



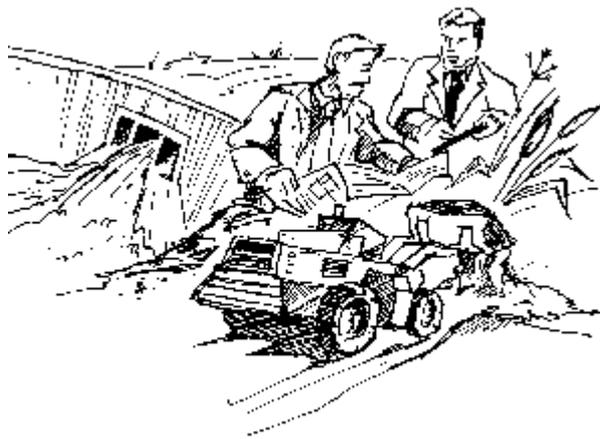
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Introduction

Wetland Fix is aimed at the conservation of one particular landscape feature of river catchments, namely wetlands. It provides a simple method of wetland evaluation for use by an agency extension official and others who are unfamiliar with wetlands and who are not wetland specialists. It is intended to be used for education, simple impact assessments, management or restoration guidelines, and wetland inventory purposes.

The term wetlands groups together a wide range of habitats; from mountain seeps and midland marshes to swamp forests, estuaries and even the open coast - all linked together by corridors of stream bank wetlands. Wetlands are a component of river catchments which by virtue of their unparalleled value for flood control, water storage, stream-flow regulation, drought relief, soil erosion protection, wildlife protection and superb re-creational areas for people offer substantial advantages to enhancing catchments with subsequent benefits to society.



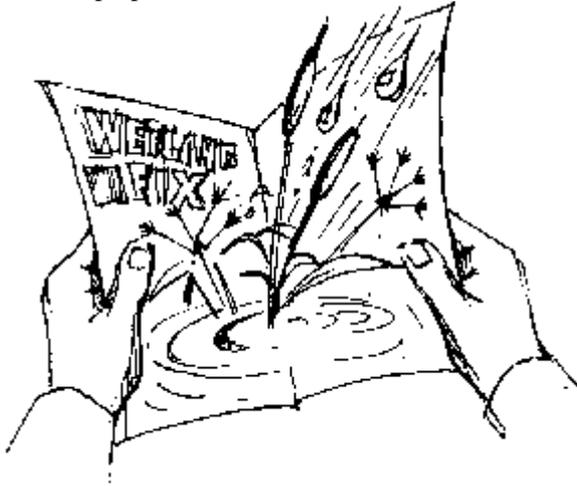
Despite their importance wetlands have historically been regarded as unproductive and even unhealthy wastelands. The symptoms of a highly stressed catchment that has lost many wetlands and their functions are often reflected by plumes of silt opposite river mouths, flood ravaged rivers, sterile fishing grounds, sediment filled estuaries and lagoons choked with water hyacinth as a result of polluted inflows. Activities such as waste water and industrial effluent disposal, the injudicious use of agrochemicals, the cultivation of overly steep land, stream bank encroachment, the drainage of wetlands, irrigation, canalisation and overgrazing have been recognised as factors responsible for the degradation of South Africa's rivers. However, downstream consequences such as oxygen depletion, the destruction of aquatic life, habitat disruption, the increased incidence and severity of floods, river flow cessation, reduced winter flows, lowering of the water table, bank erosion and rivers carrying high sediment loads have become so entrenched that most people now virtually regard them as a norm.

From time immemorial the vagaries of our semi-arid climate and the recurring wet and dry phases have underlined the importance of wetlands and water, our most precious resource. Water which is so inexpensive today will become more costly tomorrow and rationing will become a way of life. For wetland dependent wildlife there will be greater loss of habitat and the very real threat of extinction.

Unless water conservation begins with the protection of



wetlands together with the entire catchment system we will find yourselves dealing with a survival crisis of immense proportion.



Wetlands throughout the world have been recognised as key resources for biological, hydrological and economic reasons. However they are also recognised as being amongst the most threatened resources in the world and so it is appropriate that a field guide of this nature - aimed as it is at assisting the wetland owner or manager - should be compiled.

What is a wetland?

1

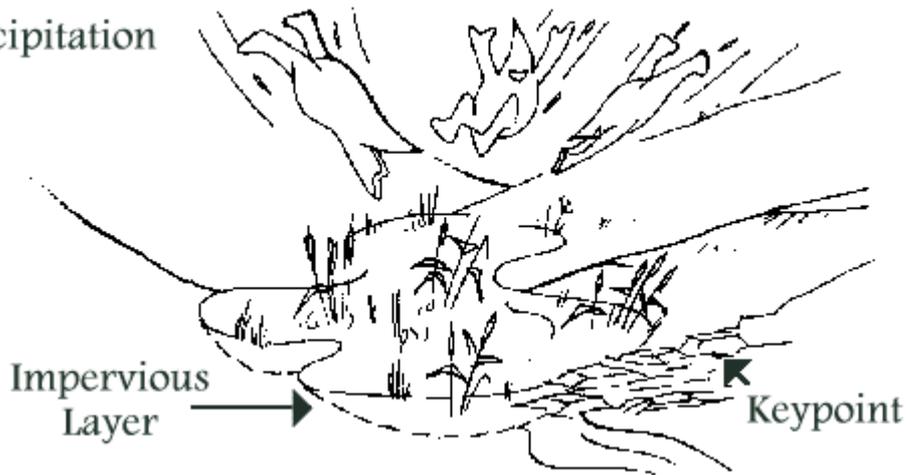
WETLANDS OCCUPY A CHARACTERISTIC POSITION IN THE LANDSCAPE WITH IMPEDED DRAINAGE

Wetlands are just that - they are "wet...lands" which are flooded or saturated by water for varying periods of time.

- *COASTAL WETLANDS* are influenced by tides and contain waters that show appreciable salinity. *IN LAND WETLANDS* include fresh water (non-tidal) areas and can often be likened to a basin filled with soil which has an impervious layer that retains water.

The lowest point is normally obstructed by a rock dyke or sill or even an alluvial ridge that acts as a dam wall. This "plug" or "keypoint" is ultimately responsible for the wetland holding water and whilst resisting downward erosion forces the collected water to the surface to support plant growth and to sustain stream flow.

Precipitation



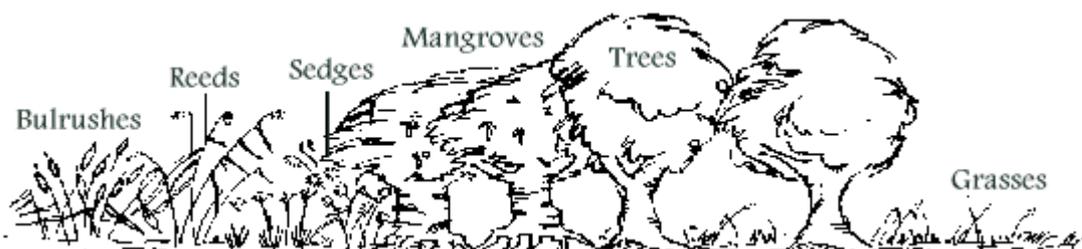
2

WETLANDS HAVE DISTINCTIVE PLANT COMMUNITIES

It is normally possible to determine if wetlands exist by being able to identify a few plant types such as bulrushes, reeds, sedges, mangroves and other water loving trees and grasses.

Wetlands such as swamps or marshes are obvious but some wetlands are not easily recognised, often because they are dry during part of the year or they just don't look very wet at first sight as the water table is just below the surface.

A wetland's luxuriant plant growth develops by virtue of the greater moisture availability. The plant cover fills an important function of intercepting surface run-off and reducing water velocity through the increased resistance caused by the plant stems. This also allows time for water scrubbing, filtering and infiltration into the soil.

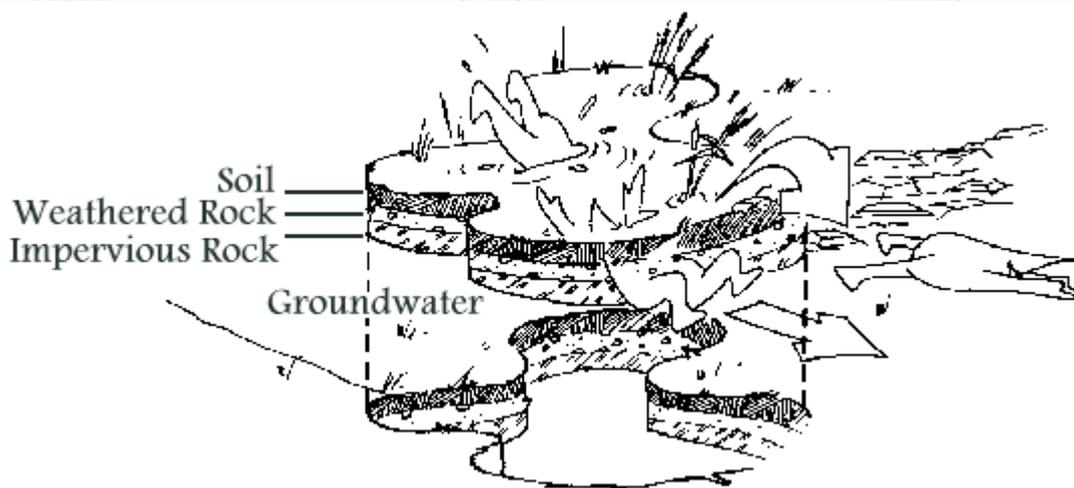
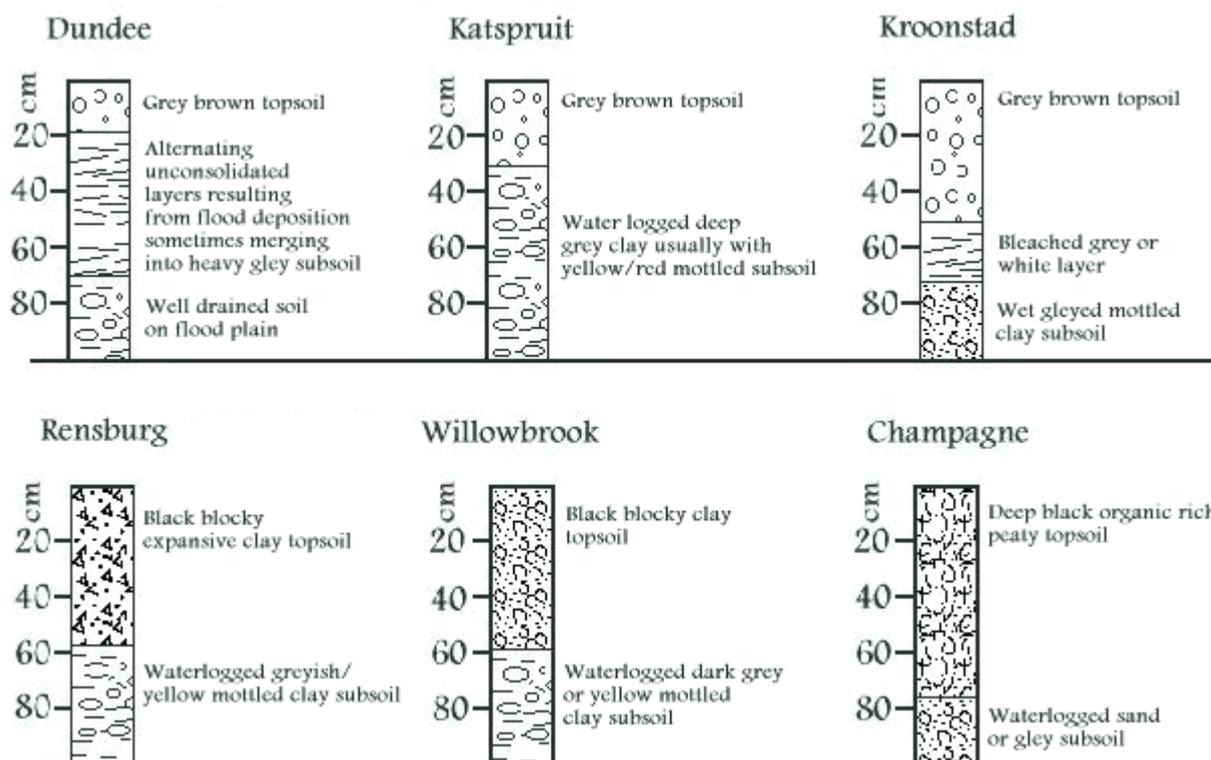




WETLANDS ARE CHARACTERISED BY DISTINCTIVE SOIL TYPES FORMED UNDER WET CONDITIONS

Of all the wetland processes operative in the environment infiltration is probably the most important This is a process by which water soaks into the soil and replenishes the moisture stored therein.

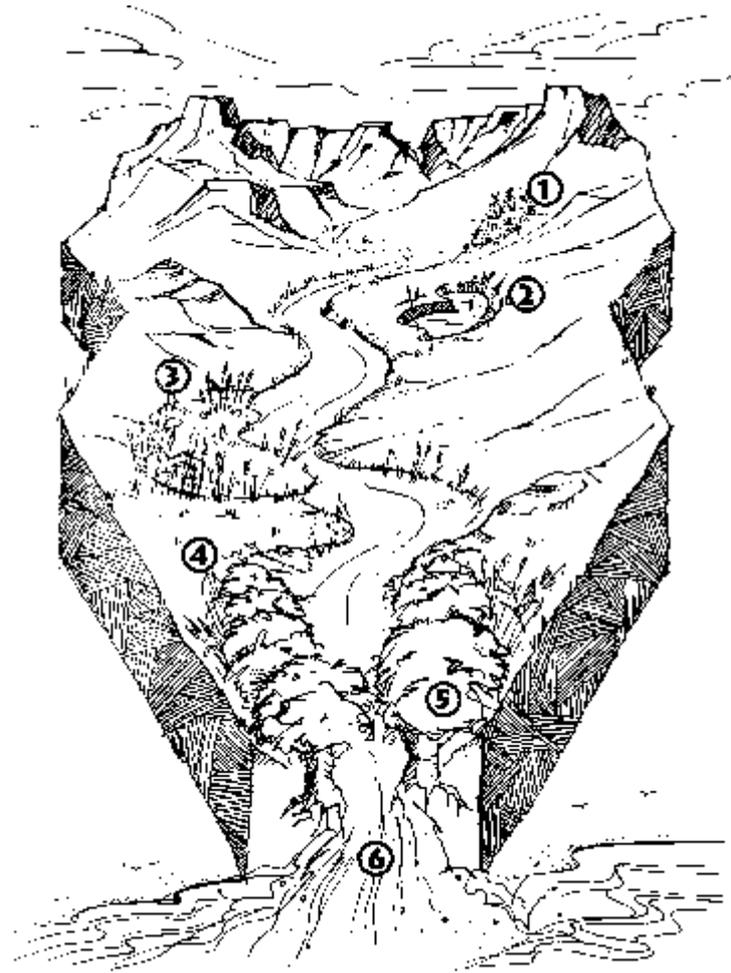
In most wetlands the passage of water through the soil profile is slow often due to the high clay content of the soil together with the gentle gradient of the wetland. Water which flows this particular route remains within the catchment for the longest possible time and in so doing, sustains the flow of streams.



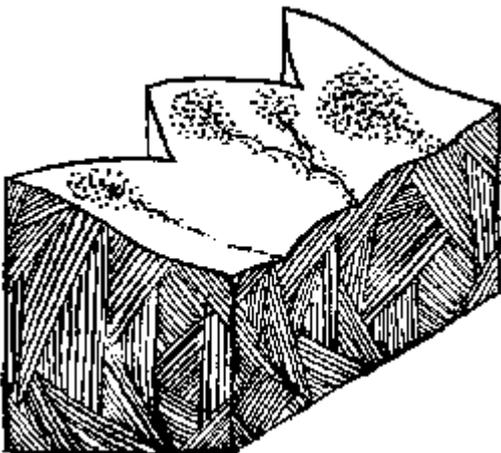
Where to find wetlands

Wetlands occupy characteristic positions in the landscape and with a little practice it becomes relatively easy to identify probable wetland settings from a distance.

Whilst stream source (1), estuarine (5) and marine (6) wetlands remain fixed at their respective upper and lower positions of a catchment; basin (2), plains (3) and streambank (4) wetlands span a wide range of landscape settings within the catchment's gradient and need not necessarily occur in the sequence indicated.

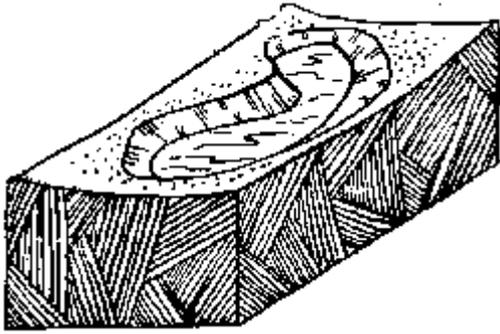


1 STREAM SOURCE SETTING



The stream source spring, seepage slope or seepage plain in steeper younger valleys just below the watershed. Water inflow is diffuse and outflow can be diffuse or channelled. These settings are easily overlooked as "wetlands" and because they are often the only green "oases" in an otherwise dry landscape they can be heavily utilised as a water source and "green bite" by domestic stock and game.

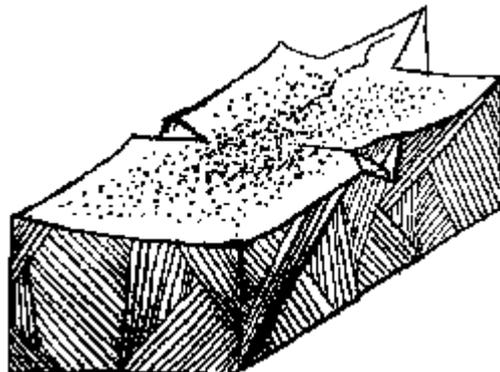
Unfortunately the over use of these areas are now apparent as many of the dongas on our hillsides. A possible future Ramsar site - The Drakensberg Park has many examples of stream source settings.



2 BASIN SETTING

The depression, fringes and open water of temporarily, seasonally, or permanently wet pans, dams and lakes. They can occur in all positions in the landscape. Pans have no obvious drainage. Pans, lakes and man-made dams are not always recognised as "wetlands" specially when temporarily or seasonally wet pans are in their dry condition.

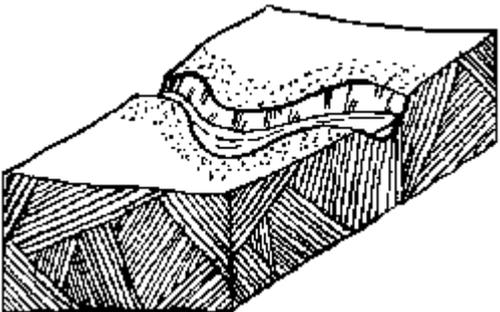
Ramsar sites that are basin settings include:- Barberspan, Lake Sibaya and De Hoop Vlei.



3 PLAINS SETTING

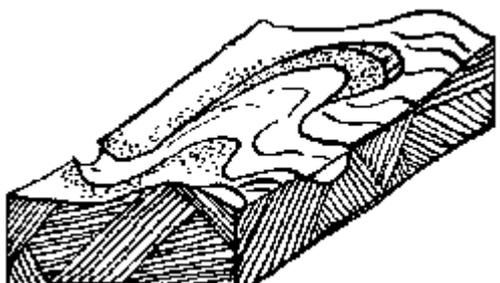
These have gentle gradients and can occur in all but the highest positions in the landscape. Water inflow is channelled or diffuse and can be directly linked to a stream source. Outflow is channelled, but within the site the flow can be diffuse, channelled or braided, i.e., a number of small channels separated by bars. Ox-bows (cut off meanders) and back-marshes often occur on the alluvial plains.

Plains wetlands are some of the most recognisable of wetland systems and are commonly referred to as vleis, marshes and swamps. A Ramsar site that is a plains setting is Blesbokspruit.



4 STREAMBANK SETTING

The channels, walls and adjacent riparian corridors of streams, rivers and dry water courses (including dongas) that occur throughout the catchment - connecting many wetland settings to each other thus creating a continuum of wetlands from mountain to sea.



5 ESTUARINE SETTING

The waterbody, fringes and peripheral wetlands around an estuary. For descriptive purposes they are sub-divided as follows:-

- Estuaries - the tidal portion of river mouths
- Lagoons- normally closed river mouths; and
- Non-tidal open river mouths.

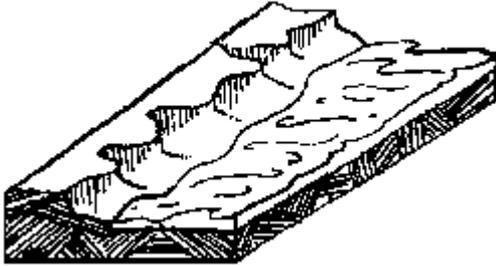
Whilst estuarine wetlands are amongst the most diverse and richest of natural habitats they are the recipients of intense local use and all up-river use

and as such are the ultimate barometers of the condition of their catchments.

Ramsar sites that are estuarine settings include:- Orange River Mouth Wetland, Kosi system, De Mond State Forest, St. Lucia system, Verlorenvlei and the Wilderness Lakes.

6 MARINE SETTING

This setting includes the:-



- *Inter-tidal zone*: rocky and sandy marine shores.
Sub-tidal zone: permanent marine shallow waters and coral reefs less than 6m deep at low-tide
Coastal bays: coastal inlets without feeder streams or rivers.

Ramsar sites that are marine settings include Langebaan and the Turtle Beaches/Coral Reefs of Tongaland.

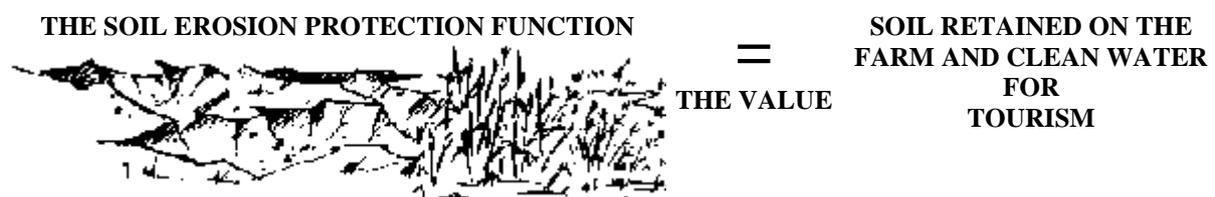
Wetland functions and values

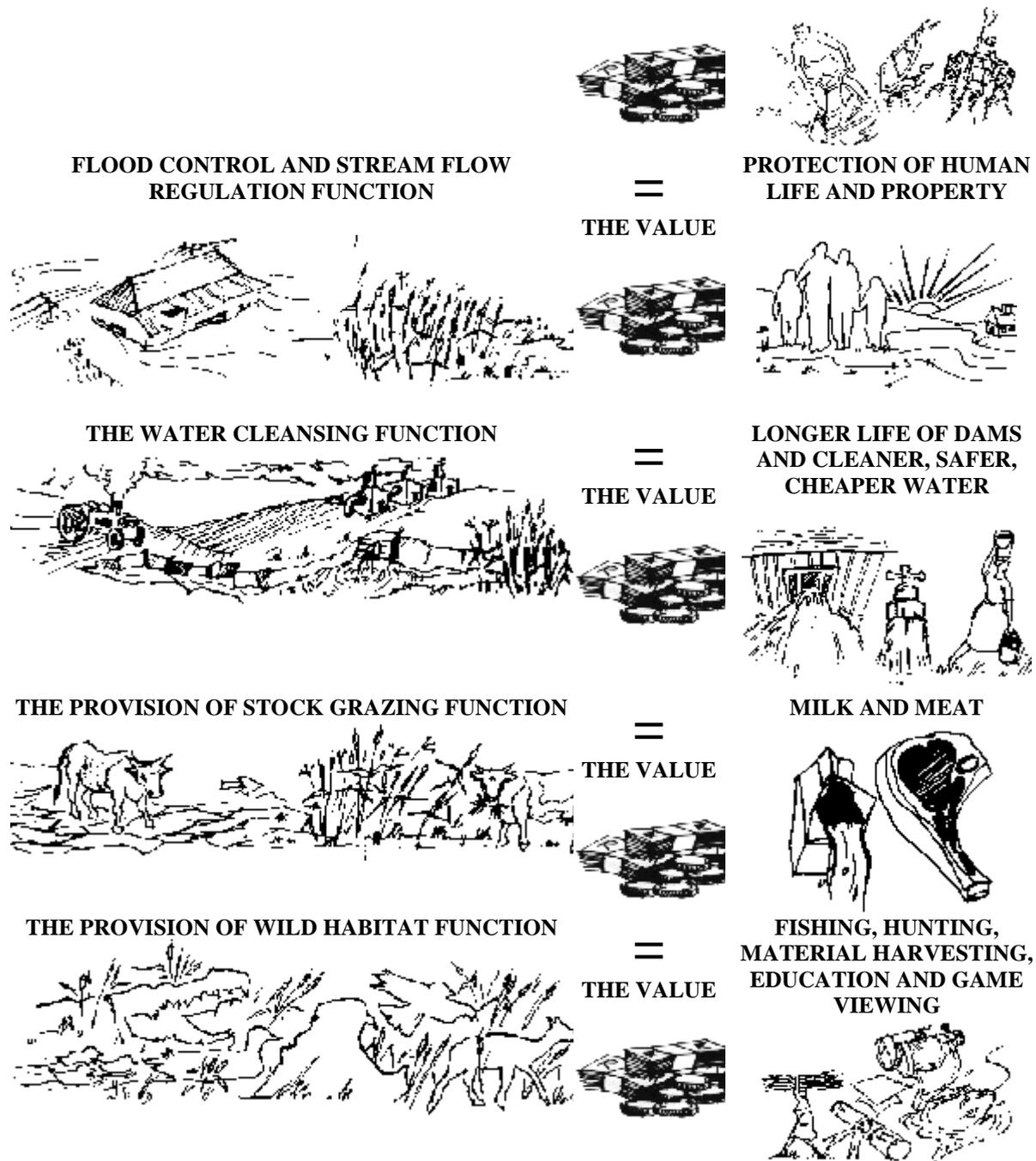
Despite being an extremely important distinction, the functions and values of specific wetland sites often remain undefined. Indeed it has only been in recent decades that wetlands have been recognised as valuable natural resources that, in their natural state provide many important economic benefits to people and their environment.

The societal benefit or value of a wetland is a subjective estimate of the worth, merit quality or importance of the wetland to mankind. This implies that a Rand value can be ascribed to wetlands in terms of providing habitat for fishing, hunting, viewing, plant material, harvesting, domestic stock grazing, flood damage control and water cleansing, to name a few.

These values are derived directly from the existing wetland functions. For example to establish the value of a function such as flood attenuation. The question : "what will it cost to replace that function?" should be answered . Likewise to establish the value of the "nursery" function of an estuary it would be necessary to establish the economic dependence on fishing and tourism in the vicinity of the estuary.

Far more needs to be done in terms of quantifying wetland functions and relating them to human values. This insight would enable us to determine what we will lose should we alter or develop wetlands.





Wetland assessment form

The "Wetland Fix" assessment form provides a simple method of wetland evaluation for use by land agency extension officials and others who are not necessarily wetland specialists. It is intended to be used for education, simple impact assessment, management or restoration guidelines, and wetland inventory purposes.

The key question that needs to be addressed under any wetland assessment scenario is whether or not wetland functions have been significantly altered. The degree of impairment to wetland functions is directly related to the type and magnitude of impact - with drainage and lowering of the water table to the extent that the wetland

dries up being the most serious from which the wetland rarely recovers on its own accord.

The design and intention of "Wetland Fix" is not to embark on any detailed impact assessment but to merely record whether a land use is present and to highlight those activities that are considered potentially serious and detrimental to the wetlands functions.

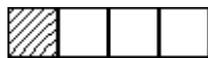
A further important consideration for future wetland conservation efforts is that we have to think about wetlands in a holistic context, as components of river catchments. This raises the very real problem of assessing the cumulative effect of man-made impacts on wetlands and of wetland losses. The incremental effect of those insidious impacts and wetland losses that seem minor on an individual basis can become major when considered collectively over time and on an entire catchment.

Information on cumulative impacts and wetland losses can be generated by collating completed "Wetland Fix" assessment forms and processing them at a regional computer centre. The results could then be used to provide management or restoration guidelines best suited to deal with pending dangers.

Finally we need to consider the bigger picture, not only with man as creators of impact, but also as the potential solution. The future success of wetland conservation will to a large degree depend on the enthusiasm and application of the various extension agency officers as they are best placed to deal with and to gain the co-operation of wetland owners and managers.

How to Use the Wetland Assessment Form

1. Supply available wetland data information.
2. Indicate your assessment of the impact of the land use onto the wetland from- the wetland uses (in the right hand column) ; and the catchment uses (in the left hand column) as follows:

	the land use is present but without any obvious effect on the wetland
	the land use has a slight effect on the wetland
	the land use has a moderate effect on the wetland
	the land use has a serious effect on the wetland

3. Indicate necessary wetland management or remedial requirements.

Wetland Data and Land Use Assessment

(Append a sketch or a copy of the 1:50 000 map with wetland location indicated)

Wetland Name:	Size:	Road Route to Wetland
Farm or Town Name:	Farm No.:	
Magisterial District:	Region:	
Catchment Name:	Altitude:	1:50 000 Sheet Name Sheet No.
Sub-Catchment Name:	Veld Type:	Geo Co-ordinates:
Landowners Name:	Tel No.:	Address:
Managers Name:	Tel No.:	Address:
Noteworthy Plants	Soil Forms	Noteworthy Animals

Compiled by:	Tel No.:	Address:
		Land Tenure:
		State:
		Municipal:
		Private:
		No. of landowners:

Impact from Catchment uses on wetland functions	Type of land uses or disruptions	Impact from Wetland uses on wetland functions	Wetland Remedial Requirements
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Mowing of veld	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Consult Regional Agricultural service
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Planted pastures	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	See Wetland Fix part 3
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Planted crops	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	See Wetland Fix part 3
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Planted timber	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	See Wetland Fix part 3
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Domestic stock	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	See Wetland Fix part 3&2
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Game	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Consult Regional Nature Conservation
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Ditching	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	See Wetland Fix part 3
	Ridge and Furrow	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	See Wetland Fix part 3
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Donga incised <input type="checkbox"/> Erosion <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	See Wetland Fix part 3
	Keypoint disruption	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	See Wetland Fix part 3
	Flow concentration zone	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	See Wetland Fix part 3
	Flood debris	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Consult Regional Nature Conservation
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Dams <input type="checkbox"/> or Weirs <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Consult Dept. Water Affairs
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Water abstraction	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	See Wetland Fix part 5
	Pipelines	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Consult Local Authority
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Pylons	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Consult ESCOM Env. Officer
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Road construction	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Consult Regional Roads Dept.
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Rail construction	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Consult Spoornet
	Bridges <input type="checkbox"/> or Culverts <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Consult Regional Roads Dept.
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Urban development	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Consult Local Authority
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Industrial development	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Consult Local Authority
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Informal settlement	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Consult Local Authority

<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Tourist development	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Consult Regional Nature Conservation	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Estuary breaching	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Consult Regional Nature Conservation	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Mining <input type="checkbox"/> or Dredging <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Consult Dept. of Mining and Energy Affairs	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Siltation	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Consult Regional Nature Conservation	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Infilling	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Effluent disposal	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Consult Dept. of Water Affairs	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Sewage disposal	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Consult Dept. of Water Affairs	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Solid waste disposal	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Consult Dept. of Water Affairs	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Invasive alien plants	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	See Wetland Fix part 6	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Problem indigenous plants	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Consult Regional Nature Conservation	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Burning	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	See Wetland Fix part 2	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Angling	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Consult Regional Nature Conservation	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Hunting	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Consult Regional Nature Conservation	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Bait collecting	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Consult Regional Nature Conservation	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Food harvesting	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Consult Regional Nature Conservation	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Material harvesting	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Consult Regional Nature Conservation	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Boating: power, sail, paddle	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Consult Regional Nature Conservation	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Diving, swimming, surfing	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Consult Regional Nature Conservation	

Wetland description form

How to use the Wetland Description Form

1. Indicate the wetland setting in the landscape as follows:

<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	this is the dominant setting occupied by the wetland
<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	this minor setting is also attached to the wetland (i.e., feeder stream ;source wetland)

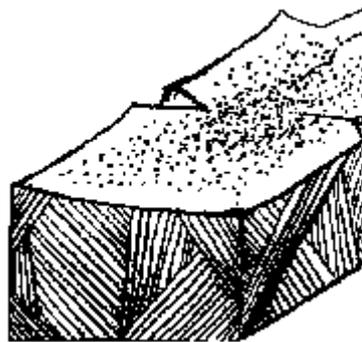
2. Indicate the cover type in the wetland as follows:

-

<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	this cover type is dominant in the wetland
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	this cover type has a fair representation in the wetland
<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	this cover type has only a slight representation in the wetland

- NOTE: The cover types indicated above should also correspond to the wetlands various saturation zones and which are based on the following:-

Where standing water is evident in the wetland-
temporarily - for up to approximately a month during the wet season,
seasonally - throughout most of the wet season, or
permanently / semi-permanently - throughout most of the year.



STREAM SOURCE SETTING

- 1-spring
- 2-seepage slope
- 3-seepage plain

In steeper younger valleys just below the watershed, water inflow is diffuse and outflow is diffuse or channelled



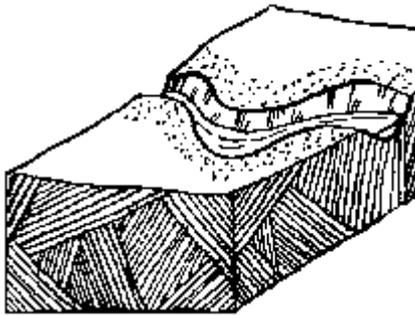
PLAIN SETTING (UNCHANNELED)

These have gentle gradients and can occur in all but the highest positions in the landscape. Water inflow is channelled or diffuse and may be directly linked to a stream source. Outflow is channelled but within the site the flow is diffuse.



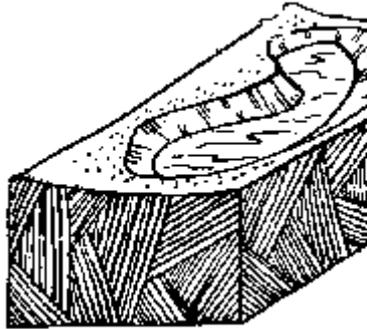
PLAIN SETTING (CHANNELLED)

These are similar to the unchanneled plains setting but water through flow is channelled or braided, i.e., a number of small channels separated by bars, oxbows (1) or back marshes often occur on the alluvial plains



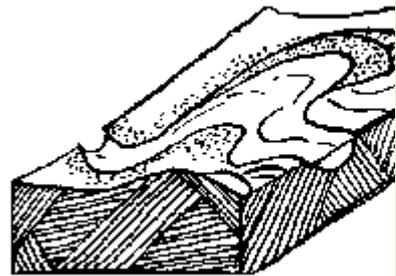
STREAM BANK SETTING (CHANNELLED)

The channels, walls and adjacent riparian corridors of streams, rivers and dongas. these occur throughout the catchment, connecting many wetlands to each other.



BASIN SETTING

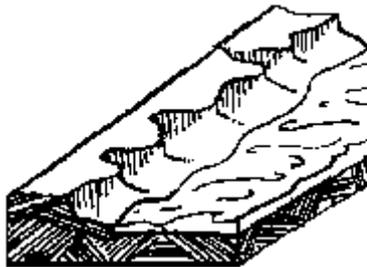
The depression, fringes and open water of temporarily, seasonally or permanently wet pans, dams and lakes. They occur in all positions in the landscape. Pans have no obvious external drainage.



ESTUARINE SETTING

The water body, fringes and peripheral wetlands around an estuary. For descriptive reasons they are divided as follows:

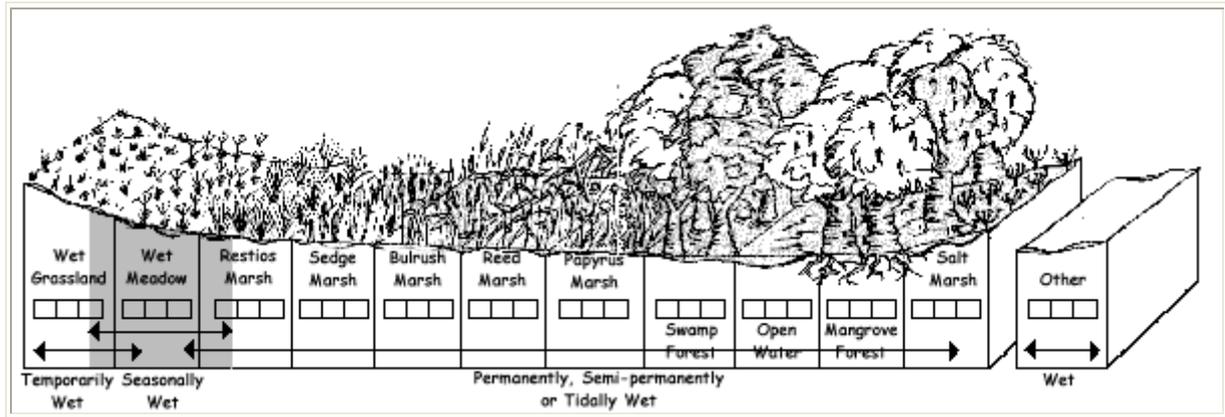
- Estuaries - the tidal portion of river mouths
- Lagoons - normally closed river mouths
- Non-tidal open river mouths



MARINE SETTING

- Intertidal zone - the rocky and sandy marine shores
- Sub-tidal zone - the permanent marine shallow waters and coral reefs less than six metres deep at low tide
- Coastal bays - coastal inlets without feeder streams or rivers

Cover Type



Further reading

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- The Wetlands of Natal (Part 2) : The distribution, extent and status of wetlands in the Mfolozi catchment. Begg, G.W., 1988. Natal Town and Regional Planning Report, 71.
- The Wetlands of Natal (Part 3): The location, status and function of the priority wetlands of Natal Begg, G.W., 1989. Natal Town and Regional Planning Report, 73.
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Glossary of terms

Alien	Plants or animals introduced from one locality to another, where they had not occurred before.
Agro-chemical	Chemicals used in the agricultural industry.
Aquatic life	Animals and plants which live in or frequently use wet areas.
Biological	Pertaining to the plant or animal life of a place.
Breaching	The act of artificially opening the sand-bar across a closed lagoon.
Catchment area	The area of land which catches rainfall for a particular river, lake or estuary.
Conservation	The wise use of natural resources.
Diffuse	To spread out freely in all directions.

Effluent	Liquid waste resulting from an industrial process.
Environment	The sum of all the external conditions and influences which effect the development and life of organisms.
Erosion	The movement of soil and rock material by agents such as running water, wind, moving ice and gravitational creep.
Estuary	A semi-enclosed water body where land-derived fresh water mixes with sea-water.
Extinct	No longer existing in living form; having died out.
Flow concentration zone	Where flowing water within a wetland converges before reaching the keypoint. This is often at the "nick point" or " head-cut" of an eroded channel.
Habitat	The place or environment in which specific organisms live.
Hydrology	The study of water, particularly the factors affecting it's movement on land.
Impact	The influence or effect that any particular land use has on a wetland's functions. The degree of impairment to the wetlands functions is directly related to the type and magnitude of the impact.
Impervious	Incapable of being penetrated by water.
Inventory (of Wetlands)	A stocktaking / mapping or listing exercise designed to generate information on the location and characteristics of wetlands in any given area.
Keypoint	A natural obstruction that resists downward erosion of the river channel or the wetlands lowest point. Frequently the keypoint is a hard stratum of rock (such as a dolerite dyke or sill) but lateral alluvial ridges sometimes act as keypoints to off-channel wetlands.
Marsh	A wetland zone which is dominated by emergent herbaceous vegetation (usually taller than 1m), such as common reed - <i>Phragmites australis</i> . Some marsh zone areas are seasonally wet but most are permanently or semi-permanently wet.
Organism	Any living individual; plant or animal.
Pollution	The contamination of the purity of the environment
Ramsar	Convention of Wetlands of International Importance especially as waterfowl habitat.
Resource (natural)	Any raw material, either living or non-living, renewable or non-renewable, obtained form nature.
Restoration	The act of enhancing the condition of degraded wetlands to a level whereby certain of the functions which the system formerly provided become replaced.
Ridge & Furrow	The result of a prescribed system of repetitive ploughings in a wetland which cause soil to be thrown into a series of parallel cambered beds that ensures controlled drainage through the excavated furrows.
Riparian	Occurring on the banks of streams and rivers.
Siltation	Sediment that occurs when water velocity drops sufficiently to allow deposition to occur.
Swamp	Wooded wetlands with standing, or gently flowing water. typical species include <i>Barringtonia racemosa</i> , <i>Svyzygium cordatum</i> , and <i>Icus trichopoda</i> .
Vlei	A vernacular term used to describe wetlands that resemble wet meadow or wet grassland zones.
Water table	The upper surface of groundwater, or that level below which the soil is saturated.
Wet grassland	A wetland zone which is usually temporarily wet and supports predominantly grasses common to dry and wet areas.
Wet meadow	wetland zone which is usually seasonally wet and dominated by short sedges (usually shorter than 1m) and grasses.
Wetland	A collective term used to describe those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support and that under normal circumstances do support a prevalence of vegetation typically adapted for life in saturated soil conditions. The internationally accepted definition of a wetland includes - areas of marsh, fern, peatland, or water, whether natural or artificial, permanent, or temporary, with water that is static or flowing, fresh, brackish, or salt, including areas of marine water the depth of which at low tide does not exceed six metres.

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