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LAND CLASSIFICATION AND NEW GEOGRAPHICAL NAMES IN THE NORTH-EAST PART OF CANNING BASIN, W.A.

by

J.N. Casey and P.F. Nelligan.

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Land Classification Map, N.E. Canning Desert, W.A.
Scale 1" = 10 miles.

INTRODUCTION.

Mr. P.F. Nelligan, a surveyor from the Department of Lands and Survey, Perth and J.N. Casey from this Bureau, combined to produce a land classification map of the north-east part of the Canning Basin - an area covered largely by sand and dunes, interspersed with isolated rock outcrops, claypans and salt lakes.

The classification was plotted on 1 mile to 1 inch photo-indices prepared by National Mapping, Canberra, and the information was transferred to a 10 mile to 1 inch Land and Survey Dept. map by the drawing section of the L. and S. Dept.

The controlled compilation of this section of the Canning Basin from aerial photographs has not been completed; therefore the land classification map is not accurate, but serves to show the relative distribution of the various land units.

Many features in the desert have been named by the surveyors and geological parties which operated in this area during 1955. Most of these features are plotted on the accompanying map, and their description is given in this record. All such names have been approved by the Nomenclature Committee, Lands and Survey, Perth.

The description covering the various land appraisal and classification units is as follows:-

SYMBOL		DESCRIPTION
(1)	R.	RIVER FRONTAGE: consists of alluvium soil supporting a growth of tall eucalyptus, (white gums, river gums and bloodwoods), some chestnuts, bohemias and cadjebuts, Mitchell and Flinders grass and other pastoral grasses. This area is excellent for stock but the unit is mainly confined to the Christmas Creek, Wolf Creek, and upper reaches of the Sturt Creek areas; along Sturt Creek patches of blue bush grow in swampy areas. This unit occurs in isolated patches along major creeks draining from the higher ranges within the desert proper, but these occurrences in the desert may be too scattered to be of any effective use.
(2)	C.	PREDOMINANTLY CLAY SOILS WITH SCATTERED CLAY PANS: the predominant clay soil provides pasture grasses with only small amounts of spinifex, and if this unit occurred in sufficient quantity it would provide good pastoral lands; but apart from areas south of Mt. Bannerman (Lake Jones, Lake Betty, etc.), the occurrences are too isolated and small. The main tree growth is supplejack, konkerberri, a type of sandalwood, some low mallee, and good grasses; some claypans are covered with a "samphire like" herbage. The prospect of obtaining shallow water is fair, but these areas produce impermeable claypans which act as good surface catchments which last for several months after rain; water at 250-350 feet depth can usually be found. This unit occurs near breakaway hills, and it has a transition boundary with the sand of the rest of the desert. In some places low ti-tree scrub grows around the claypans.
(3)	S.	SAND AND SAND FLATS: these are practically entirely covered with spinifex clumps, stunted low acacia, mallee scrub, desert and white gums, needlewoods, and a few distinctive desert walnuts. Thick belts of desert oaks (Casuarina) grow near No. 49 Well and Chungla Well (west side of Sturt Creek). Very little

grass is seen except after fire burns when a wealth of leguminous herbage, low shrubs and grasses appear for 6 to 18 months until the spinifex, once again, takes control. In most places water can be found at shallow depths although a supply may not be guaranteed. Usually this shallow water will be fresh or suitable for stock; however, a better supply should be obtained at depth from this country. In areas such as west of French Hills, south-west of Fisher Bluff, south of Billiluna Station, west of the Lewis Range and north-west of L. Lucas, the sand is mixed with a pisolitic ironstone rubble; this country, although soft to vehicles, is very open, has more grass than usual and less large spinifex clumps; needlewood trees predominate here.

Sand that overlies Precambrian rock areas (viz. northern part of Mt. Bannerman, north and east part of Billiluna, east half of Lucas and Stansmore) always seems to grow more grasses amongst the spinifex, and more trees and shrubs than the sand over the sedimentary younger rocks. This may be due to the higher concentration of trace minerals and phosphates in the Precambrian rocks.

(4) D. SAND DUNES: this is by far the most predominant pattern, and it is characterised by long parallel sand dunes, many miles in length, often $\frac{1}{4}$ to 1 mile apart and varying in height from 10 ft. to 90 ft., although the average height in this area is 30 - 40 ft. In places many large gum trees grow along the crest of the dune; the inter-dune valleys are flat and open, although many groves of acacia, mallee and ti-tree occur. Spinifex is practically the only form of grass except after fire burns when other grasses and herbage grow for a short time. Native wells are often dug at the base of dunes, particularly near a group of gums or ti-tree.

(5) L. SALT LAKE, SALT PANS AND TRAVERTINE: this unit is characterised by stunted gums (mallee), boree (like mulga), some acacia, low ti-tree scrub, and pastoral grasses scattered amongst spinifex; samphire often covers some salt pans. There are usually many salt pans surrounded by sand and the pans are often associated with areas of internal drainage; some small claypans occur near the margins of salt pans; travertine or limestone may represent an earlier extension of a salt-lake system, and usually provides quite good grasses and shallow sub-surface water. Many native wells and soaks are found in this travertine , which is cavernous in places; some of the travertine country has been partly covered by sand dunes. Main occurrence of this unit is in the lower reaches of the Sturt Creek where it provides the large grazing area for Billiluna Station; smaller outcrops occur south of the Gardiner Ranges, and west of the Stansmore Range.

(6) H. HILLS, BREAKAWAYS, ROCK OUTCROPS: around all the many predominant ranges, various breakaways and isolated rock outcrops that are dotted through the sand plain country, there is always a certain amount of grass mixed with spinifex. Valleys in the range country itself, have a certain amount of grass. The hills are usually covered with acacia, minnirichie (type of acacia), low gums and some rock fig, and spinifex. Rock holes are usually found in the hills but few of these may be regarded as permanent.

A general note on some aspects of the area may be of importance in the event of future land development.

POISONS

Poisonous shrubs have been reported from various parts of the area by early explorers who had lost horses and camels, allegedly from poison, during journeys through the desert. The most prevelant poison is Gastrolabium and its known occurrences are: (a) An area aroung Mt. Bannerman and Shiddi Pool (b) An area south of and around the Gardiner Ranges (c) Near the Erica Ranges.

It seems always to occur around rocky ranges, and because of its scattered known occurrence, a careful check should be made on land that is taken up for future pastoral use.

WATER SUPPLY

The area may conveniently be divided into two for the purpose of summarising the water supply. Firstly, the Precambrian areas to the north, north-east, and east extending approximately from north of Mt. Bannerman, to north of Knobby Hills, southwards towards Mt. Elphinstone and south again along the eastern side of the Stansmore Ranges. In this area good supplies of water can often be obtained at reasonably shallow depths, i.e. less than 100 ft. but failing this shallow supply, depths of 300-400 feet may have to be drilled to obtain a supply in quartzite-shale country (as for example east of Sturt Ck. Homestead) or new sites selected if granite or gneiss is struck. However, suitable sites can usually be chosen by taking into consideration the geological structure of the rocks.

Secondly, the area covered by sedimentary rocks of possible Carboniferous, Permian and Mesozoic Age; water should always be found at depths less than 500 ft. but in many parts of the area a good supply of fresh water may be obtained at much shallower depths and in practically all cases, sub-surface water will be struck at depths of less than 100 ft., although this shallow water may not be fresh and the supply may be limited. A few permanent rock holes exist throughout the area but reliance on surface water for pastoral purposes could be disasterous for any pastoral development. The first requirement for pastoral work would be to sink some bores to such a depth that a reliable supply of water results.

FIRE BURNS

Whenever the spinifex is burned, a lush growth of low shrubs and grasses appear and the new spinifex also becomes green and tender and edible for stock. After 6 to 18 months the spinifex again has control and becomes coarse and useless for stock. Although burning is therefore beneficial, consideration must be given to the effect of erosion, because after the spinifex has been burned the sand tends to blow and migrate towards the west, and if such an area of sand is used as a pastoral land and the land is burned to encourage growth of young spinifex, serious erosion might ensue.

SUMMARY

Although isolated good patches of land exist within the desert proper, it is felt that, for the time being anyway, the intervening sand and sand dune areas would prove too worthless and too difficult for access to make economic use of the scattered patches of good pastoral land. The most suitable patch of land not already used for grazing was in the Bishop Range area.

GEOGRAPHICAL FEATURES (New Names)

All names have been approved by the Lands and Survey Department, Perth.

The names will be listed under the 4-mile military map sheets.

Mt. Bannerman Sheet

Boundary Hill - 80 feet high Permian sandstone hill, 1500 feet east of Christmas Creek Station, south-east boundary peg.

Bulka Hills - Precambrian quartzite hills, 40 miles north-west of Mt. Bannerman. Named from Bulka Creek, which drains west into Bulka Swamp from these hills.

Brown Lookout - An abrupt 120 ft. high hill composed of Triassic fossiliferous sandstone, 2 miles south of a break-away range and 8 miles West of Mt. Erskine. Cairn erected. Named after Len Brown, manager of Billiluna Station.

Lake Betty - Most westerly of a chain of claypans, Lat. 19°30' long. 126°25'; it is 5 miles by 4 miles. Named after Mrs. Betty Brown, wife of the Manager of Billiluna Station.

Lake Jones - Samphire-covered lake with small claypans on the east side; dimensions 5 miles by 2 miles. Named after Mr. Vic Jones, manager of Christmas Creek Station.

Lake Lonergan - Central claypan of a chain of three; dimensions 5 miles by 3 miles. Named after the wife of a stockman with whom she travelled over the Canning Stockroute - the only white woman to do so.

Lake McLernon - Eastern claypan of a chain of three; dimensions 4 miles by 1 mile, altitude 950 feet. Named after McLernon, who was with the Locke Oil Exploration and killed by blacks.near Well 37 in 1922.

Lake Doman - A hard claypan, 1½ miles in diameter, 12 miles south-west of Mt. Erskine (Carnegie 1896). Altitude 980 feet. Has a smaller claypan to the N.W. and a string of claypans to the S.E.. Named after Miss Doman (Waneroo) the present owner of Billiluna Station.

Shiddi Creek - The creek flowing S.W. from Shiddi Pool (named by Carnegie after a camel which died here) in the Mt. Bannerman area.

Billiluna Sheet

Astro Waterhole - Semi permanent waterhole in Wolf Creek at Billiluna - Halls Creek road crossing. Astrofix (N.I. by P.F. Nelligan, lat. 18°59'36", long. 127° 41'19") was taken at the east end of the pool.

Denison Range - Range of quartzitic sandstone Precambrian hills S.E. of Sturt Creek Homestead, approximately lat. 19°15', long. 128°15'. Length of range 14 miles and runs in S.E. direction. It is parallel to a similar range farther east which terminates in Mt. Weekes.
Named after Denison Downs Station, the original name of Sturt Creek Station in 1896; Sturt Creek Station then was marked many miles to the N.E.

Falconer Hills - Hills of probable Carboniferous ferruginised sandstone, 80 ft. high, 4 miles N.W. of Billiluna Homestead. Named after Falconer, an early owner of Billiluna.

Skeen Hill - 2 miles east of Skeen Waterhole which is on the East bank of Sturt Creek. Hill is 80 feet high, composed of probable Carboniferous sandstone.

Lucas Sheet

Condren Pinnacles - Two pinnacles of Permian sandstone with plant fossils, 8 miles S.S.E. of Old Billiluna Homestead. Approx. position lat. 20°8'. long. 127°40'. Locally called "the Pinnacles", but so as no confusion will result with other features in the Fitzroy Basin, they have been called Condren Pinnacles, after Mr. Condren who was killed by blacks at a yard east of Old Billiluna H.S. in the early nineteen hundreds.

Kearney Range - Quartzite range 250' high, 20 miles E. of the 1955 position of Balgo Hills Mission. It has an elongated razor ridge on the S.W. side of the Range (representing a fault line). Bore site selected between this razor back and main Range. Approx. position lat. 20°10', long. 128°10'. Named after Father Kearney, in charge of the Mission during the absence of Father Alphonse.

Lake Maddox - A "lake" or claypan 10 miles N.N.E. of Balgo Hill Mission; lake is 1½ miles in diameter. Position lat. 20°05', long 127°50'. Named after W.H. Maddox, Caltex geologist who did work in the north part of the desert in 1941.

Pallottine Headland- A prominent 150' high headland projecting north from the breakaway country, 13 miles S.E. of Balgo Hills Mission. Composed of sandstone with Permian marine fossils at its base. Approx. position lat. 20°15', long. 127°55'. Named after the Roman Catholic Order of "Pallottine" which controls the Balgo Hill Mission.

Point Alphonse - Conspicuous northern point of the breakaway at the Old Djaluwon Mission, 23 miles S.S.W. of the 1955 Balgo Hill Mission. Sandstone hills about 120' high, position approx. lat. 20°20', long. 127°35'. Named after Father Alphonse, the founder of the mission at Djaluwon and Father-in-charge at the present site at Balgo Hill. The Mission was moved from Djaluwon to Dumadora (7 miles E. of Balgo), before the present site was selected. A shortage of water was the prime cause for moving. - Pt. Alphonse is 2 miles E. of present bore at Djaluwon.

Point Nelligan - A detached mesa on the N.E. side of the Lewis Range. Consists of Precambrian quartzitic sandstone, overlying granite. Position approx. lat. 21°15', long. 128°40', and 2 miles W. of Astrofix N.18. Named after P.F. Nelligan, surveyor from Lands and Survey, Perth, who was in charge of the astrofix work in 1955.

Pownall Creek - Creek 12 miles long, draining N. from the Stretch Range (Carnegie 1896). Position approx. 20°50', long. 127°45'. Named after K. Pownall, cadet surveyor from L. & S. Perth, who worked with the party 1955.

Thomas Peak - A Permian sandstone hill 80' high, with ironstone and claypans at base. Cairn on top; ½ mile N.W. from Astrofix N.28. Named after Allan Thomas Wells, geologist from Bureau of Mineral Resources, who was with the party in 1955. Position approx. lat. 20°58', long. 128°05'.

Cornish Sheet

Chilpada Chara- A group of 200' high hills, lying immediately W. of a N-S line of faulting. Hills are Sandstone with Triassic fossils on top and Permian plants towards the base. Position is lat. 20°10', long. 127°05', and 10 miles N.N.W. of Well 50 or 16 miles S.E. of Astro-Fix N.9, at Black Rocks. Named taken from a report by geologist Maddox for Caltex in 1941, and obviously represents a local native name.

Bishop Range - A conspicuous N-S trending sandstone range, 200' high with a steep eastern side; westerly draining streams form isolated hills. A further range occurs 5 miles East. The position is lat. 20°40', long. 127°25', and 25 miles S.S.W. of Gregory Salt Lake. Astrofix N.13 is near a prominent pinnacle (with cairn) lying 2 miles W. of the main Bishop Range - the highest point has a cairn erected. It was named by the party after Warburtons (1876)"Bishop Dell" - a waterhole found by Samuel Lewis with Warburton's party. Warburton's "Bishop Dell" probably lies further S. in vicinity of Robert's Range, where a waterhole agrees with Lewis' description of "a clump of large gum trees growing in a swamp at bottom of a small creek, which was hemmed in by high sandhills, and then ran through a rocky ridge in which there were fine clear deep water holes 100 ft. in circumference, the green of the gums contrasted with the red of the sand hills on either side and the barren, rocky range in front". No such conditions exist in this area of Bishop Range. But as local usage refers to the area as "Bishop Dell", we retain the name "Bishop" and attach it to the Range.

French Hills - These form a 4-mile long north-south line with a breakaway face on the W. side; a 1½ mile wide claypan is also on the W. side. The 120' high sandstone hills are Permian in age, rockholes (not permanent) occur in a creek draining S.W. from their Southern extremity. Named after S. French, an assistant to the party in 1955. Approx. position lat. 20°55', long. 127°10', and 32 miles S.E. of Lady Edith Lagoon.

Mt. Elliott - Hill rises 150 ft. above the sand plain and it is dissected on the W. side by a stream 50 ft. deep. A fault line passes slightly to the W. of the Mount. It is composed of sandstone of Permian age. Approx. position lat. 20°40', long. 126°45', and 17 miles S.S.E. of Godfrey Tank. Named after Robin Elliott, geologist with W.A.P.E.T. Oil Coy. and who was with the party for a traverse in 1955.

Roberts Range.- These hills form an 8 miles long breakaway, stretching from the S. in a curve to the N.W.; the breakaway face is on the W. side. The 150' high sandstone hills are Permian in age and have marine fossils at their base. Good waterholes exist in the creeks flowing to the N. from this Range. Approx position is lat. 20°55', long. 127°15', and 50 miles S.S.W. of Gregory Salt Lake. It is named after D. Roberts who was a geologist working with the W.A.P.E.T. party in this area in 1955.

Stansmore Sheet

Murraba Ranges - These north-trending quartzitic sandstone ranges are 300 feet above the salt lakes of Wills and Hazlett and outcrop on their eastern edge. Position approx. lat. 21°30', long. 128°50', and 40 miles E. of the Stansmore Ranges. M. Terry (1933) first explored this area, naming the lakes, Nicker Ck.,(after Ben Nicker, his camelman, in 1932-33 Expedition), Brookman Water, and Red Pound Cliff. The range is named from the native word "Murraba" meaning salt water; this seems appropriate as the Ranges are interspersed by salt pans and salt lakes.

Point Moody - Conical hill 100 ft. high of Sandstone, with Permian marine fossils. Has a breakaway immediately north and breakaways to the south and S.W. Cairn erected. Ironstone and claypan flats surround the hill and make the floor of the breakaways. Position approx. lat. 21°20', long. 127°50', and 12 miles W. of the Stansmore Range scarp and 25 miles S.E. of Astrofix N.12. Named after Robert Moody, publican at Halls Creek, who was with Canning 1906 on the Stock Route Survey.

Warrie Peak - A 200 ft. high dissected sandstone peak in the south part of the Stansmore Range. It appears to have a flat laterite cap over north-dipping sandstone and has Permian marine fossils at the base. It is 1-2 miles west of the eastern front of the Stansmore Range. Position approx. lat. 21°24', long. 128°06' and 3 mls. N.E. of Astrofix N.26. Named after the black boy Warrie, who was with Carnegie in 1896 - Carnegie named the Stansmore Range and Warrie Peak is near the southern extremity of this range.

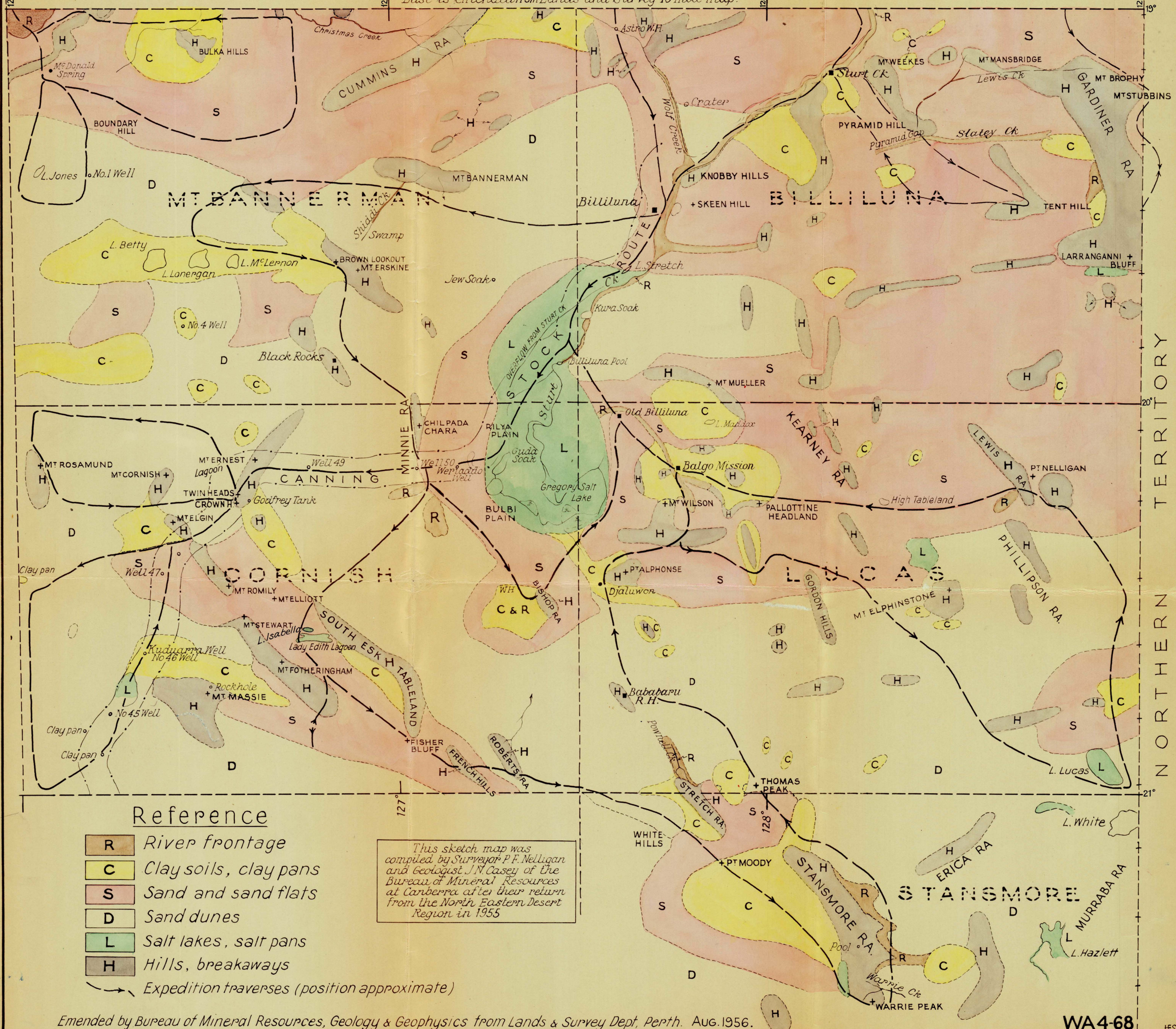
Warrie Creek - This creek rises near Warrie Peak in the Stansmore Range and runs east for 12 miles towards Lake Hazlett (Terry 1933). It is the longest Creek flowing from the Stansmore Range. Named after Warrie Peak. This creek, Carnegie 1896 thought, may have reached "Warburton's Lake White".

White Hills - 80' high sandstone hills of Permian age. They form a broken north-trending line, - this line has formed as a result of faulting. The White Hills refer to the north part of this line and are conspicuous from the north or west. Several claypans occur 2 miles to the W. Position approx. 21°08', long. 127°32', and 9 mls. S.S.E. of Astrofix N.12. Named after Allan White, mechanic from Darwin, who was with the party in 1955.

LAND CLASSIFICATION MAP
N.E. CANNING DESERT
WESTERN AUSTRALIA

SCALE OF MILES
10 8 6 4 2 0 10 20 30

NOTE: *Positions of features are approximate only and not controlled by aerial photographs*
Base is emended from Lands and Survey 10 mile map.



Reference

R	River frontage
C	Clay soils, clay pans
S	Sand and sand flats
D	Sand dunes
L	Salt lakes, salt pans
H	Hills, breakaways
→	Expedition traverses (position approximate)

This sketch map was compiled by Surveyor P.F. Nelligan and Geologist J.N. Casey of the Bureau of Mineral Resources at Canberra after their return from the North Eastern Desert Region in 1955

Emended by Bureau of Mineral Resources, Geology & Geophysics from Lands & Survey Dept, Perth. AUG. 1956.

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