

5578

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Form 504
Ed. June, 1928

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
R. S. Patton, Director

State: Florida

DESCRIPTIVE REPORT

~~Bathymetric~~ } Sheet No. 4 5578
Hydrographic }

LOCALITY

Florida Keys

Long Reef to Turtle Reef

1934

CHIEF OF PARTY

Harold A. Cotton

5578

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

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REG. NO. 5578

HYDROGRAPHIC TITLE SHEET

The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.

Field No. 4

REGISTER NO. 5578

State Florida

General locality Florida Keys

Locality Long Reef to Turtle Reef

Scale 1:20,000 Date of survey May-June-July, 19 34

Vessel Chartered Powerboat V 26174 - Houseboat ROWENA

Chief of Party Harold A. Cotton

Surveyed by W. O. Hinkley

Protracted by C.G.W. Swanson - J. D. Groff - W. H. Harth - A. Black

Soundings penciled by A. Black - W. H. Harth

Soundings in ~~fathoms~~ feet

Plane of reference M.L.W.

Subdivision of wire dragged areas by _____

Inked by W. L. Muller

Verified by W. L. M.

Instructions dated November 17, 1933, 19 _____

Remarks: _____

DESCRIPTIVE REPORT

to accompany

HYDROGRAPHIC SHEET NO. 4 5578

FLORIDA KEYS

PROJECT H. T. 158

1934

Shore Party No. 3

Harold A. Cotton,
Lieutenant Commander,
U.S. Coast & Geodetic Survey,
Chief of Party.

5535
L 22
2 1/2

DESCRIPTIVE REPORT
to accompany
HYDROGRAPHIC SHEET NO. 4 5578
FLORIDA KEYS

INSTRUCTIONS:

This survey was executed in compliance with the Director's Instructions dated November 17, 1933 - Project H.T. 158. ✓

LIMITS:

This sheet includes the hydrographic development of a section of the Florida reef extending off the following Florida Keys: viz Elliott Key, Old Rhodes Key and Key Largo. The northern limit is an east and west line about opposite triangulation station POINT ADELLE near the center of Elliott Key where the sheet joins Hydrographic Sheet No. 5536 (No. 2 H. A. Cotton - 1934). The southern limit is an east and west line extending off shore about three miles south of Angelfish Creek where the sheet joins Hydrographic Sheet No. H-5726 (No. 6 H. A. Cotton - 1934). The work extends from the outside shore of the keys to just beyond the edge of the reef, developing the 10 - 15 fathom ^{curve} and at places the 20 fathom along the reef. At the northern edge of the sheet, the hydrography extends about five miles off shore and about six miles at the southern edge. ✓

CONTROL:

The control for the survey of this area consisted of a main scheme triangulation involving the following triangulation stations: ✓

Point Adelle, Elliott, Old Rhodes, Angelfish, Triumph Reef, Pacific Reef. ✓

The numerous navigation beacons along Hawk Channel (following the coast about two miles off shore) were located as triangulation intersection stations and were a great help toward making excellent fixes available generally over the area covered by the sheet. ✓

Two triangulation stations, viz Tonn and Last were located by a three-point fix - two angles to three triangulation stations. From the former, station Ton was located close-by. ✓

The topo. signal (Ton) only is plotted on the sheet.
AEE

Numerous topographic signals were located along the shore between the triangulation stations; these locations were determined by Plane Table traverses between the respective triangulation stations. It was later found unnecessary to use all of these for hydrographic control as the Hawk Channel beacons furnished excellent fixes at many points along the shore. *The signals are shown on control boat sheet.*

To complete the control it was necessary to locate several signals by sextant cuts and angles. These were the following:

Station Alice; an exposed wreck on Ajax Reef ✓
Stations Black and Red Beacons #1 and 2 Pacific Reef Channel ✓
Station Can; a water signal ✓
Station Gage, White and Next; signals south of Anglefish Creek ✓

In a few cases it was necessary to place banners on some of the Hawk Channel beacons in order to use them for off shore fixes. ✓

CONTROL SHEET

A control sheet accompanies this hydrographic sheet. It was used for the location of numerous topographic stations along shore between the triangulation stations, these locations being determined by Plane Table traverses between the respective triangulation stations. Originally it had been intended to locate the Hawk Channel navigation beacons on this sheet but these were finally located by triangulation. *Filed with sheet as boat sheet.*

Between triangulation stations Log and Point Adelle, there are several old shacks which are neither of sufficient prominence nor permanence to qualify as "Landmarks" but it is believed advisable to chart them simply as buildings for they are the only objects which break the otherwise green landscape. There are brief notes on the control sheet indicating the character of these buildings. *Possibly appear on H-5536. Not covered in title of this sheet.*

Station ^o Ton was located by measured directions and distance from triangulation station Tonn close-by. The name Ton has been used in the records throughout for this topographic station altho it was stamped "Ed" in the field. Triangulation station Tonn is in about two feet of water, out on the Caesar Creek flats and is not marked; the marked station is Ton.

Topographic station Ton is one of the outside signals of a net of signals located through Caesar Creek on Sheet No. H-5535 (No. 1 H.A. Cotton - 1934). The triangulation station was located close by in order to get a well determined position for the topographic station as well as to break the long along-shore traverse from triangulation station Elliott to triangulation station Old Rhodes. The Caesar Creek signals on Sheet No. 1 were adjusted to the position of station Ton on this sheet; actually this adjustment was very slight.

Similarly as at Caesar Creek, there was a net of signals located through Broad and Angelfish Creeks on Sheet No. H-5535 (No. 1 H. A. Cotton - 1934). As this control through these creeks was not very strong, the position of the outside signals of this net were located on this sheet (hydro. signals LATHB, BAN, KAY, POINT, TRI.) The position of all the signals in this net were adjusted as necessary to make the position of the outside signals agree with the determination on this sheet.

About a mile of shore-line just to the south of Point Adelle is shown in blue on this control sheet. This section of shore-line was located in the field by Plane Table during the present survey; it is a section which is not shown on aerial-
Transferred - see tracing with WLM

METHODS:

This survey was performed by a field party quartered on the houseboat ROWENA. On account of the extensive areas of coral heads coming within the limits of this sheet, it was not possible to use the drag boats for any of this hydrography; all of the work was accordingly done with small 26 ft. hydrographic launches.

Most soundings were taken with an 8 - 12 pound lead line. Beyond 8 - 10 fathoms, a 20 pound lead was used. Sampson bronze center tiller rope was used for lead lines and maintained its length excellently. In shoal areas of less than 8 - 10 feet, soundings were taken with a 16 foot sounding pole with flat disc on its lower end.

Positions of the sounding launches were determined by the usual three point fixes.

In areas of possible coral heads, the left angleman took an elevated position on the lookout for any coral heads or other shoals visible from the sounding line. A record was made of any shoals thus picked up, the record consisting of notation that a coral head or otherwise had been noticed a certain distance off a certain point of the sounding line. This distance off the sounding line was determined by measuring the angle between the shoal and the sea horizon beyond. A table was prepared giving this distance for the particular height of the eye. All such points were later, investigated.

DEVELOPMENT:

In general the entire area was developed by a system of 200 meter lines run east and west, crossed by north and south lines spaced half a mile apart. Usual sounding speed was four to five knots with soundings taken at twenty second intervals up to four fathoms, at thirty second intervals up to seven fathoms, and at forty second intervals up to ten fathoms. Beyond six fathoms, the bottom usually dropped off so suddenly that it was necessary to stop for up and down soundings which, when in excess of ten fathoms, were taken at one minute intervals. For such stop soundings, fixes were taken on every other position.

Practically all of the development work on this sheet was done by simply investigating areas of shoal indications at times when the bottom was clearly visible. Under favorable conditions of light, sea and water clearness, the sea bottom is plainly visible and at such times, rocks and shoals can be picked up quite readily by simply cruising over an area. During such examinations a water glass was generally in use. Under these conditions, it is believed that such visual examinations give more positive results than a system of sounding lines; the shoalest spots are actually quite small and the chances of hitting them with a lead are rather slight. All shoals on the old chart were investigated. About five hundred fifty shoals were developed in this manner.

In Caesar Creek, one line of soundings was run along the center line between the banks and an additional line along each bank during high water. One line of soundings was also run in through Old Rhodes Creek. The entrances to Broad and Angelfish Creeks were developed on Hydrographic Sheet No. H-5535 (No. 1 H. A. Cotton - 1934).

COMPARISON WITH OLD SURVEY:

There is general agreement with the old survey over the area of this sheet.

The new survey has been critically compared with a section of the present chart enlarged to the scale of the smooth sheet. In the following cases appreciably deeper water was found than indicated on the present chart. In each case a special search was made and it is believed that the shoal spots marked on the chart no longer exist.

1 (a) Latitude 25 - 21.5 longitude 80 - 09.7, nothing less than 20 ft. was found about an old 4 ft. spot. The bottom was plainly visible at the time of the examination. ✓
20' sounding plotted

2 (b) Latitude 25 - 20.0 longitude 80 - 13.1, thirteen feet was the shoalest depth found about an old seven foot spot. During the examination, the bottom was only dimly visible but indications could be plainly seen; a shoal of seven ft. should have been quite evident. During later wire-drag work, a depth of ten feet was found on the channel side of Beacon 20 which is near this spot. ✓

3 (c) Latitude 25 - 20.1 longitude 80 - 12.6, sixteen feet was the shoalest depth found about an old ten foot spot. Later during wire-drag work a special search was made for this 10 ft. spot by the drag boats. The day was perfect and the bottom clearly visible. but nothing shoaler than 16 ft. could be found. ✓

4 (d) Latitude 25 - 18.7 longitude 80 - 15.5, nothing less than ten feet could be found about an old four foot spot. The bottom was not clearly visible during this examination but could be seen and any shoal of four feet could undoubtedly ^{have} been noticed. ✓

5 (e) Latitude 25 - 18.1 longitude 80 - 11.7, a least depth of thirty ft. was found about an old twenty two foot sounding. The bottom was not clearly visible at this time but shoal indications could ^{have} been seen - the shoalest depth found was thirty feet. ✓
29

6 During the present survey innumerable additional rocks were found than now shown on the chart. As far as possible the rocks located were either isolated or marked the extent of foul ground. It was not attempted to locate all shoals in a generally foul area. ✓

7 The line and width of Ceasar Creek agrees very well with the previous survey except that the present entrance of the channel at the east end is about 150 meters further east than formerly charted. ✓

CHANNELS AND ANCHORAGES:

8 The Florida Reef is five to six miles wide along this section of the coast, five miles at the northern end of ~~the~~ and about six at the southern end. Hawk Channel parallels the shore being about one mile off Point Adelle at the northern end of the sheet and about two miles off Angelfish Creek at the southern end of the sheet. This channel is well marked with numerous beacons, easily intervisible and can be followed without any difficulty. The general depth in this section of Hawk Channel ✓

is 12 - 15 ft; the channel was later dragged to an effective depth of 10 - 11 ft. and several shoals found with less than ten feet. These are listed in the Descriptive Report for Wire Drag Sheet No. 4 (d) 45548 (1934)

Just inside the edge of the main reef, there is another north and south channel which runs immediately behind Pacific Reef, Ajax Reef and Long Reef. This outside channel is known locally as White Channel of account of the white sand bottom along most of its length, a characteristic which often aids navigation at night. This channel is not marked and is only partially protected by the reefs just outside of it; it is only used to a limited extent locally. This channel is generally somewhat deeper than Hawk Channel.

not located by survey

Opposite Caesar Creek there is a narrow well marked channel leading across the reef from north of Pacific Reef Light to opposite the entrance to Caesar Creek. This channel was later wire-dragged and so many obstructions found that its use can only be considered safe for very light draft (3 - $3\frac{1}{2}$ ft.) boats. Just to the north of Beacon #3 a number of shoals with 4 - 5 ft. were found; also numerous others between Beacons #3 and #7. Just to the north of Beacon #5 there is the stub of a broken beacon with $1\frac{1}{2}$ ft. of water on it. By passing very close to the beacons, the shoal spots can be avoided but great caution is necessary to avoid this broken off beacon.

Another channel crosses the reef just north of Turtle Harbor (Turtle Harbor itself is just south of the southern limit of the sheet). The eastern section of this channel is deep (4 - 6 fathoms) and extends from Turtle Harbor Sea Buoy #2 at the outside edge of the reef to Turtle Harbor Entrance Buoy which is about a mile northeast of the entrance into Turtle Harbor. The continuation of this channel to Hawk Channel is marked by two beacons (#1 and #2) and has a minimum found depth of 14 ft. The entire length of this cross-reef channel was later dragged and found to be clear (20 ft. outside Turtle Harbor Entrance Buoy and 10 ft. inside of it).

During usual weather, fairly good anchorage is available at most points on the reef from Hawk Channel to the shore. In general, eight feet carries to within a half mile of the shore, which affords protection from northwest, west and southwest wind but the holding ground is not so good in places. Along most of the shore north of Caesar Creek 8 - 10 feet can be carried to within 300 - 400 meters of the beach; this is also true for some points to the south of Caesar Creek.

Good anchorage is available in the bight just north of Caesar Creek bank; there is good holding bottom in depths of 5 - 10 feet. From close in-shore, this anchorage is only exposed to the northeast, the keys furnishing protection to the north and west and the banks giving

protection from the south. This anchorage is frequently preferable to running into Caesar Creek where, with unfavorable conditions of light, considerable difficulty will be experienced in following the channel between the banks and where strong currents will be encountered.

Indifferent protection can at times be secured just to the westward of Long, Ajax or Pacific Reefs; there is sand bottom with depths of 15 - 25 feet.

CREEKS:

Good anchorage can be secured in the several creeks between Elliott Key and Key Largo; there are generally strong currents in these creeks and the entrance channels are somewhat hard to follow. These creeks were all surveyed and described on Hydrographic Sheet No. H-5535 (No. 1 H. A. Cotton - 1934) with the exception of the eastern extension of Caesar Creek.

The eastern entrance to Caesar Creek is two miles off shore to which point the channel extends from the keys through shoal banks on either side which mostly bare at real low water. The maximum depth through this entrance is six (6) feet. Inside this entrance there is good anchorage between the banks in 12 - 16 feet of water.

This off-shore extension of Caesar Creek is a narrow and tortuous channel with a sharp bend to the northward over the bar at the entrance. There are no beacons to mark this entrance except occasional small stakes or brush set up by people of the vicinity. If the light is good there is no trouble following this channel altho if running toward the sun or with certain conditions of overcast weather, the banks are practically invisible.

Near the inshore end of the north spit of Caesar Creek, there is a narrow channel across the spit with a depth of about two feet.

Of the various creek channels giving passage from Hawk Channel to the inside water, the Angelfish Creek Channel is the easiest to follow as well as having a little better water. The entrances to either end of this channel are narrow but reasonably straight and usually fairly well marked with stakes set by the Key Largo Anglers Club as well as others living in the locality. Anchorage in the creek is not so desirable on account of swift currents and rocky bottom, but in case of bad weather, Angelfish Creek provides a quick passage to Steamboat Creek on the inside which is an excellent hurricane anchorage.

CLEARNESS AND COLOR OF WATER ON THE REEF:

Under favorable conditions, the bottom is clearly visible at any point on the reef; the bottom has been seen in twenty fathoms along the off shore edge of the reef.

The most favorable conditions are on a clear calm day following several days of quiet weather. The sun should be high and shine behind toward the area being viewed. Visibility is frequently better with just a slight breeze sufficient to break the glare on a perfectly calm surface. Under these conditions a difference of three or more feet in the depth of the water can be determined in thirty feet of water.

The water always becomes milky following windy weather; after one days storm, the bottom may be completely invisible at ten feet. Passing clouds frequently cast such shadows as to practically destroy visibility in any but the shallowest water. With a breeze sufficient to cause a choppy surface, the visibility is practically destroyed. A water glass is particularly helpful with any kind of rough weather or choppy surface.

Generally speaking, the water did not appear to be as clear over the southern portion of this sheet as it was further to the northward; the cloudiness of the water seemed to increase as Turtle Harbor was approached.

The color of the water above ten fathoms is deep indigo blue; such depth is only found beyond the off shore edge of the reef. The usual color of the water on the reef is a blue green where the shoaler rock patches show dark, shading through brown to yellow as they approach the surface. The shoal sand patches show as a bright green. At depths of ten to fifteen feet, grass patches on the bottom show quite similar to rocks.

Bearing in mind the above water characteristics, it is quite feasible to navigate with safety among the reefs when conditions of light, etc. are favorable.

DESCRIPTION OF THE AREA SURVEYED:

This section of the Florida Reef can be briefly described as a shoal area with numerous reefs and coral heads extending five to six miles off the Florida Keys. There are general depths of 8 - 10 feet within half a mile or less of shore and depths of 20 - 30 feet just inside the outer reefs marking the outer edge of the main reef proper. Beyond these outer reefs the depth increases rapidly to 100 feet and again quickly to 100 fathoms.

As already noted, there are two channels crossing this sheet in a north and south directions viz Hawk Channel and the locally called White Channel. The area between these channels includes the major part of the sheet; it is one vast nest of rock shoals and coral heads and should be avoided at all times except when weather conditions are such that these dangers are visible. These shoals are ordinarily visible in reasonable calm weather but with a rough sea or following a spell of stormy weather or with a partially overcast sky, it is very difficult to see them.

Long, Ajax and Pacific Reefs between the White Channel and deep water mark the extreme outside edge of the main reef and constitute a long narrow shoal area almost awash at numerous points.

From Hawk Channel to shore the bottom is sandy and quite regular with few coral heads. Generally a depth of 6 - 10 feet extends quite close to shore except for the extensive banks about Caesar Creek and the shoal areas reaching off Broad and Angelfish Creeks. There are rock shoals making off from shore at the north point of Old Rhodes Creek and south of the sand bar at Angelfish Creek.

The land area coming on this sheet consists of the southern part of Elliott Key, the north end of Key Largo and the numerous intermediate keys. These are all low coral islands thickly wooded with deciduous growth with occasional pine and palm. Thick mangrove line practically the entire shoreline of both the outside coast as well as the extensive creek passages between the keys.

North of Point Adelle on Elliott Key there are long stretches of coral and sand beaches with materially less mangrove than elsewhere; south of this point the mangrove becomes thicker and thicker and from Point Elliott south it is continuous. Along the northern portion of Elliott Key there are several old cocconut and lime plantations. A few inhabitants still live in several old houses along the beach but frequently remain here only while picking lime or while on some other particular task. There are numerous old cisterns along this stretch of Elliott Key, being the remains of former buildings since destroyed by storms.

There is no natural water at any point in this area but in emergency, small quantities can be obtained at the few dwellings or from the old cisterns.

PROMINENT OBJECTS:

The only object of any prominence coming within the limits of this sheet is the red roof of a white house between Broad and Angelfish Creeks (station MEM) which is listed on the "Landmark" sheet accompanying Sheet No. H-5535 (Hydrographic Sheet No. 1 - H.A. Cotton - 1934).

There are two lone palm trees along the outside coast north of Caesar Creek which can be easily identified and might be charted to advantage. The position of these are given on the accompanying "Landmark" sheet.

TOPOGRAPHIC STATIONS:

In addition to the triangulation stations, two topographic stations were permanently marked on this sheet viz station Gar and station Ton. Descriptions for these as well as for station Palm, one of the above noted lone palm trees, accompany the control sheet.

TIDES:

Two tide gages were used for the reduction of soundings on this sheet. The Soldier Key gage was used until the establishment of the Angelfish gage on June 15, after which time the Angelfish gage was used. The approximate dividing line for the two gages was Caesar Creek.

The Mean Low Water reading on the staffs at these gages was as follows:

Soldier Key - Mean Low Water read 2.0 feet
Angelfish Key - Mean Low Water read 2.1 feet

WRECKS:

To the northward of Ajax Reef Beacon, three wrecks are located along the outer edge of the reef. The most southerly lies 0.6 miles north of the beacon; the old boiler of this one bares about 6 feet and was used as a hydrographic signal (station Alice). The second is 1.4 miles north of the beacon and is in two pieces about 80 meters apart; these are covered with $1\frac{1}{2}$ feet of water respectively. The third is 2.6 miles north of the beacon and is covered with 3.0 feet.

(bare $\frac{1}{2}$ feet at NLW)

WRECKS (CONTINUED)

This third wreck is also in two parts, the other portion close-by having a depth of 5 feet on it. Both of these latter wrecks consist of jagged pieces of steel coming close to the surface of the water with rather deep water close-by especially to the eastward; they all constitute dangers to craft navigating this vicinity.

DISCREPANCIES (PLOTTING):

The crossing at 96 mm and 25 rr did not agree within five feet. Another line was run across this spot (42 vv to 46 vv) with the result that apparently one sounding on mm day was misread probably a fathom short. The soundings on the vv day check all other soundings on the mm line as well as the cross soundings on the rr day.
Ø 25-19.2 A 80-10

A two foot spot marked on boat sheet just north of Beacon "7" - Pacific Reef Channel is in error due to a wrong fix and should be eliminated.
Ø 25-23 A 80-10.85

ANGELFISH TIDE GAGE:

Altho this was a new gage, a great deal of trouble was experienced in getting it to operate satisfactorily with the result that the Soldier's Key gage was used further south than originally intended. A computation of simultaneous observations for the two gages showed close agreement in the time and height of tide.

STATISTICS:

Total miles sounding lines (statute)	754.9
Total number of positions	4263
Total number of soundings	25441
Number of rocks	550
Area square statute miles	78

This report was compiled by the undersigned with liberal use of notes prepared by Mr. W.O. Hinkley, Surveyor, who had charge of the hydrography.

Respectfully submitted,

Harold A. Cotton

Harold A. Cotton, Lieutenant Commander,
U. S. Coast and Geodetic Survey
Chief of Party No. 3

DEPARTMENT OF COMMERCE
U.S. COAST AND GEODETIC SURVEY

LANDMARKS FOR CHARTS 5578

Miami, Florida

November 24, 1934

DIRECTOR, U.S. COAST AND GEODETIC SURVEY:

The following determined objects are prominent, can be readily distinguished from seaward from the description given below, and should be charted:

Harold A. Cotton

Harold A. Cotton

Chief of Party.

DESCRIPTION	POSITION					METHOD OF DETERMINATION	CHARTS AFFECTED
	LATITUDE		LONGITUDE		DATUM		
	°	'	D.M. METERS	°			
Altho there are no really prominent objects on this sheet, there are two lone palm trees and three old buildings which can be readily identified and could accordingly be charted to advantage.							
Lone Palm Trees							
Station LONE	25-27		1278	80-11		709	Topo. 1249 ✓
Station PALM	25-24		887.1	80-12		1196.8	Topo. 1249 ✓
Center unpainted houses fairly prominent in Hawk Channel							
House	25-28		1351.4	80-10		1399.5	Topo. 1249 ✓
House	25-28		185.1	80-11		243.0	Topo. 1249 ✓
House	25-27		1018.6	80-11		747.8	Topo. 1249 ✓

A list of objects carefully selected because of their value as landmarks as determined from seaward, together with individual descriptions, must be furnished in a special report on this form, and a copy of such report must be attached by the Chief of Party to his descriptive report.

The selection, determination, and description of these points are an important factor in the value of the chart. Landmarks selected at appropriate intervals can be clearly charted. However, when none is outstanding, a group of two or three objects may by their interrelationship provide positive identification. A group so selected should be indicated.

The description of each object should be short, but such as will clearly identify it; for example, a standpipe, elevated tank, gas tank, church spire, tall stack, red chimney, radio mast, etc. Assign numerals to landmarks to indicate: (1) Offshore, (2) inshore, (3) harbor, 1, 2, 3 would be a mark useful on all charts. Generally, flagstaves and like objects are not sufficiently permanent to chart.

Field Records Section (Charts)

HYDROGRAPHIC SHEET NO. 5578

The following statistics will be submitted with the cartographer's report on the sheet:

Number of positions on sheet	<u>4263</u>
Number of positions checked	<u>680</u>
Number of positions revised	<u>2</u>
Number of soundings recorded	<u>25441</u>
Number of soundings revised	<u>100+</u>
Number of signals erroneously plotted or transferred	<u>None</u>

Date: May 29, 1935

Verification by W. L. Mullen

Time: 40 3/4 hrs.

Review by R. J. Christman
and R. L. Johnston

Time: 39 hrs

21 hrs

May 29, 1935

H. 5578

1- The records conform to the requirements of the Hydrographic Manual.

2- The usual depth curves can be completely drawn.

3-4 The field plotting was complete and accurate with the following exceptions.

a- In some instances the shallowest sounding between positions was omitted. This has been corrected by the verifier.

b- The position numbers were very poorly executed being indistinct and too small.

c- The pencil used in the field plotting was too hard and many of the soundings became so indistinct as to necessitate re-penciling by the verifier before rating.

5- The junctions which have been made as of this date are satisfactory. One junction has not as yet been made (H-5726 a) In view of the fact that the adjoining sheets were much more closely developed than this sheet, the transfer of soundings has been put on the adjoining sheets, as involving considerably less work and a consequent saving of time.

6- It seems probable that many rocks referred to in the remarks column (such as Rock 401, etc.) refer to the same rocks as were actually located by three faint sextant fixes. The probability of an

observers being unable to accurately estimate distances (especially under water) indicates that too much reliance should not be laid on the location of these rocks. However as most of these rocks fall in generally foul areas it is not believed that any discrepancies will arise on this account. When these rocks do not fall on a previously located rock the sunken rock symbol has been used.

General Remarks - Many of the positions were re-located in the field, and are so indicated in the records. A large number of these re-locations have been checked and found to be correct so the verifier did not check all of them.

Attention of the reviewer is called to Δ Tom (H 5585) and \odot Tom (H 5578) These points are not identical. See D.R. - H-5578, page 1, last paragraph.

The paper at signals and triangulation stations has in some instances been badly scored by the field party.

Vol 16 of the records contains no soundings but does contain cuts to triangulation stations and signals. These have not been checked by the verifier on the presumption that this has been done in the field.

Respectfully submitted

W. L. Muller

LAC

January 12, 1935.

Division of Hydrography and Topography:

✓ Division of Charts: Attention: E. P. Ellis

Tide Reducers are approved in
16 volumes of sounding records for

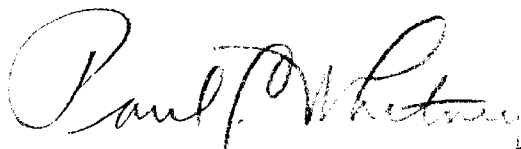
HYDROGRAPHIC SHEET 5578

Locality Long Reef to Turtle Reef, Florida Keys

Chief of Party: H. A. Cotton in 1934
Plane of reference is mean low water reading
2.0 ft. on tide staff at Soldier Key
1.8 ft. below B.M. 1
2.1 ft. on tide staff at Angelfish Key
3.1 ft. below B. M. 1

Height of mean high water above plane of reference is 1.8 feet
at Soldier Key; 2.4 feet at Angelfish Key.

Condition of records satisfactory except as noted below:



Chief, Division of Tides and Currents.

Section of Field Records

REVIEW OF HYDROGRAPHIC SURVEY NO. 5578 (1934) - FIELD NO. 4

Long Reef to Turtle Reef, Florida Keys, Florida
Surveyed in May - July, 1934
Instructions dated November 17, 1933 (H. A. Cotton)

Hand Lead and Pole Soundings.

3 Point Fixes on Shore Signals.

Chief of Party - H. A. Cotton.

Surveyed by - W. O. Hinkley.

Protracted by - C. G. W. Swanson, J. D. Groff, W. H. Harth, A. Black.

Soundings penciled by - A. Black, W. H. Harth.

Verified and Inked by - W. L. Millen.

1. Condition of Records.

The records are neat and legible and conform to the requirements of the Hydrographic Manual except as follows:

- a. No description of hydrographic signal "Hard" (lat. 25° 19.7', long. 80° 10.8') is given in the records. It is believed to have been a temporary water signal, as the Chief of Party states that several signals of that nature were used during the season.

The Descriptive Report is exceptionally complete and satisfactorily covers all items of importance.

2. Compliance with Instructions for the Project.

The plan and extent of the survey is in accordance with the instructions for the project.

3. Sounding Line Crossings.

Sounding line crossings are satisfactory. Differences in excess of 1 foot occur only in areas where the bottom is irregular.

4. Depth Curves.

Within the limits of the survey, the usual depth curves may be satisfactorily drawn, including the 6 foot curve.

5. Junction with Contemporary Surveys.

- a. The sheet joins H-5536 (1934) to the northward. The junction is satisfactory except for a small holiday just off \triangle Point Adelle where at least two additional sounding lines should have been run.

- b. The sheet joins H-5535 (1934) at the entrances to Broad Creek and Caesar Creek. The junction is satisfactory.
- c. Junction with H-5726a (1934) to southward will be considered in the review of that sheet.
- d. The greater part of the contemporary wire drag survey, H-5548 (1934), falls within the area of H-5578 (1934). Parts of H-5540 (1934 WD) and H-5726 (1934 WD) fall on the north and south ends of the sheet respectively. Dangers discovered by the wire drag have been transferred to H-5578 (1934). The hydrography of the present survey is consistent with the effective depths of the drag.

No contemporary surveys have been made to eastward.

6. Comparison with Prior Surveys.

a. Misc. 4 (1849 to 1851).

This is a small scale map compiled from various sources and shows only generalized reef outlines with no soundings. All the information on the sheet has been superseded on the chart by later surveys.

b. H-369 (1853), H-443 (1854), H-444 (1854).

These surveys generally are in good depth agreement with the present survey; the latter however shows slightly different locations and depths for some of the shoals and discredits a few of the shoals that are now charted. It is assumed that the sunken rock symbols on the above surveys are a generalized representation of coral heads and foul areas and none of them have been transferred to H-5578 (1934).

The shoal spots discredited by the present survey have been disposed of as follows:

- (1) The 4 foot sounding (charted) at lat. 25° 21.4', long. 80° 09.7' was a single shoal sounding (1 fath. 1 ft.) between a 4 fath. and a 4 fath. 1 ft. sounding in the records of H-369 (1853). It is probably an error in recording since the present examination made when the bottom was plainly visible showed nothing less than 20 feet. (See page 5, par. a, Descriptive Report). The 4 foot spot should be removed from the chart

- (2) The 7 foot sounding (charted) at lat. 25° 20.05', long. 80° 13.1' was derived from H-443 (1854) but it could not be identified in the records. Neither of the two lines passing close to this sounding makes any reference to the 7 foot spot. Depths in the vicinity are 12 to 14 feet and are in good agreement on the two surveys. The 7 is considered disproved by the present examination (par. (b) page 5 of the Descriptive Report) and should be removed from the chart.
- (3) The 10 foot sounding (charted) at lat. 25° 20.1', long. 80° 12.65' is derived from H-443 (1854). The records show that it was one of the first two soundings of the day taken by the 2nd cutter. The soundings probably were recorded 1 fathom too shoal as the 1st cutter starting from the same position shows 3 fathoms $\frac{1}{2}$ foot soft bottom. The present examination made when the bottom was clearly visible (see par. c, page 5, Descriptive Report) is considered sufficient to disprove the 10 foot sounding, which should be removed from the chart.
- (4) The 4 foot sounding (charted) at lat. 25° 18.75', long. 80° 15.45' was derived from H-443 (1854). It was the first sounding of the day recorded as \emptyset fathoms $5\frac{1}{2}$ feet, reduced to 4 feet. In view of the results of the 1934 survey, it is apparent that the reduced depth should have been 10 feet and the 4 should be removed from the chart. (See par. d, page 5, Descriptive Report).
- (5) The 22 foot sounding (charted) at lat. 25° 18.1', long. 80° 11.7' was derived from H-443 (1854). The original sounding record states that it was a "black spot, grass and small rocks." The general bottom characteristic in this vicinity is white sand. The shoalest depth found by the present survey was 29 feet (pos. 90tt) and the record states "no indication of any shoal spots in this vicinity." It is believed that the shoal spot has either disintegrated since the 1854 survey or the original sounding was erroneous. The 22 should be removed from the chart. (See par. e, page 5, Descriptive Report).
- (6) The sunken rock symbol (charted) at lat. 25° 20.65', long. 80° 09.95' comes from H-369 (1853) where it is shown as a 4 foot spot with sunken rock symbols scattered around it. The present survey has depths of 22 to 25 feet in this place but shows a coral head with 3 feet over it about 150 meters to the eastward. They are probably the same rock. This is further supported by the relative position of a 3 foot sounding (charted) at 25° 20.3', long. 80° 10.1' of

the 1853 survey and a 4 foot rock on the present survey. It is assumed that the positions of both these rocks are in error on the 1853 survey and the present locations should be accepted. Both the sunken rock symbol and the old 3 foot sounding should be removed from the chart.

- (7) The 4 foot sounding (charted) at lat. 25° 17.5', long. 80° 14.2' was derived from H-443 (1854). The 4 foot is an estimated depth off the regular line of soundings and as plotted falls on a 13 foot sounding of the present survey although there is a 6 foot spot about 200 meters to the southeast. Because of the close development and careful look out maintained during the 1934 survey, the 4 is believed to be incorrect and should be deleted from the chart.

7. Comparison with Chart 1249.

a. Hydrography.

Within the area of the present survey the chart is based on surveys discussed in the foregoing paragraphs with the exception of three wrecks in the vicinity of Long Reef which were charted from Coast Pilot "D" page 201. The charted positions of these wrecks are from 200 to 400 meters southward of the positions determined by the 1934 survey.

b. Aids to Navigation.

The beacons as formerly charted did not agree with the 1934 locations, especially those marking the northern part of Hawk Channel on this sheet. The 1935 edition of the chart shows the aids corrected to agree with the 1934 locations.

8. Field Plotting.

The protracting was accurate but in many instances the position numbers and day letters were indistinct. The wrong day letter was applied to some of the positions. The penciling of soundings was satisfactory except that too hard a pencil was used and in some instances the shallowest sounding between positions was omitted.

9. Sunken Rock Symbols on Sheet.

The sunken rock symbols on this sheet indicate the location of rocks spotted by a lookout as described under "Methods", page 3 of the Descriptive Report and are plotted from notes in the sounding records. This method was used primarily for the purpose of approximately locating these rocks and shoal indications so that the field party

could return later and investigate them. The notations in the records were so numerous, however, that it was found impractical to make a separate investigation of all of them. In some cases the left angle man may have observed discolored water or seaweed and not actual rocks, however sunken rock symbols have been shown on the smooth sheet wherever so noted in the sounding records. For this reason the sunken rock symbols on this sheet should be considered as representing "shoal indications" rather than definite sunken rocks. This is concurred in by the Chief of Party.

10. Additional Field Work Recommended.

The survey is complete and satisfactory except for the small holiday north of lat. 25°27.0', long. 80°11.0' at the junction with H-5536 (1934). This area should be covered when opportunity affords.

11. Superseding Old Surveys.

Within the area covered the present survey, with the indicated additions from previous surveys, supersedes the following surveys for charting purposes:

Misc.-4	(1849 to 1851)	in part.		
H-369	(1853)	"	"	
H-443	(1854)	"	"	
H-444	(1854)	"	"	

12. Reviewed by - R. J. Christman, June, 1935.

Inspected by - R. L. Johnston, July 8, 1935.

Examined and approved:

C. K. Green,
Chief, Section of Field Records.

L. O. Tolbut,
Chief, Division of Charts.

F. S. Borden,
Chief, Section of Field Work.

G. H. de
Chief, Division of H. & T.

Applied to CM 1249 - Nov. 1935. H. S. Gamble

Applied to chart 848 Nov. 30 1935 ~~AMR.~~

APPLIED 849 EXTENSION 6/4/76 AMR

Re APP 841, INSET #3, PAGE A & C, 1249 FOR ADDITIONAL SUDGES & SPACING, M. J. 4/7/76