

## WHAT CAN YOU DO?

If you hear about a proposed development that you think may affect a saltmarsh or you are concerned about a saltmarsh that has become degraded from activities such as drainage works, dredging and reclamation or rubbish dumping, contact your nearest Conservation Manager.

Enjoy your fishing and *Fish for the future*  
WEBSITE: [www.fisheries.nsw.gov.au](http://www.fisheries.nsw.gov.au)

## Contact

Conservation Managers can be contacted at the following NSW Fisheries offices.

Ballina: 02 6686 2018  
Port Stephens: 02 4982 1232  
Sydney: 02 9492 9432  
Nowra: 02 4423 2200

## FURTHER READING

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# fishnote



NSWF1226

## Saltmarsh

by Cassie Burns and Greg Davey

### WHAT IS A SALTMARSH?

A saltmarsh is a community of plants and low shrubs that can tolerate high soil salinity and occasional inundation from salt water (Morrisey, 1995). They are characterised by vegetation interspersed with unvegetated patches (salt pans) and often occur landward of mangroves, in the high tide zone (Figure 1) (Adam, 1990).

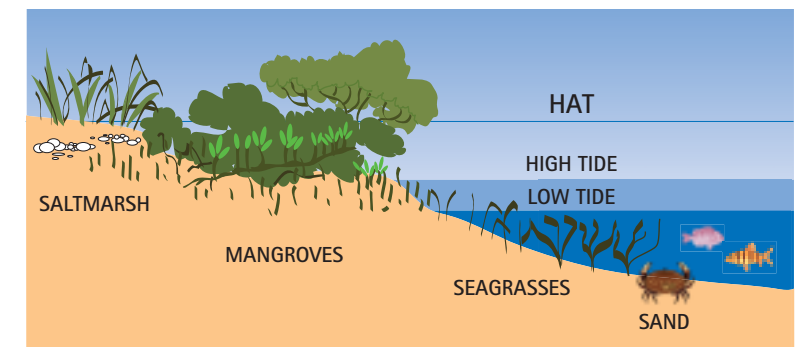


Figure 1. Common habitat zones in an estuary (Adapted from Kailola *et al.* 1993) (\*HAT = Highest Astronomical Tide).

### SALTMARSH PLANTS

Along the north coast of NSW, saltmarshes are dominated by a few plant species such as red samphire (*Sarcocornia quinqueflora*), salt couch (*Sporobolus virginicus*) and rushes, including *Juncus kraussii* (native) and *Juncus acutus* (noxious) (Copeland, 1992). The number of species of saltmarsh plants increases on the south coast of NSW (Adam *et al.* 1988)



Figure 2. Red samphire (*Sarcocornia quinqueflora*) (G. Davey).



Figure 3. Salt couch (*Sporobolus virginicus*) (Sainty and Associates)



Figure 4. Sea rush (*Juncus kraussii*) (Sainty and Associates).



Figure 5. Spiny rush (*Juncus acutus*) (Sainty and Associates).

## WHERE ARE SALTMARSHES FOUND?

Saltmarshes can be found in estuaries along the whole New South Wales coastline, with the larger areas occurring in the Manning Bioregion (Table 1 and Figure 6).

Bioregion	No. of Estuaries	Area (km <sup>2</sup> )
Tweed/ Morton	28	5.5
Manning	18	36.5
Hawkesbury	17	4.9
Batemans	57	10.7
Twofold	13	1.5
<b>Total NSW</b>	<b>133</b>	<b>59.1</b>

**Table 1.** Distribution of major areas of saltmarsh in New South Wales (West *et al.* 1985).

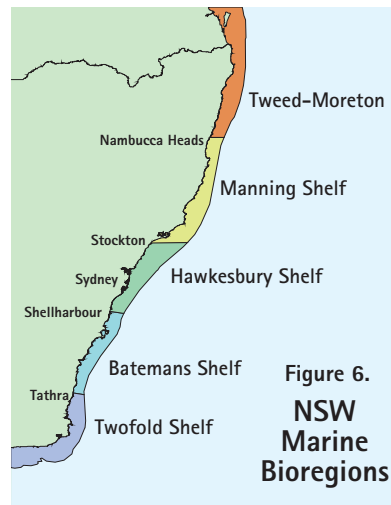
## WHY IS SALTMARSH IMPORTANT TO FISH?

Saltmarsh is important to fish species by providing a source of food which may support estuarine food webs and by providing habitat and shelter when the saltmarsh is inundated at high tide.

Studies by Thomas and Connolly (2001) found that up to 41 species of fish can inhabit tidal saltmarsh areas.

These included commercial species such as yellowfin bream, sand whiting, various mullets and snub nosed garfish. The most common fish were small species such as perchlets and gobies, which are important in the estuarine food chain as a source of food for larger fish and birds.

Saltmarsh vegetation provides basic inputs of carbon to estuaries primarily in the form of dead leaves and branches. The carbon material becomes part of the food chain. This occurs when it is colonised by bacteria and fungi which convert the carbon into more easily digestible carbohydrates and proteins. Tidal currents disperse this material which can then be taken up by filter feeders such as mussels or oysters and substrate surface feeders such as crabs and mullet (Valiela *et al.* 1978).



**Figure 6.** NSW Marine Bioregions

Saltmarsh supports a variety of invertebrates, including crabs, prawns, molluscs and insects. The invertebrates are preyed upon by fish during high tides. For example, yellowfin bream feed on crabs and prawns while small fish such as gobies feed on mosquito larvae (Williams, 2001).

Saltmarsh also provides habitat for many migratory bird species, such as the Sharp-Tailed Sandpiper (*Calidris acuminata*) (Smith, 1991).

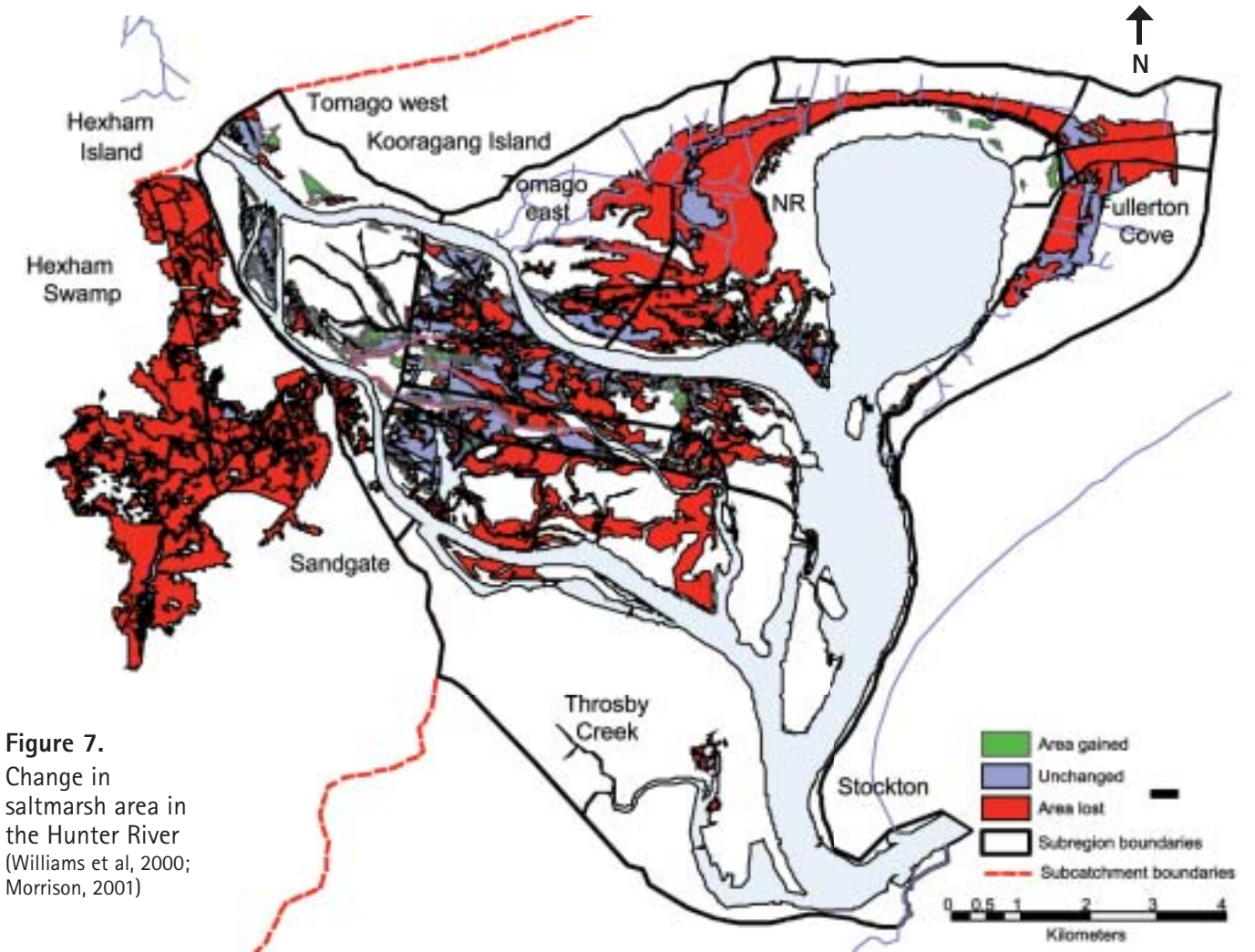
## STATUS OF SALTMARSH IN NSW

Many areas of saltmarsh, particularly those near urban centres, have been lost or become degraded as a result of drainage (floodgates), unrestricted stock access, weed invasion, dumping, stormwater runoff and damage from motor vehicles. Significant losses have also occurred as a result of reclamation and drainage activities (Adam *et al.* 1988; Zann, 1995; Zann, 1996).

Where saltmarsh is restricted along its landward edge by urban development or elevated topography, it can be squeezed against these obstacles by landward-shifting mangroves, and over time, will be replaced by them (Saintilan and Williams, 1999).

Within NSW, saltmarsh area is contracting. A study by Wilton (2002) of mangrove and saltmarsh dynamics in 9 estuaries in NSW showed that saltmarsh loss ranged from 12% to 97%, largely due to landward mangrove incursion into saltmarsh habitats.

Williams and Watford (1997) found that within Berowra and Marramarra Creeks, tributaries of the Hawkesbury River, the area of saltmarsh had decreased by 38% between 1941 and 1992. In the Hunter River, the area of saltmarsh has fallen by approximately 52% from 2133ha in 1954 to 1112ha in 1994 (Figure 7) (Williams *et al.* 2000).



**Figure 7.** Change in saltmarsh area in the Hunter River (Williams *et al.*, 2000; Morrison, 2001)

Saintilan and Williams (1999) concluded that there maybe a number of factors contributing to the landward incursion by mangroves into saltmarsh such as:

- changing patterns in annual rainfall
- changes in, or cessation of, agricultural activities
- changes in tidal regimes or sea level
- changes to catchments from urban activities resulting in altered sediment and nutrient inputs and land subsidence.

However, they also found that there was little consistency between the estuaries in the pattern of contributing factors.

## MANAGEMENT OF SALTMARSH IN NSW

- \* Approval is required from NSW Fisheries for dredging and reclamation in any saltmarsh.
- Collection of invertebrates by the use of a spade or fork is prohibited within saltmarsh areas.
- NSW Fisheries policy (NSW Fisheries, 1999) requires buffer zones of at least 50m between

saltmarsh and potentially damaging developments.

- Local councils are responsible for development approvals in saltmarsh and are able to prohibit or modify proposals that they view as environmentally unacceptable.
- Saltmarshes mapped as protected wetlands under SEPP 14\* are afforded specific protection and most activities within these areas require an environmental impact statement.
- Some larger saltmarshes (eg. Towra Point and Kooragang Nature Reserve) are protected in the National Park estate and are subject to management plans or conventions related to their role as migratory bird habitat.

(Footnotes)  
\* SEPP 14 = State Environmental Planning Policy Number 14 (Coastal Wetlands).