

# Planning for the future of the New South Wales coast: history and science in the quest for certainty

Paul Adam

School of Biological Earth and Environmental Sciences  
University of NSW, NSW 2052

## ABSTRACT

The framework for coastal planning in New South Wales was established before there was detailed understanding of the environmental values of coastal habitats. Measures to give greater consideration to environmental values have to be applied within a system which gives high weight to western property rights. Inadequate knowledge and changing environments mean that absolute certainty is impossible and that the merits of particular developments will continue to be contested. The proposed comprehensive coastal assessment should improve the decision making process but will not, of itself, be the panacea to solve all problems.

**Key words:** planning, environmental legislation, historical legacies, coastal assessment.

## Introduction

Coastal development in New South Wales and elsewhere in Australia arouses great passions. A week before this conference the historic victory by the Greens in the Cunningham by-election reflected, in part, concern over development at Sandon Point, in the northern Illawarra. Two days after the conference the NSW State Government introduced State Environmental Planning Policy 71 – Coastal Protection, a comprehensive package of measures which sets overall objectives for coastal management and gives greater power to the Government to control coastal development. This account is focused on the New South Wales – but similar issues arise elsewhere.

The pressures on the coast arise from continuing urban and recreational development. Unfortunately the very attributes of the coast which drive the demand for development are those which are at most risk from development. Over the last few decades concern about the consequences of coastal development has been continuously high on the public's environmental agenda. In response there has been a series of government initiatives, some of which have set new international standards for coastal protection. One major advance has been the dramatic increase in the proportion of the coast included in National Parks. The expansion of the conservation reserve network started following public outcry over mineral sand mining on the north coast. (Opposition to sand mining was not restricted to NSW as one of the first Commonwealth environmental initiatives was the stopping of sand mining on Fraser Island.) The reserve system has continued to grow, although opportunities for establishing large terrestrial national parks are now virtually exhausted; future expansion is likely to take the form of nature reserves and marine parks.

Declaration of conservation reserves gives absolute safeguards against future development, but managing conflicts between recreational use and conservation is still likely to generate ongoing controversy. For example conflict between conservationists and proponents of 4-WD access to beaches persists in many National Parks.

Local government throughout the state has had a range of extra environmental assessment responsibilities placed upon it as the state government has amended environmental and planning legislation to reflect public concerns. Arising from these changes a particular issue of relevance to many coastal councils is management of development on sites with potential acid sulfate soils.

In 1997 the State Government articulated a grand vision for the coast when it introduced the *NSW Coastal Policy*. It is this policy that has now been reinforced by SEPP71 - "Government found it necessary to create SEPP71 because the NSW Coastal Policy 1997 was not being sufficiently embraced and implemented" (Coastal Council of NSW 2003).

Paradoxically, the development of measures to protect the coast has exacerbated the pressures. The coast is an even more attractive option for affluent retirees and life style changers, but less and less land is available for development. Most of the land transferred to the conservation estate was previously public land under the control of other agencies. Freehold coastal land is too expensive for much to be purchased for conservation. The Coastal Lands Protection Scheme has permitted purchase of some strategic sites but holders of prime development land are unlikely to readily surrender it. Many of the sites which were controversial when Piper (1980) made her plea for coastal environmental protection are still causes of concern. Coastal environmental protection

has undoubtedly advanced beyond what might have been thought realistically possible twenty years ago but sites of high conservation scenic, heritage and cultural value are still under threat. The fact that many of the proposed developments of twenty years ago have not yet eventuated is due more to fluctuations in the economy and the fate of individual entrepreneurs than it is to the introduction of sound environmental planning. From the perspective of those opposed to particular developments there is an asymmetry in the planning and assessment process – a developer only has to win once, the opposition must win every time.

Decisions about coastal development reflect social, political, economic and environmental concerns. As members of society, scientists may well have strong views about particular developments. As scientists, our task is to assemble and interpret data, to address questions posed as part of the environmental planning process and to the extent that is possible to make predictions about the future. Even outside the Land and Environment Court, the Court's Expert Witness Practice Direction (2002) provides appropriate guidance for the behaviour of scientists involved in coastal development issues – in particular the need to act impartially and to specify assumptions relied on in deriving opinions.

While it is important that those engaging scientists to act as experts in development issues do not have unrealistic expectations of what science can deliver, it is equally important that scientists engaging in such exercises be aware of the diversity of other issues which will influence decision making.

### ***The dead hand of the past***

The planning and common law heritage which has guided the development of environmental law in NSW places considerable weight on the "rights" accruing from land ownership (Bates 2002). A consequence of this is that historic decisions which confer benefits on private landholders are very difficult, if not impossible, to reverse. Decisions of this nature are a concern in relation to management of the coastal zone.

### **Premature (paper) subdivisions**

If maps of the NSW coast are examined, patterns of urban subdivision and proposed roads can be seen at a number of localities, although no settlement has occurred. Particularly striking examples occur at North Arm Cove (on the northern side of Port Stephens (CMA 1976) and around Jarvis Bay (CMA 1988, 1998).

These examples show the trademark circular street plans of Walter Burley Griffin realized in country towns such as Griffith, Leeton and Canberra. Burley Griffin is an iconic figure in Australian town planning, revered as a pioneer of environmental awareness. His coastal subdivisions were planned over eighty years ago, but even by the standards of those days included extensive areas of environmentally sensitive land, including wetlands, which would have been unlikely to be developed. Current zonings preclude development, and for as long as

the estates remain in single ownership are not an active concern. However, as part of valid subdivisions each individual plot can legitimately be sold. Any advertising must identify current constraints to development, but nevertheless can hint that this is a chance to buy land cheaply in anticipation of changes to planning rules. Sale of such land thus creates a frustrated constituency of landholders who will lobby local and state government for changes to zonings, and who may be tempted into illegal clearing and development. The problems for local government created by these historic subdivisions have been drawn to the attention of successive state governments, with the suggestion that where zoning and other constraints precluded the possibility of development, Councils should be given the power to cancel subdivisions. However, to date no government has accepted the challenge of creating a precedent. These subdivisions thus remain as potential traps for the gullible or incurably optimistic, and constraints to rational planning of the coastal zone. (A discussion of one particular case is provided by Cleland 1999).

### **Inappropriate zoning**

The basis of planning by local government is zoning. The area covered by a plan is divided into various zones, which define the range of developments and uses permissible.

Many zonings were established long before there was any understanding of the environmental values and sensitivity of many coastal standards. While zoning does not create a right to develop it does create an expectation. If a certain category of development is permitted with approval in a zone, a particular application for a development in that category may be rejected on a variety of grounds, but such a refusal would not preclude further applications for a modified proposal. While rezoning is possible, in general this is in the direction of increasing opportunities for development. Rezoning in favour of increased environmental protection is also possible, but is rare and may generate claims for compensation for opportunities foregone. As an example, attempts by Randwick City Council to rezone the western portion of Malabar Headland from residential to proposed National Park have been consistently rejected by the landholder, the Commonwealth government.

Although rezoning for environmental protection is unlikely, but not completely impossible, additional assessment requirements can be superimposed over the zoning scheme, which while not precluding development are aimed at ensuring that environmental issues are properly taken into account by decision making authorities.

In New South Wales the last two decades have seen increasing use of measures superimposed over zonings. A series of State Environmental Planning Policies (SEPPs) have sought to require proponents of development to undertake more extensive assessment (and to make this publicly available), and to involve state government agencies as consent or concurrence authorities in partnership with local government. The intent of involving state government in what had previously been the sole province of local government is to secure consistent application of government policy throughout the state.

This aim has been realised in SEPPs, those particularly relevant to coastal development include SEPP14 (Coastal Wetlands), SEPP26 (Littoral Rainforest) SEPP44 (Koala Habitat) and the new SEPP71. Listing of threatened species, populations and ecological communities, under both the *Threatened Species Conservation Act 1995* and the *Fisheries Management Act 1994* also affects consideration of development proposals, and may require that Species Impact Statements be produced even if the development concerned is not designated, and hence does not involve production of an Environmental Impact Statement. It is important to recognize, however, that new listings cannot disturb existing valid development approvals. Thus the listing of the Hurstville and Kogarah population of *Acacia prominens* as an endangered population did not cause a prior approval to be overturned even though the development concerned was immediately adjacent to the Head Office of the National Parks and Wildlife Service.

Historically, zoning has not been applied to the sea or sea bed. Marine reserves, of various types, have been established, and permission given for activities such as waste disposal and dredging but decision making has been ad hoc on a case by case basis. The States have jurisdiction only in waters immediately adjacent to the coast (to 3 nautical miles), so that rational planning would require co-operation between States and the Commonwealth. Whether the traditional terrestrial zoning plan provides the appropriate model for planning for management and use of marine resources remains to be determined, although the management plans from the Great Barrier Reef Marine Park and other marine reserves are based on zoning – but for a restricted range of uses.

### Significant commencement

A development approval will lapse if it is not acted upon. However, if a significant commencement of the works proposed is made then the approval remains alive, essentially in perpetuity. Precedent would suggest that what constitutes significant commencement may be relatively minor works. This means that work on a site may be suspended for long periods (perhaps years) and then suddenly recommence without need for additional notification or assessment. There may be a number of quiescent developments along the NSW coast which could suddenly be re-activated.

### Planning mechanisms

The planning system in New South Wales (and elsewhere) has developed over time, but has failed to accommodate changes in understanding and appreciation of environmental issues. The spatial framework within which planning occurs is defined by boundaries which are, for the most part, arbitrary constructs which do not reflect biogeographical or biophysical realities (Tsamenyi *et al.* 2003). While there is increasing recognition of the importance of landscape and catchment approaches to land management, development approval is still the responsibility of local government, and the boundaries of local government areas may cut across catchment or other natural boundaries. Developments are normally considered

in isolation, and although authorities are enjoined to consider cumulative impacts, in practice this is rarely done and in many cases is not possible. An individual developer cannot be expected to know what other landholders may propose. Even where the likelihood of other major developments is high it is not factored into assessment. For example the evaluation of the Third Runway at Sydney Airport did not take into account the future expansion of Port Botany (Adam 1993). The ‘artificial’ boundaries of local government areas further exacerbate the difficulties of assessing cumulative impacts.

Increasing responsibility for at least initial assessment of environmental impacts has been devolved to local government. The extra workload has not been accompanied by additional resources, and not all councils possess the necessary professional expertise to provide adequate assessment. Public expectations of what the planning system can and should deliver are therefore frequently disappointed. The additional responsibilities imposed on councils by threatened species legislation (*Threatened Species Conservation Act* and *Fisheries Management Act*) cause particular difficulties, as they presuppose access to appropriate data – but in many cases current data are inadequate even if the problems of accessibility are overcome.

The nature and language of the tests applied during evaluation of development applications are sources of discomfort to scientists. Planners are required to assess the likelihood and significance of possible environmental impacts, and then balance these against economic and social consequences. These assessments are often made on the basis of little or no data and with, at best, sketchy understanding of the functioning of the ecosystems likely to be affected. Terms like ‘significant’ acquire a vague generality, at odds with the precise use of the term in statistics. Ecologists are able, with appropriately rigorous experimental design, to determine whether particular activities have had an effect, but by the time the effect is identified the damage has been done. Prediction of impacts requires modelling which will need to be based on understanding of processes and their variability as well as the analysis of past events. While there is a long history of applying mathematical modelling to prediction of impacts on the physical environment, it is only infrequently that biological/ecological impacts are modelled in anything other than the most general terms.

### The quest for certainty

The planning system is designed to give certainty – landholders should know what may be permitted on their land, the broader public should know where development will occur. The “need for certainty” is one of the current political mantras, but is it a realistic expectation?

While it is understandable that certainty is desirable from both the perspective of landholders and the broader society, change must be possible if the objectives for coastal zone management are to evolve, so that certainty will never be absolute.

There are a number of reasons why evolution of coastal management systems will occur including:

## Changes to societal expectations

Concern for the environment has developed over time. Developments which were acceptable, and even encouraged, fifty years ago may not be so today.

For example, historically wetlands have been regarded in western society as unhealthy, dangerous places and their destruction was a public good (Adam 2001, Giblett 1996). Reflecting such views, little attention was given to wetland protection when the zoning schemes in most local government areas were first prepared. Most coastal wetlands were therefore included in zonings which would have permitted a range of actions inimical to wetland conservation. As knowledge about the role of wetlands as ecosystems improved (Adam 1985), the inappropriateness of the zonings became increasingly apparent. However, rezoning would have been a major task for local government, given the expectations of at least some landholders (particularly those like 'Sea Change's Bob Jelly who saw wetlands merely as the sites for future shopping malls). In December 1985 the then State Government addressed the situation by introducing SEPP14 – Coastal Wetlands, which regardless of then current zoning required additional assessment and consent procedures for any development affecting more than 1300 mapped coastal wetlands. The new SEPP71, while not altering SEPP14, adds further protection by invoking an effective buffer zone of 100 m around SEPP14 wetlands. While applying a uniform buffer width around all wetlands is arbitrary, it does confer additional protection and accommodates changes in the position of wetland boundaries as a result of changes in hydrology or climatic fluctuations.

## Changes to technology

Some developments may have been prohibited in the past because with then available technology they were not feasible.

For example, development might have been prohibited because of lack of provision of a sewage system. Availability of various non-mains sewage technologies (composting toilets, grey water treatment wetlands etc) might mean that such prohibitions could be reconsidered.

## Changed understanding of the environment and biota

Many zonings were put in place before detailed studies had been made of ecosystems or biota. Even today we are largely ignorant of the nature and distribution of many components of the biota. As knowledge increases it is likely that stronger cases will be able to be mounted as to why development of certain sites would be undesirable.

## The environment changes

We are increasingly aware of environmental variation and also of the probability that in addition to fluctuations there may also be underlying trends in environmental change.

Planning needs to be receptive to the range of conditions likely to be experienced during the life of developments (so that we may need to design for higher widespread or more frequent floods than would have been the case in the past. We also need to consider whether it is prudent to plan for the longer term. In northern Europe "planned retreat" of coastlines in the face of rising sea level is occurring in several countries (Adam 2002); should we be preserving the hinterland contiguous with coastal wetlands so that opportunities for landward movement of saltmarshes and mangroves remains possible? Unfortunately, for much of the coast this opportunity has already been lost.

The distribution of organisms will change in response to environmental change. Just because a species is found at a particular location now does not mean that it will still be at the same location fifty or a hundred years hence. If rare species in particular are to survive we need to ensure that appropriate habitats are available in the future.

## Changes to schedules of threatened species

The advent of threatened species legislation (*Threatened Species Conservation Act*, *Fisheries Management Act*, and at the Commonwealth level, *Environmental Protection and Biodiversity Conservation Act* 1999) has introduced considerable uncertainty into the planning process. The schedules of the acts change frequently (in the case of the *Threatened Species Conservation Act*, weekly), and in the foreseeable future there is unlikely to be a slackening of the rate of change. Many species of invertebrates and cryptogams, which would satisfy the criteria for listing if data were available, will never be listed, but the schedules do provide important tools to be used in planning. Listing of communities will allow for measures to conserve all components of ecological communities, even if definition is only by reference to a few species.

Changes to the schedules do not impact on existing approvals. Landholders would undoubtedly support this, but does it assist achieving the overall objectives of threatened species legislation? To take an extreme hypothetical example – if Wollemi Pine had been discovered, not in a National Park, but on private land over which there was a valid development approval, I suspect that public opinion would have prevailed to prevent destruction of the species and its habitat. However, a newly discovered invertebrate – biogeographically and phylogenetically every bit as remarkable as *Wollemia* – would be unlikely to prevent an approved development occurring. New listings do have to be considered, regardless of zoning, up to the time approval is granted, so that a developer may be faced with uncertainty during preparation of documentation. Even at a late stage in the process additional investigation may be demanded.

## Comprehensive Coastal Assessment – panacea for all our problems?

As part of the package of measures, including SEPP71, recently announced by the State Government, has been a commitment to comprehensive coastal assessment. Will this provide the certainty demanded by planners and developers?

The reason for conducting a comprehensive coastal assessment is the recognition that we do not have adequate documentation of coastal resources nor consistent identification of sites of high conservation value or environmental sensitivity. Such an assessment will, however, necessarily be a never ending task (for reasons of the slow accumulation of knowledge about many taxonomic groups and the responses of organisms to environmental change). The early phase of any assessment will identify some sites of importance, which society would not wish to see developed, and to that extent will add to certainty, but the fact that a site is not initially identified as important would not mean that at some time in the future this evaluation could not change. To identify sites as development 'certainties' may be to jeopardize the survival of features of high conservation value.

The exact form of the comprehensive coastal assessment has yet to be announced, but a number of suggestions can be made.

The first issue is that of database structure. Whatever database is adopted it must be capable of being added to in the future. There are also substantial amounts of existing data, some already in databases, much in the possession of individual researchers. These data will need to be identified, critically evaluated and consolidated. Quality control in particular will be a major task.

What attributes will the database include? Threatened species legislation in NSW permits the listing of species, populations and ecological communities (endangered populations is a category unique to the state).

Species distribution data can be incorporated regardless of listing status, but populations could not be added until after listing. The recording of community data presents considerable challenges. There are no agreed typologies which at this stage would permit consistent recording (and the task of compiling one should not be underestimated – the completion of the account of British Plant Communities (Rodwell 2000), for example, was the culmination of a quarter of a century project, but systematic consideration of faunal assemblages has yet to be contemplated). Conventional terrestrial vegetation mapping in Australia tends to neglect communities which form stands of limited spatial extent, even though such communities may be important from a biodiversity perspective. Communities of this nature can be described and recorded (as in Rodwell 2000) even if not mapped.

Both saltmarshes and seacliffs contain distinctive plant communities which at individual sites occupy very limited areas (Adam *et al.* 1988; 1989).

Different researchers employ different method and sampling strategies, so that comparability of data will be an issue. Some techniques may be inappropriate, but no single method will be suitable for all taxa or habitats. The Commonwealth is seeking to establish 'Draft National Flora and Fauna Survey Standards' (tender 62/2002), but whether this is an achievable objective remains to be seen.

As well as biological data there is a need to assemble and utilize data on the geology, geomorphology and soils of the coast. Osborne (2000) has argued persuasively that in addition to biodiversity there is a need to conserve geodiversity. The nature of coastlines is such that geological exposures are frequent so that opportunities to conserve and interpret geological features and processes are many. Conservation debates in New South Wales (and elsewhere) have concentrated on biodiversity, but consideration of geodiversity is long overdue.

The coastal policies of the State Government are focused on the land-sea interface and the landward catchment. The comprehensive coastal assessment does provide an opportunity to evaluate the marine resources of the State, although as a State based exercise it would suffer from an arbitrary seaward cut-off at 3 nautical miles.

## Conclusions

The movement of population to the coast (NSW EPA 2000) will create continuing pressure on a limited resource.

Previous decisions, made in ignorance of ecological and environmental values, continue to influence the pattern of development pressure. The intentions of the past will not necessarily be realized if countervailing arguments, based on current knowledge, prevail, although environmental issues are not the only matters which decision makers will take into account.

The planned comprehensive coastal assessment will be vital in providing data which can be used in determining the outcome of development proposals. The assessment must be an ongoing process and thus cannot provide 'certainty', but will provide a better basis for decision making than is currently available.

## References

- Adam, P. 1985. Chapters 1-6 In *Coastal Wetlands of New South Wales. A survey and report prepared for the Coastal Council of New South Wales*. Dept. of Environment and Planning: Sydney.
- Adam, P. 1993. Botany Bay – the third runway and some issues in environmental assessment. *Australian Biologist* 6:161-169.
- Adam, P. 2001. Wetlands: policy ahead of knowledge? Pp.209-235 In *Ecology, uncertainty and policy. Managing ecosystems for sustainability* Edited by Handmer, J.W., Norton, T.W. and Dovers, S.R Prentice Hall: Harlow.
- Adam, P. 2002. Saltmarshes in a time of change. *Environmental Conservation* 29:39-61.
- Adam, P., Stricker, P., Wiecek, B.M. and Anderson, D.J. 1989. The vegetation of seacliffs and headlands in New South Wales, Australia. *Australian Journal of Ecology* 14:515-547.
- Adam, P., Wilson, N.C. and Huntley, B. 1988. The phytosociology of coastal saltmarsh vegetation in New South Wales. *Wetlands (Australia)* 7:35-85.
- Bates, G.M. 2002. *Environmental law in Australia*. 5<sup>th</sup> ed. Butterworths: Sydney.
- Central Mapping Authority of NSW. 1976. *Port Stephens 9332-IV-S 1:25,000 Topographic map*. CMA: Orange.

- Central Mapping Authority of NSW. 1988.** *Nowra 9028-3-S 1: 25,000 Topographic map.* CMA: Orange.
- Central Mapping Authority of NSW, 1998.** *Crookhaven 9028-2-S 1:25,000 Topographic map.* CMA: Orange.
- Cleland, K. 1999.** *Report of the Commission of Inquiry into the Heritage Estate, Jervis Bay.* Office of the Commissioners of Inquiry for Environment and Planning: Sydney.
- Coastal Council of NSW 2003.** *New Legislative Support for the NSW Coastal Policy.* *Coastal Council News #13.* March 2003:1.
- Environment Australia. 2002.** *Provision of data for national flora and fauna survey standards. Request for Tender. No.62/2002.* Dept. of the Environment and Heritage: Canberra.
- Giblett, R.J. 1996.** *Postmodern wetlands. Culture, history, ecology.* Edinburgh University Press: Edinburgh.
- Land and Environment Court 2002.** *Consolidated Expert Witness Practice Direction 23.09.02.* Land and Environment Court: Sydney,
- New South Wales Environment Protection Authority. 2000.** *State of the Environment Report.* NSW EPA: Sydney.
- Osborne, R.A.L. 2000.** Presidential Address for 1999-2000. Geodiversity: "green" geology in action. *Proceedings of the Linnean Society of New South Wales* **122**:149-173.
- Piper, G. 1980.** *My one fourteenth million share.* Temnor Publications: West Ryde.
- Planning NSW 2002.** *State Environment and Planning Policy no.71 – Coastal Protection.* Planning NSW: Sydney.
- Rodwell, J.S. (ed.) 2000.** *British Plant Communities. Vol.5. Maritime communities and vegetation of open habitats.* Cambridge University Press: Cambridge.
- Tsamenyi, M., Rose, G. and Castle, A. 2003.** International Marine Conservation Law and its Implementation in Australia. Pp1-17 in *Conserving Marine Environments. Out of sight, out of mind*, edited by P. Hutchings and D. Lunney. Royal Zoological Society of NSW, Mosman, NSW.