

4631

(encl #13 not received)
CALB Apr 29 1917

See also Desc. Report 4654
This Report refers also to 4654

Form 504

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

....., Director

State: Hawaiian Is.

DESCRIPTIVE REPORT

~~Topographic~~ } Sheet No. ¹² 4631
~~Hydrographic~~ }

LOCALITY

Niihau

N. End of Niihau

(For inches hydro see desc. rep. for H. 4654)

1926

CHIEF OF PARTY

C.L. Garner

GOVERNMENT PRINTING OFFICE

4631

C. & G. SURVEY
L. & A
APR 19 1927
Acc. No

Descriptive Report
of
Hydrographic Sheet.

North Niihau, T.H.
Scale 1:20,000.
Str. Discoverer - 1926.
Clem L. Garner. Chief of Party.

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

Note:

This descriptive report of ship work covers the work on both north and south ribbon sheets. The south sheet is left on the Discoverer at time of transfer for completion and descriptive report of master's work for both sheets are to be written by Mr. Hubbard and transmitted with the sheet for the south end of the island. C. L. G. -

DESCRIPTIVE REPORT
to accompany

HYDROGRAPHIC SHEETS NO'S. 13 AND 12,

south Niihau, and north Niihau, respectively,

surveyed by the Str. DISCOVERER, C. L. Garner, Comdg,
during the season of 1926.

Commanding Officer's Instructions, dated Nov. 23, 1925.

1. LIMITS, SCALE: Hydrographic sheets No's. 13, and 12, field designation, cover the survey of the waters around Niihau and Lehua Ids., from close inshore out to the 100 fathom curve. Sheet 13 takes in the southern part of Niihau, and extends from latitude 21° 44' N, longitude 160° 06' W, to latitude 22° 00' N and longitude 160° 17' W, respectively. Sheet 12 covers the northern part of Niihau, and also Lehua Island, and reaches from latitude 21° 50' N to 22° 04' N, and from longitude 160° 01' W to 160° 11' W. The scale of this work is 1 : 20,000. Duplicate boat sheets were used in executing this survey, so that the ship and launch work might be done most expeditiously. The close inshore development is covered in the report submitted by L. S. Hubbard, Jr. H. & G. Engineer, who had immediate charge of that work. This report will cover the ship work on the above sheets, which work extends approximately from the 15 to the 100 fathom curves.

2. GENERAL DESCRIPTION OF THE COAST LINE: The coast line of Niihau, except for the northern section of the east side, is low, rocky, and interspersed with sections of sand beach. On the west side, the Coast line is irregular, with a high table land directly back of the coast. The coast line on the north-eastern side of the island is rugged and considerably cut up by gorges. The most prominent features on the coast of Niihau are the high, precipitous cliffs on the east side of the island, near the north end. The southern point of the island, which is marked by a prominent hill, is steep - to. The northern part of the island, extending north from the high table land near the middle of the island, is low and undulating, with a number of grass-covered knolls a short distance back of the coast.

3. LANDMARKS: "Paniau" is the highest point on the island of Niihau, and marks the precipitous cliffs on the east coast, near the middle of the island. The northern section of the island is low and flat, and not recognizable from seaward till close to.

"Kaeo" is a cone-shaped peak near the center of the island, readily distinguishable from the westward, but not visible from the eastward.

Cape "Kawaihoa", marking the southern extremity of Niihau, is a bold promontory, rising abruptly above the low land to the northward. This makes a conspicuous landmark as seen from seaward from the east and west.

"Kawaewae" is a low, rounded, wooded hill near the middle of the island and near the west coast. It is distinguishable from the westward, because of the low, flat land that surrounds it.

"Lehua Island" is a small, crescent-shaped, conical topped, rocky, bold islet, lying about 1/2 mile north of Niihau, which makes a prominent landmark from seaward as viewed from the east and west.

Should be more definite c.p.b.

4. INSHORE DANGERS: This subject is dealt with in detail in the descriptive report accompanying the inshore development. The bottom off the northwest coast of Niihau is shoal and quite irregular, and sunken rocks or coral heads, dangerous to navigation, lying from 1/2 to 1 mile off shore, were developed by this survey. On the east side of Niihau, near the north end and extending south of Kii Anchorage, the bottom is shoal and irregular, hence this section of the coast should be given a berth of at least 1 1/2 miles. Foul ground extends off the north end of Niihau, but there is a safe steamer channel between Niihau and Lehua, close to the southerly and southeasterly shores of Lehua. Except for the dangerous ground extending off the northern coast of Niihau as mentioned above, the foul ground, stated in the Coast Pilot, as extending well north and east of Lehua does not exist. Deep water surrounds Lehua Island, close to. Except for the irregular bottom off the northwest and northeast sections of the coast, as stated above, the remainder of the east and west coasts of Niihau is free of outlying dangers.

5. ANCHORAGES: Nonopapa anchorage, on the west coast, is a safe anchorage, well sheltered from ~~the trade~~ ^{SE winds only}. The Discoverer anchored about 400 meters off the landing in 7 - 9 fathoms. The sailing directions as given in the Coast Pilot, were verified. There are no other ^{regular} recommended anchorages on Niihau, though temporary anchorage can be made off Kii Bay, and elsewhere along the coast.

6. SURVEY METHODS: The control for this hydrographic survey is based on triangulation as carried forward from recovered triangulation stations of the Hawaiian Territorial and the U. S. Geological Survey, on the island of Kauai. This triangulation is on the Independent Hawaiian datum. However, the hydrography as protracted and plotted on the boat sheets is erroneous as to position, due to an existing discrepancy in the old triangulation on Niihau. The connection from Kauai to recovered stations on Niihau and Lehua was reobserved by this party near the close of the season, necessitating a revision of the triangulation and topography on Niihau and Lehua. An explanation of the unadjusted discrepancies on the boat sheets is attached to the sheets. Also, reference should be made to the descriptive reports accompanying the topographic sheets of Niihau. All work is correctly depicted on the hydrographic smooth sheets, based on the Independent Hawaiian datum.

All soundings from the ship out to the 100 fathom curve were made with the hand lead or the Fischer-Rude pressure tubes. Soundings beyond 100 fathoms were taken by vertical casts. In general, a system of lines run perpendicular to the coast was used.

Bottom characteristics were obtained at frequent intervals. Automatic tide gauges were operated at Nonopapa, Niihau, and at Waimea, Kauai, during the period of this survey.

Respectfully submitted,

Jack Senior
Jack Senior

*Approved and Forwarded,
Chas L. Garner.
Chief of Party.*

STATISTICS SHEET
to accompany 12
HYDROGRAPHIC SHEET NO. ~~9~~
North end Niihau, T. H.

<u>12</u>	(Letter)	(Volume)	(Position)	(Soundings)	(Stat. Miles)	(Vessel)
July 16	a	1	111	322	13.8	Port M. Sailer
20	b	1	89	222	7.1	"
26	c	1	148	254	12.6	"
Aug. 18	d	2	165	452	13.4	"
19	3	2	177	464	15.7	"
Sept. 11	f	2&3	122	450	12.0	"
13	g	3&4	175	594	21.3	"
14	h	4	108	207	7.8	"
15	j	4	17	50	2.0	"
16	k	4	95	256	11.2	"
Sept. 15	a	1	88	470	12.7	Stbd. M. Sailer
Aug. 17	A	1	120	190	27.5	DISCOVERER
18	B	1	52	52	29.8	"
19	C	1&2	127	325	36.8	"
20	D	2	54	112	18.0	"
Sept. 10	E	2	30	81	7.5	"
11	F	2	116	266	24.1	"
13	G	2&3	136	331	32.0	"
15	H	3	66	163	18.4	"
16	J	3&4	154	378	47.2	"
17	K	4&5	158	418	49.5	"
		Totals:	2319	6057	420.4	

Scale 1 : 20,000
Area 67.2 sq. Stat. miles.

11
May 17, 1927.

Division of Hydrography and Topography:

Division of Charts:

Tide reducers are approved in
9 volumes of sounding records for

HYDROGRAPHIC SHEET 4631

Locality: NORTH COAST OF NIIHAU ISLAND, HAWAIIAN ISLANDS.

Chief of Party: G. L. Garner in 1926.

Plane of reference is M L L W

2.2 ft. on tide staff at Nonopapa, Niihau Island.

2.0 ft. -----do----- Waimea, Kauai Island.

Condition of records satisfactory except as checked below:

1. Locality and sublocality of survey omitted.
2. Month and day of month omitted.
3. Time meridian not given at beginning of day's work.
4. Time (whether A.M. or P.M.) not given at beginning of day's work.
5. Soundings (whether in feet or fathoms) not clearly shown in record.
6. Leadline correction entered in wrong column.
7. Field reductions entered in "Office" column.
8. Location of tide gauge not given at beginning of each day's work.
9. Leadline corrections not clearly stated.
10. Kind of sounding tube used not stated.
11. Sounding tube No. entered in column of "Soundings" instead of "Remarks".
12. Legibility of record could be improved.
13. Remarks.

Chief, Division of Tides and Currents.

DEPARTMENT OF COMMERCE

AND REFER TO NO. 11-DRM

U. S. COAST AND GEODETIC SURVEY

WASHINGTON

February 20, 1928.

SECTION OF FIELD RECORDS

Report on Hydrographic Sheet No. 4631

North end of Niihau, Hawaiian Is.

Surveyed in 1926

Instructions dated November 23, 1925.

Chief of Party, C. L. Garner.

Surveyed by C. L. G. and L. S. Hubbard.

Protracted and soundings plotted by T. B. Reed.

Verified and inked by F. B. Kelly.

1. The records conform to the requirements of the General Instructions.
2. The plan and character of development fulfill the requirements of the General Instructions.
3. Crossing lines, while not very frequent, show good agreement except in 2 instances, and since the error could not be found by the verifier, they were left in pencil for check by the reviewer. The two instances referred to are 67c to 75c and 102f to 106f, both Motor Sailer days.
4. Due to signals Tiz and Ink being slightly in error, a considerable portion of the work between Niihau and Lehua Islands had to be completely replotted.
5. There is a hole extending completely through the north end of Lehua Island and in doing the hydrography in the small bay to the east of this hole the east end of the hole was evidently used as a signal and yet when the field men plotted the sheet the signal at the west end was used. It was plainly impossible to see this flag from the bay.
6. The protractor used to plot the offshore work to the southeast of Niihau Island was in error which necessitated the replotting of a considerable number of positions.
7. Of a total number of 460 positions checked, 238 were found to be incorrect and had to be replotted.

8. Considerable difficulty was experienced by the verifier due to the field plotter's disregard of the true position of soundings on lines where there was insufficient room to plot all of the soundings.
9. All of the depth curves from the 5 fathom curve out were plotted in the field.
10. The sounding records of "a" day (green) were located in the volumes for sheet H. 4654.
11. The junction with H. 4630, which is an offshore sheet, was good except in a few instances north of Lehua Island.
12. A shoal sounding of $3 \frac{5}{6}$ fathoms was obtained 1500 meters W x S of \triangle Black which should have been developed.
13. Breakers to the west of station Tiz on the topographic sheet were found by the hydrographic party to be 150m. southwest.
14. The rocks awash south of \odot Del were plotted from the boat sheet.
15. Field drafting, fair.

Report by F. B. Kelly, February, 1928.

AND REFER TO NO. 11-DEEM

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

WASHINGTON

August 13, 1928.

SECTION OF FIELD RECORDS

Report on Hydrographic Sheet No. 4631

North End of Niihau Island, Hawaiian Islands

Surveyed in 1926

Instructions dated Nov. 23, 1925 (DISCOVERER)

Chief of Party, C.L. Garner.

Surveyed by C. L. G. and L. S. Hubbard.

Protracted and soundings plotted by T. B. Reed.

Verified and inked by F. B. Kelly.

1. The records conform to the requirements of the General Instructions with the exception that some of the signals are shown on the sheet as having been located by sextant cuts from offshore but the angles can not be found in the records. One of these, \odot Grass, is shown in a different location on the topographic sheet. This signal was also located by sextant cuts on the topographic sheet (apparently a different set of cuts). In the absence of the recorded angles it is impossible to tell which location is correct. It is assumed that the location on the hydrographic sheet is correct.
2. The plan and character of the development fulfill the requirements of the General Instructions with the following exceptions:
 - a. The $3 \frac{5}{6}$ fathom sounding one mile 255° from \triangle Black is not developed on this sheet. As this sounding is at the junction with Hydrographic Sheet No. 4654 which has not yet been verified, this sounding may be investigated when the junction between the two sheets is reviewed.
 - b. The 5 fathom sounding $1/2$ mile northeast of \triangle Black should have been investigated.
 - c. The extensive shoal 1 mile northeast of \triangle Black was insufficiently developed.
 - d. No inshore work off \odot Bye to show 5 and 10 fathom curves.
 - e. Insufficient inshore work between \odot End and \odot Drum to show location of 5 and 10 fathom curves.

- f. Insufficient development of the shoal area off \odot Hos.
 - g. A gap left in the inshore work off \odot Dike.
 - h. No soundings in the small bay at the head of which \odot Log is located.
3. The plan and character of the development satisfy the specific instructions with the exceptions noted above.
4. No regular system of cross lines was run, but in many instances lines run by the ship crossed the launch work, or crossed other ship lines. The crossings show good agreement except for the two instances noted by the verifier. The soundings from '67 c to 74 c appear about 5 fathoms too deep; the plotting of the positions was carefully checked and it seems probable that these soundings were taken before the launch had come to a full stop. These soundings were rejected.

In the other instance noted, 102 f to 106 f, it seems most probable that the right angle is in error on positions 104 and 105. This conclusion is reached through a comparison of time intervals. These two positions were plotted on left angle and course. This made the intervals check, assuming positions 102, 103 and 106 as correct.

5. The depth curves from 10 to 200 fathoms can be completely drawn with the exception of two small sections of the 10 fathom curve.

The greater part of the 5 fathom curve can be drawn. The 2 and 3 fathom curves could not be developed by the launch on account of their being too close to shore line or breakers.

6. Field plotting was completed to the extent prescribed in the General Instructions.
7. About 10 per cent of the work had to be re-plotted in the office for the following reasons: Signals being plotted slightly in error combined with weak fixes, plotting with an invisible signal, and a part of the work being plotted with an erroneous protractor.
8. The junction with H. 4630 is satisfactory. The junction with H. 4654 should be taken up with the review of that sheet.
9. Additional survey work should be done on the shoals to the west of the northern part of the island.
10. There is a hole, or natural tunnel, extending through the north-west peninsula of Lehua Island. The west end of this hole was located as a hydrographic signal by sextant cuts and called \odot Hole. It is clearly impossible to see this from the small bay to the eastward, yet the work was both recorded and plotted as if the west end of the hole were visible. This work has been

replotted using the east end of the hole as taken from the topographic sheet.

In developing the channel between Lehua and Niihau Islands a very weak fix was used, one of the signals of which, ⊙ Ink, was plotted slightly in error, which caused a considerable error in the field plotting of the positions, and this work all had to be replotted. One line, 108 - 113 d, plots out of position due to the weak fix and it is recommended that it be rejected.

The position of a breaker 600 meters west of ⊙ Pan does not agree with the topographic location by 150 meters. A pencil note on the sheet by the Chief of Party directs that the hydrographic location be accepted.

11. The character and scope of the surveying are fair, and the field drafting is fair.
12. Reviewed by M. O. Witherbee, March 19, 1928.

Approved:

Chief, Section of Field Records (Charts)

Chief, Section of Field Work (H. & T.)

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

HYDROGRAPHIC TITLE SHEET

The finished Hydrographic Sheet is to be accompanied by the following title sheet, filled in as completely as possible, when the sheet is forwarded to the Office.

U. S. Coast and Geodetic Survey.

Field No. 12
Register No. 4631

4631

State . . . Hawaiian Islands

General locality . . . ~~Niihau Island~~

Locality . . . North end -- Niihau

Chief of party . . . Clem L. Garner

Surveyed by . . . Clem L. Garner & L. S. Hubbard

Date of survey . . . July 16. - Sept. 17, 1926

Scale . . . 1 : 20,000

Soundings in . . . Fathoms

Plane of reference . . . Mean Lower Low Waters

Protracted by T. B. Reed. Soundings in pencil by T. B. Reed

Inked by Verified by

Records accompanying sheet (check those forwarded):

¹/₂ Des. report, ✓ Tide books, ³³/_{*} Marigrams, 2 Boat sheets,
⁹/₁₀ Sounding books, Wire-drag books, Photographs.

Data from other sources affecting sheet

Remarks: * Previously forwarded.

Applied to chart 4181 Aug. 27, 1940 g.H.S.