THE NORTH QUEENSLAND NATURALIST

CAIRNS

Journal of

NORTH QUEENSLAND NATURALISTS CLUB

Founder, Presd. The late Dr. HUGO FLECKER.

OBJECTS - The futherance of the study of the various branches of Natural History and the preservation of our heritage of indigenous fauna and flora.

ADDRESS — Box 991, P.O. CAIRNS.
Q. 4870, Australia.

MEETINGS - Second Tuesday of each month at Oddfellows Hall, Lake St., 8p. m.
FIELD DAYS - Sunday before meeting. Notice of place and time given in "Cairns Post".

Subscriptions (Due September 30):
City and Suburban Members, $2.50. Country Members, $2.00.
Junior Members, 50c.

Vol. 35. NOVEMBER, 1968. No. 147.

CONTENTS.

"Each Author is responsible for the opinions and facts expressed in his or her article".

Club Officers — September 30, 1968 to September 30, 1969.

President : A. J. CASSELS, Esq.

Hon. Secretary : Mrs. M. L. CASSELS. Hon. Treasurer : Mr. G. AYRES.

Editor : Miss J. MORRIS.

CLUB HANDBOOKS.

Check List of North Queensland Orchids	75c
Check List of North Queensland Ferns	10c
Edible Plants in North Queensland	20c
List of Birds Occuring in North Queensland	20c
Marketable Fish of the Cairns Sea	10c
Check List of Australian Dryopidae	5c

(Plus Postage).

EDITORIAL.

A report released in State Parliament recently by the Minister for Primary Industries indicates that the simple economics of the kangaroo shooting industry will safeguard the continued existence of the red kangaroo: that when 'roo numbers fall below an exonomic level, the number of shooters will fall also. The Minister further assured us that the kangaroo could live unmolested in inaccessible tracts of country where it was uneconomic for shooters to go.

Will our Minister ever be able to claim that our kangaroos and other native animals can be senn readily and in large numbers in a systme of scientifically controlled parks and sanctuaries throughout the State, and not merely as relicts behind the bars of a zoo? It has been achieved in other countries.

Christmas greetings to all readers of this Journal, and a gentle reminder that many more contributions are needer for its publication in 1969.

-ooo-

N.B. Could your subscription still be due?

FOREST FIRES AND EROSION

"Thou shalt inherit the holy earth as a faithful steward, conserving its resources and productivity from generation to generation."

"Thou shalt protect thy fields from soil erosion and thy hills from overgrazing by the heards, so that thy descendants may have abundance forever."

"If any shall fail in this stewardship of the land, his fertile fields shall become infertile stones and gullies and his descendants shall decrease and live in poverty or vanish from the face of the earth."

This quotation is called "the eleventh Commandment" and was written by an American soil conservation officer. It was written in the first place for the man who owns and uses the land, but city people are also affected by what happens on the land.

"Conserving its resources as a faithful steward" is meant for everybody. Natural vegetation, and forest in particular, is one of the resources
Natural vegetation, and forest in particular, is one of the resources.

Forests are particularly valuable for various reasons. Firstly, they are timber producing areas. Timber and timber products are the second largest item on our annual import bill.

Secondly, forests regulate our water supply by soaking up rainfall and releasing it slowly over a long period. They work like a sponge.

Thirdly, by intercepting the rainfall they protect the soil from erosion.

Finally, forests have an influence on local climate and form a refuge for wild life, necessary to keep the balance in nature.

Wild fires are the greatest enemy to the natural vegetation on non-cultivable land.

The influence of a fire on this protective cover and the soil is three-fold. Physical: Dry grass and forest litter give a fierce hot fire which kills all young trees, preventing regeneration of the forest. It also weakens the stand of older trees. If this process of burning goes on year after year the tree vegetation disappears, the rain has free access to the soil and erosion takes place. Eventually even grasses are unable to grow because of the lack of soil, and bare rock is the end of the process.

After just over 100 years of settlement in Queensland, we are well on the way of losing the soil, and this process of destruction is an accelerating one. Its effects can be seen in the bare eroded soils and sand-filled creek beds in the upper region of the Burdekin River.

Other effects are the flash floods in the rivers, and the dry season shortage of water.

Some of the costs which may be linked with this same process are the hundreds of thousands of dollars spent annually by State Government and Local Authorities on repairing roads, railways and bridges after the floods and on dredging to keep our harbours open.

Biological: The biological aspect of fire is the killing of animals and insects. Soil is not a dead substance as the rock from which it was derived, but is alive with fungi, bacteria, earthworms, ants, termites and many other organisms. They live, feed, multiply and die in the soil. They transform organic and inorganic matter, increase the infiltration, change the structure of the soil and influence many other processes that take place in a fertile soil.

Chemical: Chemical changes take place as a result of a fire. Colloids are permanently changed by heating. Nitrogen is lost to the atmosphere and many minerals are more easily leached or washed out.

Man in his search for more cultivable land is of course the greater destroyer of the natural vegetation. However, wild fires are also an important agent in the destruction of vegetation and creation of conditions for erosion to take place.

To understand the importance of forest fires in the erosion process, we have to examine what happens when natural vegetation has been destroyed.

The main agents that cause erosion are water and wind. Of these water is the most important in this part of Queensland.

If you drop a big stone on the soil it makes a hole.

Energy is required to do this.

The total amount of energy from a good storms is tremendous, if you consider that 1 acre-inch of water weighs 100 tons and that this falls from a considerable height.

This energy has to be dissipated.

When rain falls on land protected with vegetation, the falling drops are intercepted by the trees, the undergrowth and the grass. The energy is dissipated here. Clean water filters through the surface litter into the soil and eventually reappears as springs to feed the creeks and rivers. This is the sponge working, as mentioned earlier.

Once the protective cover has been removed, the full force of the raindrops hits the bare soil.

It is the impact of raindrops on beare soil that starts erosion. In this case, the energy dislodges small soil particles which are thrown up in the air and brought into suspension. The resulting muddy water blocks the pore spaces in between the soil crumbs and a surface crust is formed. This crust inhibits further infiltration and the result is run-off on the surface.

Soil is moved down the slope in two ways: the fine material in suspension and the coarser material through the scouring effect of running water on the surface. To the farmer this means the loss of productive land, on uncultivable land it means that creeks and rivers are choked with rock, gravel and sand.

This material, deposited where it is not wanted, may damage roads, railways and bridges. The rivers may even change course and destroy productive land lower down the slope or overlay farm land with useless material. The silt in suspension is deposited in harbours and along the coast, causing all its associated problems.

For the farmers there are ways and means to keep this man-made erosion to a minimum; on all other land we have only the natural vegetation to rely on for protection.

What has erosion done in the past?

Life and therfore agriculture flourished in the Middle East ages ago. The valleys of the Euphrates, Tigris, Jordon and the Lebanon were once centres of great civilizations. Today these areas are barren wastes, stripped of natural vegetation and fertile soil. They are a good example of man's destructive powers and of uncontrolled erosion.

In China the Yellow River has over the ages built up its own bed 40 feet above the surface of the surrounding country - a result of de-forestation followed by erosion in the upper regions of the river.

In North America, in recent times, over 50 million acres of cultivable land were lost after the removal of the natural vegetation follower by unwise land use.

In Queensland we have 4 million acres under the plough, of which the biggest portion once was ocvered with forest. At present $1\frac{1}{2}$ million acres are in urgent need of protection from soil erosion.

These examples show what erosion does, and forest fires contribute much to the start of this destructive process that ends with bare rock.

There are other aspects in relation to forest fires which I have not mentioned. I feel it is quite obvious that to look at green trees is more pleasing to the eye than to look at bare rock or black stumps.

J. D. Veurman - Soil Conservation Officer, Atherton - from an address to the N. Q. Naturalists' Club, Feb. 1965.

—o-o—

A WALK UP A RIVER.

I went for a walk at Easter (1966) up the .... River. I did not get right up to the high country, where there are some good rock holes full of fish. However I went up the creek about 14 miles. I caught one fresh water crocodile as it was trying to swallow a frog (the frog escaped), but I let it go. I am very soft-hearted as far as all reptiles go. I also saw a beauty submerged in a shallow pool. It was over 4 feet long. I stroked it on the tail and it made no movement, so I poked it with a stick, whereupon it did a backward somersault and shot for the open river. When going on trips like that I always carry a rifle, but only use it for what I consider vermin - mainly pig (of which I shot two). All through the night, when I got up to stoke the fire, I would shine the torch up the creek and see the red eyes of fresh water crocodiles all over the place, most of them small but the occasional large one. There were plenty of tracks in the sand, too; also many dingo tracks, although I did not see any in the flesh. I saw jabirus and a duck with young, and many other water birds, mainly shags, herons and bitterns. I caught enough fish for a feed and cooked them in the coals. But by then I was getting a bit lonely - two days are enough

for me with no one to talk to - so I headed back, and got to the road at dusk. A walk of 30-odd miles over rough going in less than 48 hours certainly had its effect on me next day, but it was a pleasant trip.

Ben Constable.

*River not named for the sake of its crocodiles.

THE GENUS SONNERTIA IN AUSTRALIA

with notes on HYBRIDIZATION OF ITS TWO SPECIES

J. MULLER AND C. G. G. J. VAN STEENIS
Rijksherbarium, Leyden, Netherlands.

In a previous paper (1) we have treated the material of Sonneratia in Queensland and the Northern Territory as far as represented in the Brisbane Herbarium.

We have now examined also the material in the herbaria at Sydney, Melbourne, and new material collected by Dr. C. den Hartog in 1967.

This has yielded some interesting data. It confirmed that Sonneratia occurs only scattered and that the number of localities is fairly restricted, and that in several localities the number of trees is small, or even very small. Also the remarks by MacNae (2), who mentioned its occurrence from the mouth of the Daintree R., Johnstone R. and Darwin, emphasize the scarcity if compared with the mostly massive occurrence in the Malesian archipelago.

The most interesting discovery is that hybridization occurs, the second record known in this genus, and that the rarest partner, S. caseolaris, has hardly been observed in its pure form as far as collections are made.

As far as the material examined goes, the range of Sonneratia in Australia is from Sunday I. in northern western Australia eastwards to the Northumberland Is. off eastern Queensland.

According to Mr. L. S. Smith (in litt.) "Sonneratia occurs intermittently along the Queensland coastline from the tip of Cape York to at least as far south as near Proserpine."

On the accompanying map we have indicated the localities known to us. Fig. 1.

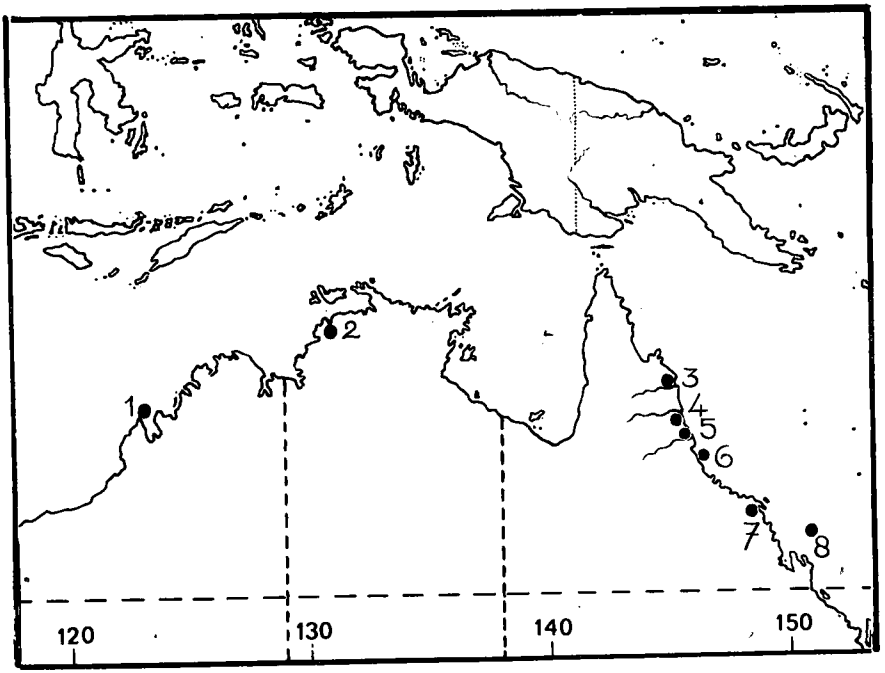

Fig. 1. Localities of Sonneratia in North Australia where collections were made. 1. Sunday I., 2. Port Darwin, and just east of it Adan Bay, 3. Cooktown, near mouth of Endeavour R., 4. Cairns, and Port Douglas Beach, south of the mouth of Daintree R., 5. Innisfail on Johnstone R. mouth, 6. Hinchinbrook Is., 7. Proserpine, 8. Northumberland Is.

Sonneratia alba J. Sm.

Only a few remarks are necessary because the larger part of the material is clearly S. alba. Curiously den Hartog collected near Cairns from one tree growing on the northern outskirts of the town, at c. 100 m distance from the house of Dr. L. J. Brass material in which no petals could be found, but in which a single spathulate petaloid stamen was observed.

Furthermore, there is often an anomaly with the fruit in which there is a shallow circular depression round the base of the style; in normal material the top of the fruit is flattish with a conical style-base elevated from it. As we

will mention later this depression is characteristic in all hybrids. It might point to a slight degree of sterility due to introgression, but we are not certain that all fruits observed were fully mature.

The following localities are known:
WESTERN AUSTRALIA. W. Kimberley, Sunday I., W. V. Fitzgerald, Nov. 1906, N. S. W. 85230.
NORTHERN TERRITORY. Darwin: Schultz 93 (MEL); Holtze 334, 340 anno 1883 (MEL); Point Stephens, Adan Bay, S. T. Blake 16953 (BRI); Bleeser 624, Darwin, without precise locality, cf. O. Schwarz, in Fedde, Repert. 24 (1927) 88 (not seen).
QUEENSLAND. Cooktown, A. Musgrave 9/6/51, N. S. W. 85229; ditto, W. E. Roth, 30/6/99 (BRI); Port Douglas Beach, W. T. J., without date or number (BRI); Cairns: two small trees in northern outskirts of town near Dr. Brass' house, Cairns, den Hartog 893 (no petals; fruit top with a depression) (L); ditto, 1 tree in harbour, den Hartog 975 (L). Hinchinbrook I. at Scraggy Point, S. T. Blake 18838 (BRI). Northumberland Is., Woods, without number, probably S. alba (young fruit) (MEL).
Without precise locality: North Queensland: W. Hill 45 (or 48?) (MEL).

Sonneratia caseolaris (L.) Engl.

This species surely occurs in Australia, but in a genuine form it has been collected only twice, on Endeavour R., Cooktown vicinity, and on Johnstone R., Persietz (Persich? or Persieh?) Oct. 1885 (MEL). Johnstone R., Dr. Th. L. Bancroft, anno 1886, sterile hence uncertain (BRI 063649); ditto, in fruit, G. H. Ladbrook, July 1917 (BRI 063648).

Sonneratia alba x Sonneratia caseolaris.

Above we have already remarked that a number of specimens show a slight discrepancy with the pure species in having a depression on the top of the fruit which might point to partial sterility. Indubitable hybrids are, however, also found. Den Hartog 1060 from Daintree R. has a depression on the fruit, with the latter only partly emerging from the calyx tube (receptacular tube), red filaments, and pollen of the caseolaris type, while the leaves resemble S. caseolaris, but it has abnormally large buds, with sometimes peculiar, large, wart-like, bulging, solid excrescences at the base, the same fruit anomalies as in den Hartog 1060, and a pollen sterility of c. 26%; it has red filaments and well-developed, wide, red petals, whilst also the leaves are those of S. caseolaris.

We may add that similar anomalies as mentioned for these two specimens have also been recorded by one of us (3) from Brunei.

Finally we may again encourage that observations be made in the field and good collections made of complete material of single, marked trees. Hitherto we have not seen any complete collection of S. caseolaris.

REFERENCES

(1) van Steenis, C. G. G. J. : Do Sonneratia caseolaris and S. alba occur in Queensland or the Northern Territory? The North Queensl. Natur. (1968)
(2) MacNae, W. : Mangroves in eastern and southern Australia. Austr. Journ. Bot. 14 (1966) 67-104, 9 fig., 3 pl., especially p. 85.
(3) Müller, J. & S. Y. Hou-Liu: Hybrids and chromosomes in the genus Sonneratia. Blumea 14 (1966) 337-343, 5 fig.