riparian vegetation in the catchment. To that end the LSCMPIC successfully sought funding for fencing off riparian areas from stock for interested landholders within the catchment. It was

essential to have a defined area so the committee could communicate the availability of this funding to those who were eligible to access it.

Clearly defining boundaries is also important to avoid create confusion with regards to collection and validity of environmental data. Boundaries were not clearly defined in the early stages of the water management planning process in the LSC, which later raised concerns in regard to the interpretation of hydrological data collected during this period (LSCMPIC, 2008, p.20). Furthermore, although the DPIPWE boundary for the catchment included the smaller catchments of the Buxton and Lisdillon Rivulets and to that end representation was sought on the WMPCG, these rivers were not considered in the final LSC WMP (DPIWE, 2006a; LSCMPIC, 2008, pp.13, 14, 16).

These examples highlight how poor definition of boundaries can create confusion. A lack of clarity may result in reluctance of the community to participate, if they are unsure if they are eligible or not. It will also make it difficult to assess what resources required to undertake tasks (for example when undertaking monitoring activities or on ground works). Defining boundaries is one important component of clarifying what an ICM or NRM process is and what it is not.

Hamstead et al. (2008) observed from a review of eleven water planning case studies from across Australia that all jurisdictions are trying to come to grips with integrating water allocation planning with regional NRM or ICM planning. The processes often run separately despite the opportunity for ICM to provide the broader context for water planning. Resources available through the NRM framework in Australia could significantly contribute to offsetting the public good aspects of a robust water management planning process, from development through to implementation; this is because ICM usually considers such a broad range of NRM issues. Among such issues are the potential impacts on water quality of land use practices and the protection of riparian vegetation which, like water extraction, can impact upon freshwater and estuarine aquatic ecosystems. Conversely, water allocation planning generally focuses

upon only one aspect of these broader NRM issues. Nevertheless, they remain intertwined.

The best means of integrating these two processes is still unresolved in the LSC, although the revised catchment plan recommends improving *'communication between State Government water management and planning agencies, the committee and the broader community'* (LSCMPIC, 2010, p.20). There can be difficulties in communicating to stakeholders the integral and complex nature of ICM, NRM and water management planning; the amount of complex documentation that the WMPCG is required to comprehend is a testament to this. Refusal to acknowledge these difficulties will have repercussions, for current and future NRM initiatives and for successful water management planning. The development of Standard Operating Procedures for the development of statutory water management plans in Tasmania demonstrates that the state government has recognised this and have included a range of steps and task to minimise the associated risks (DPIPWE, 2010a, p.16, 20, 23, 27, 28, 31). The experience in LSC demonstrated that such a refusal can contribute to conflict, confusion and anger in the community. It is important to consider further developing and implementing strategies to strengthen integration between ICM, NRM and water management planning, or '*ensure regional catchment plans inform regional water plans*' (Cullen, 2006, p.2). To that end an improved understanding of the differences in the approaches to participatory ICM and NRM that were used in the LSC might be useful. Probst et al. (2003) modified the classification of participatory research approaches of Bigg (1989), with the purpose of enabling the linkages, levels of involvement, and degrees of control between the different 'actors' involved in participatory research and development processes and projects to be described. The four types of participation articulated are useful to consider when determining what an ICM or NRM process is and is not. They are detailed in Table 4.

TABLE 4: Four types of participation in participatory research

Type of participation	Description
Contractual participation	One social actor has sole decision-making power over most of the decisions taken in an innovation process, and can be considered the 'owner' of this process. Others participate in activities defined by the stakeholder group, i.e. they are (formally or informally) 'contracted' to provide services and support.
Consultative participation	Most of the key decisions are kept with one stakeholder group, but emphasis is put on consultation and gathering information from others, especially for identifying constraints and opportunities, priority setting and/or evaluation.
Collaborative participation	Different actors collaborate and are put on an equal footing, emphasising linkage through an exchange of knowledge, different contributions and a sharing of decision-making power during the innovation process.
Collegiate participation	Different actors work together as colleagues or partners. 'Ownership' and responsibility are equally distributed among the partners, and decisions are made by agreement or consensus among all actors.

Source: Biggs, 1989 modified by Probst et al., 2003

The ideal informing ICM and NRM is that of a *collaborative or collegiate participation* process (refer to the principles of ICM, NRM and regional NRM governance, noted earlier) but that may not always be the case. It is important the type of participation is clarified and agreed to not only in the initial stages of any ICM or NRM process but reemphasised at different stages of implementation, particularly during review periods.

A comparison of three different projects involving members of the LSCMPIC is presented in the Table 5. This comparison aims to clarify how the underlying essence of ICM differs from other related NRM processes. It also illustrates how easy it would be to confuse accidentally, or even deliberately manipulate the interpretation or

understanding of the type of participatory process or approach that people are involved with.

TABLE 5: Comparison of types of participation in three different projects involving members of the LSCMPIC

Process / project – involvement of community members	**Actual type of participatory approach**	**Comments**
Implementation of the LSC Management Plan – a voluntary community committee of diverse stakeholders is formed to progress the implementation of a plan developed by and for the community. Participation in any activities initiated by the committee is entirely voluntary.	*Collaborative participation* Different actors collaborate and are put on an equal footing, emphasising linkage through an exchange of knowledge, different contributions and a sharing of decision-making power during the innovation process. *Collegiate participation* Different actors work together as colleagues or partners. 'Ownership' and responsibility are equally distributed among the partners, and decisions are made by agreement or consensus among all actors.	ICM processes, at least currently in Tasmania are about *collaborative participation.* However, without clear articulation and communication of the purpose and parameters of the process it may be perceived by those both participating in and observing from the outside that it is a *consultative* as opposed to a *collaborative participation* depending upon who has initiated or is driving process. Another example may be when participants and observers believe that membership in a particular group gives them influence or additional rights over land managers in a catchment, and or when a plan is used to influence other political or legislative processes. A further example is when outside observers perceive that the committee is a 'puppet' for government or 'local elites' who are really driving the process and that it is just another way to influence and control private land development. In an ideal situation, particularly with formal commitment from the state, local and regional agencies the implementation of a catchment management plan could be a process of

		collegiate participation.
Development and implementation of the LSP Water Management Plan – a legislative process under the Water Management Act 1999. Community consultative committee formed to '*advise the department on local water management issues, seek advice from their representative organisations and represent their economic, social and environmental interests; and facilitate education of, and dialogue with, respective stakeholder groups*' (DPIWE 2005a, p.14).	*Contractual participation* One social actor has sole decision-making power over most of the decisions taken in an innovation process, and can be considered the 'owner' of this process. Others participate in activities defined by the stakeholder group, i.e. they are (formally or informally) 'contracted' to provide services and support. *Consultative participation* Most of the key decisions are kept with one stakeholder group, but emphasis is put on consultation and gathering information from others, especially for identifying constraints and opportunities, priority setting and/or evaluation.	The DPIWE Planning Principles set out activities that *may enhance* engagement including a consultative group (DPIWE, 2005a, p15). The official process clearly indicates that this could be considered either a *contractual* or a *consultative participation* process but at the end of the day the 'key decisions are kept with one stakeholder group'. Although the consultative committee had significant influence over many outcomes of the LSP WMP, it was the state government, through the formal processes prescribed by the WMP Act 1999 that made the final decisions. As the final document reflects the legislation the decision whether or not to abide by or participate in the outcomes is not voluntary but mandatory. A concern that may arise with this approach is if the state government either does not have or does not adequately allocate appropriate resources to ensure implementation then it is only through voluntary cooperation that the plan is likely to be implemented. Ultimately a *collaborative* or a *collegiate participatory* approach may have been more appropriate in order for the plan to be effective.
The LWA / FRDC funded project *'Water use across a catchment and effects on estuarine health and productivity'*. Project is managed by the Principal Investigators from TAFI and DPIW. The	*Consultative participation* Most of the key decisions are kept with one stakeholder group, but emphasis is put on consultation and gathering information from others, especially for identifying constraints and opportunities, priority setting and/or evaluation.	Although this project was required to be consultative by the funding bodies the roll out over the last two years and the challenges involved could result in the perception that it is more like a process of *contractual participation.* There is the danger, or perceived danger that a project such as this uses the local stakeholders to 'legitimise' the outcomes of a project that outsiders and/or particular interest groups perceive as important.

LSCMPIC makes up the 'core' of the Steering Committee for the project which has an external Chair and technical specialist members also. Community participation on the Steering Committee was a requirement of the funding body, particularly given the 'socio-economic' element of the research.		Given a different beginning this type of project could always have been a *collaborative* or even a *collegiate* type of project, for example had the project been developed in partnership with the LSCMPIC rather than been imposed upon them.

Using this framework to reflect critically upon these separate yet interlinked processes in the LSC demonstrates how easily it is to confuse the purpose and parameters of ICM and NRM processes and projects if they are not clearly and repeatedly articulated. Consideration of the LWA / FRDC funded project *Water use across a catchment and effects on estuarine health and productivity* draws attention to social and economic considerations of ICM and NRM. Participation by the LSCMPIC in the project highlighted how critical a 'systems' or 'holistic' approach is to the success of ICM and integrated NRM at both the planning and implementation stages (Allison and Hobbs, 2006; Boxelaar et at., 2007; Coastal CRC, 2007; Flora et al., 2000; Penton et al., 2005).

A holistic approach that requires consideration of every element of the defined catchment (for example) is frighteningly overwhelming. Is it possible to consider the complexity of the social, cultural, political, and economic system, as well as every element and interaction of a complex natural system over all temporal periods? There are researchers who spend lifetimes investigating complex systems and developing concepts and models to explain them (Allison and Hobbs, 2006). It is so overpowering

that without simplification one would never bother starting, especially if part of a voluntary community group or research team with limited resources.

An increasingly popular concept that recognises the need for a holistic approach yet provides a simplified systematic framework for action is triple bottom line accounting and reporting. It is increasingly being used by governments, business, industry, non-profit and community groups around the world as a means of grappling with how to account for, and reporting upon, the economic, social and environmental impact of their activities.

There is no right or wrong way to do triple bottom line accounting and reporting. It will depend upon the type of organisation and the resources available. Often a structured risk-management approach is used that systematically reviews the *likelihood* and *consequence* of a specified activity undertaken by the organisation impacting upon economic, social and environmental elements of the spatial and temporal landscape of operation.

Increasingly businesses keen to demonstrate sustainable practices, particularly to retain market share, will formalise the approach to 'triple bottom line' accounting by developing detailed *Environmental Management Systems (EMS)* such as the international standard ISO14001 (http://www.iso.org/iso/iso_catalogue/management_standards/iso_9000_iso_14000/iso_14000_essentials.htm accessed 26th November 2008).

At the other end of the spectrum is the national move to encourage agricultural industries to use a structured approach to assess, monitor and improve environmental, safety and financial performance (Seymour and Ridley, 2005). In Tasmania the Property Management Planning Systems framework[31] and the associated tools are an example of this approach.

[31] '*The Tasmanian Property Management Planning Framework (PMPF) is a state-wide framework which overarches the development and delivery of property planning activities in Tasmania and is recognised by the Tasmanian Farmers and Graziers Association, The State Government and Tasmania's Natural Resource Management Bodies. Its basic function is to ensure co-*

At a catchment scale it is also possible to undertake this kind of a systematic approach. The LSCMPIC recognised that, in the development of the initial ICM plan, the focus was almost entirely on the environmental elements of the catchment. The subsequent years of struggling clearly highlighted that recognition of the social and economic elements (and the political and governance issues that this encompasses) would be necessary in the review process.

A risk assessment approach was used for the review of the catchment management plan. The initial brainstorming session highlighted a range of social, economic and environmental issues facing the catchment community and the possible ramifications that this might have for those living and working there. The outcomes of the workshops and the subsequent actions in the revised plan not only directly reflected some of the risks identified during the review but also were considered in the broader social and economic context. An obvious example was the necessity to consider an uncertain future with regard to the ongoing resourcing of an extension officer (LSCMPIC, 2010, p.14). This observation leads one to consider how important it is, especially in the early stages of an ICM and NRM process, to be realistic about what can be achieved with any given set of resources.

Early planning to facilitate a shared understanding of the capacity of stakeholders to deliver on expectation is important so that groups can be realistic about what can be achieved. For example after forming in early 2003 the LSCMPIC embarked upon a number of projects that would to take up an extreme amount of time, energy and resources. Some of these projects, such as community water quality monitoring and the salinity trial, despite the official requirements of the funding bodies, would not be formally completed until over five years later.

Compounded by the limited resources and commitment from other agencies even the simplest task can become complicated. For example before the LSCMPIC could do anything they needed to develop a mailing list of all landholders in the catchment

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ordination and consistency between the various property planning activities and policies which are developed within Tasmania' http://www.tfga.com.au/policies/tfga-projects/framework-publications-and-tools.aspx accessed 3rd December 2010).

(LSCMPIC, 20008, p.15). Given that the catchment covered two municipalities and that neither Council nor the State Government had a complete and current list, this essential task, necessary for communication with the catchment community, took many hours of voluntary work to achieve.

Another example of the effects of limited resources is the community water quality and salinity monitoring project which was dependent upon external technical and coordination support (LSCMPIC, 2008, p.15). At the time of developing the original funding application it was anticipated that the regional NRM process would continue to support local or regional Waterwatch coordinators. It was wrongly assumed that the coordinators would provide support for the development and implementation of this project. It was only due to the commitment of committee members, and the eventual funding of the CEO position, with additional funding from the Envirofund grant, that it was possible for the project to progress and the requirements of the grant to be completed, although regular monitoring has yet to occur.

The capacity of the LSCMPIC to undertake the water monitoring project, at this particular time of transition and uncertainly in NRM governance, was limited. Without institutional support it was impossible for a voluntary committee to undertake this project efficiently; this was similar for the SGSL trial which was initiated by DPIWE not the LSCMPIC. The case study gives an indication of the level of work that was required to see this complex project implemented. In the initial stages there was an underlying expectation that DPIWE would provide ongoing technical support for the project however this was not the case.

These are examples of how the LSCMPIC was not realistic in evaluating its capacity to implement even a few actions in the catchment plan. A much stronger and broader network of administration, coordination and technical support is essential to enable even the most apparently simple integrated NRM task to be achieved. Following the cessation of NHT 1 it has only been with the establishment of the CTC program that this support has been available for individuals and community groups outside of Little

Swanport in GSB. This break in support has severely affected the capacity of groups to achieve on ground actions and has resulted in cynicism and burnout amongst volunteers. Such an experience is not isolated to the east coast of Tasmania, with other community groups engaged in NRM activities reporting similar experiences (Paton et al., 2004; Victorian Government, 2008; Whelan and Oliver, 2005). Recognising limitations will avoid disillusionment and burnout, enabling much more realistic and achievable actions and objectives to be pursued. The key to a realistic appraisal is identifying the mix of financial, human and technical inputs or resources necessary for actions to happen.

Defining available resources at the beginning of a process is crucial to enable the effective planning necessary to achieve 'realistic' outcomes. The extensive research undertaken by Margerum (1993) highlighted that the role of the coordinator was the single most important resource in an integrated management process. Australian stakeholders interviewed during this research considered the effectiveness of the coordinator was the key to the success or otherwise of an ICM or NRM process.

Effective local participation in NRM requires skilled planning and facilitation by professionals with considerable input from carefully selected local participants. An understanding of the social and cultural landscape that programs are being developed in is as critically important as any understanding of the natural landscape. In light of this complexity, NRM facilitators and coordinators need a wide range of skills, including communication and conflict resolution skills, knowledge of planning processes, an understanding of physical processes as well as an understanding of sociology and microeconomics (Margerum, 1993; Oliver, 2004, pp.218-35).

No facilitator or coordinator can possible know everything about every element of NRM so it is necessary to have a network of technical specialists who can offer support, advice and direct participants to existing information on best practice, and provide advice and direction as required. Curtis et al. (2000) recognise that successful rural development projects are those that are flexible, provide for the active participation of beneficiaries,

and are sensitive to local conditions and cultures. Without a skilled and adequately resourced and supported coordinator the likelihood of success will be reduced.

The experience in the LSC highlighted the need for the coordinator or extension officer to have the support of a steering committee made up of a small select group of NRM professionals and key well chosen local residents. The role of the steering committee is to provide guidance and encouragement for the coordinator either as a group or on a one to one basis as required. Establishment of the CTC Steering Committee is recognition that ICM is difficult and it is often the coordinator who will bear the brunt of broad and often conflicting expectations from many different stakeholders. This observation is reinforced by Margerum (1999) who found that coordinators in both the USA and Australia suffered from burnout and high turnover rates due to limited support from other organisations and stakeholders, heavy work loads and time demands.

Curtis et al. (2000) note that participation processes often favour advantaged groups in the community and may not lead to more widespread community involvement. This process is one of many good reasons to undertake thorough planning prior to undertaking community engagement programs and to regularly review planning recognising an ever changing cultural landscape. It is often possible to recognise various subcultures within a community and to develop a variety of strategies to encourage engagement at different levels.

The planning phase of the '*implementing a whole of catchment and whole of ecosystem planning model'* project clearly identified a number of discrete communities, and networks that existed within the LSC. The advantage of employing a local resident as the CEO was the knowledge of existing networks and understanding of the catchment community, evident during the planning stage: it enabled the project to focus on the strategic and sensitive targeting of existing subgroups. One of the sub-groups identified was that of large acreage graziers who with the support of the extension officer became involved in a National Landcare Sustainable Agriculture program (NLSA). Few of this

group of upper LSC farmers had any involvement in the activities or initiatives of the LSCMPIC in the previous five years.

Although this is an example of how selecting and supporting the right person as a coordinator or extension officer can enable targeted engagement it is not always going to be possible, or perhaps even desirable to employ a local person to undertake the extension position. It has been through the support of the CTC coordinator that another sub group in the catchment, a self motivated group of smaller landholders at Woodsdale, have received funding and support for a range of sustainable farming initiatives. In this instance the necessary local knowledge was provided through supporting program staff and through the networks of local government, whilst the CTC coordinator was able to tap into an extensive NRM network from around the state and beyond.

Integration of local insights with other knowledge sets can result in challenging situations. The experience in the LSC highlighted that at times personalities, underlying agendas and complex issues made it very difficult for the members of the LSCMPIC to collaborate effectively. The *'implementing a whole of catchment and whole of ecosystem planning model'* project required the LSCMPIC to engage an external facilitator to work with them. The role of the facilitator was to attend committee meetings and events such as public meetings when difficult issues were to be discussed or key decisions needed to be made.

Members of the LSCMPIC agreed to engage a particular professional facilitator chosen from a number nominated by committee members. Each of the nominated facilitators was asked to submit their interest and experience in participating in the project. It was clear from the responses which facilitator was the most appropriate and the engagement decision was unanimous. The process of selecting the facilitator was transparent and democratic and the facilitator was accepted and respected by all committee members (LSCMPIC, 20008, pp.27-28).

It has been very clear throughout the *'implementing a whole of catchment and whole of ecosystem planning model'* project, which integrated together all the other projects of the

committee, that access to a professional facilitator was critical at particular times. The facilitator was able to move the committee through difficult transition periods and assist them in coming to decisions whereas in the past stalemates were met and meetings had became testing and even unpleasant. The facilitator was able to offer fresh and unbiased insights as well as guiding processes to enable the committee to make decisions and move on.

Very importantly the facilitator was available to speak confidentially with the catchment extension officer, Council NRM officers and committee members if and when required. The combined human resources of the extension officer and the facilitator enable the committee to successful complete projects. For community-based volunteer programs these early successes are important in order to build trust, pride, and a spirit of camaraderie amongst participants. Interviews with participants in Australian ICM committees clearly highlighted that it is these early activities that help produce momentum and move groups forward to other actions (Margerum, 1999).

That said, what is the definition of an 'early success' and what is the best way to celebrate and communicate this success? Given the complexity of the tasks required of the LSCMPIC and what needed to be overcome to make any headway, five years later could still be considered 'early'. When and how do you communicate intangible change (for example, attitudinal shifts) and the incremental tangible changes that may result from an ICM or NRM process (for instance, the time lags between attitudinal and behavioural change)? The willingness of a diverse group of stakeholders with different agendas to return to the table again and again over many years is itself a significant achievement. Given the depth and breadth of involvement of the projects it is very likely that willingness to continue to participate has led to a subtle but gradual increase in understanding of the complexity of NRM issues in the catchment. The process of information exchange, debate and discussion experienced by members of the LSCMPIC may have resulted in much greater recognition of the legitimacy of all stakeholders to contribute to the ICM process.

The LSCMPIC finally received public recognition of its 'runs on the board' when they won the Community Group Award at the Tasmanian Landcare Conference in 2009, followed in 2010 by winning the National Landcare Community Group Award. Not so much an early success for the committee, but certainly a welcome appreciation of its work, which has been given legitimacy at last.

5.2 Now the ball is rolling

In NRM regional processes it is important to '*ensure the 'right people' are involved for the 'right reasons''* (Farrelly and Conacher, 2007, p.319). Research undertaken by Bidwell and Ryan (2006) into the implications of the design of collaborative watershed partnerships on the types and success of activities confirmed previous research that partnership composition is related to outcomes (Korfmacher, 2000; Moore and Koontz 2003; Steelman and Carmin 2002). Reference to the *structure* is defined as *the set of characteristics that can be used to describe a particular partnership (e.g., composition of participation, funding, age, or organisation affiliation).* Whilst partnership activities are defined as *' the physical tasks that groups accomplish, such as the development of plans or the completion of restoration projects* (Bidwell and Ryan, 2006, pp. 830-31).

An outcome of the research by Bidwell and Ryan is that independent partnerships (community-led and driven without formal support from government agencies) are more likely to conduct scientific assessments or plans, whereas agency affiliated partnerships focused primarily on restoration projects. The experience in the formative years of the LSCMPIC reinforces this experience. It has only been since the establishment of the CTC program, that there has been any ability to genuinely support landholders with on ground works. Of particular interest to this discussion is how this research reinforces the significance of the stakeholder committee in shaping the outcomes of an ICM process. Furthermore it is suggested that the characteristics that make up the structure of a partnership or committee are variable and can be manipulated.

Stakeholder committees are generally made up of members who represent different sections of community, interest groups and government organisations, and or different

members with different skills and knowledge sets relevant to the task at hand. The level of complexity involved in achieving accountability will be dependent upon the types of activities that the committee initiates and implements, and the time and resources available to the committee. When a committee is the recipients of funding its members need to have the capacity to be financially accountable.

The LSCMPIC was originally established as a representative committee, not a skill based committee. Although it was successful in applying for and receiving grants members did not have administrative or technical capacities to manage projects. Recognising these limitations the LSCMPIC chose not to become an incorporated body and did not open a bank account. Funding was managed by the East Coast Regional Development Organisation (ERDO), an incorporated voluntary group, also with limited capacity. This situation proved difficult in the longer term as the committee was unable to be vigilant in the financial accountability of these grants. With the employment of the GSB NRM officer it was decided that it would be preferable to move the money to the administration of the council.

This reflection and review process highlighted that it was not appropriate for a representative committee, especially one that was not incorporated and had very limited paid support, to apply for large grants. The LSCMPIC did not have the capacity to be financially accountable to the funding bodies. This situation resulted in significant stress for committee members, particularly the executive, and took a long time to be resolved even with the support of the catchment extension officer. The capacity of the committee to be accountable is subject not only to available resources but also requires considered planning and ongoing reflection and review. Strategic partnerships and coordination between stakeholders will influence the effectiveness of efforts to ensure accountability.

Developing formal partnerships with existing stable organisations with paid staff, such as local government, may be a more appropriate means of enabling financial accountability. It may alleviate unrealistic expectations of the level of financial accountability that certain stakeholders may have of voluntary groups. It is also an

example of the type of invaluable contribution that key stakeholders such as local government can provide in a collaborative process.

It is equally important that individual group members have the capacity to be accountable to their representative stakeholder groups through agreed reporting mechanisms. This is a key means of ensuring the actions of the committee reflect the interests and concerns of the broader community and one of the ways that an ICM / NRM process is transparent. There is a similar requirement when developing a WMP, although the capacity of the stakeholders during the development of LSP WMP, and the inexperience of DPIWE, prevented this from happening effectively.

Establishing a committee to oversee an ICM or NRM process can occur in any number of ways. In Tasmania there is no legislation, policy or framework that prescribes how to do this. Despite this lack the experience in the LSC highlighted the need to have the process open and transparent. Nominations for membership of committees to oversee the development and then the implementation of the plan were called for at public meetings. These public meetings were all advertised both locally and in the major state newspapers. Much work was also done behind the scenes to inform potential committee members about the process and to encourage participation; this is usually the case for ensuring membership of any voluntary committee.

In this regard, transparency is important when considering the composition of a catchment committee, particularly if diversity is an influencing factor in determining outcomes. Consideration needs to be given to how under-represented stakeholders can be encouraged or supported to participate. It may be necessary to consider providing monetary and technical resources to facilitate this participation (Ryan, 2000). How this facilitation is achieved will depend on what is the most appropriate in the circumstances. For example, the GSBC offers reimbursement for mileage for members of the NRMC who attend on a voluntary basis. It is important that this process is formally agreed upon and is transparent, and in this instance the GSBC allocates an annual budget to support

volunteer engagement in NRM. Perhaps in the future this support could be extended to the LSCMPIC.

It is also necessary to ensure transparency in the governance process through timely and accurate documentation. This documentation includes maintaining records of meetings and activities, professionally managed with copies of all records being stored in more than one agreed location, ideally with more than one agency involved in the process. The experience of documenting the last ten to 12 years of ICM in the LSC highlighted how quickly important records can disappear. It has been recognised that electronic copies of documentation are also valuable, thus the revised LSC Plan recommends that *'a DVD with electronic copies of reference documents including links to websites of relevance to the LSC'* (LSCMPIC, 2010, p.11).

Many ICM and NRM type plans were developed during NHT 1 in Tasmania (DPIWE, 2002; NRM South, 2005a). Hundreds of different projects have been funded in Tasmania over the last ten years (Australian Government 1999; Australian Government 2000; Australian Government 2001). An interesting observation is the difficulty in obtaining copies of these plans, let alone copies of meeting minutes and governance processes guiding their development, via internet searches. These records can be useful as a valuable historical record of the work undertaken, as well as for monitoring and evaluation purposes. Records can also be useful if there are conflicts that require a review of documentation to resolve.

With increased availability of electronic document management systems there is improved capacity for documenting governance processes and outcomes such as catchment plans and meeting minutes. Systematic documentation, and the capacity to recall this documentation, is one of the many elements that assist in building trust between stakeholders engaged in an ICM process.

Case studies from Sweden and Canada are used to present the development of adaptive co-management systems. They show how local groups self-organise, learn, and actively adapt and shape change with social networks that connect institutions and organisations

across levels and scales which facilitates information flows (Olsson and Folke, 2004). They identify that trust is a fundamental characteristic in social self-organising processes toward ecosystem management.

A collaborative research project in South East Queensland which developed a typology for engagement in NRM also identified that '*for many NRM engagement practitioners, engagement is about people, interacting in a relationship over time in the context of developing trust*' (Smith et al., 2005, p.5). The experience in the LSC reflects this observation. But it is a double edged sword. Trust is hard won and easily lost. With trust much can be achieved. Trust lubricates collaboration but without trust it can be very difficult to make progress (Pretty and Ward, 2001). Baland and Platteau (1996) recognised that the lack of trust between people is a barrier to the emergence of collaborative arrangements, such as ICM.

It has been recognised that examples of successful co-management involve long periods of trust building (Kendrick 2003; Pretty and Ward 2001): this has been the experience in the LSC with those original members of the LSCMPIC still participating having an appreciation of each others commitment, and limitations, through shared experiences. Reflection upon these experiences, have led to the identification of specific actions that may assist in facilitating the development of trust between stakeholders involved in ICM.

Formalising procedures and protocols for the regular operations of the steering committee might appear to be creating needless bureaucracy and paperwork. But enabling this transparency and accountability is another step in ensuring that the rules of participation are clear, which is an important element of building trust. The LSCMPIC experienced conflict on occasion as a result of not having documented and agreed to formal procedures and protocols of operation. These were learning experiences. They reflected the limited capacity and experience of the committee in managing complex NRM projects. The diverse experiences of members resulted in different interpretations of what was an acceptable and appropriate procedure or protocol. On occasion, had

there been procedures and protocols for operating that had been formally adopted, then conflict or perceived conflict could have been more quickly resolved (LSCMPIC, 2008, p.28).

Given the often unchartered territory of ICM it is difficult to predict what type of situations will arise. They are likely to be different between catchments, regions, states and, undoubtedly countries. A framework within which to progress complex issues may reduce the likelihood of conflict and can lead to the progression of collaborative decision making. Not having this framework can make it difficult for groups to move forward as individuals or allegiances can back themselves into a corner and, as there is no right or wrong, a stalemate may result. Margerum (1999) reinforces the need for decision-making rules that are made clear to all participants to avoid misunderstanding and confusion.

The research by Margerum (1999) also emphasised the importance of consensual decision making in collaboration. This conclusion reinforces that of other authors (Gray, 1989; Innes et al., 1994; Pasquero, 1991). Although MacKenzie (1993) deemed consensus to be important not only for reaching acceptable decisions, but also for building long-term trust and support for outcomes, this conclusion is not consistent with the experience in the LSC. Although consensus was the objective and was usually achieved, in some instances it was not possible. This could have been for any number of reasons, from political alliances to a lack of meeting preparation, to a complete philosophical opposition to a particular motion. Given that the committee could only realistically meet approximately every two months if only consensual actions progressed then the committee would have struggled to progress at all. Margerum (1999) notes that consensus reduces the importance of stakeholder group composition and numbers, which is critical in a voting process. In light of this observation, identifying consensus as a key element of successful collaborative processes is at odds with other research that highlights diverse participation as a critical design consideration for collaborative partnerships (Bidwell and Ryan 2006).

Finally, Margerum (1999) notes that some groups and individuals may refuse to become involved (in groups that have voting processes) fearing that their participation will lend legitimacy to an unacceptable outcome. In the LSC, any controversial motions involved long discussion prior to voting with a consensus outcome being the objective, but a majority outcome being the requirement. However, should a participant be opposed to a motion this could be clearly recorded in the minutes of the meeting upon request. This experience again highlights the need to have formalised procedures and protocols that have, at their essence, standard democratic procedure. In light of this observation LSCMPIC has subsequent developed and formally adopted a Terms of Reference.

ICM is all about collaboration, and collaboration requires recognition that resolving complex NRM issues requires diverse stakeholders, at times, to compromise in the best interest of all. Although for some stakeholders, in some circumstances, this may not be acceptable, the experience in the LSC has demonstrated that more often than not it is possible to come to decisions that, *everyone was willing to live with* (Margerum, 1999, p.158).

Democratic procedures embrace the different capacities, skills and resources that stakeholder representatives bring to the collaboration table. State Government has staff with specific knowledge, technical skills, and equipment to assist in investigating and understanding many NRM issues such as water quality. Regional NRM bodies can provide links between the local priorities, and broader regional and national priorities. Local government has networks and administration systems invaluable for communication. Local landholders have detailed knowledge of the landscape both current and historical, as well as their own networks and resources.

The key local stakeholders should form the core of a sub regional ICM or NRM committee. Other stakeholders with an interest in the defined area, such as research institutions, regional bodies and state government representatives can contribute to progress the local, regional and broader priorities that the local stakeholders have agreed to. The opportunities for effective collaboration will be increased with a defining of

roles and thus a formal recognition of how different contributions combined, which often are not financial, may result in a whole that is greater than the sum of the parts.

Defining and communicating the roles of different stakeholders, realistically considered in light of both capacity and limitations, will enable each participant to more effectively deliver on their end of the bargain. The more often all stakeholders are able to deliver upon their parts of any deal, the more trust in collaboration grows. An early project of the CTC team involved key stakeholders, including state government, Inland Fisheries Service[32], local government, local landholders and volunteers working together to build a fish ladder (an in stream structure that enables fish migration) on the Swan River weir. The successful project combined stakeholder contributions of mostly planning and labours with minimal financial resources. Each participant bought a different yet crucial contribution to the project. The success of the fish ladder, substantiated with follow up monitoring by the Inland Fisheries Service has buoyed the collaboration, and discussions are underway to install another ladder further up the river.

Celebrating achievements is a further key element in developing trust and camaraderie in group processes (Flora et al., 2000). During the early days of implementing the LSCP, particularly whilst water management planning was happening simultaneously, there was a lot of stress and little time, energy or enthusiasm for celebration. The volunteer capacity of the individuals involved was so stretched and the morale so low that organising celebrations was not even on the agenda.

The CEO, upon engagement, recognised immediately that the LSCMPIC was burnt out. A fresh approach to committee meetings and activities that focused on celebrating the LSC and the catchment community was initiated. Initially it did not take much.

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[32] '*The Inland Fisheries Service is responsible for administering the Inland Fisheries Act 1995, Inland Fisheries Regulations 1996 and subsequent Orders. The Service has an obligation to manage Tasmania's freshwater resources in a sustainable manner, so that the best use is made of them while ensuring that Tasmania's freshwater fauna and its habitat are protected for the benefit of future generations.', s*ourced http://www.ifs.tas.gov.au/ifs/aboutus/responsibilities accessed 4th December 2010.

Meetings began to involve cakes and snacks and even a few drinks when little breakthroughs were made or when projects were completed. Often committee members came straight from work to meetings, so providing food assisted in maintaining concentration. Strict deadlines on meeting finishing times ensured that people got home at a reasonable hour.

Other activities such as the bushwalk and bushdance not only raised the profile of the LSCMPIC but focused on celebrating the catchment as opposed to the controversial elements of NRM, such as the water management planning process, which had dominated the committee's existence to date. These were symbolic events that highlighted that the LSC had a vibrant and fun community that enjoyed the wonderful place where they lived. The bushwalk was an opportunity for other stakeholders from outside of the catchment to meet some of the people who live and worked there, and explore a part of the catchment may have only ever seen on a map. These experiences highlight the social element that need always be a component of an ICM / NRM process, and how both organising and participating in such events can facilitate trust.

Just like celebrating, communicating the vision, the process and the outcomes of an ICM and NRM process are too often left as an afterthought. The focus is on doing the necessary tasks to ensure the on ground works are achieved and projects are implemented. It is often not recognised that it takes perception, skill, time and patience to deliver the necessary messages in the most effective way to different audiences. Those with the technical skills in environmental management may not necessarily be those with the communication skills. In the early days of implementing the catchment plan the communication between the LSCMPIC, and the many other stakeholders an interest in the catchment, was minimal, ad hoc and ineffective. The systematic determination of processes for communication, the allocation of sufficient resources to achieve this and a review of the outcomes were never undertaken by the LSCMPIC. Consequently the earlier work undertaken by the committee and by the other agencies and organisations operating in the catchment was not communicated in any formal manner or in some instances not communicated at all.

The implications of this lack of communication resonate still. Many landholders in the catchment are unaware of the activities of the LSCMPIC even with the additional resources of the CTC team. It is anticipated that the CTC partnership will enable more resources be allocated to strategic communication, perhaps through involving other partners such as Southern Water. This work will require determining who is responsible for communication and what level of communication is required, possible and mutually acceptable. The availability of resources will be a key determinate in what actually can occur. The development of the CTC newsletter has been the major outcome from the communication strategy developed for the *implementing a whole of catchment and whole of ecosystem planning project*, although the current level of resourcing still makes this difficult to produce in a timely manner. Determining appropriate and consistent means for communication is dependent upon identifying key stakeholder groups, individuals and networks.

It is important to recognise that knowledge exchange should ideally value both 'expert' and locally acquired knowledge to inform change-oriented action (Davidson and Stratford 2001). In the LSC it is still only early days in establishing a reciprocal relationship between technical and scientific 'experts', agency staff and the community, that formally recognises that communication and knowledge exchange is a two way process.

Achieving meaningful participation from a variety of stakeholder groups and individuals, beyond those with existing networks, confidence and vested interests, is a difficulty faced by those participating in evolving decentralised and participatory NRM within formalised frameworks around the world (Bohensky 2008; Sherwill et al., 2007; Smith et al., 2005). Individuals not involved in the usual NRM activities, such as the 'care' network (landcare, coastcare, bushcare, rivercare), may be involved in groups that are in fact undertaking NRM activities as a matter of course, but that are called something else, such as the volunteer fire brigade or 'friends of' or 'tidy towns' group. The involvement of the local voluntary fire brigade in a prescribed burn to destroy the seeds from the serrated tussock infestation in the lower LSC demonstrated that there are

opportunities for different groups and individuals to become involved in NRM. In a way that suits their own interests as well as recognising their skills and knowledge. Most of the members of the fire brigade are local landholders who have an interest in learning about the control and location of serrated tussock, but most of whom have not attended any of the field days or workshops run by the CTC team.

The catchment walk and the bushdance provided another opportunity to indirectly engage other groups and networks in the catchment. Individuals outside of the LSCMPIC assisted the CEO in organising these events. They also involved businesses such as the local bus company and a tourism operation in the lower catchment. The local hall committees from Buckland and Woodsdale are critical to many activities of the LSCMPIC. Catering for meetings and other events is organised by local groups and raises funds for other community initiatives.

The demographic of rural communities is always changing. In the LSC, as in many other rural locations, particularly those close to the coast or within a reasonable distance from major centres, long time residents are now living side by side with new landholders who have moved from the city or another state to experience the rural lifestyle (Smith et al. date unknown). Many of these newer landholders, particularly in a rural catchment like Little Swanport which does not have any major town or centre, do not belong to any local group or club through which it may be possible to engage them (Hundloe and Crawford in press 2010). They may also be unaware of NRM issues as they may have limited experience in living in a rural environment and limited understanding of the impact of certain activities on natural assets. Conversely, despite a lack of long association with the land, many lifestyle farmers and landholders have a high level of environmental awareness and interest (Curry et al., 2001; Kaplan & Austin, 2004; Smith et al; 2005)

The question remains on how to engage these landholders in NRM activities. In the lower LSC lack of engagement is compounded by the fact that many landholders are only part time residents, residing in the major cities during the week and only visiting

the catchment on the weekend. Ensuring that all community members in the catchment are aware of NRM activities is a first step in rising consciousness and also highlighting different opportunities for community involvement. A project to increasing the awareness of shorebird values is currently being developed by the CTC team targeting part time shack owners and visitors to the coast over summer. The Little Swanport estuary will be a focus for this project which aims to explore a range of participatory approaches to educate and engage targeted stakeholder groups in shorebird awareness and protection.

The CTC newsletter is one component of a communication strategy. Another component has been identified, particularly targeted at informing coastal residents in the catchment of what they need to know if owning or buying property in a particular location. A '*Living at*' booklet will soon be developed based upon one recently revised by the GSBC in partnership with a local ratepayers group for landholders along Nine Mile Beach, a subdivision along a sandspit north of Little Swanport (http://www.gsbc.tas.gov.au/webdata/resources/files/Guide_to_Living_at_Nine_Mile_Beach_2009.pdf accessed 3rd December 2010). This friendly and accessible booklet (first produced through the Coastcare program) has been very well received and is an excellent model. The booklet highlights, amongst other information, the legislative obligations around key elements of living in this particular location, from planning regulations to information on weeds declared under the *Weed Management Act 1999*. The ICM experience in Little Swanport demonstrated a very poor general knowledge of most landholders around their legislative obligations around specific elements of NRM.

For example very few people have any understanding of the SPWQM, and the WMA 1999, and thus the reasons for various activities being undertaking within the LSC from 2003 to 2005. The LSCMPIC requested that DPIWE send an overview of *'all programs, associated timelines, contact numbers and a bimonthly update'* of activities being undertaken as a part of the water management planning process to everyone in the catchment. A commitment to undertake this task was later reneged on the basis that '*it is not DPIWE protocol to send letters to all members of a catchment community to*

inform them of any monitoring activities' (LSCMPIC, 20008, p.18). This response posed a difficult situation for members of the catchment committee who were being asked about what was going on by others in their community, curious to know what the researchers moving around the catchment were doing.

No formal strategy by the State Government for communicating activities and their context resulted in misinformation and/or only selected bits information being discussed in the broader community. Back in 2003 there was confusion about who had the responsibility, legitimacy and ultimately the resources to undertake such a communication task. The CTC program now provides a framework and (limited) resources to do this role. It does require, however, timely input from all key partners to be effective.

The power of word of mouth in rural communities cannot be underestimated. Research undertaken by Whelan (2005) noted that managers and agency staff appeared to misjudge the sophistication of data systems available to community members. In light of this understanding it is important that the correct information and messages are getting out regularly as inaccurate or incomplete information can undermine the work that is being done. Access to and use of telecommunication systems is increasing in rural areas, albeit more slowly than in cities due to infrastructure issues. The internet and email are slowly becoming important communication tools for stakeholders in the LSC, although this has taken some time. The development and promotion of a website with updates of the activities of the LSCMPIC, the CTC team and other NRM initiatives would be ideal. However, the development of an effective website requires ongoing commitment and resources, lacking to date.

Using existing networks and means of disseminating information is also a strategic way to keep a broader range of stakeholders updated with NRM activities. In the LSC both local government newsletters are used to disseminate information. Use of the mainstream media, such as the Tasmanian Country (a weekly newspaper targeted to rural landholders and primary producers) should be utilised more effectively. Greater

exposure of the work that is being undertaken in the catchment is an important means of creating linkages between external stakeholders and the local community. Understanding that the community is active is a key step in ensuring that researchers consider the need to engage respectfully with the community when working in the catchment.

Over the last decade many representatives from many government agencies and research institutions have worked and visited the LSC. They have met with the community on many occasions formally and informally, by invite or otherwise. In the last five years relationships have developed between the catchment committee and some of these representatives.

During the development of the LSC WMP a number of research projects were initiated to assist in answering the many questions that were raised by the consultative group. Word of some of the research being undertaken travelled far and other researchers from other places became interested in working in the catchment. Projects were initiated and commenced in the catchment with little or no consultation with existing community groups such as the LSCMPIC.

More people started driving around the catchment and down driveways to front doors, sometimes asking for access through private property to the river. The purpose and implications of this research was not communicated clearly, or in some instances not at all, to those who lived and worked in the catchment, and not to the LSCMPIC. Increasingly some members of the community began to feel research fatigued. Given the sensitivities of the water management planning process, on occasion, this resulted in frustration and anger. At one point threats of violence were made which resulted in all research being undertaken by DPIWE staff being temporarily halted.

The full extent of research undertaken in the catchment is not known by the LSCMPIC. Much effort has been made over the last few years by the CEO, the council NRM officers and the CTC team to liaise with researchers and to create opportunities for communication between researchers, government officers, the catchment committee and

the broader community. For example the LSCMPIC was only informed about the LWA/FRDC research project after it had been developed and submitted to the funding body. The socio-economic component of the research by design, required community engagement and in hindsight, much input by the CEO and the committee. The committee made it very clear that they should be informed about projects and research proposals for the catchment in the development phase and not once they were *au fait accompli* (LSCMPIC, 2008, p.25). This communication was especially important if the committee was expected to participate, and if the outcomes of the work had implications for the catchment community, as the LWA/FRDC research project intended to have for future water management planning.

There is a need to develop protocols for undertaking NRM activities and research in any place where there is a representative community group such as a catchment committee or NRM committee. Protocols are especially important in situations where there is a community elected representative committee and / or a management plan which had significant community input, with identified and prioritised issues and gaps in knowledge. Not to recognise the work and commitment of the community to NRM not only risks missing an opportunity to add value to work already underway or proposed, but also risks putting the community off side, potentially jeopardising the success of the research.

Regional NRM bodies have an important role to play by recognising existing sub regional organisations, such as the LSCMPIC. They can work with sub-regional bodies to develop protocols to ensure that the local organisations are consulted about any projects or research that may impact upon them in the planning stage. This consideration needs to be mutual, with sub-regional groups, such as local ICM, NRM, development or farmer groups, also needing to recognise the legitimate interest in local NRM issues by a broad range of stakeholders outside of their membership, including those located external to the particular area.

It is important that key research organisations, such as universities, also consider the social implications of work undertaken in rural communities (Strang, 2007), particularly during stressful times such as drought. Where subregional organisations exist it is important that they are consulted about proposed research that has implications for the work they are involved in. This communication is particularly important when field work requires access through private land, and also when the outcomes of the work may have implications for land managers.

Ideally, proposed research should also assist in achieving the objectives of sub regional organisations. Discussing proposed research may highlight gaps not previously identified. The support of a sub-regional organisation may increase the likelihood of success; by facilitating access to sites through local networks, or by gaining insight into the local history and knowledge of the landscape, and of the issues that may be of relevance to the research. Most importantly if the purpose of the research is to increase the understanding of the landscape and contribute to sustainable future management then this is more likely to be successful if both the process and the proposed outcomes are known, understood and respected by those who do actually manage the landscape.

Developing and abiding by protocols creates an opportunity for all parties to develop mutual respect for different objectives, experiences and ways of knowing. They can also provide a framework for more realistic expectations of what each party can contribute and the limitations or parameters of the contribution. Although the development of relationships and protocols between subregional organisations and other stakeholders such as regional NRM bodies and research institution takes time and requires negotiation and patience, the investment needs to be considered in light of the alternative. Without due consideration and communication with local groups where they exist, it is possible that research and NRM projects, including any major infrastructure projects such as water development, will cause considerable anxiety and frustration for all involved. The research may ultimately result in more reports and papers but little change in the sustainable management of the landscape. It may also result in landholders becoming less receptive to NRM initiatives in the future or indeed become

the cause of conflict. Whelen et al. (2005) suggest, however, that conflict is a natural and healthy element of partnership based organisations and is a potential source of creativity.

Managing conflict according to partnership principles can enable participants to develop mutual and constructive relationships. The experience in the LSC reflects this observation. A combination of actions, such as developing protocols and formal frameworks for participation, as well as adequately resourcing and implementing communication activities, can assist in reducing conflict or at least create a culture where problems can be constructively resolved.

In the LSC, resolving conflict was made much smoother and less traumatic with the assistance of a professional facilitator. When deeply entrenched philosophical differences exist between individuals it can at times be very difficult to make any progress. This difficulty can be exacerbated when there is limited time and opportunity to resolve issues and make decisions. Being able to access a neutral facilitator with skills in negotiation and conflict resolution to attend meetings as required enabled the LSCMPIC to make progress during difficult discussions (LSCMPIC, 2008, p.28, 29).

There are many processes and theories on conflict resolution and it is beyond the scope of this research to consider these. Recognition that facilitators of ICM and NRM, such as catchment coordinators and extension officers, require skills in negotiation and conflict resolution requires opportunities to undertake training that builds upon these skills. A broader network of professionals is also necessary to provide support for those at the coal face of NRM.

Acknowledging that proficiency in conflict resolution are elementary attributes of NRM professionals is further confirmation that the knowledge and skills of social scientists are critical to achieving successful ICM and NRM. Strang (2007, p.4) remains concerned that:

despite the rhetoric about 'integrated catchment management' and 'triple bottom lines', people's efforts to manage and conserve resources, and the research activities that attended these endeavours remained largely dominated by the natural or environmental sciences.

NRM programs need to clearly recognise that, particularly in the planning stages, equal time and resources need to be allocated to the socio-cultural elements of NRM as to the practical ecological elements. To recognise this need is to recognise also that a different combination of skill sets is necessary, and that to find suitable people with this combination may be difficult. This reinforces the need to provide opportunities for ongoing training and also the need to utilise other professionals, such as facilitators and mediators when necessary. It is not yet fully appreciated that people with the combination of skills and experience necessary do this work are of great value, and the current working conditions and remuneration, particularly in rural areas in Tasmania currently, does not reflect the calibre of professionals required. This lack of recognition contributes to difficulties in recruiting and retaining staff which can greatly impact on the success of NRM and ICM programs.

5.3 Ensuring success

Initiating an ICM or NRM program can be difficult. Achieving success once you have people sitting around the table, and work happening on the ground, continues to be difficult. The importance of making certain that a participatory program is informed, at a number of levels, is reinforced by the research of the Coastal CRC (2007) which demonstrates that effective democracy means involvement by informed citizens.

Improved integration of scientific and socio-economic research into regional planning and investment review should assist in making investments better calibrated towards delivering strategic outcomes, and in providing better measurements of these outcomes. How do we improve this integration at catchment, local or even property scales? Regional NRM organisations are in the best position to build the necessary partnerships and networks between the organisations and individuals who are involved in this

research, and sub regional groups (and the communities they represent) such as the LSCMPIC and the GSB NRMC. Without the intermediary role of the regional organisations, as the experience of the LSCMPIC attests, to develop these relationships can be very time and resource consuming. Creating connections with researchers is even more difficult when group members live in a rural area, notwithstanding the legitimacy that first needs to be demonstrated before some agency staff will even consider liaising. That such relationships develop at all is usually due to the commitment of individuals within these organisations whom are willing to take on the professional and personal uncertainty that goes with stepping outside the safety of the office and the company of likeminded people, to face the music with the diversity out there in the 'community'. Although there is an expectation that research is made accessible to key stakeholders, in fact communicating the outcomes of research is often a requirement of receiving funding, the experience in the LSC demonstrates that this does not always happen.

Strang (2007, p.15) highlights the concern that the political demands for '*public accountability*' and '*accessibility'* may not '*engender good research practice and high quality outcomes*'. I would argue, however, that undertaking research activities in other people's 'backyards' without any attempts to communicate the intent and outcomes has ethical implications. The researcher can walk away and leave behind a distrustful and frustrated community. The long term implications of this for transfer of knowledge and achieving the behavioural change necessary for sustainability cannot be underestimated.

It is recognised that there can be power imbalances in the level of influence of certain 'stakeholders' on research (Onyx et al. 2007). The experience in LSC highlights that generally people are more likely to support research activities if they are fully informed and can see the benefits for meeting their own objectives. Many members of the LSCMPIC and the GSB NRMC have been involved in NRM initiatives for many years and are also very capable of identifying issues that require data and new research. If it is the people who live in the catchment who manage the landscape then it is in everyone's best interest that they are given every opportunity to be involved in identifying research

that may answer the very questions they are asking about how best to manage their properties for whatever outcome. To go the next step and build formal relationships between community based NRM groups, government departments, regional NRM organisations and research institutions, could enable a collaborative and systematic approach to identifying gaps in knowledge and research needs. Taking a collaborative approach is also an important step in ensuring research outcomes are considered in local decision making.

One of the projects funded under the NRM South Program Area Water Resources was to undertake validation of the '*Conservation of Freshwater Ecosystems (CFEV)*' model[33] which was developed as a component of the CFEV project by the Department Of Primary Industries Water and Environment. Validation data were required to further assist in the refinement of the CFEV database which is an important tool available to assist planning and development decisions in Tasmania. Subsequently researchers from a variety of institutions were engaged to obtain the data sets and to ground truth existing data. This project required access to rivers, wetlands, saltmarshes and estuaries across the state, much of which are either on or accessed via private land. The project had a tight time frame and in some instances required the researchers to lean on existing networks and contacts to gain permission to access private property.

In the GSB Municipality a number of important locations would not have been accessed without the support and contacts of the local NRM Officer and in the case of the LSC, without the ongoing support of the CEO. The short time frame and the absence of background information available to inform people about the project made this a difficult and awkward task. After the researchers had completed their field work no feedback or information was provided regarding the outcomes of the research. The

[33] 'The Conservation of Freshwater Ecosystem Values (CFEV) (pronounced "see-fev") Project was an initiative of the Department of Primary Industries, Parks, Water and Environment (DPIPWE). Its aim was to ensure that priority freshwater values are appropriately considered in the development, management and conservation of the State's water resources.
The outputs from this project provide an assessment of the conservation management priorities, and the associated conservation values of all freshwater ecosystems throughout the state. They are housed in the CFEV database, which is administered by the CFEV program.' Source http://www.dpiw.tas.gov.au/inter.nsf/WebPages/CGRM-7JH83F?open accessed 3rd December 2010.

landholders were requesting feedback having just allowed someone onto their property. This lack of feedback created a difficult and uncomfortable situation for those who negotiated the access. When the researchers were contacted asking for some feedback, they responded that it was not their responsibility to communicate the outcomes as it was not in the contract to do so. Particularly in the LSC, this situation further exacerbated an already distrustful rural community, some of whom were concerned that the information obtained from this research could be used against them at a later stage. The CFEV database is used in the decision making process for dam approvals amongst other purposes. It also yields valuable information that enables landholders to make informed decisions about future activities on their properties. How such information is used will depend on what, when and how it is presented, and to whom. In this instance despite requests no feedback on the outcomes of the field visits was received.

This situation could have been very different if, in the first instance, an offer was made by the regional NRM body, in partnership with DPIW, to undertake a presentation on the CFEV database to the LSCMPIC and to the GSB NRMC. The need to validate the model would have been highlighted and then an informed decision could have been made by these representative groups to assist future researchers in undertaking this task. A clearly articulated communication requirement on behalf of the project manager informing landholders, and the relevant groups of the context and outcomes of the research (subject to privacy) could also be negotiated. Again communication enables landholders to make informed decisions and increases the likelihood of them respecting, understanding and considering the outcomes of the research in their current and future decision making.

There have been other instances in the LSC when research activities have not been well received by rural landholders. Achieving a different outcome may be quite simple. It requires greater communication efforts in the early stages of planning research, and a culture of respect for the interest and concerns of the local community to be fostered.

Often paid NRM professionals, researchers and bureaucrats have little appreciation of the limitations of volunteers. In the early days of the LSCMPIC it became apparent that there was a misunderstanding of its limited capacity in terms of resources and support. A lack of clarity about the role and the capacity of the catchment committee led to unrealistic expectations. Systematically working towards improving and formalising relationships, particularly with local and state government, will contribute to mutual recognition of the roles, responsibilities and limitations of voluntary organisations. It also provides an opportunity to recognise that community volunteers are often very committed and it is imperative to respect this commitment, whilst not taking it for granted or exploiting it.

Conversely it is essential to recognise and respect the commitment and capacity of paid staff, whether they are working for local or state government, the regional body, a consultancy or a research institution. There are always limitations to any position, and myriad of complexities that restrict what can be done. Although it can be frustrating to an individual or community group why what appears to be a simple task cannot or does not happen by an agency and their staff, it is important to consider the broader considerations and parameters that any particular individual must operate within. Although it can be difficult, it is always important to try not to make things personal. Many people in paid NRM jobs are very passionate about what they do. They also often work within difficult landscapes, with limited resources, and with far too many things to do. Recognising the complexity of the NRM profession is a start to appreciating the importance of an adaptive management approach to ICM and NRM.

Much has been written about adaptive management, particularly in context of NRM (Allison and Hobbs, 2006; Coastal CRC, 2007; Mitchell and Hollick, 1993; McLain and Lee, 1996). Shaw et al. (Coastal CRC, 2007) provide a succinct introduction to adaptive management which was used as the guiding process for the activities of the Coastal Cooperative Research Centre[34] over seven years of operation. An adaptive management

[34] The Coastal Cooperative Research Centre

approach was considered the only suitable process to deal with complex ecosystems relationships where multiple objectives are sought by multiple stakeholders.

Adaptive management can be defined as a *systematic process for continually improving management policies and practices by learning from the outcomes of operational programs* (Coastal CRC, 2007, p.117). It can be further summarised as:

> *the mode of operation in which an intervention (action) is followed by monitoring (learning), with the information then being used in designing and implementing the next intervention (acting again) to steer the system toward a given objective or to modify the objective itself'* (Alcoam et al., 2003, in Coastal CRC, 2007, p.117).

The process of reviewing ten years of ICM in the LSC fits within the monitoring (learning) part of this cycle. The review of the catchment plan and the community consultation completed in 2010 reflects the designing and implementing the next stage of intervention (acting again) part of the cycle. The lessons learnt will enable the process to be steered towards modified objectives, which reflect some of the wisdom gained.

In light of this wisdom when consciously taking an adaptive management approach, essentially the *'plan – do – check – review'* concept common to environmental management systems, it is valuable to reflect on the adage that there are no perfect solutions. An adaptive management approach is used as a formal process for management experimentation for complex, adaptive and uncertain issues requiring collaborative effort (Coastal CRC, 2007). It is an approach to use when there is uncertainty and unknown responses to decision and management actions.

Given that ICM and NRM is influenced by such a broad range of social, economic and political factors, with often unknown implications for the natural resources on which we all depend, there is clearly not going to be any perfect solutions. Applying a systems approach that develops a structured basis for collaborative efforts by different

stakeholders is a means to enabling people to work together to progress some agreed too objectives. An ICM approach is about establishing a learning by doing framework. The more informed and involved participants become the more they appreciate the complexity of NRM and the more they realise that there are no simple solutions.

ICM does however require people with dedication, good will and mutual trust. Mitchell and Hollick (1993, p.735) get to the essence of ICM with the very direct statement that *ultimately, people have to make ICM function, and therefore it is essential that priority be given to cultivating the good will and trust necessary for ICM to work well*. By people they do not just mean the 'community'. They specifically refer to the many people working in agencies involved in NRM, particularly local and state government. A philosophy of respect can go a long way towards cultivating good will and trust. Respect for people's dedication and the general intention of good will that most people intuitively have, yet understanding that ICM and NRM are threatening concepts often confronting traditional roles and areas of responsibility. Threatening particularly because they imply a sharing of the decision making which can be a difficult shift for those working within traditional 'top-down' institutions, or within paradigms that do not recognise the legitimacy of some stakeholders to participate in decision making around how certain resources are to be managed.

The experience of the LSCMPIC has demonstrated over time the dedication and good will towards the ICM process by many in the local community as well as many people working for a variety of organisations and institutions. Many others outside of the catchment have developed and strengthened connections and relationships with committee members over time. Tenuous friendships and different levels of trust have developed between committee members, individuals in the catchment community and others from outside depending upon circumstances and activities. The social elements of ICM have facilitated goodwill and go a long way towards improving trust. This goodwill will also help in surviving the turbulent and difficult times when they occur, and they will occur.

Appreciation of the need for strengthened relationships requires recognition that people and processes need adequate investment (Coastal CRC, 2007). Both time and resources are necessary to assist stakeholders in working together to ride the waves ahead. Although it was never anticipated that the process of implementing the LSC catchment plan would be an easy task, it was with enthusiasm and a cooperative approach that most came to the table. But the compounding effect of external expectations and the lack of support from key stakeholders put undue pressure on the capacity of the volunteers and the minimal staff involved. It is by recognising and addressing the people and process elements of collaborative NRM by facilitating network-building, learning, negotiation and process management that the inevitable storms can be weathered (Coastal CRC, 2007). Inevitable because of change; it always needs to be anticipated and can be seen as an opportunity.

The last ten years have seen significant changes in the political climate and consequently an evolving structure for NRM delivery in Australia, from the overarching federal approach right down to the local government and community level. The funding arrangements will continue to change, that is a certainty. The delivery mechanisms will also probably continue to change, which will create opportunity as well as adversity. The likelihood of successfully obtaining funding will be linked to a demonstrated integrated approach to program delivery through creative partnerships with a variety of stakeholders, some of whom may not have been involved in the evolving NRM governance process.

The knowledge and information base is always changing – for everyone. Providing opportunities to participate and share in knowledge gathering, through research techniques such as participatory action research, creates further opportunities for partnerships which may continue beyond discrete projects. It is possible to influence change in attitude and consequently behaviour simply by enabling access to new information, delivered in an appropriate way for a particular audience. The SGSL trial is testament to this.

Finally, there has been a significant shift in the momentum and acceptance of NRM initiatives over the last three to four years, particularly in local government. This shift is a direct response to the groundswell of action around the looming implications of climate change. The recognition by the federal government of the imperative to act is creating ripples at every level throughout the country. As sustainable NRM is at the heart of the climate change agenda there will be endless opportunities to benefit from not only major policy shifts that are occurring at every level but also from the major shift in popular culture. It is gradually becoming socially unacceptable not to be active in 'reducing your carbon footprint', whilst 'landcare' and NRM are now much more mainstream than on the fringe.

An adaptive management approach to NRM and ICM requires that learning, experience and new knowledge gained from participation feeds into monitoring and review; in turn this may require changes both to long term goals and short term action objectives. The *'three legged stool'* of sustainability - the social, environmental and economic- necessitates consideration of many temporal scenarios.

The implications of land management activities today may not become evident in the landscape until years or decades down the track. Scientific monitoring is necessary yet is rarely an ongoing event, although increasingly with improved technology it is possible to obtain quality continuous 'real' time data, it is the political, social and cultural dimensions of NRM that will enable this essential monitoring information to be collected. The many active and aware community members in the LSC have indicated a willingness to support and participate in activities that assist in obtaining this essential data.

Participation in the ICM process over a number of years demonstrates that many in the community are well aware that they are participating in a long journey that is becoming an integral component of living in the LSC. The current research has aimed to encapsulate some of the key lessons learnt from the experiences of the LSCMPIC and integrate them into the evolving CTC program. It is however only by continuing to

communicate these lessons to key decision makers that the collaborative process of ICM and NRM can continue.

Chapter 6 Conclusion

Getting started

Although any individual, group or organisation can initiate an ICM or NRM process it is necessary to have the commitment of government agencies (local and state) and the NRM Region, especially in the early stages. For any ICM or NRM process to be successful it must be adequately resourced for a determined length of time. The initial objectives and length of time should not be too ambitious and cautiously consider the context of the budgetary and funding cycles of key stakeholders. This necessitates a review period to be determined to enable the next stage and level of commitment and resources to be determined.

There must be a clearly articulated purpose which is agreed to by key stakeholders, for bringing people together to progress ICM or NRM. At the early stages and beyond it must be very clear what the ICM or NRM process is and what it isn't. In must also be recognised that the purpose may change over time. The geographical boundaries of an area must be clearly defined in the beginning and a commitment to a triple bottom line approach (environmental, economic and social), at least conceptually, must be made by all stakeholders.

Resources are required to enable the recruitment and support of an extension officer / project coordinator, with adequate administrative backing. A coordinator with administrative support is essential to work with stakeholders, particular land managers and volunteer participants, in developing, implementing and communicating activities. An independent facilitator and a smaller steering group will assist in running activities and events as well as being a sounding board for volunteers and paid staff. Short term activities with clear achievable outcomes will build confidence and momentum.

A stakeholder group is necessary to oversee the development and implementation of an ICM or NRM processes. Even when initiated by an informal 'steering committee' it is necessary to develop formalised procedures and protocols for a representative committee

to manage the process over the longer term. The process must be accountable, transparent and documented. When a committee represents key stakeholders it is important to consider how the members communicate processes and outcomes back to their stakeholder groups. A committee also needs to enable the views of other groups and individuals to be considered in decision making.

Now the ball is rolling

As articulated by Bristlow and Stubbs (2010, p.138) '*building trust and relationships seems the least relevant thing to solving natural resource problems yet it is the most relevant thing, and it takes time'*. There are numerous different ways to create a framework and culture that facilitates trust and cooperation. There is no right or wrong way to go about it and for every group it is likely to evolve with time. The creation of formalised procedures and protocols at the planning and coordination level enables the accountability, transparency and legitimacy important for trust to develop, as does formalising partnerships and developing communication protocols. The NRM regions can play a brokering role between the different levels of government and the community, although the role of the regional body must be clearly defined. Creating social opportunities that celebrate the work, the landscape and the community that live and work there is also important in developing trust.

A communication strategy must be developed in the early stages that include: clear and consistent processes for reporting; identifying different groups and networks and the best means to engage them; providing regular information to the general community; developing relationships with research organisations and developing protocols on research that recognises the interests and sensitivities of the local community. It must be recognised that conflict resolution will be necessary and provide appropriate mechanisms to address issues as they arise.

Ensuring success

Successful ICM is informed by research efforts that coincide with planning and management (Margeram, 1999). This requires sub regional groups, such as catchment committees, to develop relationships (and protocols) with organisations involved in research and planning for environmental, social and economic sustainability. Too much research is undertaken that just ends up on the shelf of government and university departments. Local stakeholders can identify issues that require data and new research to be undertaken. Involving or informing the local stakeholders is a step towards ensuring that research outcomes will be considered in local decision making.

Identifying clear actions that are achievable within given time and resource constraints is a means of retaining participation of key stakeholders, as is recognising and respecting both the commitment and capacity of volunteers and paid staff from whichever organisation or stakeholder group they represent.

An 'adaptive management' approach requires recognition that: there are no perfect solutions to the complex questions, and legitimate but often different values and interests of people involved and that; successful ICM and NRM requires people with dedication, good will and mutual trust, which requires hard work to achieve and maintain. With an integrated approach involving a diversity of stakeholders, people and agencies need to move out of their comfort zones, which may result in turbulent and difficult times. With external forces always influencing the behaviour and capacity of all stakeholders nothing will stay the same and therefore change must always be anticipated and be seen as an opportunity. Finally, the process of ICM and NRM must be understood to be a long journey that by necessity involves many. It is the sum of the parts that becomes greater than the whole and must be considered from a long-term perspective.

Some of the lessons from this research are not new as the literature demonstrates. It is the conscious application of these lessons in the LSC, the GSB municipality and southern Tasmania that is new. The transition from a control and command approach to NRM, to that of a nested, collaborative approach reflects the neo liberal ideology of the

current political climate. Clearer insights into the philosophical, theoretical and policy context of NRM, and a commitment to doing the *'hard stuff'* (Bristlow and Stubbs 2010, p.139), that is the people stuff, will enable the (not so) new NRM governance frameworks in Australia to be successful. These insights need to be consciously and strategically utilised with both successes or otherwise communicated at every opportunity. This research and the ongoing implementation of the CTC program in GSB is only one of many efforts to do so.

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