FILE S18.1
CBN. Investigation Notes

Buff folder.

SPRING 1984.

MORAY FOREST DISTRICT

CULBIN INVESTIGATION NOTE

copy sent to Macaulay for info. ✓

Water Table/Salinity Check Buckie Loch Spring ' 84

The above was carried out in April '84 after a meeting between Miss MacCallum Webster of Dyke local Botanist and Moray District staff S.W.R. Stewart F.D.M. and A.N. Gordon D.F.

This dried up Winter Loch is now at its most vulnerable as a bight of coastal erosion moving slowly westward, is currently causing maximum erosion to the dunes between Buckie Loch and the sea. This is a view expressed by Sinclair Ross of Forres, local Geologist, who considers that this particular part of the coast will be severely affected by tidal scour for perhaps the next few years before the point of maximum erosion passes on, to be followed in several years by another bight. The result of this is that Buckie Loch is now subject to periodic inundations from the sea. This was especially so during the high tides at end Jan/beginning Feb '83 when large areas of this dried-up Winter Loch were flooded and lay water-logged for many weeks (ref colour prints A.W.F.W.)

Although by summer the loch dries up and the water table seemingly reverts to its normal level, ultimately the whole area may well soon revert back to the sea. Many rare botanical plants, some at the limit of their natural range, are currently found in this as yet dried-up loch. These must now be at risk along with the extensive willow scrub (and to some extent birch) widespread at the west end, where in '83 brackish water covered the area for many weeks. A decision was therefore made at the above meeting to check on the salinity of the sand at rooting depth (see below) and at the same time to determine water table depth, to enable the apparently inevitable reversion to be monitored in some way.

Reference the above, five pits were dug in an approximate E - W transect across the Buckie Loch area (ref map attached) covering a broad spectrum of site types, rather than on a purely systematic basis. Each pit has been marked with a numbered ride pin. Each pit was dug to below the water-table, i.e sufficient sand was excavated to enable the water to seep in and find its own level. Water table measurements were taken last in each case to enable the level to settle. (They were also checked the following day). All measurements were taken from a common point, the base of the live vegetation layer (the top of the humus layer).

Three measurements were taken at each pit. (o.n 11/4/84).

a. Down to bottom of humus layer (i.e. depth of humus).

b. Down to the start of gleying, i.e. start of blue.grey sand.

c. Down to the water - table.

The sand sample (salinity test) was taken in each case from around the main rooting zone of the vegetation. This was usually from 10cm below the top of the humus layer down to about 35cm. Sand taken from this general horizon left plenty of roots hanging in the scooped out space. In pit 5 however, attaining this depth was not feasible due to the high water-table.

Pit 1 (East)

Open grass/sedge area.

a. 15cm
b. 60cm
c. 92cm (94cm the following day).

CULBIN INVESTIGATION NOTE (CONTD)

Pit 2

Open area. Evidence of tidal debris inland from this point, therefore during the storm of Spring '83 at least, this area had been flooded.

a. 14cm

b. 89cm (64 - 89 intergrade).

c. 99cm (95cm the following day).

Pit 3

Again open area but definite evidence of past flooding, the surface vegetation blackened and seemingly burned (with salt?). Fresh plants are appearing on this blackened surface, [illegible]nts with rosette type leaves. From the start the sand was very wet in this pit, being mottled brown. Still plenty evidence of rooting.

a. 6cm

b. 41cm

c. 56cm (51 cm the following day)

Pit 4

Dug under hardwood scrub, mainly willow. Lush green moist grassy sward. Moist black organic layer then into moist sand.

a. 20cm

b. 47cm

c. 53cm (35cm the following day).

5

Furthest west pit. Open, squelching wet area. Willow round perimeter. Pit dug on edge of extensive patch of false bull rush.

a. 10cm very wet.

b. no demarcation of sand colour. All very wet, anaerobic.

c. 21cm (3 - 4 cm the following day, i.e. pit full).

The sand samples were sent to Macaulay Institute for salinity testing. We are currently awaiting results, and on these will depend the frequency etc. of future samplings.

Filed behind.

A.W.F. Watson.

A W F Watson
For Forest District Manager
April ' 84

Attached, 1 - lay - out
2 - photographs
3 - Running record of depths.

Attach to back of Water Table/Salinity check Buckie Loch. Culbin Investigation notes folder.

THE MACAULAY INSTITUTE FOR SOIL RESEARCH

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2 July 1984

Mr A. Watson,
Forestry Commission,
Research Branch,
Newton,
Elgin

Dear Sandy,

These are the results of your sand samples from Buckie Loch, Culbin.

	% moisture	pH	extracted Sodium. Na	conductivity
pit 1	9.6	6.64	9.6	24.2
2	10.5	6.76	11.7	57.9
3	17.6	6.75	19.6	89.7
4	33.7	6.85	20.5	126.9
5	55.4	6.62	104.5	583.0

The conductivity and sodium (mg l^{-1}) were measured on 20 g 'fresh' sand extracted with 100 ml water.

These results seem to agree with your profile descriptions showing an increase from pit 1 through to pit 5 in % moisture, sodium content and conductivity (which is a measure of the chemical (ionic) constituents).

I hope that these results are satisfactory - if you have any queries or any further samples please write or phone to above.

Yours sincerely,

John

John D. Miller

JDM/CMS

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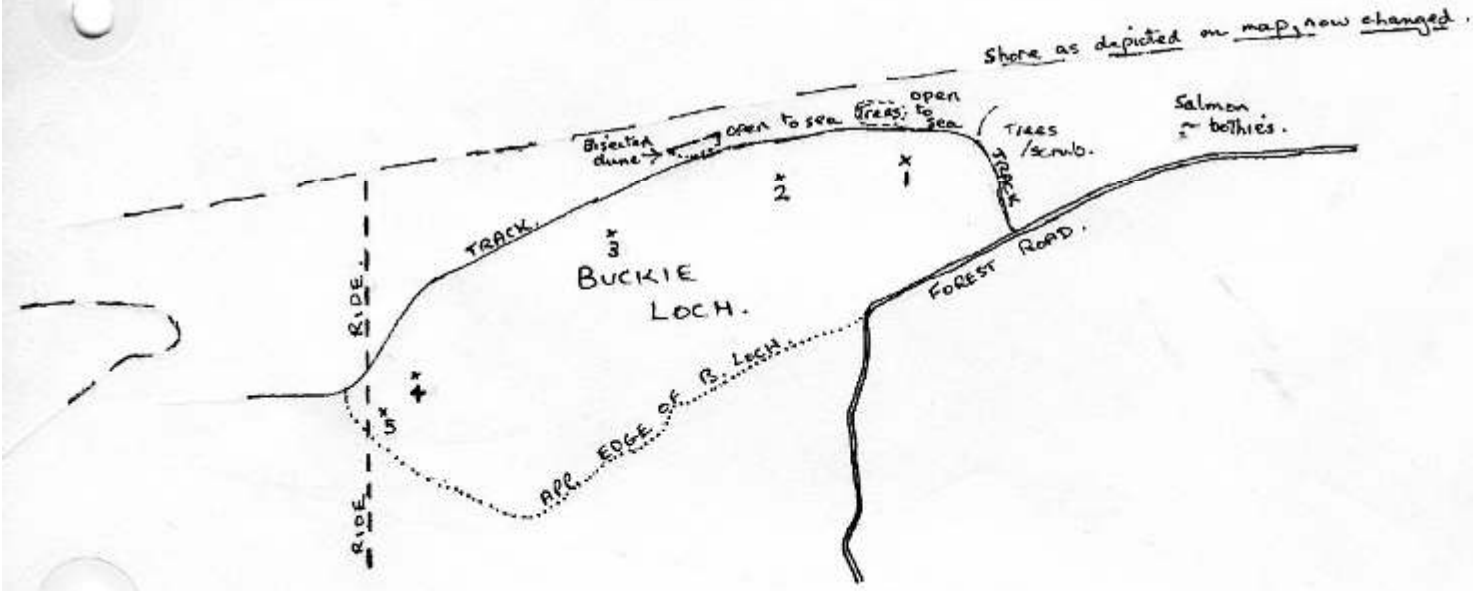
WATER TABLE/SALINITY CHECK BUCKIE LOCH SPRING '84

RUNNING RECORD OF WATER LEVELS IN CENTIMETRES

TES MEASURED	1	2	3	4	5	
G 11/4/84	92	99	56	53	21	
VELS CHECKED TER SETTLING 24/4/84	94	95	51	35	3	
22/5/84 SOME IN-FILL HAD OCCURRED	Dry Current Pit Depth 84	Dry Current Pit Depth 94	Moist in Bottom Current Pit Depth 49	50 Current Pit Depth 55	22 Current Pit Depth 29	

BUCKIE LOCH SPRING '84

SEA



Approximate positions of five pits.
Demarcated by pacing only.

Pits 1-3 are in open areas.

Pit 4 is surrounded by scrub.

Pit 5 is on edge of very wet area.

A.W.T.W.
Spring 84.

BUCKIE LOCH SPRING ' 84

Looking eastwards

BUCKIE LOCH SPRING ' 84

Typical flooding, bottom picture taken nearer west end.

LUCKIE LOCH SPRING ' 84

Looking westwards.

Bottom picture a close-up of bisected dune visible in middle distance of upper two pictures.