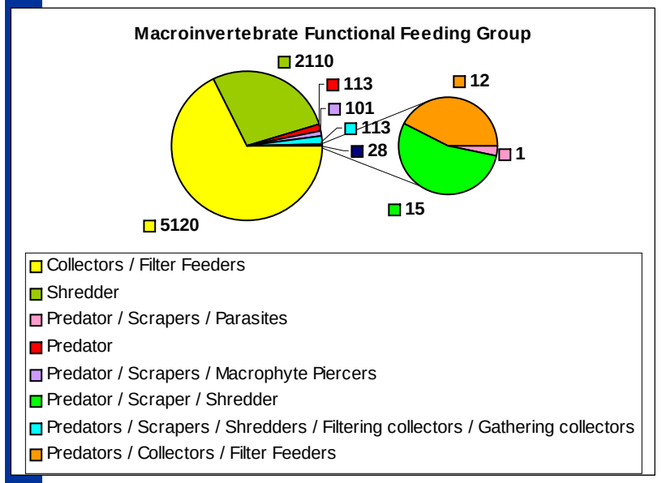
Neds Corner Swamp

South Coast Wetland Monitoring Project **June 2008**

Each group of Macroinvertebrate play a different role in the food chain, some feed on organic material (Shredders), others feed on fine organic particles (Collectors/filter feeders), others graze on algae (Scrapers), some feed on each other (Predators), others are parasitic (Parasites) and some are Macrophyte piercers that feed off living plants and algae fluids. These groups are called Functional Feeding Groups (FFG). Some macroinvertebrates fit into more than one of these groups, for example the Water Boatman is a Predator, a Scraper and a Macrophyte piercer.

A healthy wetland should have a representative of each functional feeding group. A loss or dominance in a particular group may indicate a change in ecology of the wetland. The composition of these groups at Neds Corner Swamp are displayed in the below graph.



There appears to be a high number of collectors / filter feeders which could relate to high amount of suspended decomposing fine particulate organic matter in the wetland. The high number of shredders may be due to the seagrass *Ruppia megacarpa (seagrass)* living in the wetland.

Conclusion

Neds Corner Swamp ranges from saline to brine. The swamp is fed by surface runoff, sub surface flow and via a creek line that drains secondary salinised land to the north. The main issue to consider is potential groundwater connectivity with the wetland, groundwater rise, subsequent salinity variations and the impact of this on biodiversity.

Some knowledge gaps were identified during the investigation, monitoring and data analysis for this wetland which should be addressed to improve understanding of the water quality and biodiversity and to detect changes over time. The monitoring period was relatively short and some effects of previous and current land use change and management may not yet be evident.

Macroinvertebrates would need to be identified to family or species level to allow more detailed analysis of ecological condition and relationship to other wetland characteristics. The hydrology of the wetland and its catchment is not fully understood or monitored, particularly the interaction between groundwater and surface water. A future monitoring program should be developed to address these issues.

Acknowledgements

The Department of Water would like to sincerely thank and acknowledge the following people for their assistance and contribution toward the South Coast Wetland Monitoring Program and production of this report.

- Brian and Vanessa Whiting for their support of the project and allowing access to the lake on their property.
- John Simons (Department of Agriculture and Food, Esperance) for providing knowledge of the hydrogeology associated with Neds Corner Swamp and editing assistance.
- Ania Lorenz, Sherrie Randall, Kevin Hopkinson, and Albany Department of Water team who conducted the monitoring.
- Kevin Hopkinson, Naomi Arrowsmith, Andrew Maughan and others for their support and editing assistance.
- Sherrie Randall and Tracy Calvert for data analysis and report compilation.

For further information please contact Tracy Calvert at the Department of Water Albany (08) 9842 5760.

South Coast Wetland Monitoring Project **June 2008**

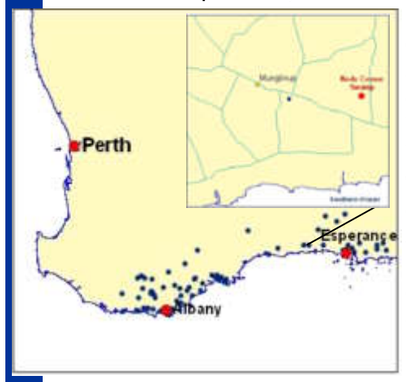
This report card summarises the current state of knowledge of physical, chemical and biological characteristics of Neds Corner Swamp based on the knowledge gained from investigation and monitoring conducted by the Department of Water through the South Coast Wetland Monitoring Program.

Accompanying this document are appendices that provide more detailed information about the wetland monitoring program, terminology of wetland classification, parameters monitored, methodology and the ANZECC&ARMCANZ guidelines used in this report.

Funding for this program has been provided through South Coast Natural Resource Management Inc. - supported by the Australian Government and the Government of Western Australia.

About Neds Corner Swamp

Neds Corner Swamp is located approximately 82km west of Esperance, Western Australia, within the Stokes Inlet catchment and the smaller sub-catchment of the Yerritup Creek and Young River. The wetland lies at approximately 65m AHD (Australian Height Datum). The area receives an annual average rainfall of 540mm.



	GPS Location Coordinates		
Wetland Suite	*Easting*	*Northing*	*MGA Zone*
Neds Corner Lake Suite	319655	6266364	51

Neds Corner Swamp

Neds Corner Swamp is located on private land owned within a small catchment of approximately 10.8km^2. The Lake lies within a fenced wetland vegetation buffer zone that ranges between approximately 20-180m from the wetland edge.

Vegetation predominantly consists of *Eucalyptus occidentalis* (Yate) and *Melaleuca cuticularis* (Saltwater paperbark) and understorey consisting of Samphires. There are a number of dead *Eucalyptus occidentalis* and *Melaleuca cuticularis* on the fringes of the lake with some regeneration occurring. *Ruppia megacarpa* (seagrass) also occurs in the wetland.

Ruppia megacarpa (seagrass) growing in Neds Corner Swamp

Approximately 90% of the catchment area has been cleared for farming practices including cropping and livestock.

Water quality monitoring commenced on the 07/02/2006 and included physical, chemical and biological parameters as outlined in the appendices.

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Neds Corner Swamp

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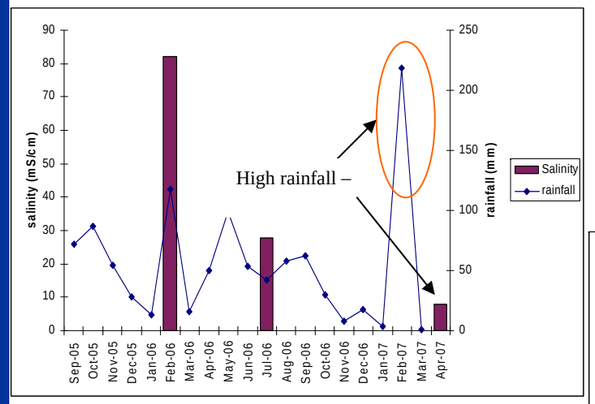
Wetland Classification

Wetland type	*Water Salinity*	*Consistency of Salinity*	*Size (Metres)*	*Shape*
Sumpland	Hyposaline - Mesosaline	Poikilohaline	Mesoscale 910 x 830	Irregular - Round

Classification of Neds Corner Swamp has been evaluated on the basis of guidelines developed by V & C Semeniuk Research Group (1997). For further explanation please refer to the appendices.

Salinity

Salinity over the sample period was moderately saline (7.8mS/cm) to brine (82mS/cm). Fluctuations in salinities relate to fluctuations in rainfall and evaporation and hence water level variations. High rainfall experienced in February 2007 influenced the low salinities recorded in the April.



Low salinities in April 2007 relate to high rainfall event February 2007

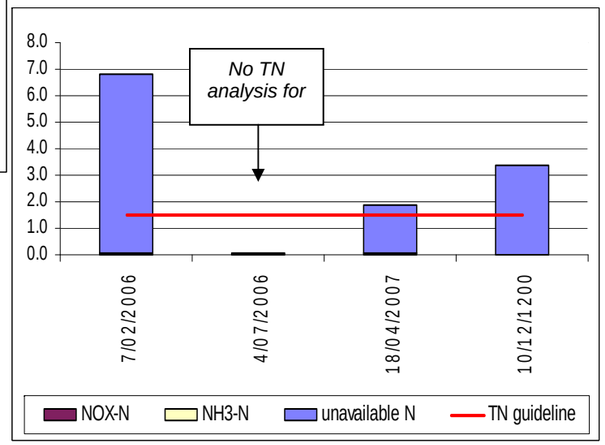
Fluctuations in salinities relate to the amount of surface runoff and sub surface flow from surrounding land and drainage through the creek which drains a catchment partially effected by secondary salinisation. Further investigations are required to determine groundwater connectivity of Neds Corner Swamp using nearby Department of Agriculture and Food bores Y01 and Y04.

Salinities (mS/cm) over the sample period

Nutrients

Total Nitrogen (TN) concentrations were high ranging from 1.9-6.8mg/L. TN concentrations on all of the sampling occasions exceeded the guidelines developed for ecosystem protection for southwest Australian wetlands for slightly disturbed systems of 1.5mg/L. Note: no TN data was collected on the 4/07/2006.

Dissolved inorganic nitrogen fractions of ammonia (NH_3-N) ranged from 0.01-0.058mg/L and total oxidised nitrogen (NOx-N) was consistent at 0.01mg/L. NH_3-N fractions exceeded the recommended guideline value of 0.04mg/L on one of the four sample occasions. The NO_X-N fraction did not exceed the recommended value of 0.1mg/L on any sample occasion.



Nitrogen fractions in mg/L over the sample period with TN guideline illustrated

Total Phosphorus (TP) concentrations ranged from 0.028-0.45mg/L. TP concentrations exceeded water quality guidelines of 0.06mg/L on two of the four sample occasions.

Soluble Reactive Phosphorus (SRP) (form of phosphorus available for uptake by plants) ranged from 0.005-0.018mg/L. In relation to water quality guidelines SRP did not exceed the recommended value of 0.03mg/L on any sample occasion.

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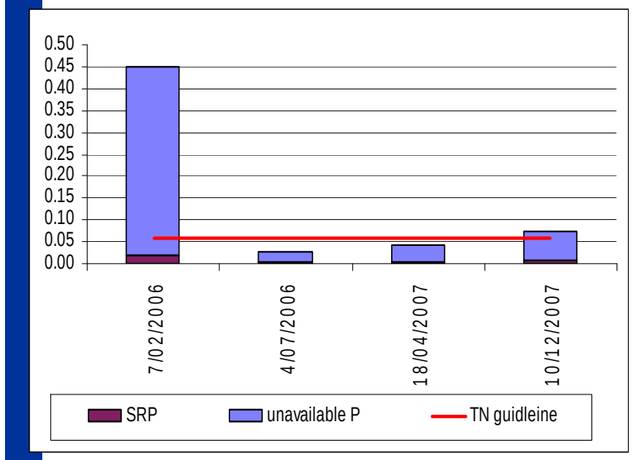


Phosphorus fractions in mg/L over the sample period with TP guideline illustrated

Nutrients are recycled naturally through the lake due to uptake and assimilation of nutrients by plants and animals and through release of nutrients for example through microbial breakdown of organic material.

Nutrients stores in the catchment may also enter Neds Corner Swamp through surface and sub surface flow from the surrounding land and via the creek line.

Low proportions of available nutrients can indicate the majority is being readily taken up by plants and animals while the remainder may be bound up in organic matter, or as dirt or dead cells that contain nitrogen or bound to clay soils in the case of phosphorous.

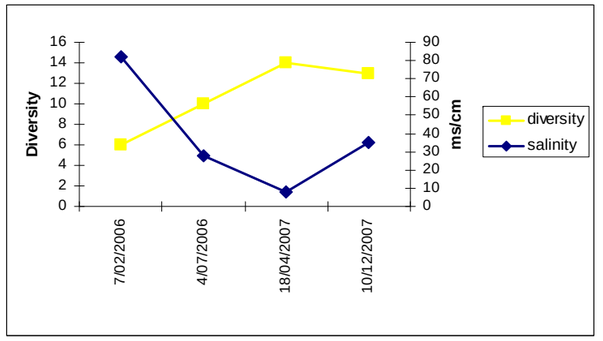
Equipment used for filtering nutrients

Macroinvertebrates

Sixteen groups of macroinvertebrates were found at Neds Corner Swamp during the monitoring period of which the most abundant included; Ostracoda (seed shrimp), Amphipoda (scuds), Conchostraca (clam shrimp), Chironomidae (non-biting midge larvae), Notonectidae (backswimmers), Corixidae (waterboatmen), Copepoda (copepods).

Other groups of less abundance were found including; Trichoptera (caddisflie larvae), Culicidae (mosquitoe larvae), Zygoptera (damselflies), Other Diptera (fly larvae), Coleoptera (beetles) adult, Epiproctophora (dragonflies), Acarina (spiders/mites), Coleoptera (beetles) larvae, Ceratopogonidae (biting midge larvae).

The diversity of macroinvertebrates found over the sample period ranged between six to fourteen groups with a median of eleven, which rates as average based on the Ribbons of Blue Wetland Habitat Score. The diversity of macroinvertebrates appears to change significantly in relation to salinity changes with higher salinity resulting in lower diversity of macroinvertebrates as displayed in the graph below.



Salinity (mS/cm) vs. Diversity