



Atlas 18: Brinton, E. Distributional atlas of euphausiacea (crustacean) in the California Current region, Part II. Published June 1973.

16 May 2007

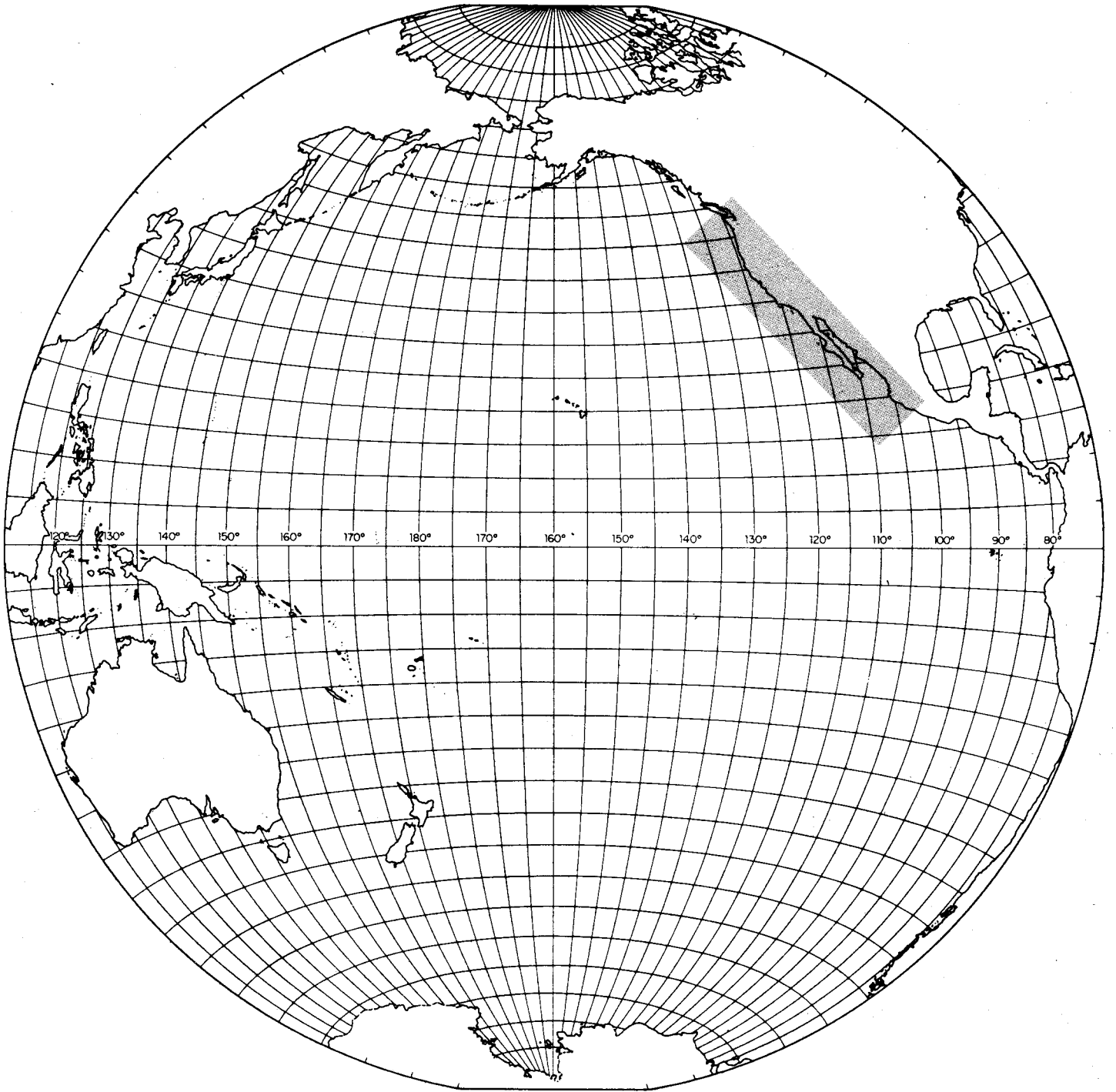
The taxonomic nomenclature in the atlas is exactly as published, even though the euphausiids have undergone taxonomic revision. Below are several references that may be useful in updating the species names:

Brinton, E., M. D. Ohman, A. W. Townsend, M. D. Knight, and A. L. Bridgeman. 2000. Euphausiids of the world ocean. Series: World Biodiversity Database CD-Rom Series Window version 1.0. Expert Center for Taxonomic Identification, Amsterdam, Netherlands, Springer Verlag, New York.

Brinton, E. 1975. Euphausiids of Southeast Asian waters. *Naga Reports* 4(5): 1-287.

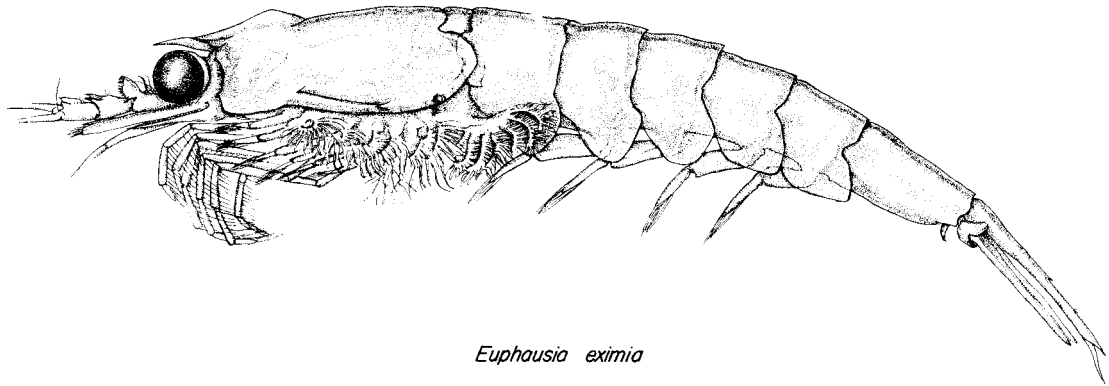
Baker, A. de C., B. P. Boden and E. Brinton. 1990. *A Practical Guide to the Euphausiids of the World*. Natural History Museum Publications. London, 96 pp.

STATE OF CALIFORNIA
MARINE RESEARCH COMMITTEE

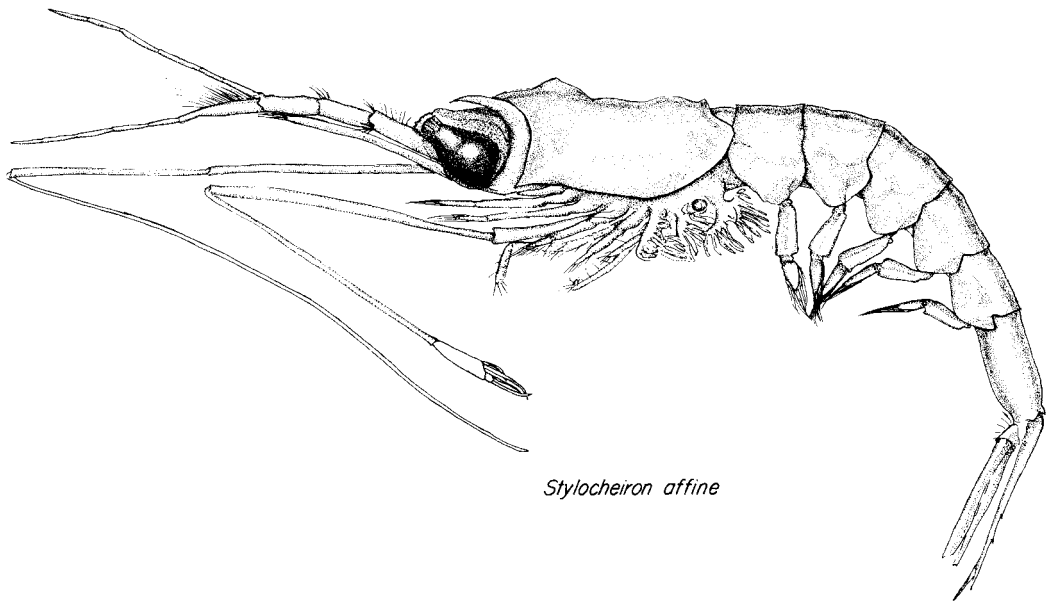


CALIFORNIA COOPERATIVE OCEANIC FISHERIES INVESTIGATIONS

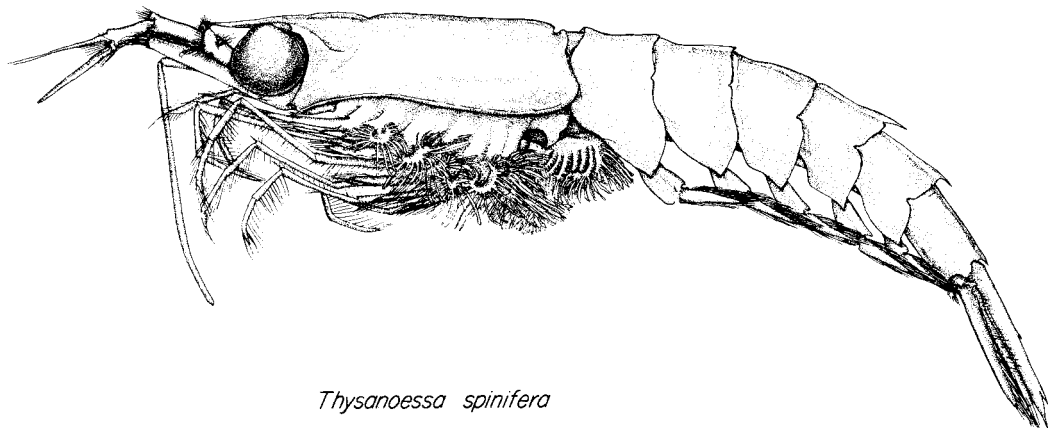
ATLAS No. 18



Euphausia eximia



Stylocheiron affine



Thysanoessa spinifera

CALIFORNIA
COOPERATIVE
OCEANIC
FISHERIES
INVESTIGATIONS

Atlas No. 18

STATE OF CALIFORNIA
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CALIFORNIA ACADEMY OF SCIENCES
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STANFORD UNIVERSITY, HOPKINS MARINE STATION
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, NATIONAL MARINE FISHERIES SERVICE
UNIVERSITY OF CALIFORNIA, SCRIPPS INSTITUTION OF OCEANOGRAPHY

June, 1973

THE CALCOFI ATLAS SERIES

This is the eighteenth in a series of atlases containing data on the hydrography and plankton from the region of the California Current. The field work was carried out by the California Cooperative Oceanic Fisheries Investigations,¹ a program sponsored by the State of California under the direction of the State's Marine Research Committee. The cooperating agencies in the program are:

California Academy of Sciences
California Department of Fish and Game
Stanford University, Hopkins Marine Station
National Oceanic and Atmospheric Administration, National Marine Fisheries Service²
University of California, Scripps Institution of Oceanography

CalCOFI atlases³ are issued as individual units as they become available. They provide processed physical, chemical and biological measurements of the California Current region. Each number may contain one or more contributions. A general description of the CalCOFI program with its objectives appears in the preface of Atlas No. 2.

This atlas was prepared by the Data Collection and Processing Group of the Marine Life Research Program, Scripps Institution of Oceanography.

CalCOFI Atlas Editorial Staff:

Abraham Fleminger and John G. Wyllie, Editors

CalCOFI atlases in this series, through June 1972, are:

- No. 1. Anonymous, 1963. CalCOFI atlas of 10-meter temperatures and salinities 1949 through 1959.
- No. 2. Fleminger, A., 1964. Distributional atlas of calanoid copepods in the California Current region, Part I.
- No. 3. Alvarino, A., 1965. Distributional atlas of Chaetognatha in the California Current region.
- No. 4. Wyllie, J. G., 1966. Geostrophic flow of the California Current at the surface and at 200 meters.
- No. 5. Brinton, E., 1967. Distributional atlas of Euphausiacea (Crustacea) in the California Current region, Part I.
- No. 6. McGowan, J. A., 1967. Distributional atlas of pelagic molluscs in the California Current region.
- No. 7. Fleminger, A., 1967. Distributional atlas of calanoid copepods in the California Current region, Part II.
- No. 8. Berner, L. D., 1967. Distributional atlas of Thaliacea in the California Current region.
- No. 9. Kramer, D., and E. H. Ahlstrom, 1968. Distributional atlas of fish larvae in the California Current region: Northern Anchovy, *Engraulis mordax* Girard, 1951 through 1965.
- No. 10. Isaacs, J. D., A. Fleminger and J. K. Miller, 1969. Distributional atlas of zooplankton biomass in the California Current region: Spring and Fall 1955-1959.
- No. 11. Ahlstrom, E. H., 1969. Distributional atlas of fish larvae in the California Current region: jack mackerel, *Trachurus symmetricus*, and Pacific hake, *Merluccius productus*, 1951 through 1966.
- No. 12. Kramer, D., 1970. Distributional atlas of fish eggs and larvae in the California Current region: Pacific sardine, *Sardinops caerulea* (Girard), 1951 through 1966.
- No. 13. Smith, P. E., 1971. Distributional atlas of zooplankton volume in the California Current region, 1951 through 1966.
- No. 14. Isaacs, J. D., A. Fleminger and J. K. Miller, 1971. Distributional atlas of zooplankton biomass in the California Current region: Winter 1955-1959.
- No. 15. Wyllie, J. G., and R. J. Lynn, 1971. Distribution of temperature and salinity at 10 meters, 1960-1969 and mean temperature, salinity and oxygen at 150 meters, 1950-1968 in the California Current.
- No. 16. Crowe, F. J. and R. A. Schwartzlose, 1972. Release and recovery records of drift bottles in the California Current region, 1955 through 1971.
- No. 17. Ahlstrom, E. H., 1972. Distributional atlas of fish larvae in the California Current region: six common mesopelagic fishes—*Vinciguerria lucetia*, *Triphoturus mexicanus*, *Stenobranchius leucopsarus*, *Leuroglossus stilbius*, *Bathylagus wesethi*; and *Bathylagus ochotensis*, 1955 through 1960.
- No. 18. Brinton, E., 1973. Distributional atlas of Euphausiacea (Crustacea) in the California Current region, Part II.

¹ Usually abbreviated CalCOFI, sometimes CALCOFI or CCOFI.

² Formerly called U. S. Fish and Wildlife Service, Bureau of Commercial Fisheries.

³ For citation this issue in the series should be referred to as CalCOFI Atlas No. 18.

**DISTRIBUTIONAL ATLAS OF EUPHAUSIACEA
(CRUSTACEA) IN THE CALIFORNIA CURRENT
REGION, PART II**

Edward Brinton

CALCOFI ATLAS NO. 18

A. Fleminger and J. G. Wyllie, Editors
Data Collection and Processing Group
Marine Life Research Program
Scripps Institution of Oceanography
La Jolla, California

June, 1973

DISTRIBUTIONAL ATLAS OF EUPHAUSIACEA (CRUSTACEA) IN THE CALIFORNIA CURRENT REGION, PART II¹

Edward Brinton²

Text

Introduction	v
Table 1	vi
Table 2	vii
Thumb Tab Index	ix

Charts

Basic Station Plans	1A, 1B, 1C
Charts	2-336

Introduction

The charts in this atlas show the abundance and distribution of 22 species of Euphausiacea in the California Current region. Charts are presented for all cruises where five or more positive records were found. The pagination of these charts is given in Table 1. Table 2 contains records of those species occurring at fewer than five stations in a given cruise. The chart data were obtained from the following 14 cruises: "E.W. Scripps" Cruise VIII, May 10—July 10, 1939; CalCOFI Cruises 4903, 4904, 4905, 4906, 4907, 4908, 4909, 4910, 4911, 5002, 5003, 5004 and 5009.

The 1939 cruise was the first extensive investigation of the California Current carried out by the Scripps Institution. Data were collected on hydrographic parameters, sea floor geology and plankton. The hydrographic data, phytoplankton counts and a description of the cruise were compiled by H. U. Sverdrup and the staff of the Scripps Institution of Oceanography (1943). The zooplankton samples were obtained by use of opening-closing nets sampling at three different depth: 0-50 meters, 50-100 meters and 100-150 meters. The nets used were similar to the standard CalCOFI net described by Fleminger (1964); an opening-closing device comparable to that described by Leavitt (1938) was used in conjunction with this net. For the charts used in the present atlas, the 1939 data from 0-50 meters and 50-100 meters

have been combined as an average so as to provide abundance values for the species occupying the 0-100 meter stratum.

During the 1949 and 1950 CalCOFI cruises, sampling was by means of oblique hauls to a depth of about 75 meters with 100 meters of wire paid out. This depth of sampling is in contrast to that employed in post-1950 cruises where 200 meters of wire were paid out permitting the net to reach a depth of approximately 140 meters. The euphausiid data shown in CalCOFI Atlas No. 5, Euphausiacea, Part I (Brinton, 1967a) based on 1954-1963 cruises, are therefore not strictly comparable with the data presented in this atlas.

The majority of species charted in this atlas are present during the night above a depth of 75 meters (Brinton, 1967b). Many of these species were consistently caught in appreciably lower abundances in that layer during the day, owing either to avoidance of the net or vertical migration or both. For those species which showed the most consistent diurnal difference in abundance estimates, inset charts based on night samples only are provided. It is believed that these provide a better indication of the real distribution.

Stylocheiron maximum and *Stylocheiron longicorne* are species which generally live in or below the thermocline. Their less frequent occurrence in 0-75 meter samples as compared with 0-140 meter samples (Brinton 1967a) may be attributed to the different depths of sampling.

In the present atlas most of the charts are based upon counts of all size groups of each species, the smallest euphausiids normally sampled by the standard net being about 2.5 mm in length and the largest 15-20 mm. Separate charts of the distribution of larvae are included (calyptopis and furcilia stages) for certain of the major species in the California Current community. These species are: *Euphausia eximia*, *E. gibboides*, *E. pacifica*, *Nematoscelis difficilis* and *Nyctiphanes simplex*.

The cruises charted in this atlas rather consistently occupy the waters in the zone 45°N to 25°N. Those charted in CalCOFI Atlas No. 5 were more consistently in the zone, 35°N to 25°N. Details of the methods of sampling, aliquoting the samples and counting are given in CalCOFI Atlas No. 5 and will not be repeated here. A brief discussion of the faunistics of the Euphausiids in the California Current is also given in that atlas. The Pacific-wide

ranges of the species are presented in Brinton (1962).

¹ This research was carried out under the Scripps Institution's Marine Life Research Program with partial support from the National Science Grant GB-2861.

² Scripps Institution of Oceanography, University of California, San Diego, La Jolla, California.

TABLE 1. Pagination of distribution charts. Charts limited to cruises with five or more occurrences of a species. Fewer occurrences (1 to 4) indicated by T (see Table 2 for data) and no occurrences by O.

		Cr VIII													
		1939	4903	4904	4905	4906	4907	4908	4909	4910	4911	5002	5003	5004	5009
<i>Euphausia eximia</i>	Larvae	2	4	O	7	9	O	12	14	16	18	20	22	24	26
<i>Euphausia eximia</i>	Total	3	5	6	8	10	11	13	15	17	19	21	23	25	27
<i>Euphausia gibboides</i>	Larvae	28	30	O	33	35	O	38	40	42	44	46	48	50	O
<i>Euphausia gibboides</i>	Total	29	31	32	34	36	37	39	41	43	45	47	49	51	52
<i>Euphausia hemigibba</i>		53	54	55	56	57	58	59	60	61	62	63	64	65	66
<i>Euphausia mutica</i>		67	68	69	70	71	72	73	74	75	76	77	78	79	80
<i>Euphausia pacifica</i>	Larvae	81	83	85	87	89	91	93	95	97	99	101	103	105	107
<i>Euphausia pacifica</i>	Total	82	84	86	88	90	92	94	96	98	100	102	104	106	108
<i>Euphausia recurva</i>		109	110	111	112	113	114	115	116	117	118	119	120	121	122
<i>Nematobranchion flexipes</i>		123	124	125	126	127	128	129	130	131	132	T	133	134	135
<i>Nematoscelis atlantica</i>		136	No Data	No Data	No Data	No Data	137	138	139	T	140	141	T	T	No Data
<i>Nematoscelis difficilis</i>	Larvae	142	144	146	148	150	152	154	156	158	160	162	164	166	168
<i>Nematoscelis difficilis</i>	Total	143	145	147	149	151	153	155	157	159	161	163	165	167	169
<i>Nematoscelis tenella</i>		170	171	172	173	174	175	176	177	178	179	180	181	182	183
<i>Nyctiphanes simplex</i>	Larvae	184	186	188	190	192	194	196	198	200	202	204	206	208	210
<i>Nyctiphanes simplex</i>	Total	185	187	189	191	193	195	197	199	201	203	205	207	209	211
<i>Stylocheiron abbreviatum</i>		212	T	213	T	T	214	215	216	217	218	219	T	220	221
<i>Stylocheiron affine</i>		222	223	224	225	226	227	228	229	230	231	232	233	234	235
<i>Stylocheiron carinatum</i>		236	237	238	239	240	241	T	T	242	243	244	245	246	247
<i>Stylocheiron longicorne</i>		248	T	249	250	251	252	253	254	255	256	257	258	T	259
<i>Stylocheiron maximum</i>		260	T	261	262	O	T	T	T	263	T	O	T	T	T
<i>Stylocheiron suhmii</i>		T	264	265	266	267	268	269	270	271	272	273	274	275	276
<i>Tessarabrachion oculatus</i>		277	T	278	279	280	281	282	T	283	T	O	O	284	T
<i>Thysanoessa gregaria</i>		285	286	287	288	289	290	291	292	293	294	295	296	297	298
<i>Thysanoessa longipes</i>		299	T	300	301	T	302	303	304	305	306	O	T	307	308
<i>Thysanoessa spinifera</i>		309	310	311	312	313	314	315	316	317	318	319	320	321	322
<i>Thysanopoda aequalis</i>		323	324	325	326	327	328	329	330	331	332	333	334	335	336

O — No Specimens Found
T — See Table 2

TABLE 2. Stations containing 1 to 4 positive samples. (These data are not presented on distribution charts)

	YEAR	CRUISE	STATION	Number 1000m ³		YEAR	CRUISE	STATION	Number 1000m ³	
<i>Nematobranchion flexipes</i>	1950	5002	87.90	6	<i>Stylocheiron maximum</i>	1949	4903	503	1	
			93.70	3				702	4	
			130.40	7				4907	105	1
<i>Nematoscelis atlantica</i>	1949	4910	130.50	4	108	8				
			1210	2	207	2				
	1950	5003	80.110	16	407	3				
			120.60	1	4908	104	1			
			120.100	4	105	1				
<i>Stylocheiron abbreviatum</i>	1949	5004	90.120	1	4909	304	2			
			4903	610	5	4911	409	3		
				703	2	410	1			
	804	2		503	1					
	1003	2		1950	5003	50.120	3			
	4905	1107	3	70.80	7					
		4906	610	2	80.55	1				
			806	2	5004	60.60	4			
		1950	5003	1005	2	97.70	2			
	1006			4	117.35	2				
	80.110			17	5009	30.80	1			
80.130	1			1939	Cr. VIII	55	4			
90.100	3					78	1			
<i>Stylocheiron carinatum</i>	1949	4908	100.100	1	<i>Tessarabrachion oculus</i>	1949	4903	503	10	
			709	1				606	1	
			710	18				608	1	
			807	15				4909	202	1
			1006	1				4911	202	3
	4909	709	50	1950	5009	30.100	1			
		710	16	1949	4903	503	1			
		910	8			504	2			
		1110	2	4906	402	18				
		<i>Stylocheiron longicorne</i>	1949	4903	601	2	403	75		
605	1				502	13				
608	3				503	4				
1950	5004		702	33	5003	40.50	7			
			50.60	18	40.90	11				
			60.60	2	40.110	1				
							70.60	1		

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- Leavitt, B. B., 1938. The quantitative vertical distribution of macroplankton in the Atlantic Ocean Basin. Biol. Bull., 74 (3): 376-394.
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Euphausia eximia

E. gibboides

E. hemigibba

E. mutica

E. pacifica

E. recurva

Nematobranchion

Nematoscelis

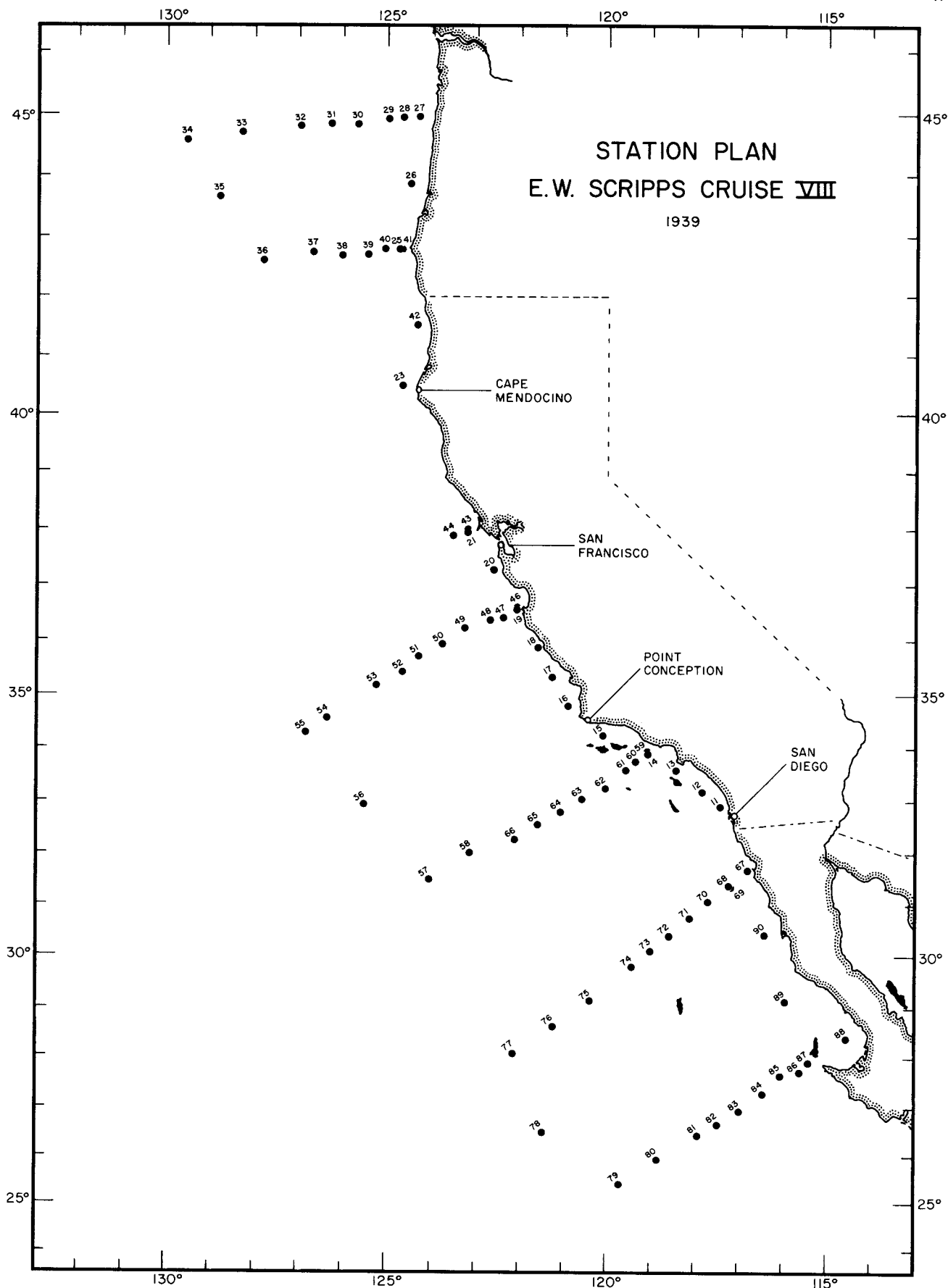
Nyctiphanes

Stylocheiron

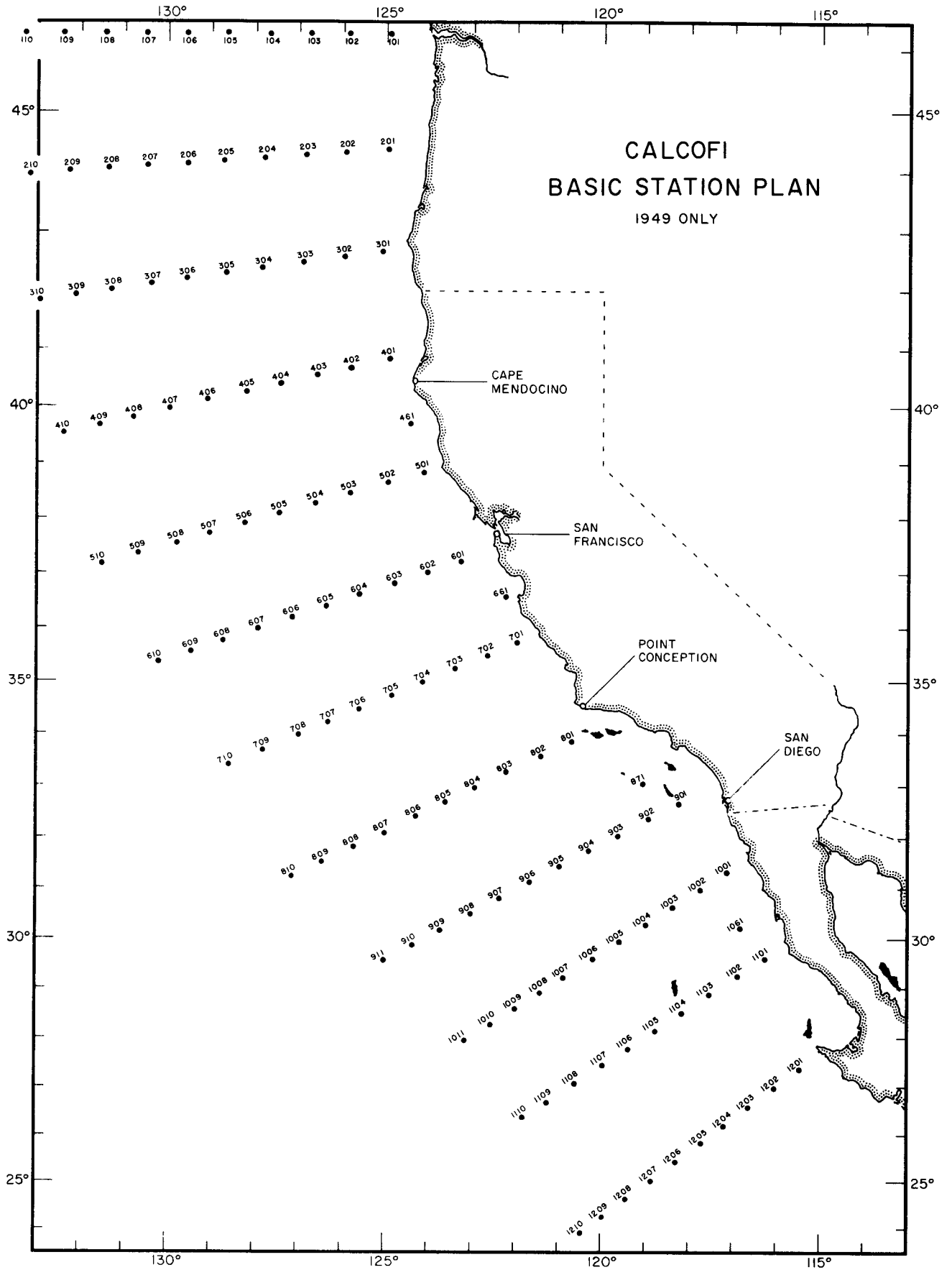
Tessarabranchion

Thysanoessa

Thysanopoda



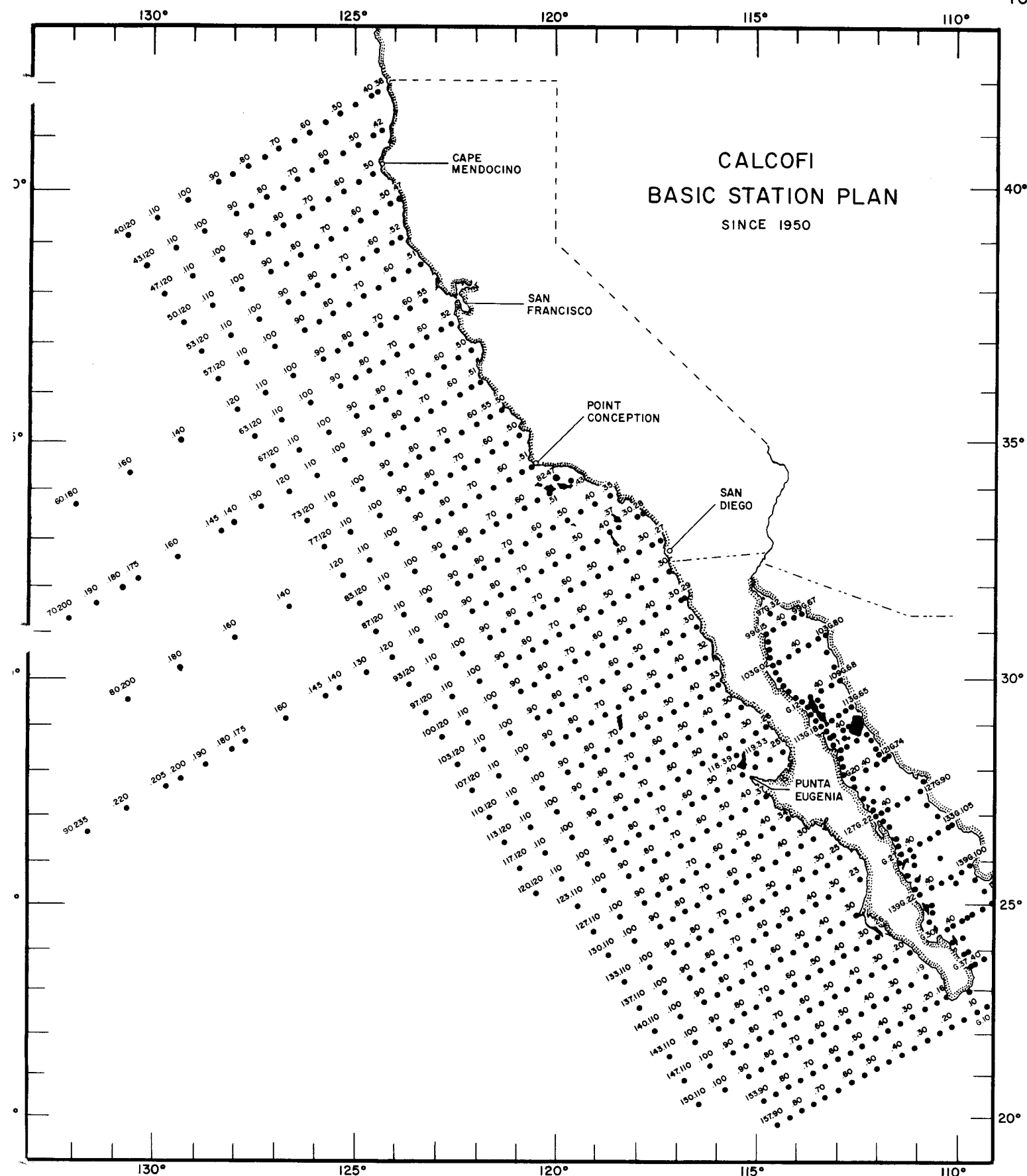
STATION PLAN



CALCOFI

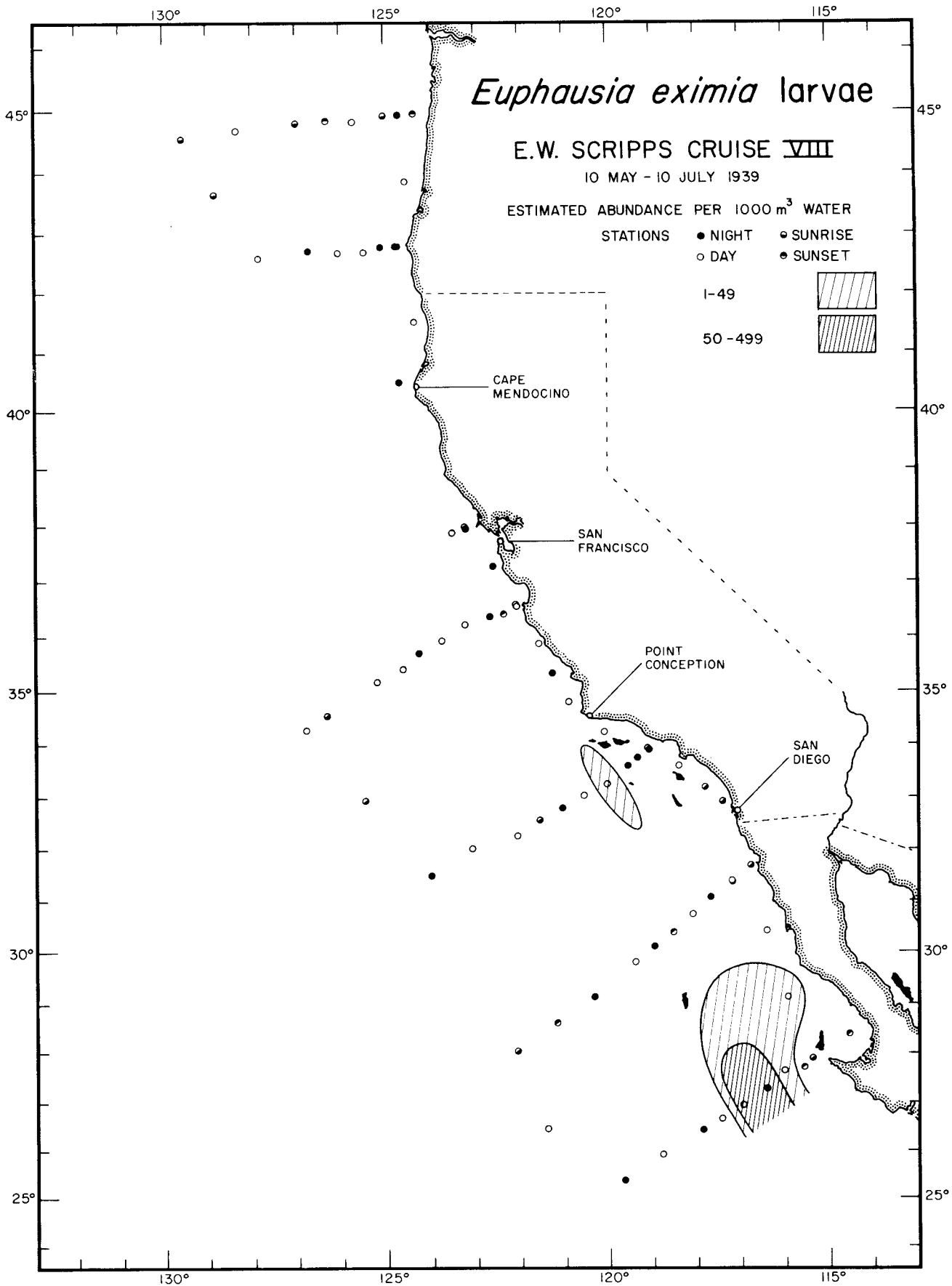
BASIC STATION PLAN

1949 ONLY

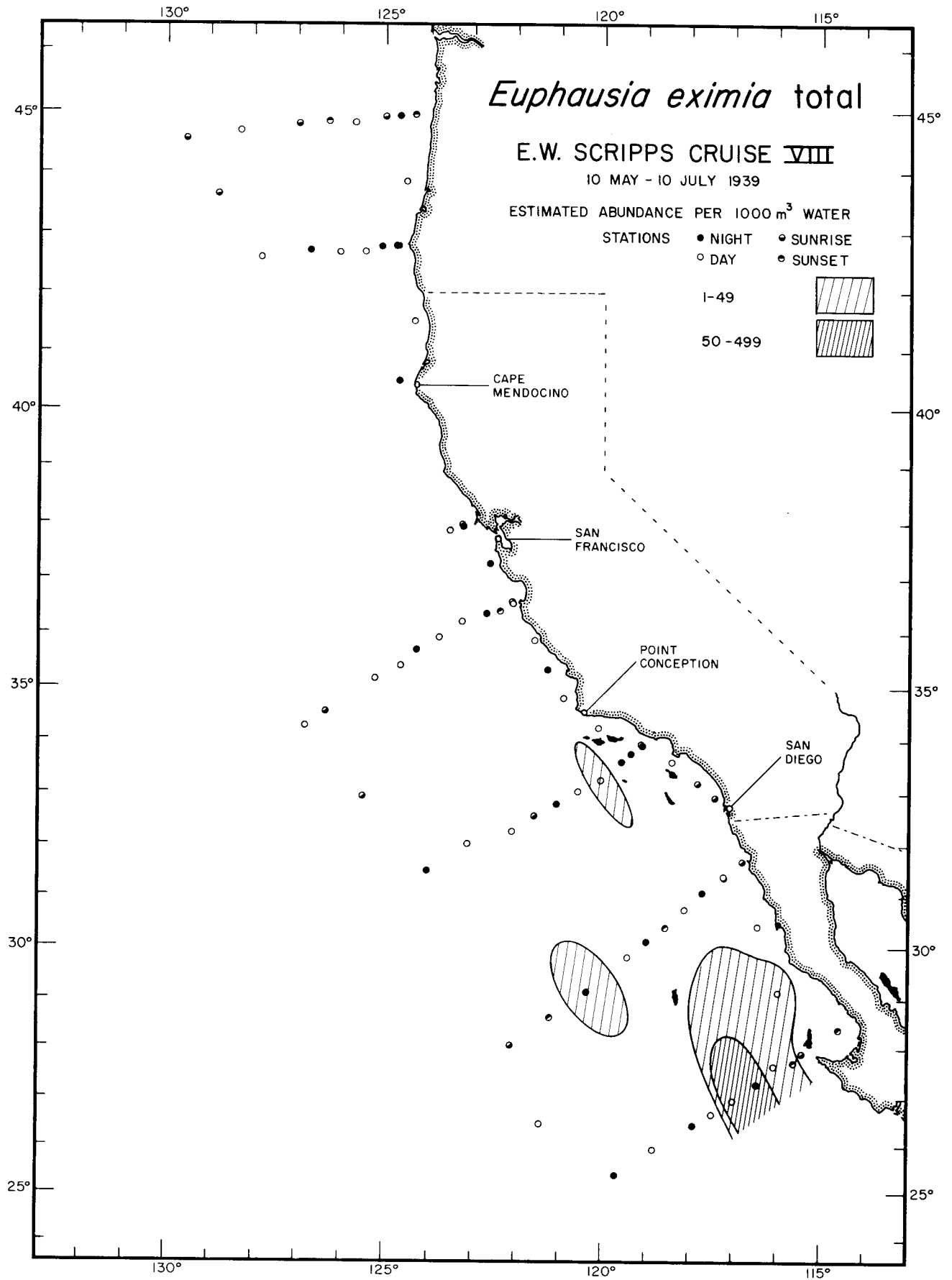


CALCOFI

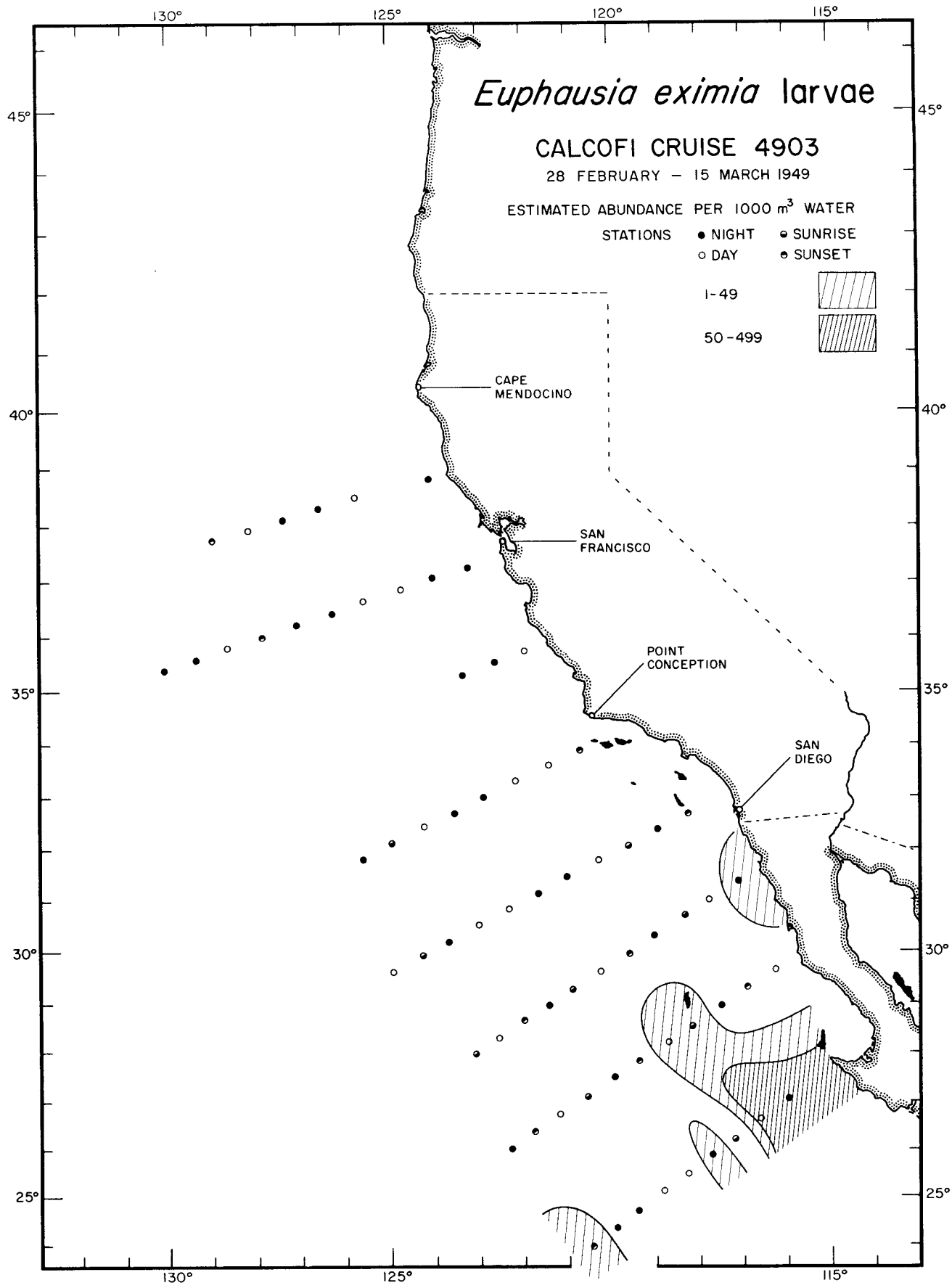
BASIC STATION PLAN
SINCE 1950



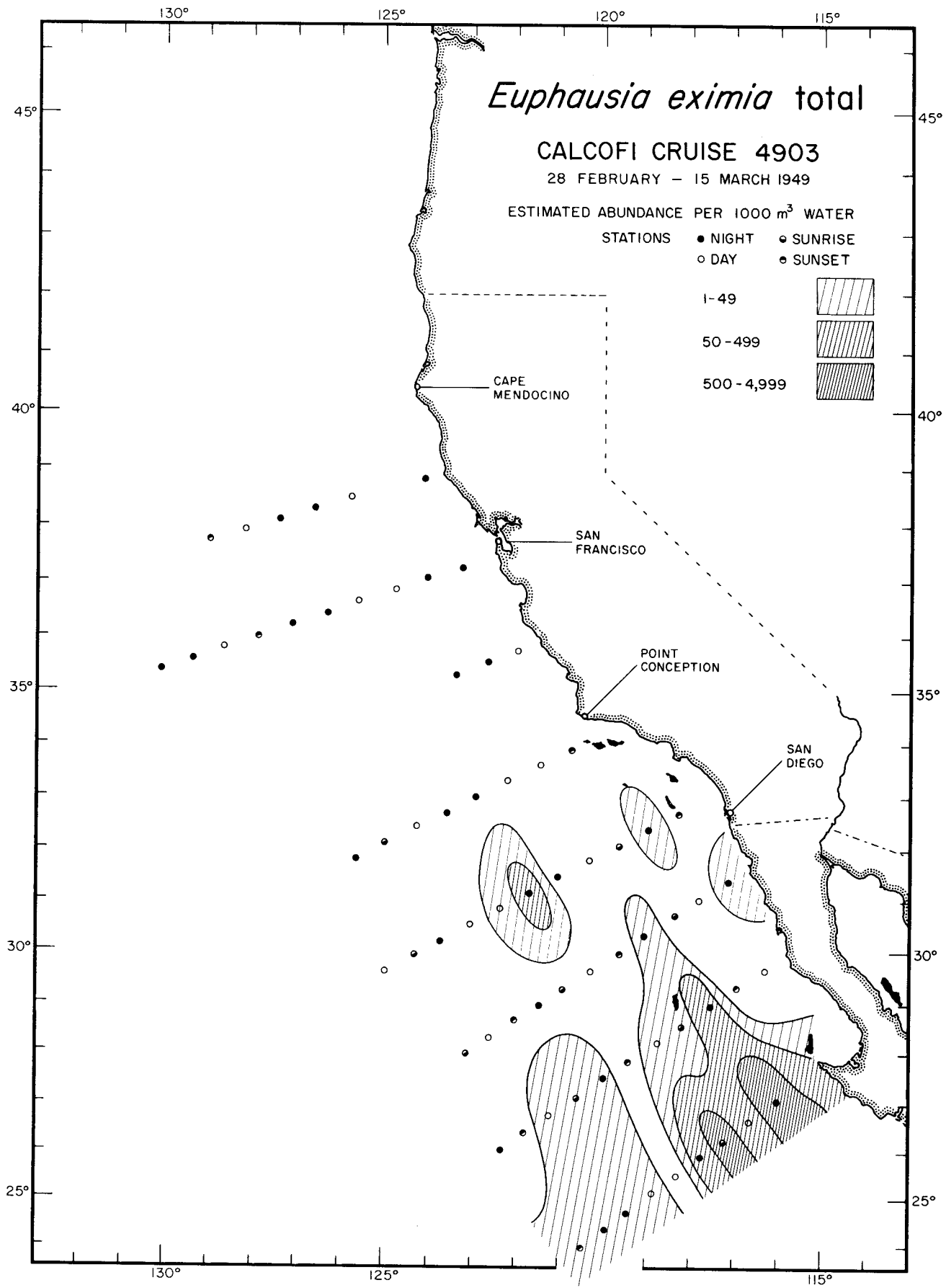
Euphausiacea
Euphausia eximia larvae
E. W. SCRIPPS CRUISE VIII



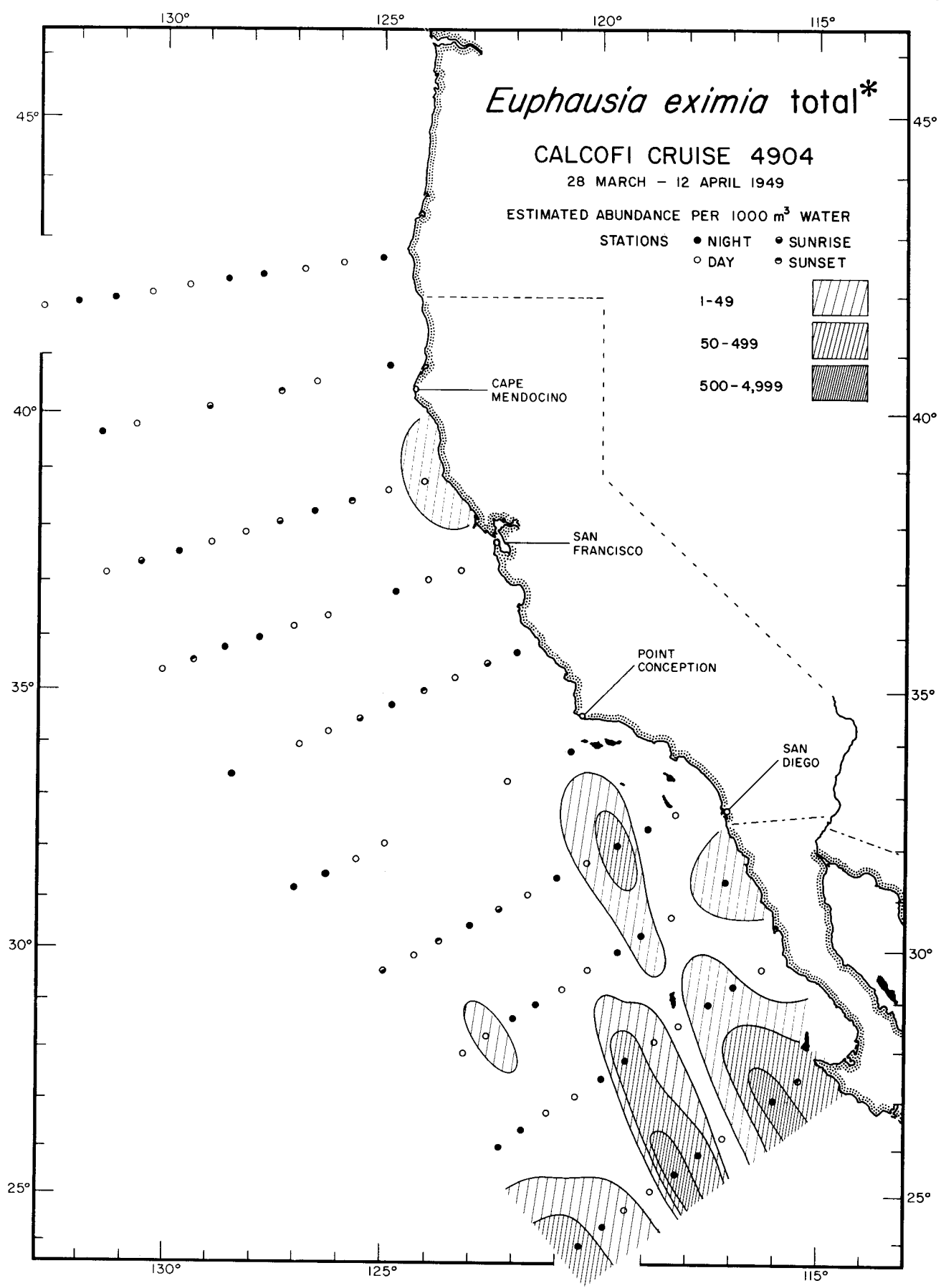
Euphausiacea
Euphausia eximia total
E. W. SCRIPPS CRUISE VIII



Euphausiacea
Euphausia eximia larvae
4903

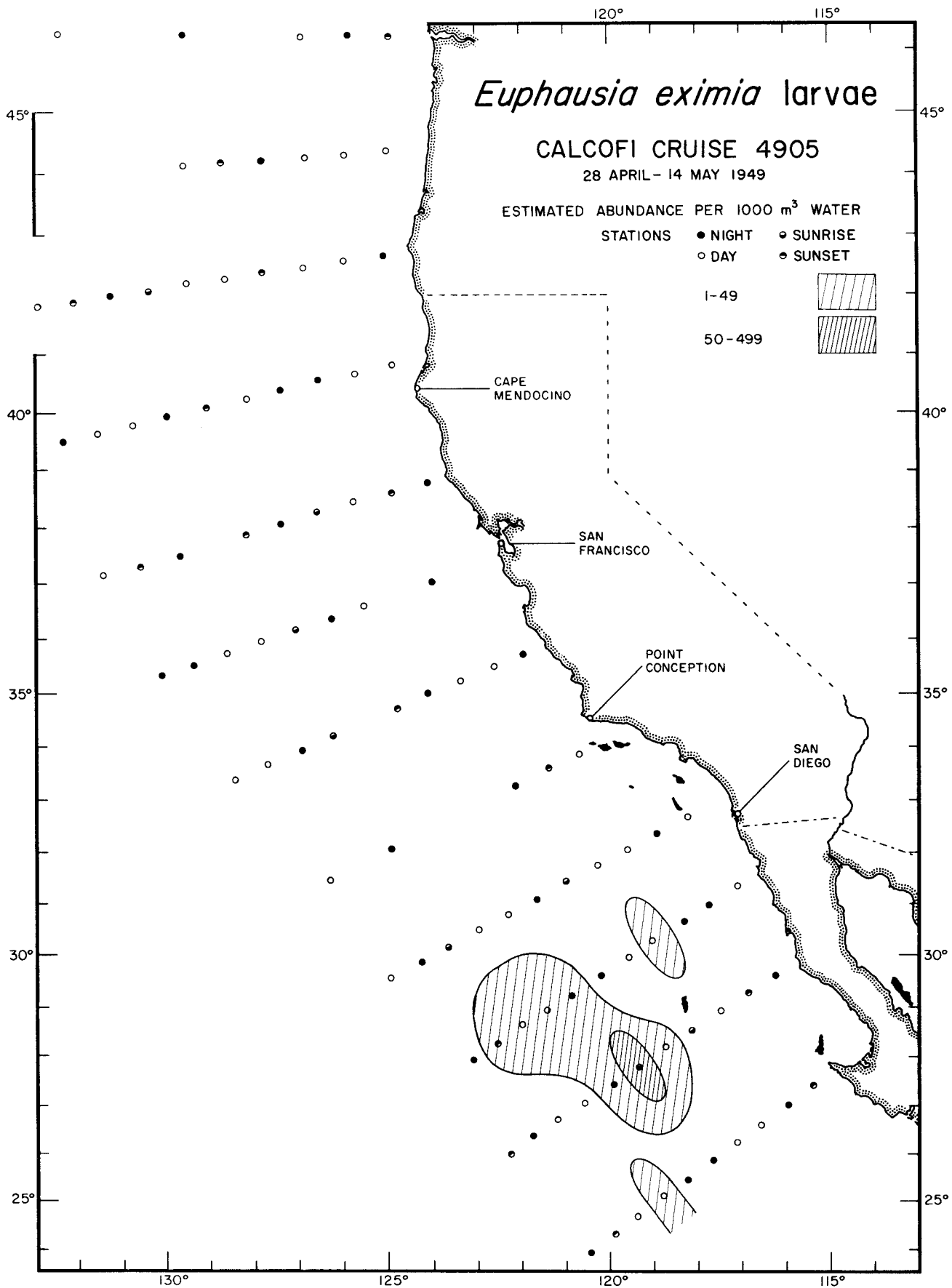


Euphausiacea
Euphausia eximia total
4903

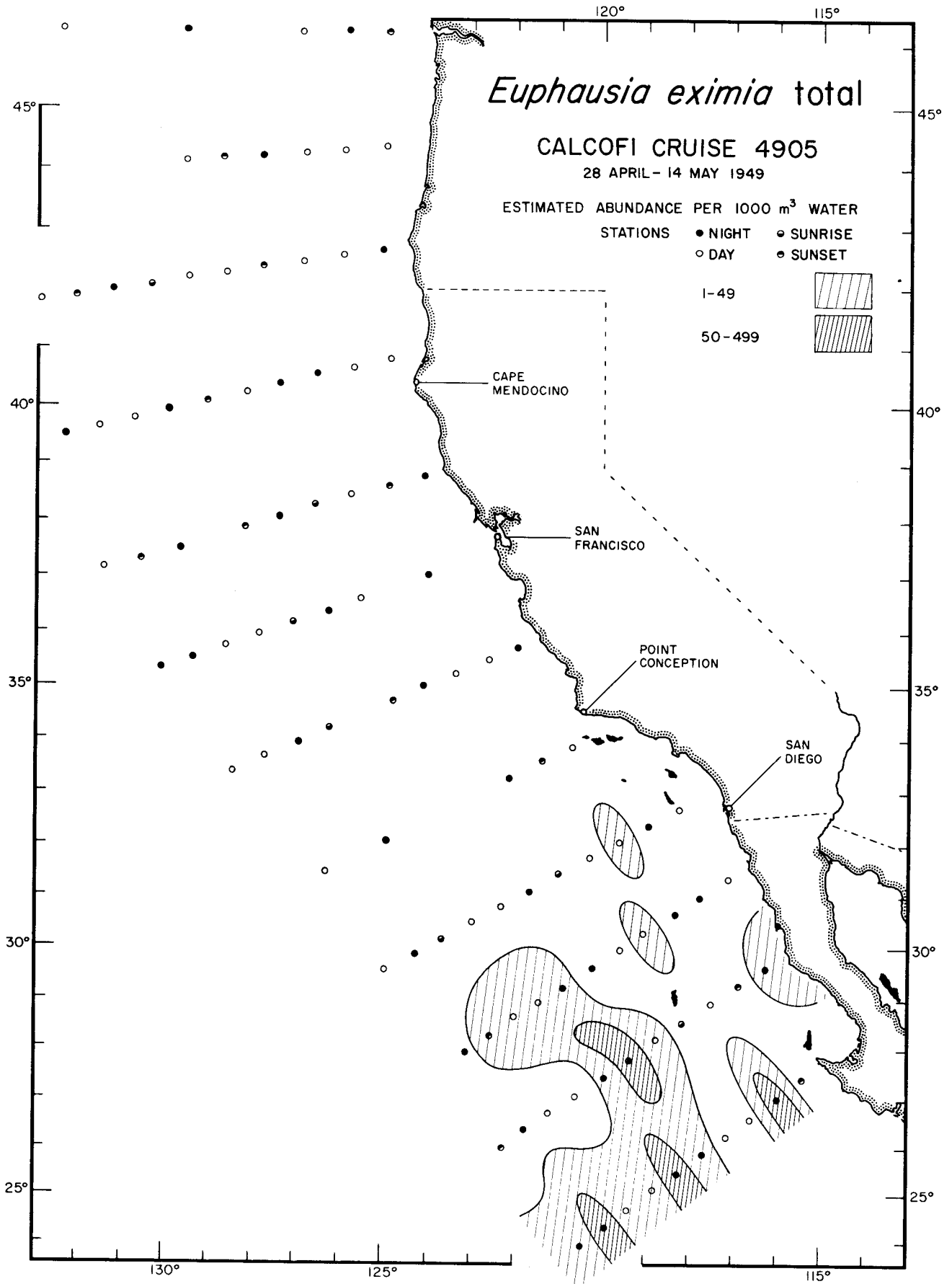


* No larvae found

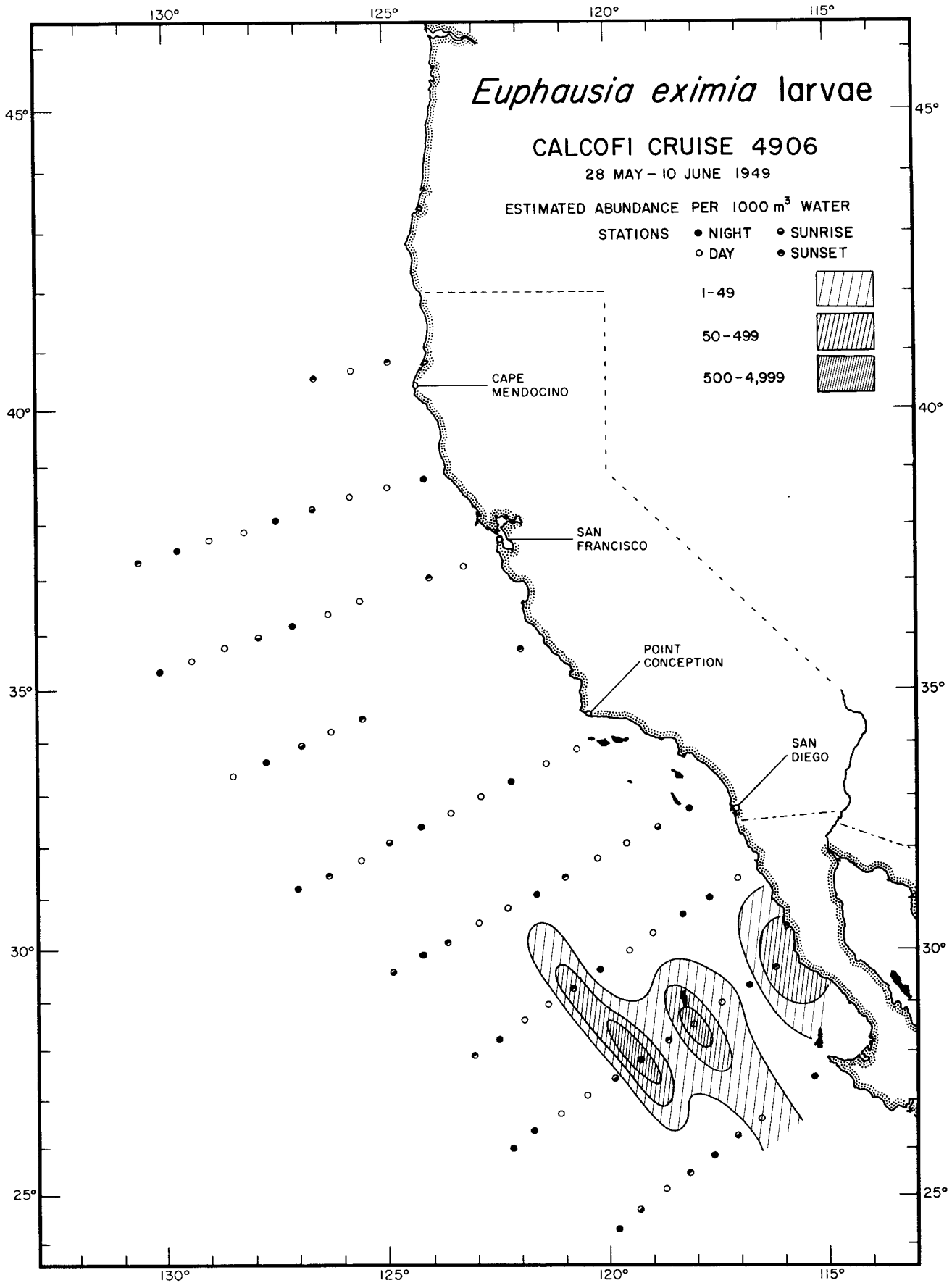
Euphausiacea
Euphausia eximia total
4904



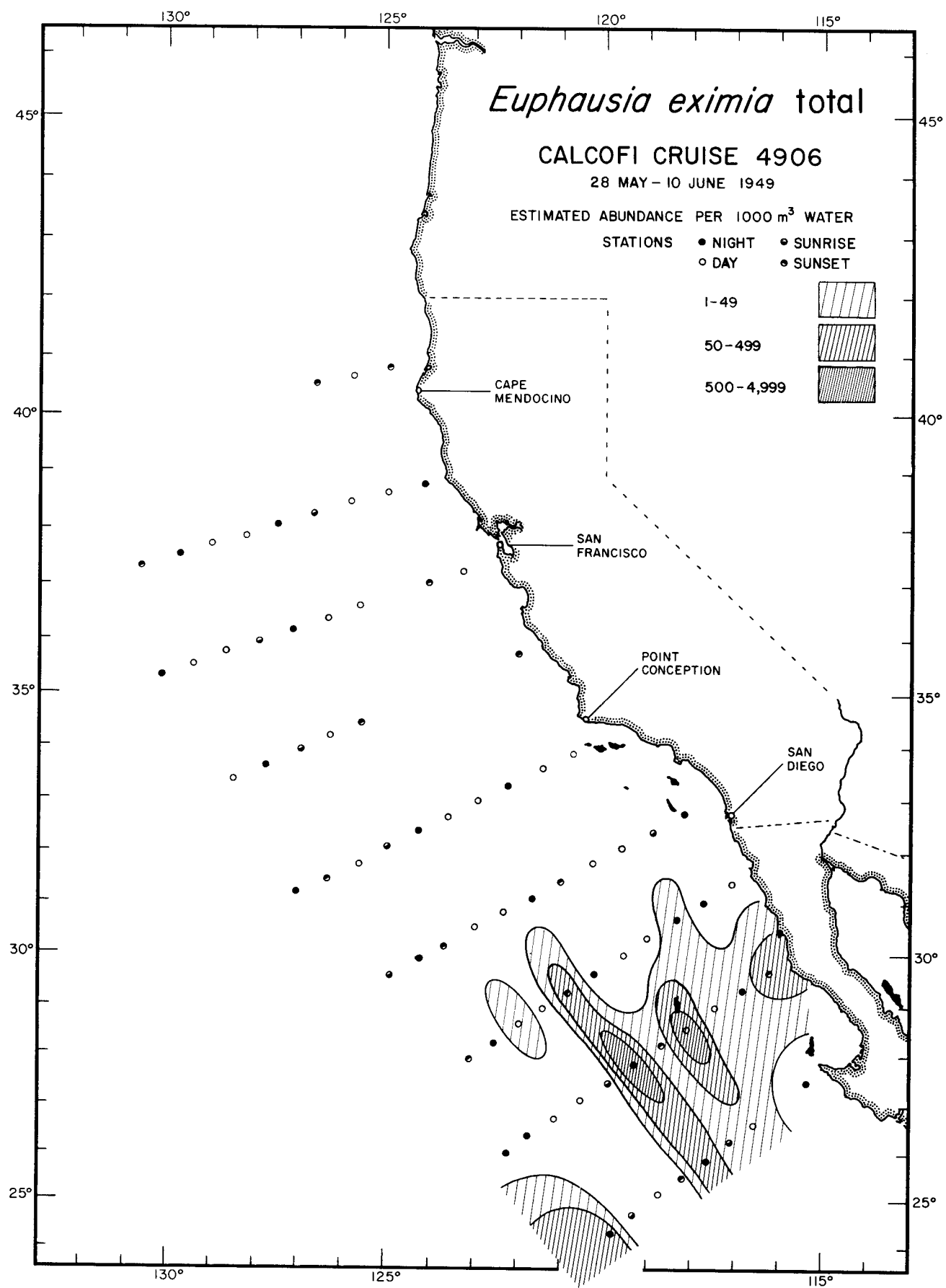
Euphausiacea
Euphausia eximia larvae
4905



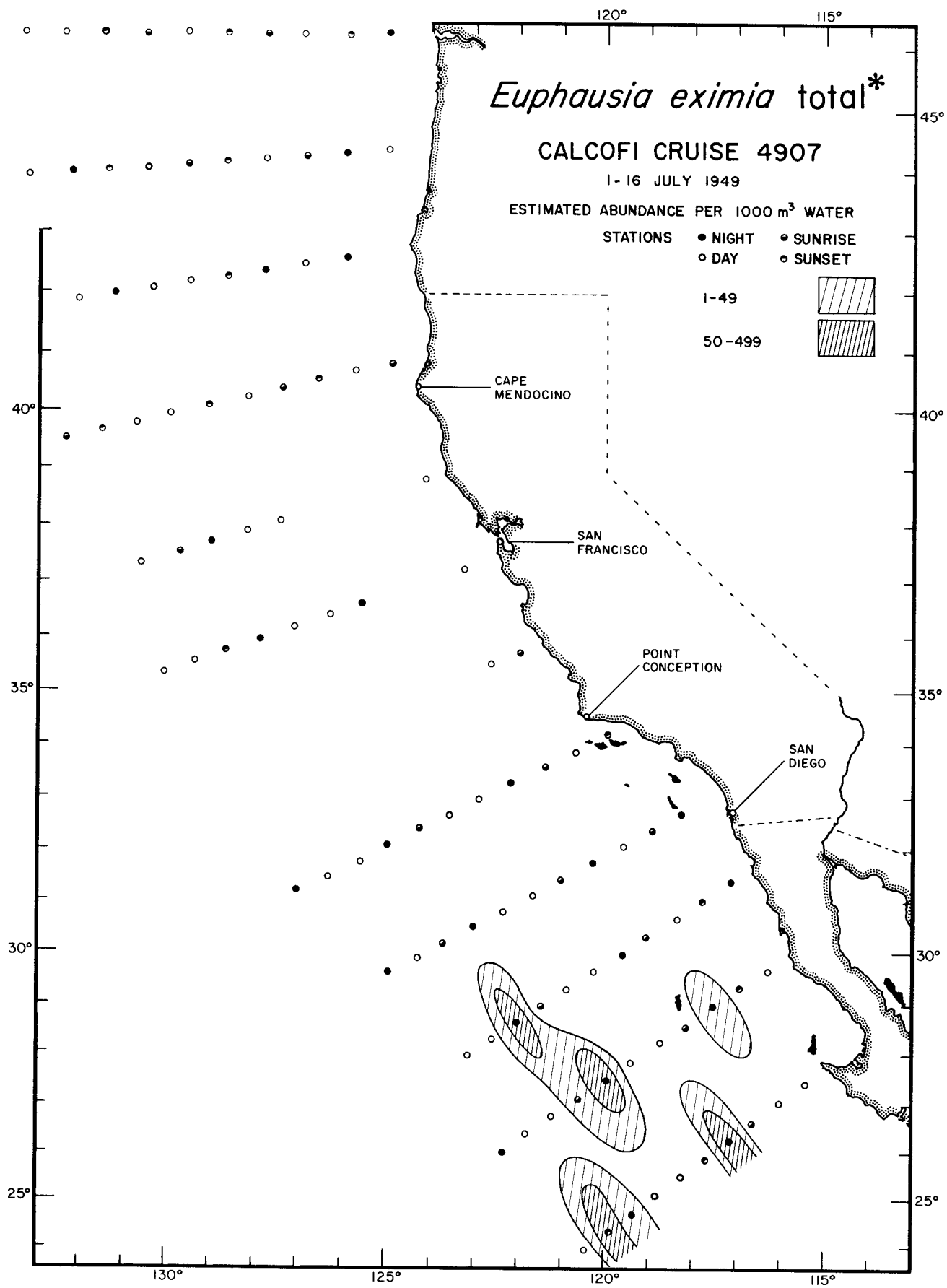
Euphausiacea
Euphausia eximia total
4905



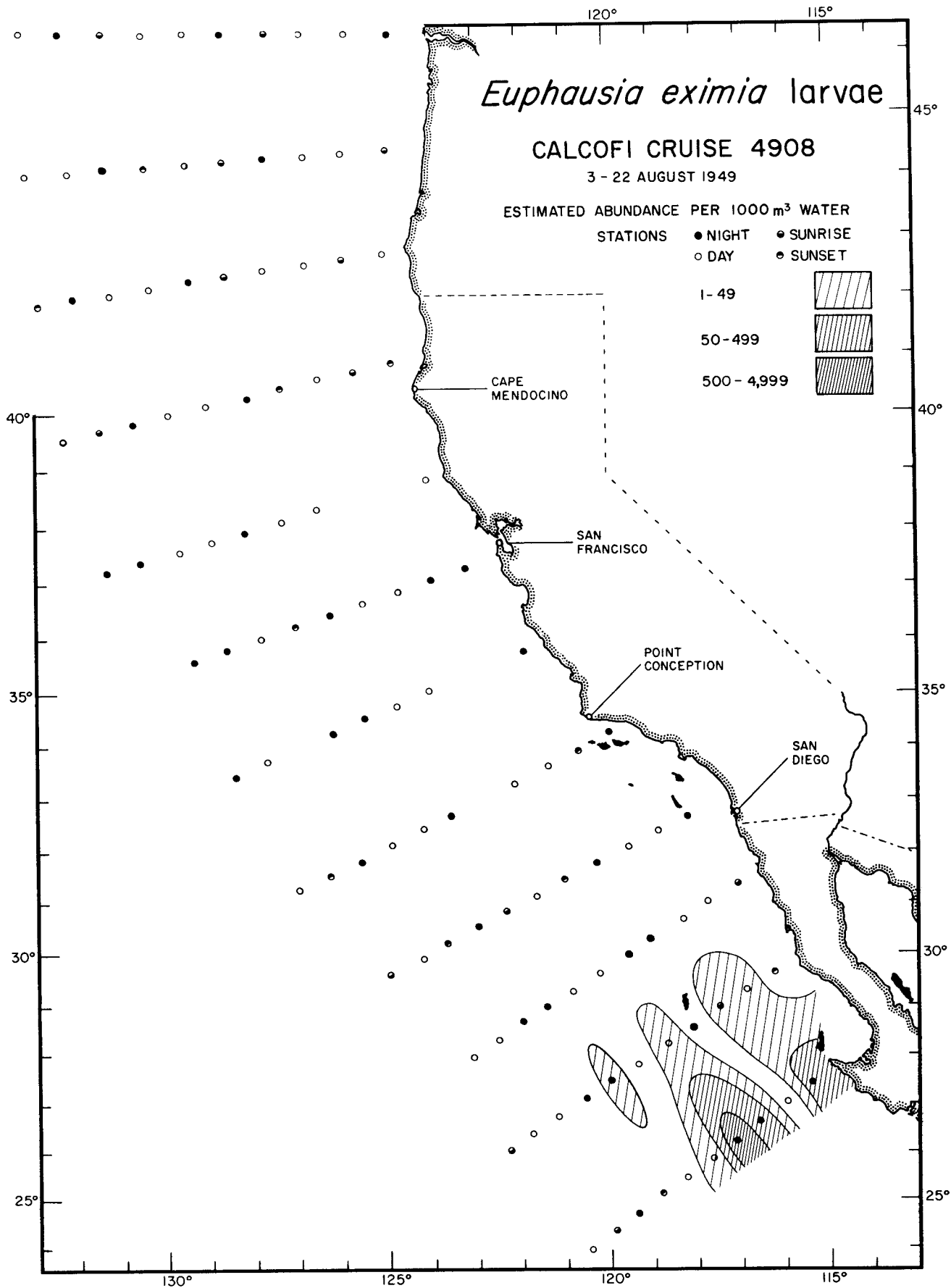
Euphausiacea
Euphausia eximia larvae
4906



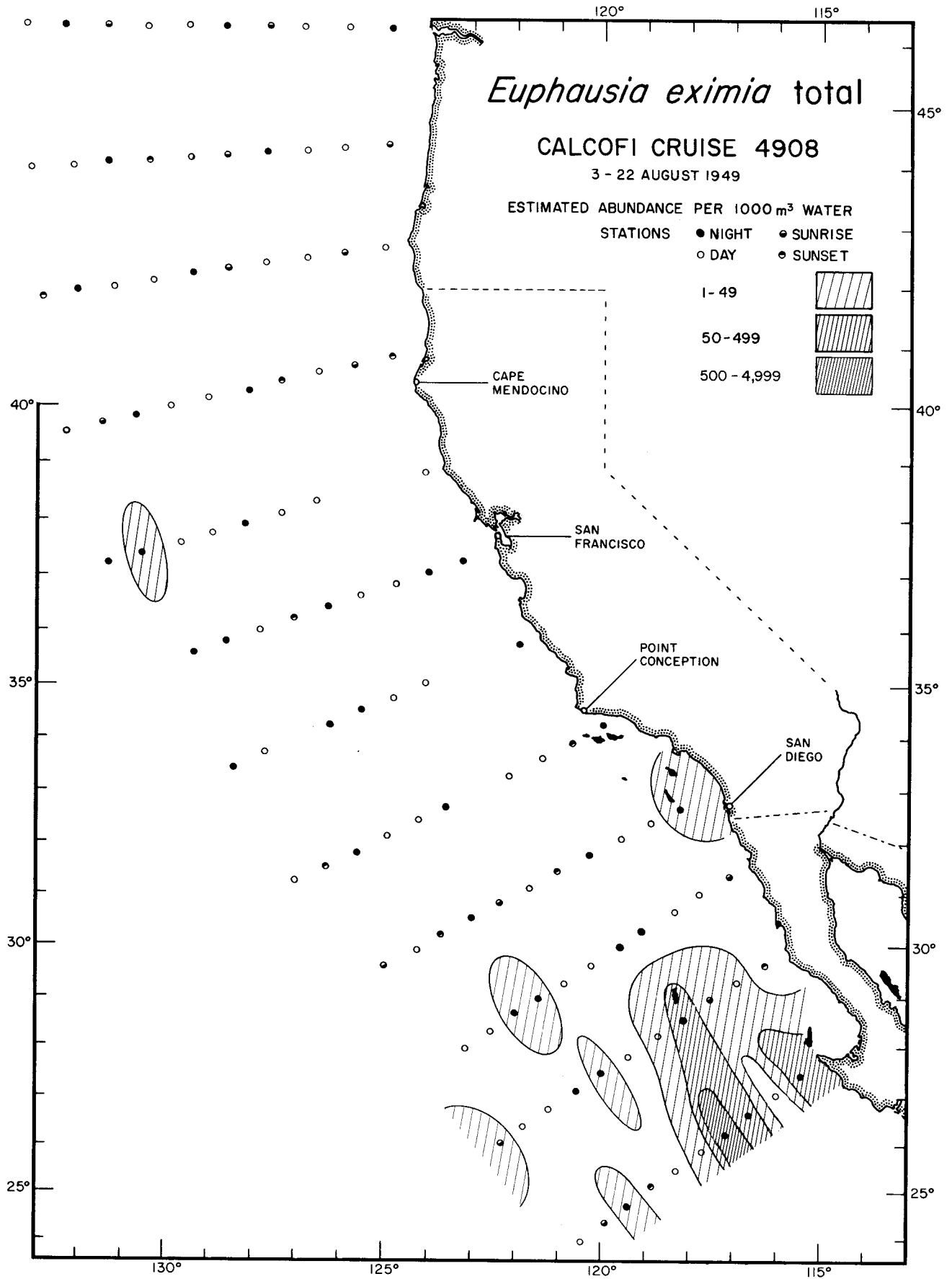
Euphausiacea
Euphausia eximia total
4906



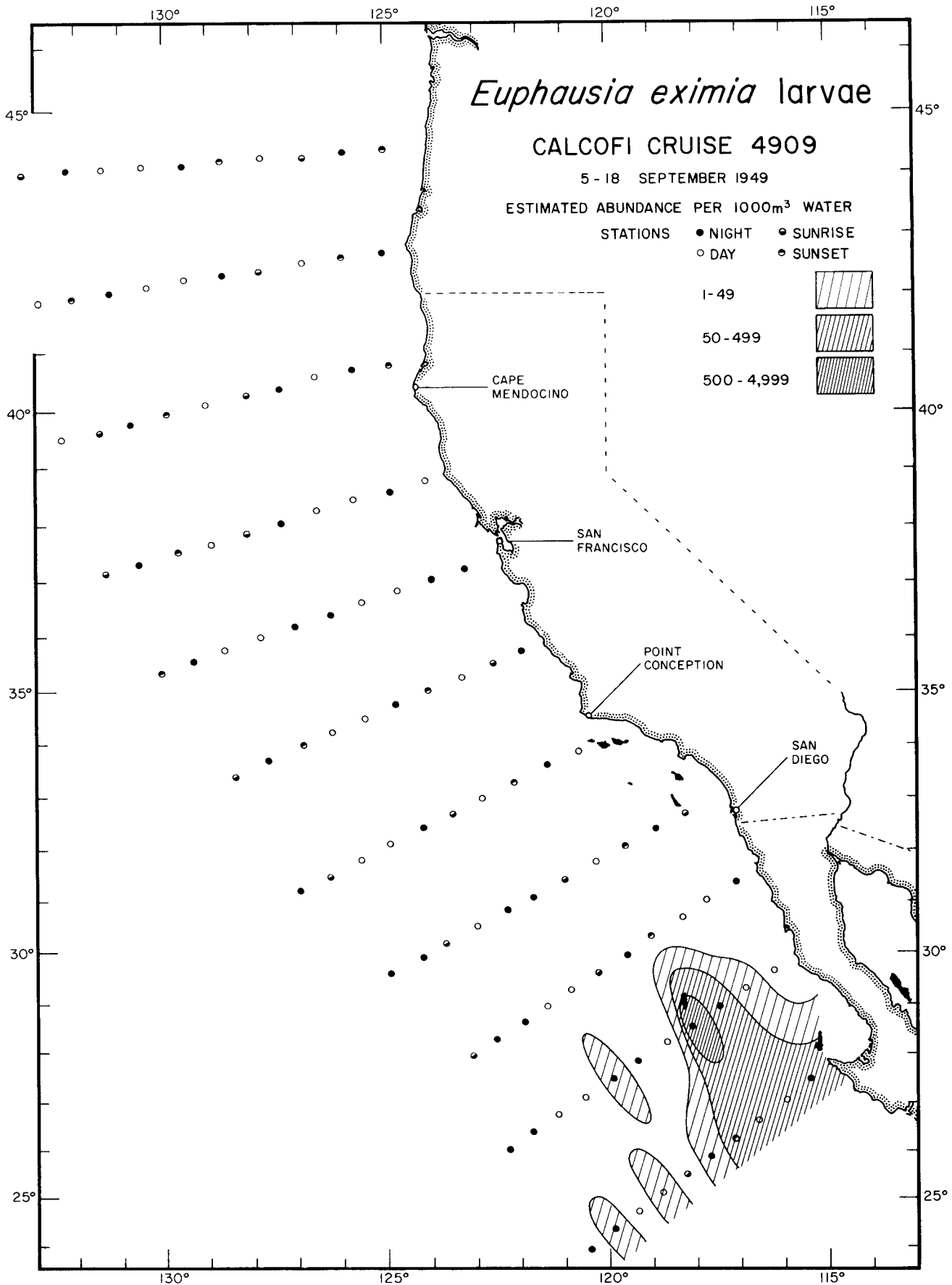
* No larvae found



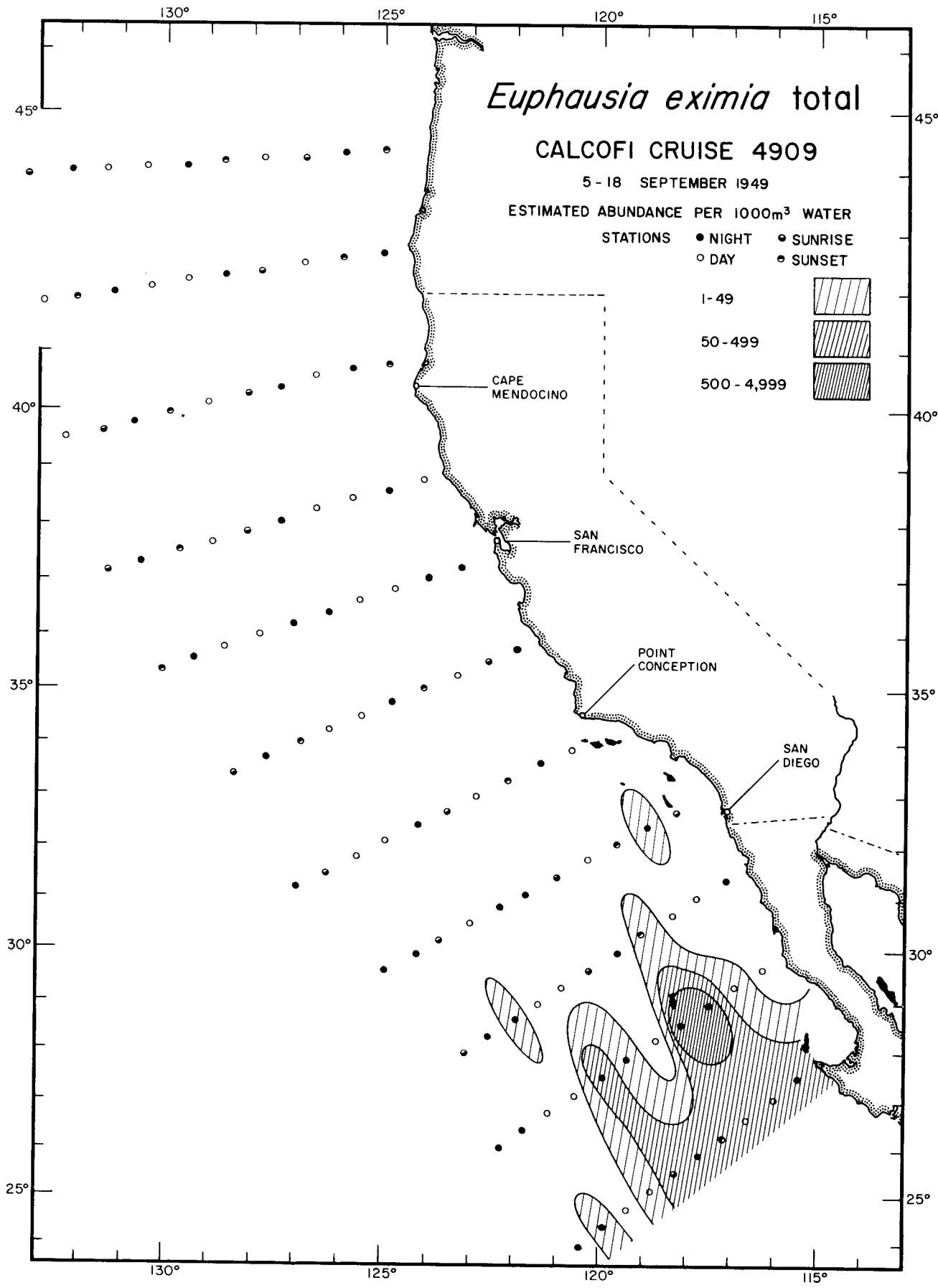
Euphausiacea
Euphausia eximia larvae
4908



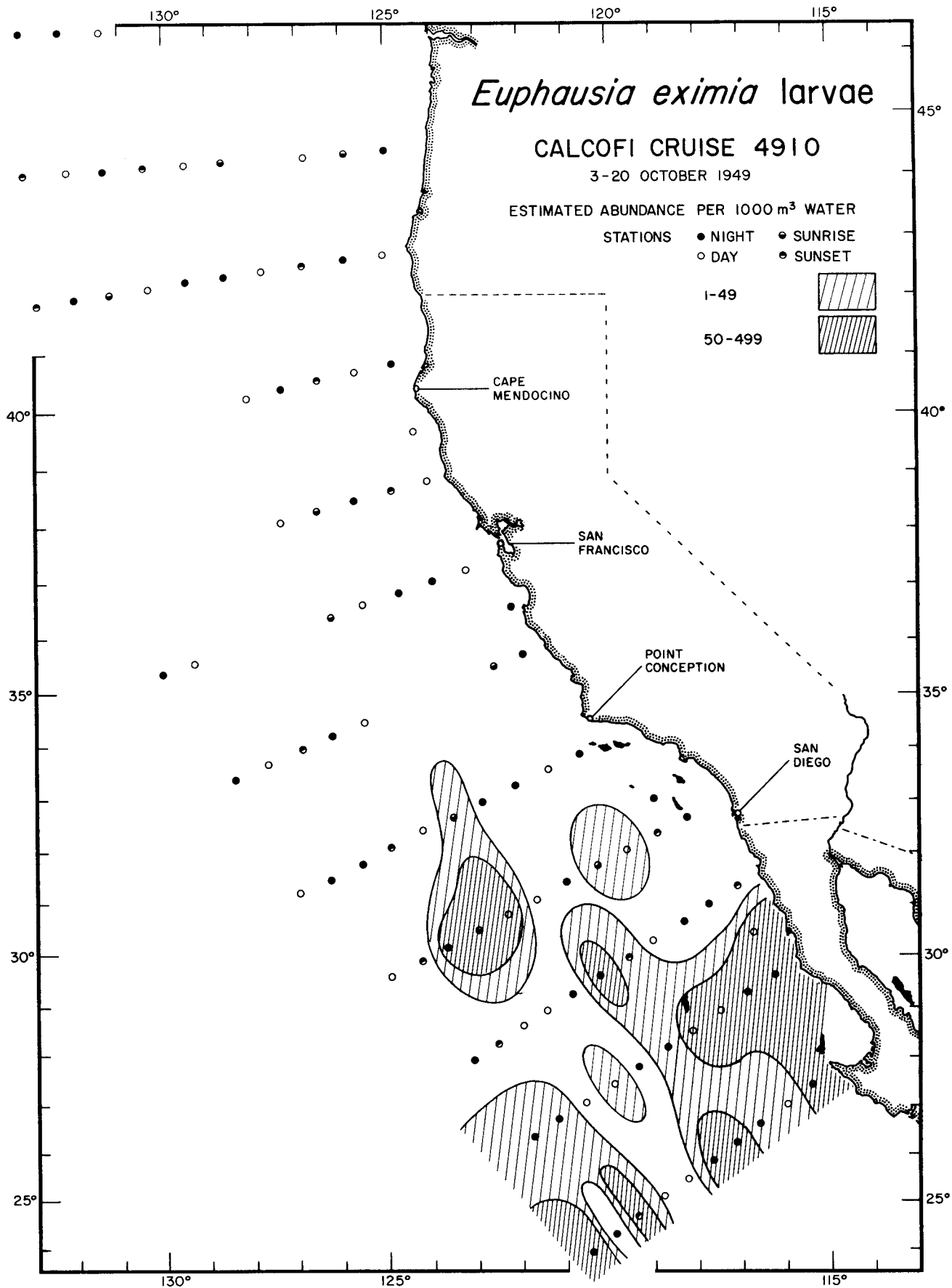
Euphausiacea
Euphausia eximia total
4908



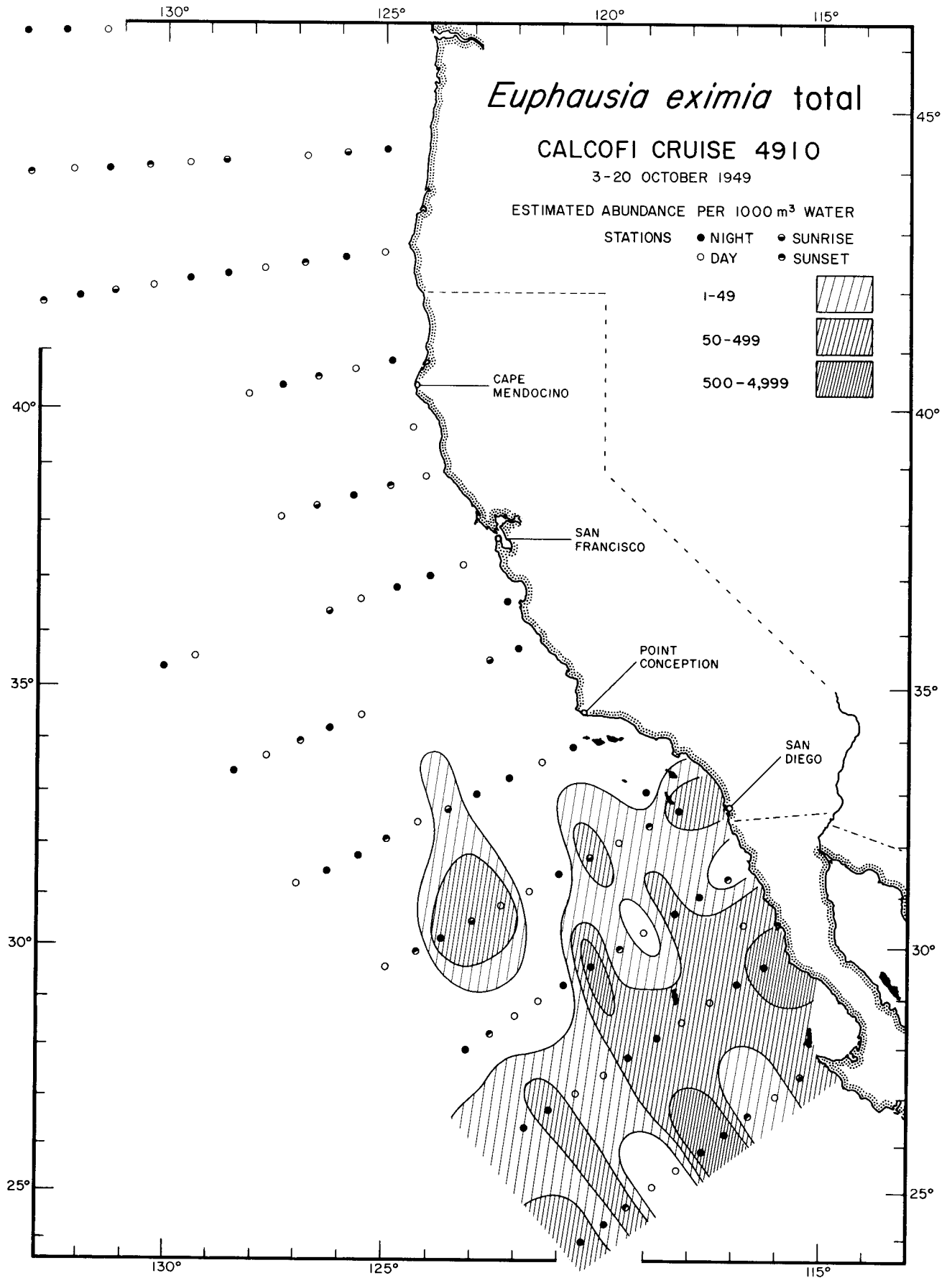
Euphausiacea
Euphausia eximia larvae
4909



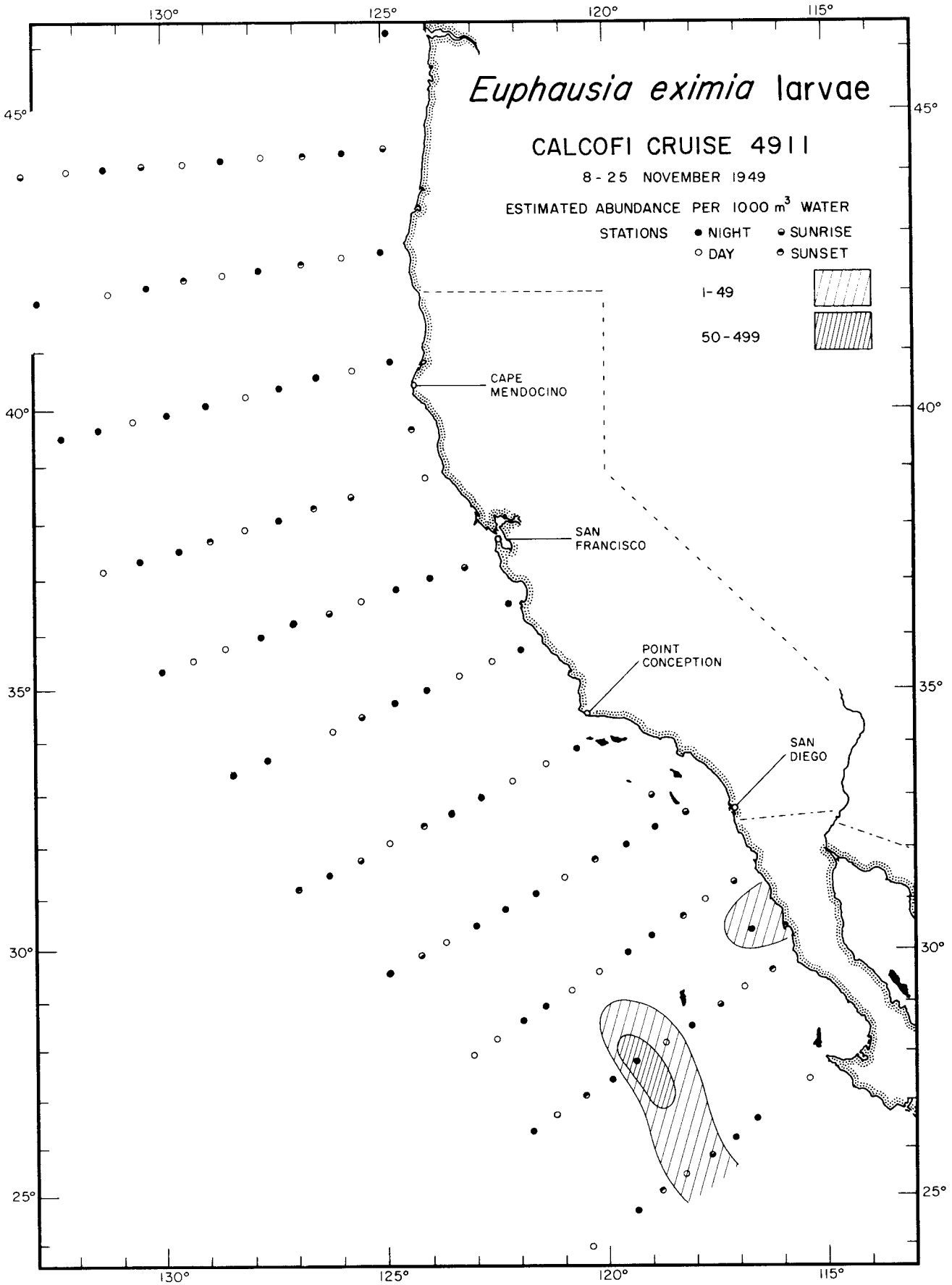
Euphausiacea
Euphausia eximia total
4909



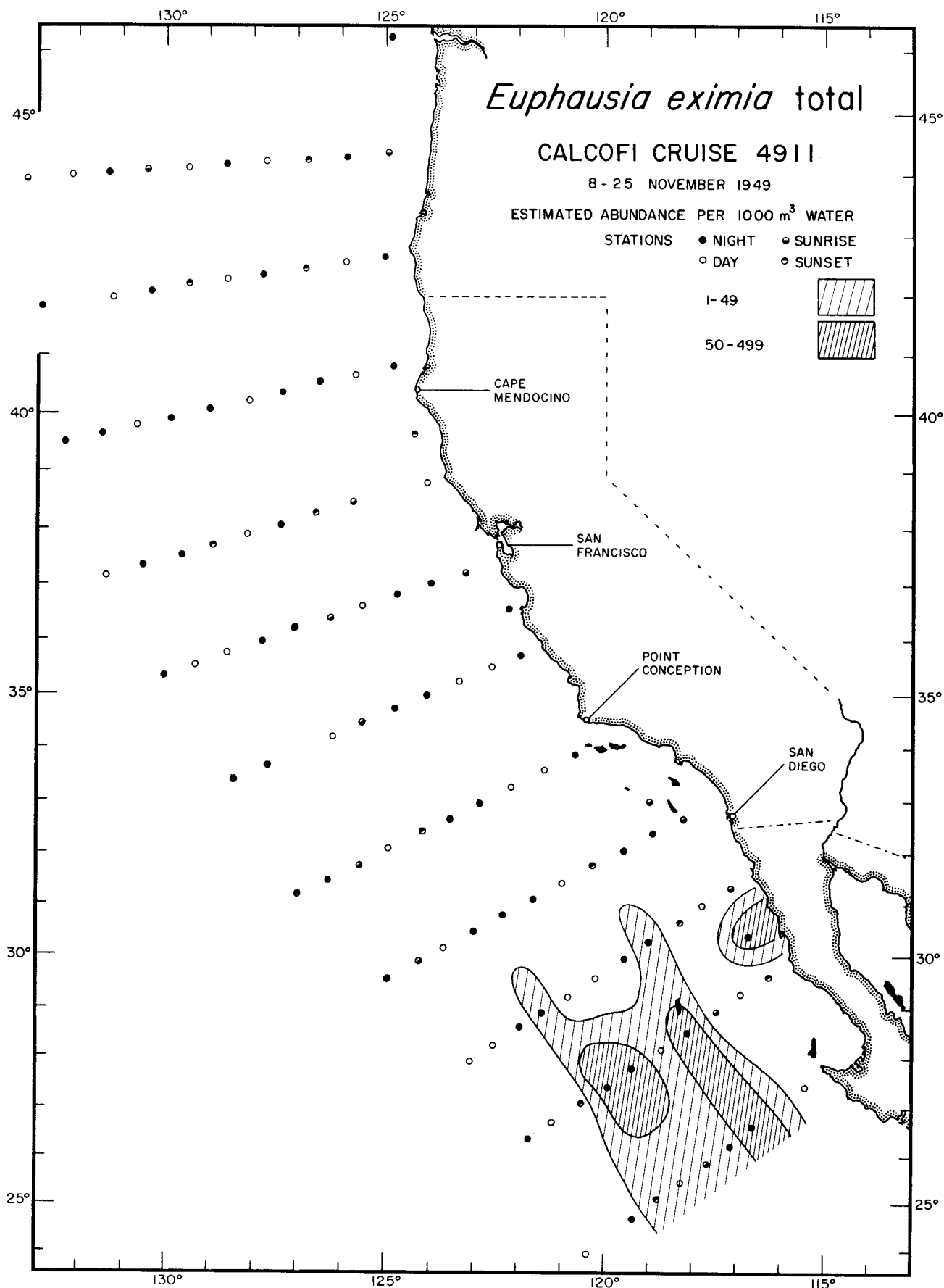
Euphausiacea
Euphausia eximia larvae
4910



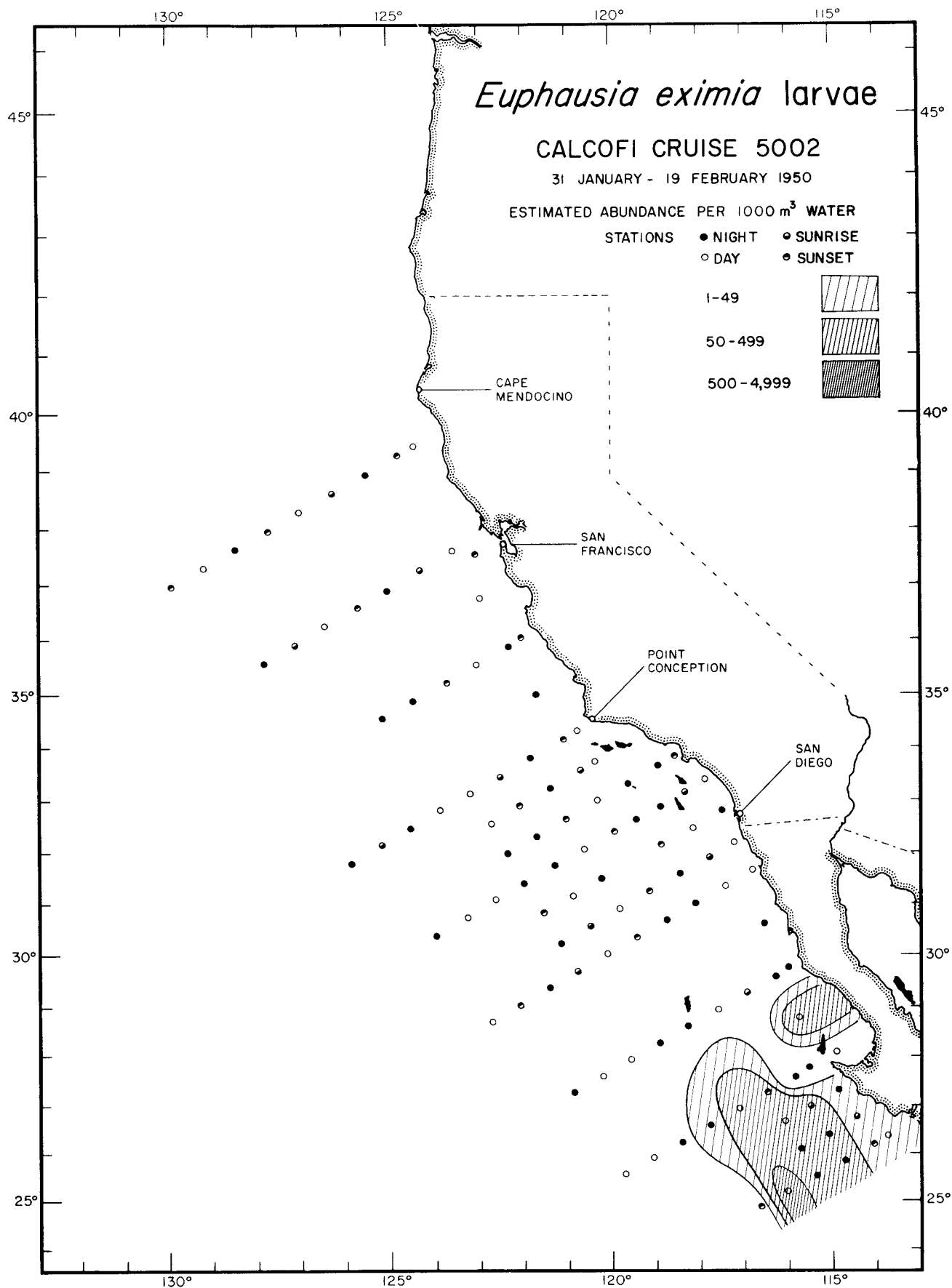
Euphausiacea
Euphausia eximia total
4910



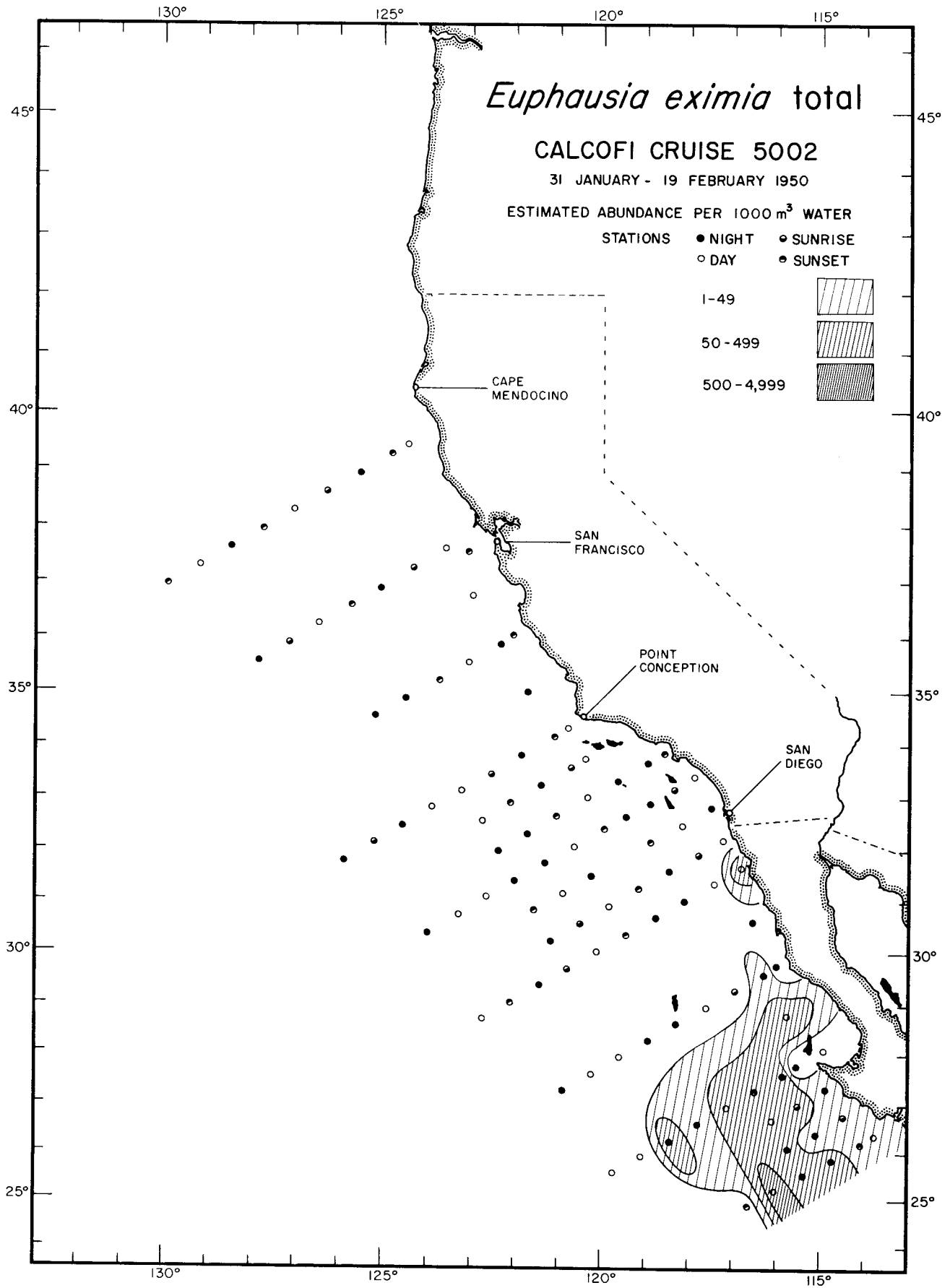
Euphausiacea
Euphausia eximia larvae
4911



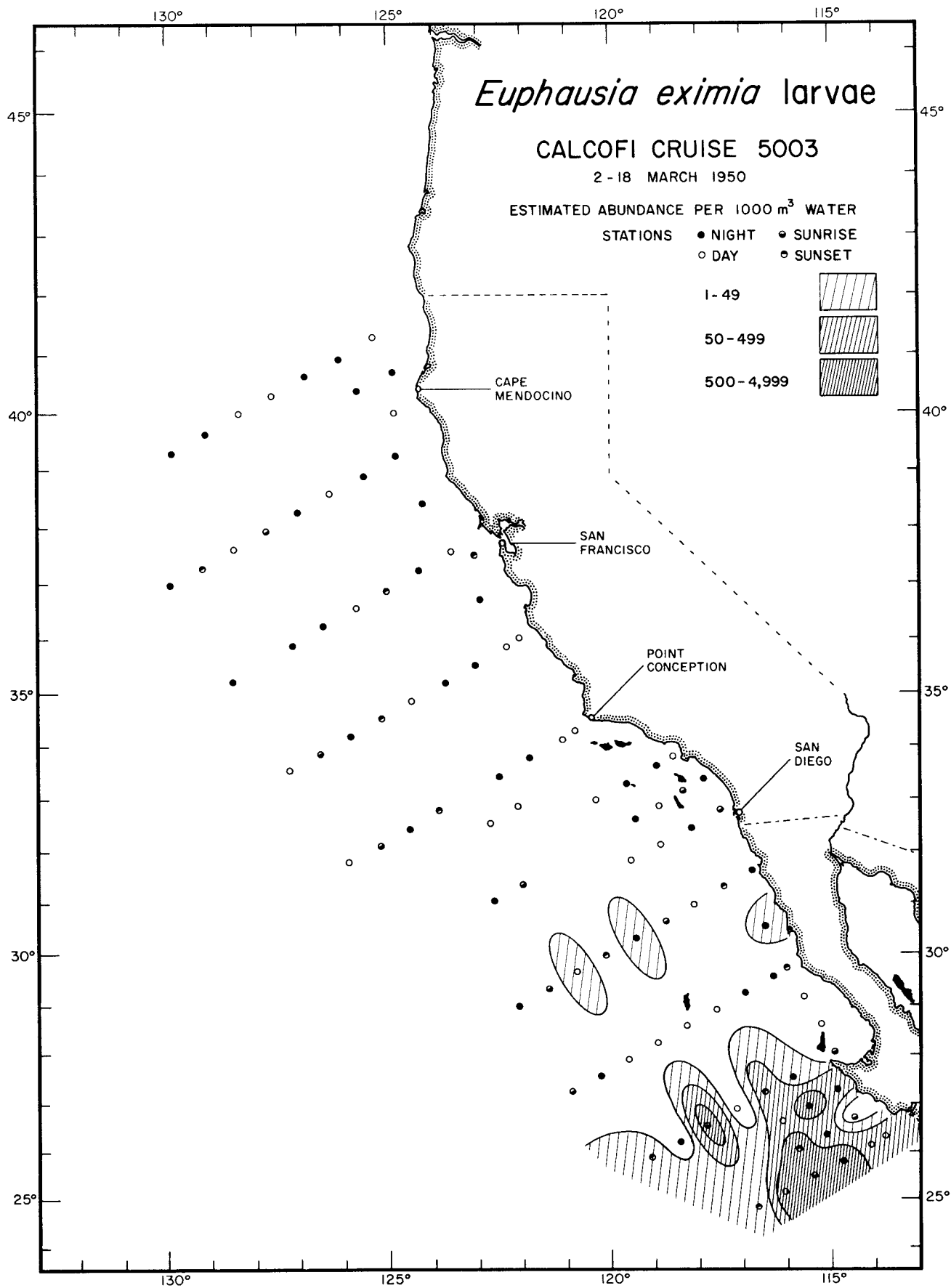
Euphausiacea
Euphausia eximia total
4911



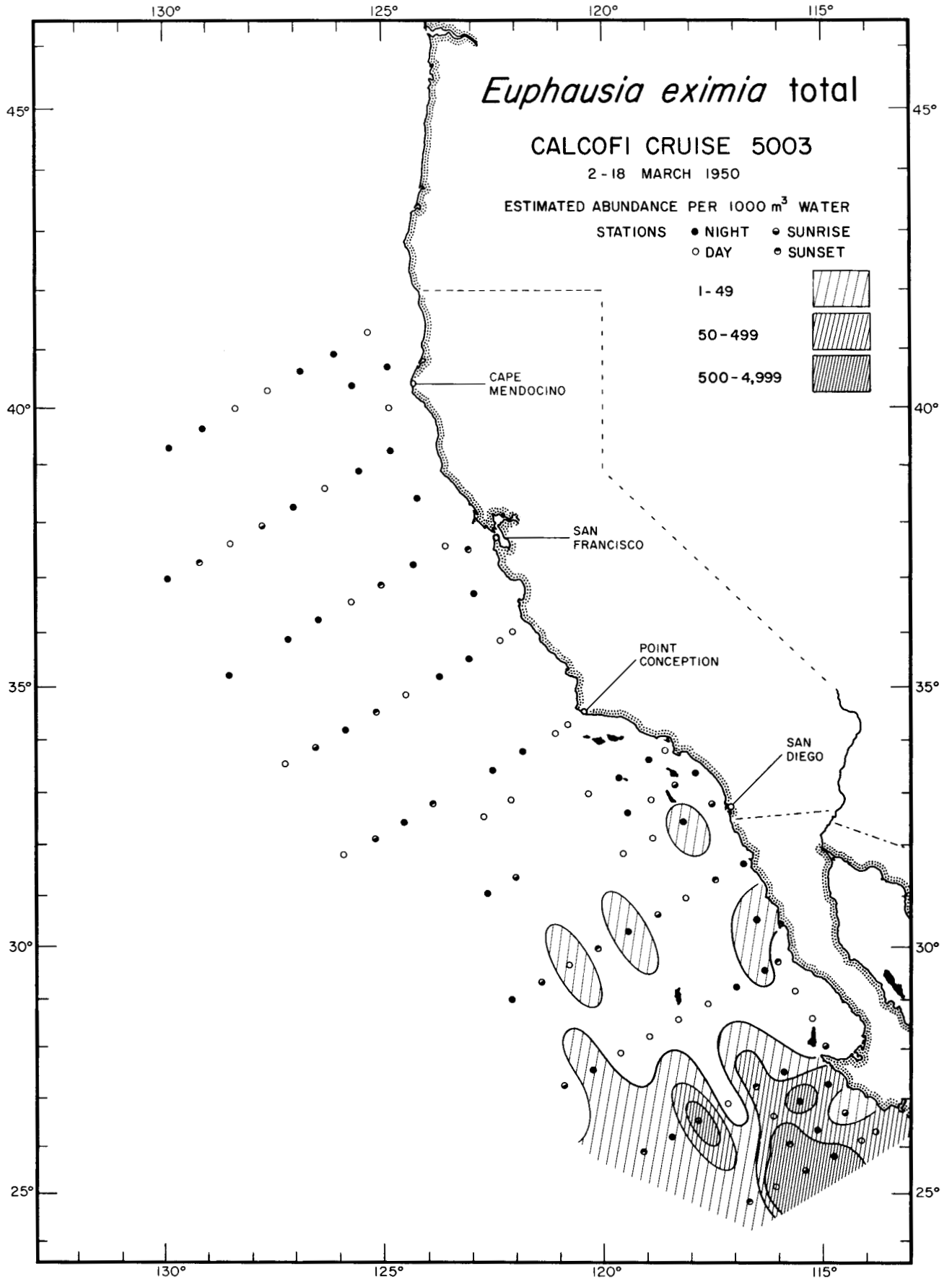
Euphausiacea
Euphausia eximia larvae
5002



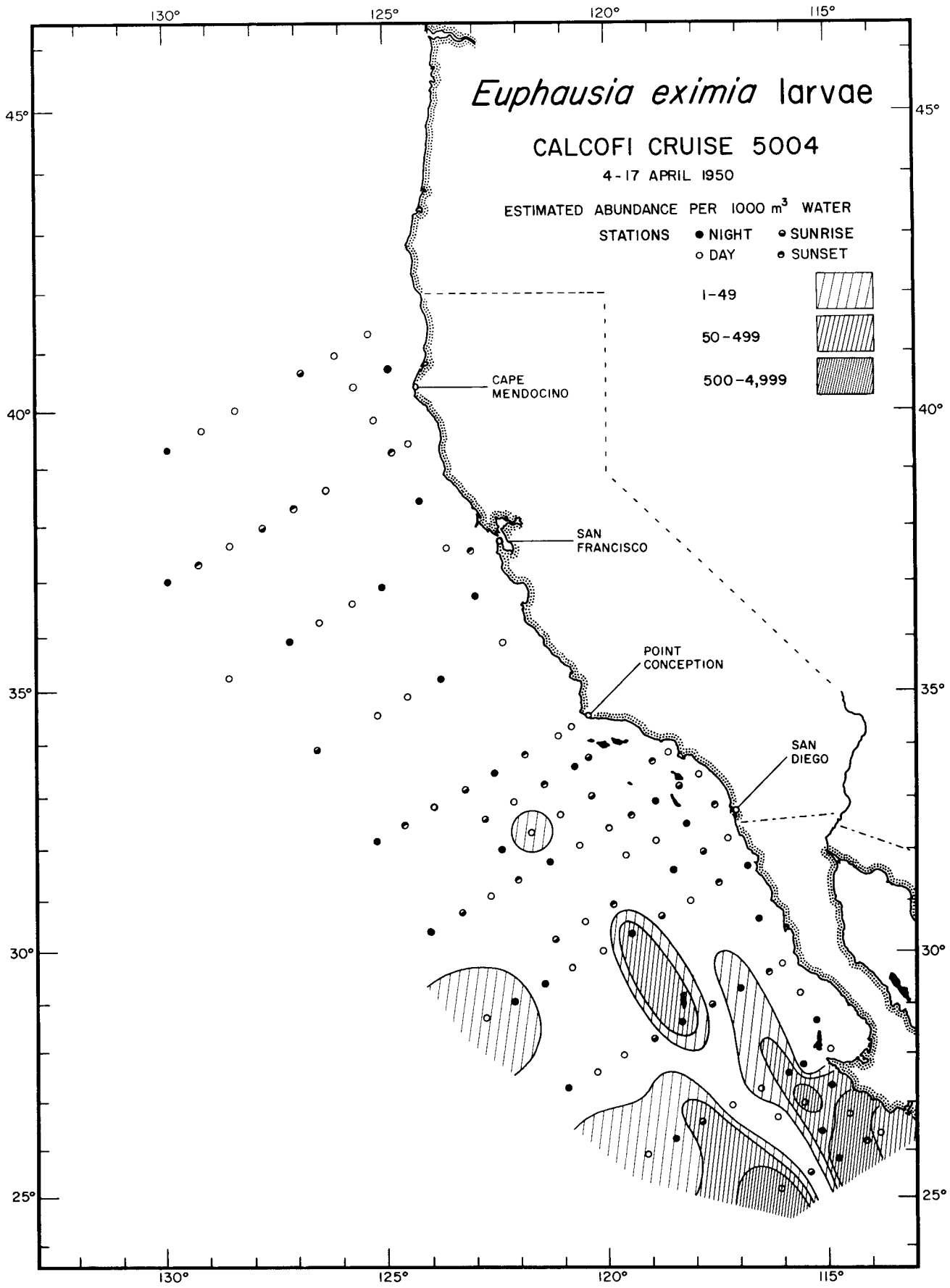
Euphausiacea
Euphausia eximia total
5002



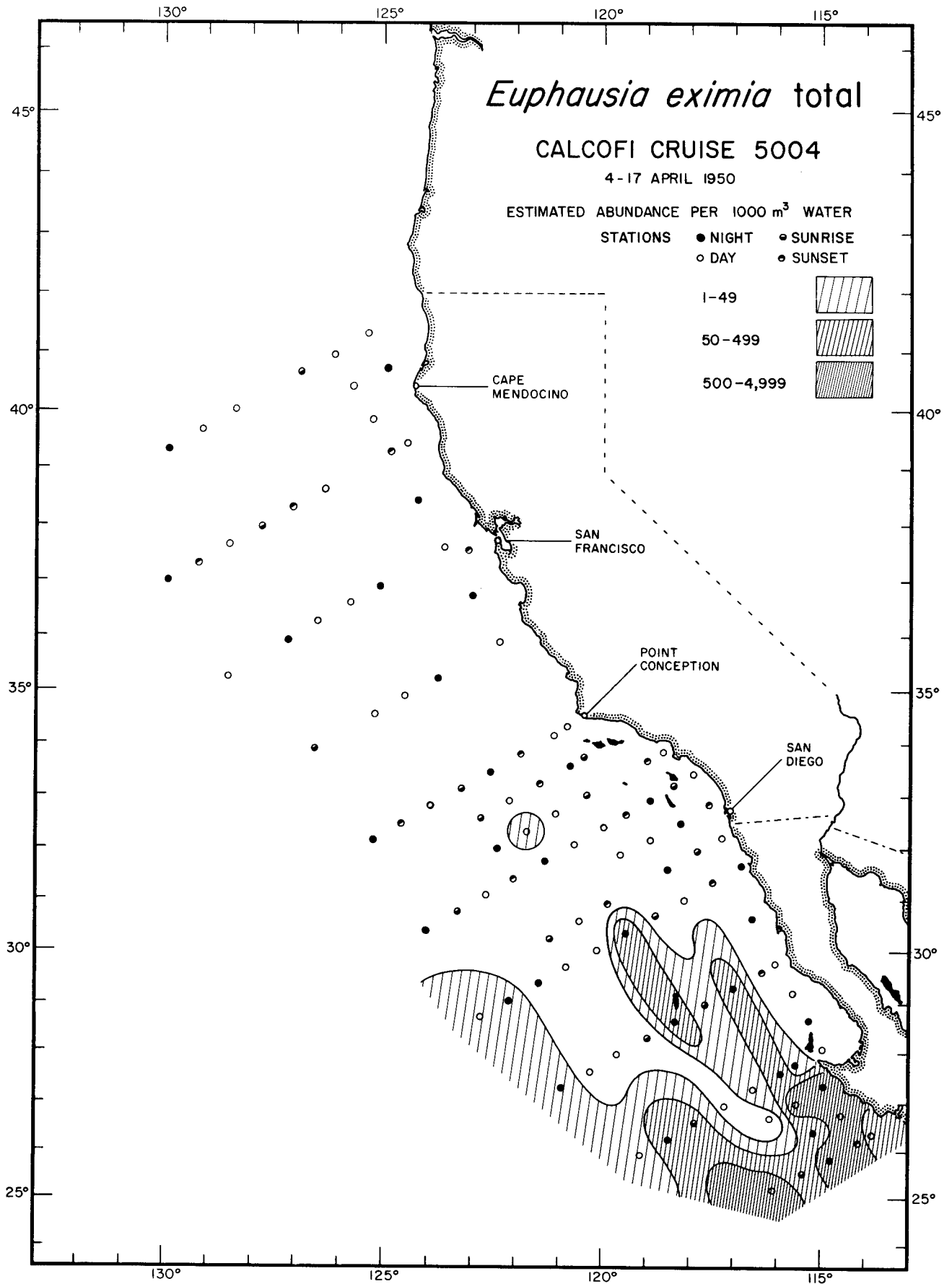
Euphausiacea
Euphausia eximia larvae
5003



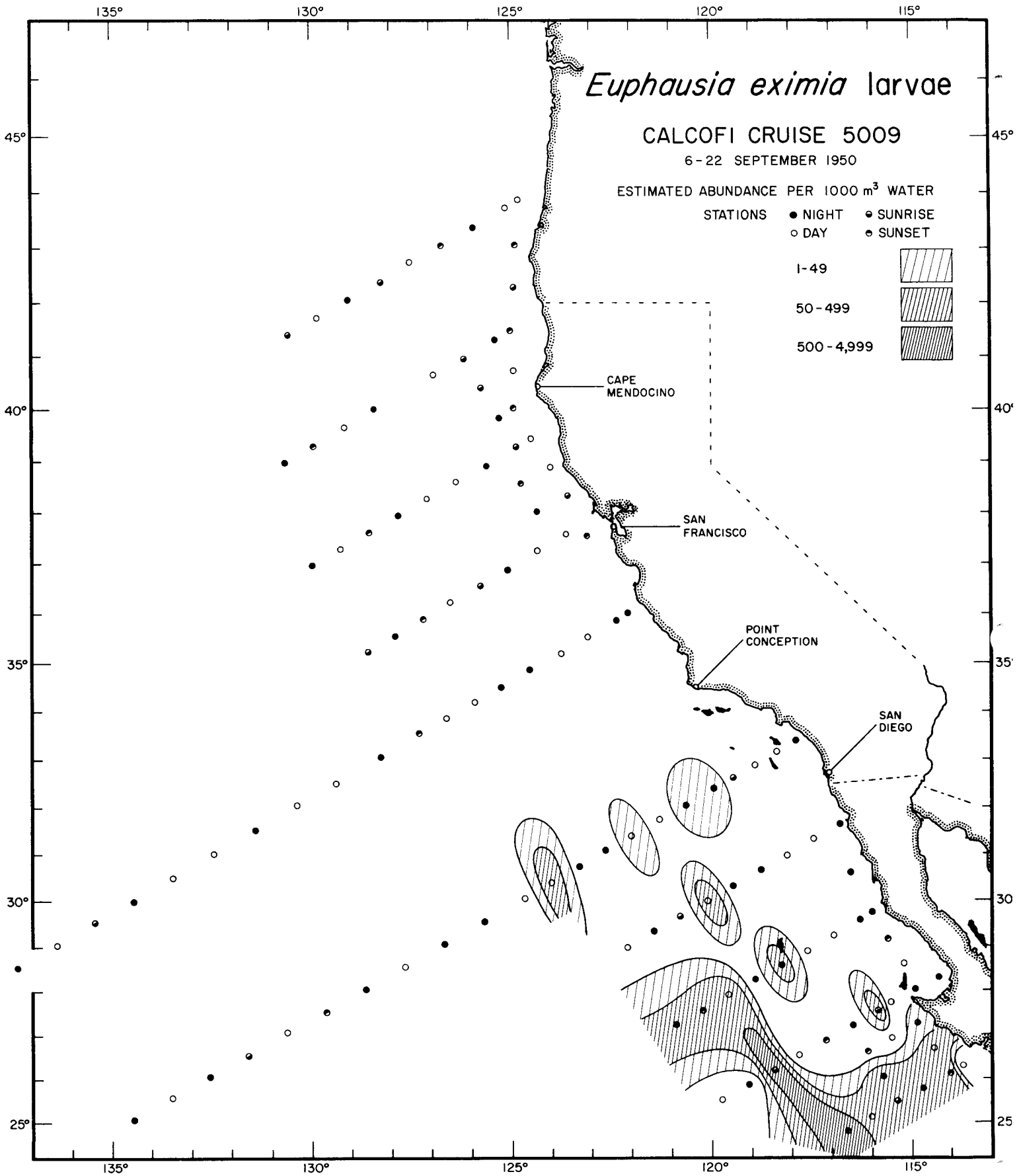
Euphausiacea
Euphausia eximia total
5003



Euphausiacea
Euphausia eximia larvae
5004



Euphausiacea
Euphausia eximia total
5004



Euphausia eximia larvae

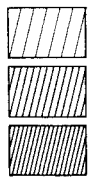
CALCOFI CRUISE 5009

6-22 SEPTEMBER 1950

ESTIMATED ABUNDANCE PER 1000 m³ WATER

STATIONS ● NIGHT ● SUNRISE
○ DAY ○ SUNSET

1-49
50-499
500-4,999



CAPE MENDOCINO

SAN FRANCISCO

POINT CONCEPTION

SAN DIEGO

135° 130° 125° 120° 115°

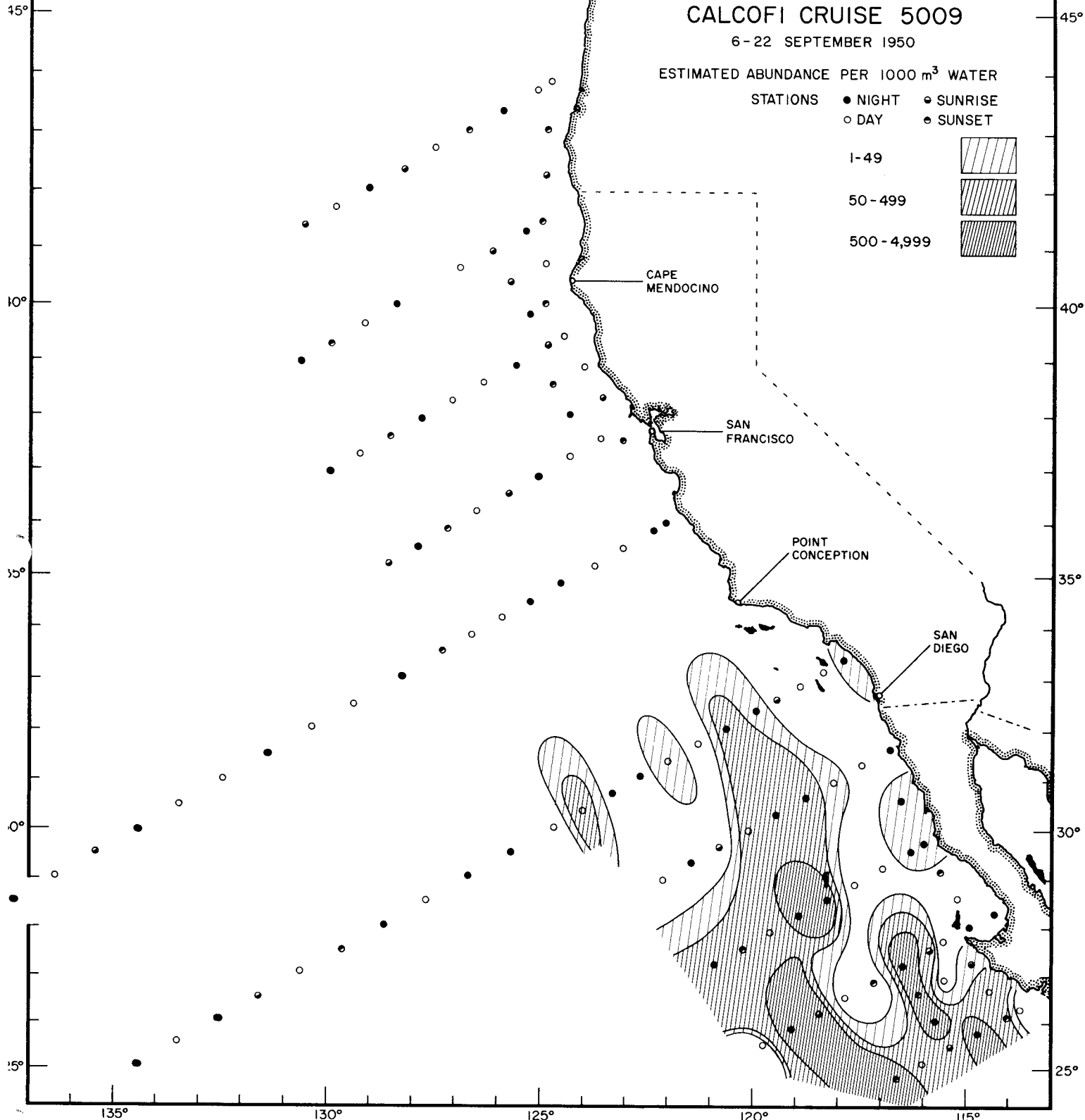
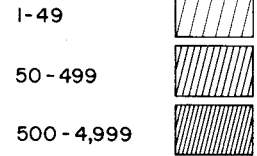
Euphausia eximia total

CALCOFI CRUISE 5009

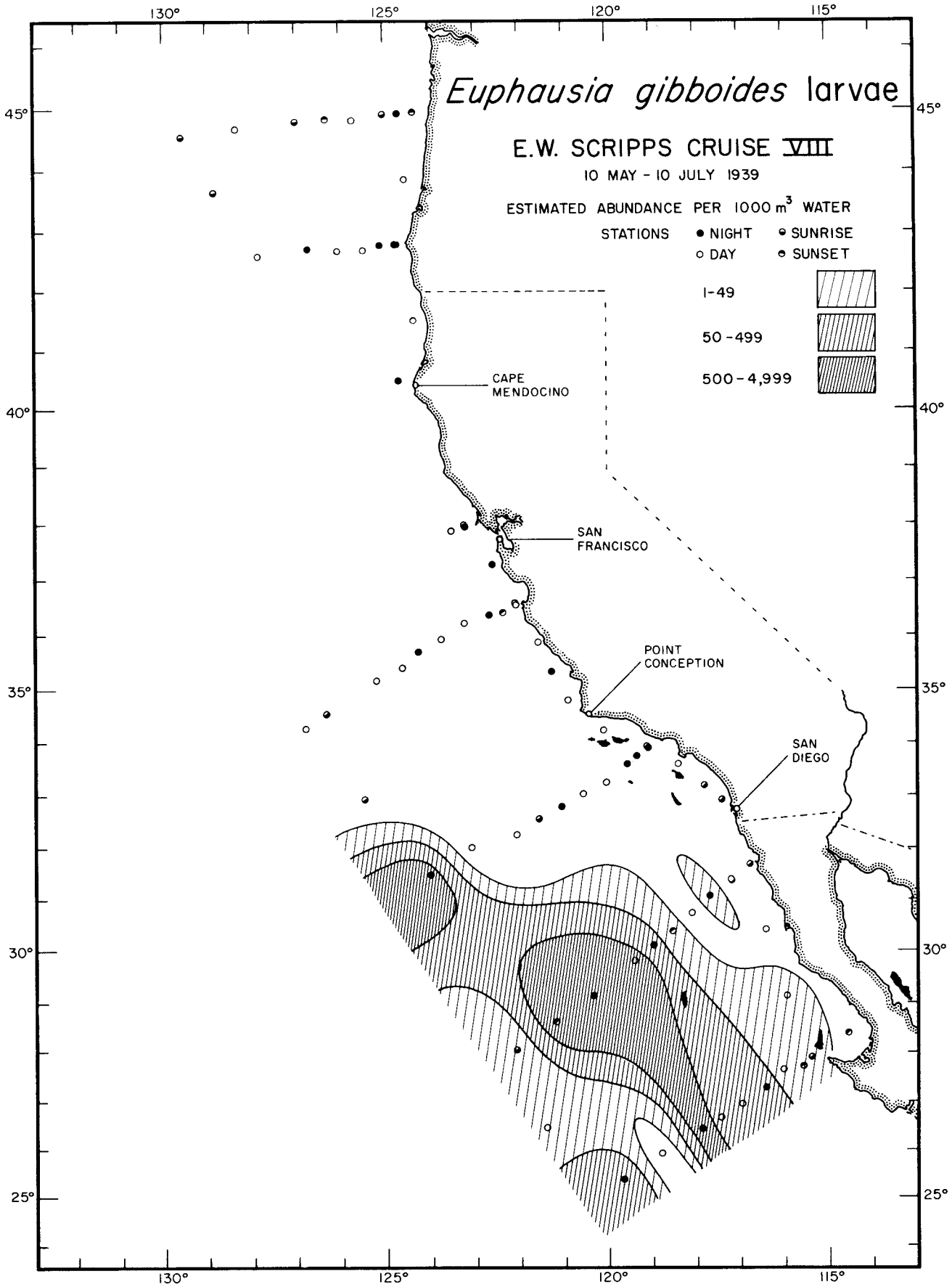
6-22 SEPTEMBER 1950

ESTIMATED ABUNDANCE PER 1000 m³ WATER

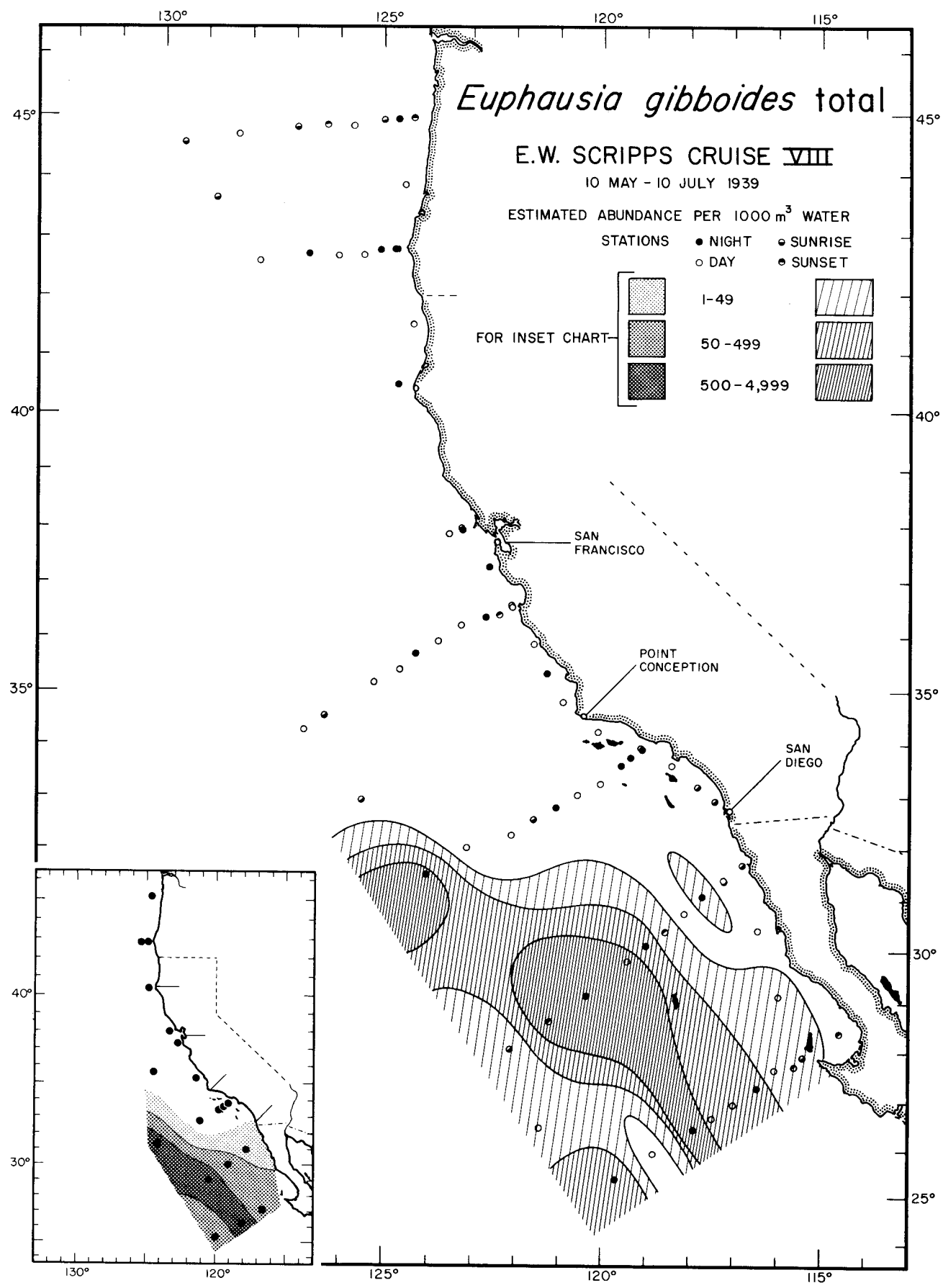
STATIONS ● NIGHT ○ DAY ● SUNRISE ○ SUNSET



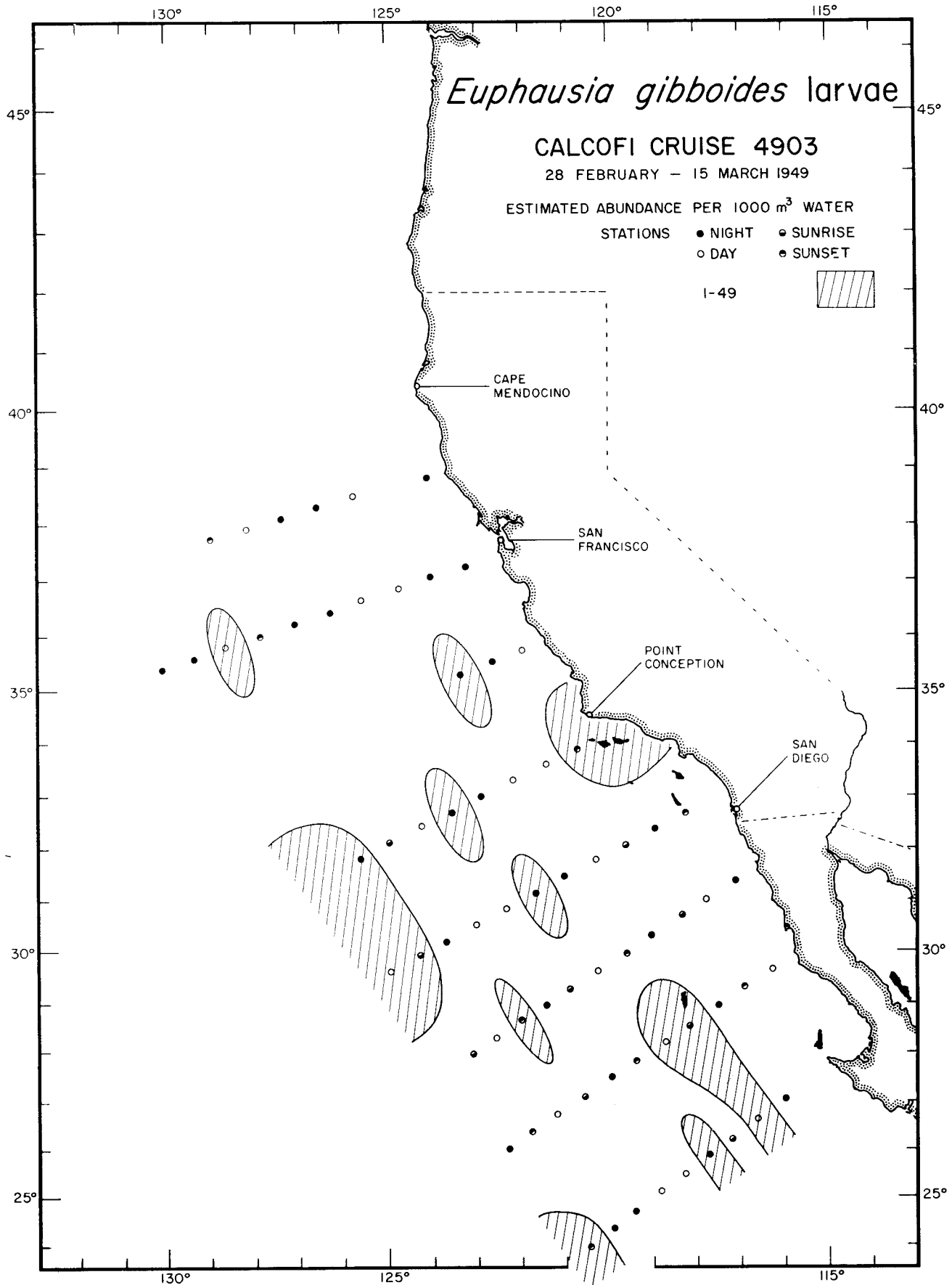
Euphausiacea
Euphausia eximia total
5009



Euphausiacea
Euphausia gibboides larvae
E. W. SCRIPPS CRUISE VIII



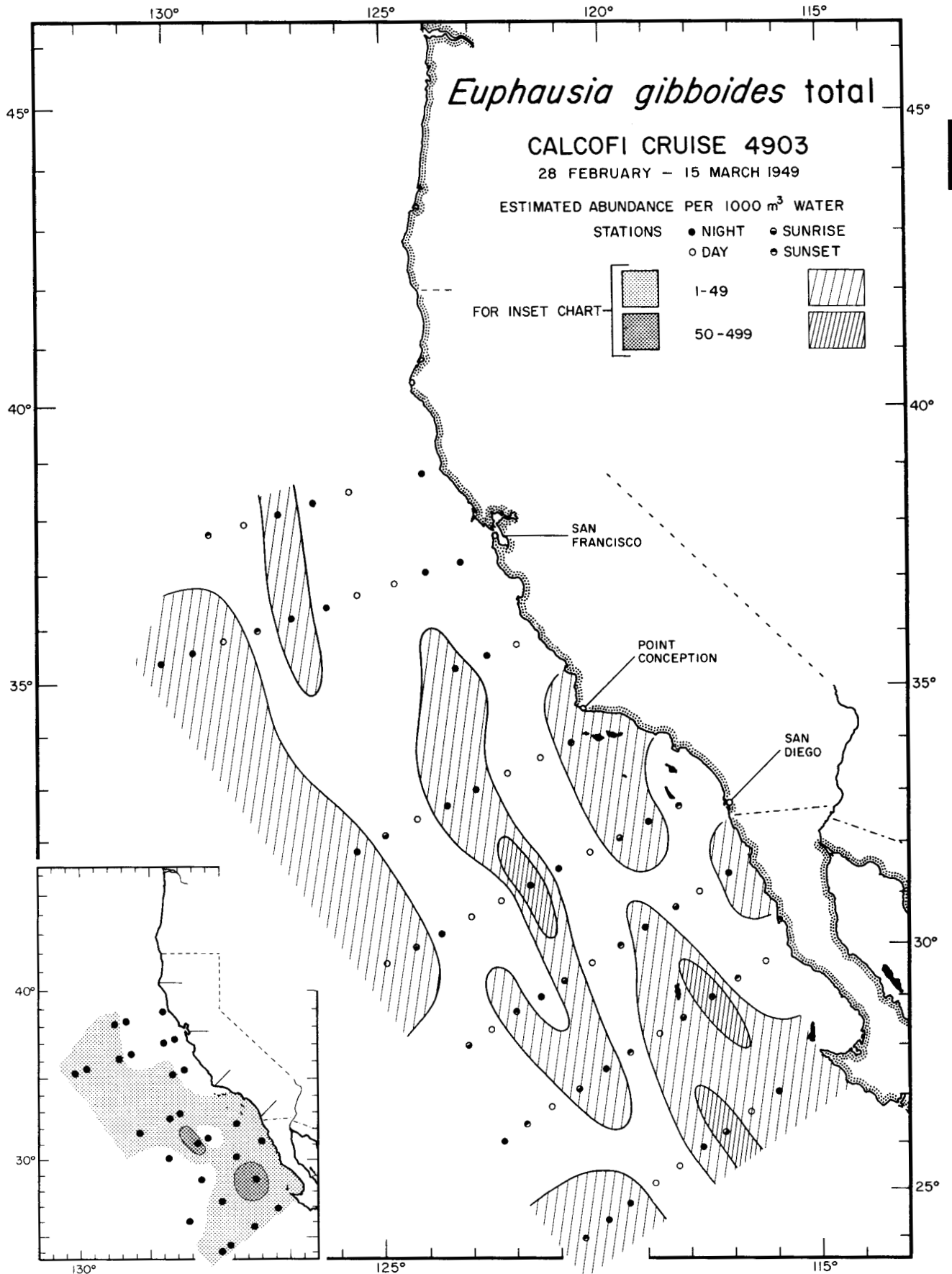
Euphausiacea
Euphausia gibboides total
E. W. SCRIPPS CRUISE VIII



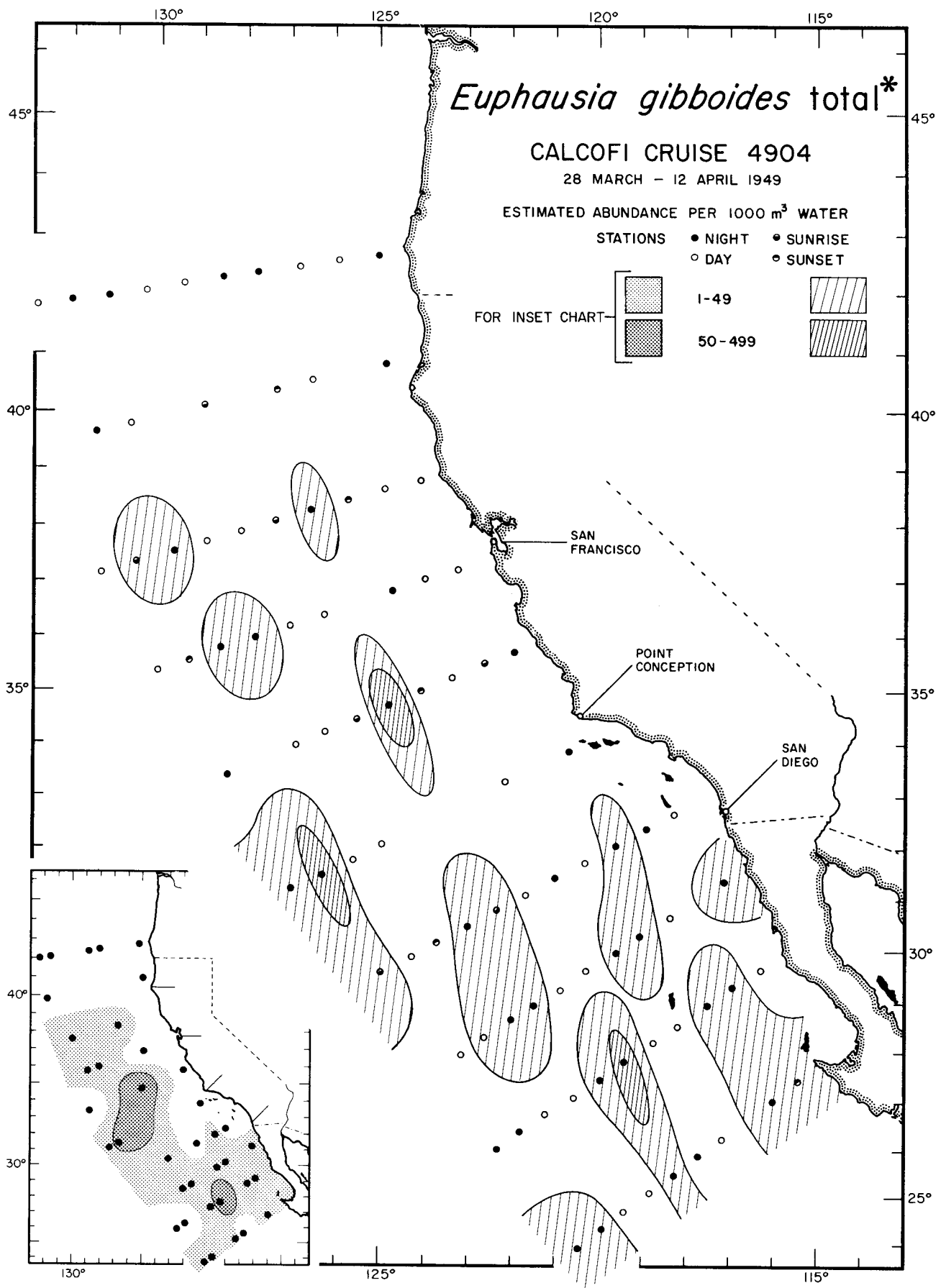
Euphausiacea

Euphausia gibboides larvae

4903

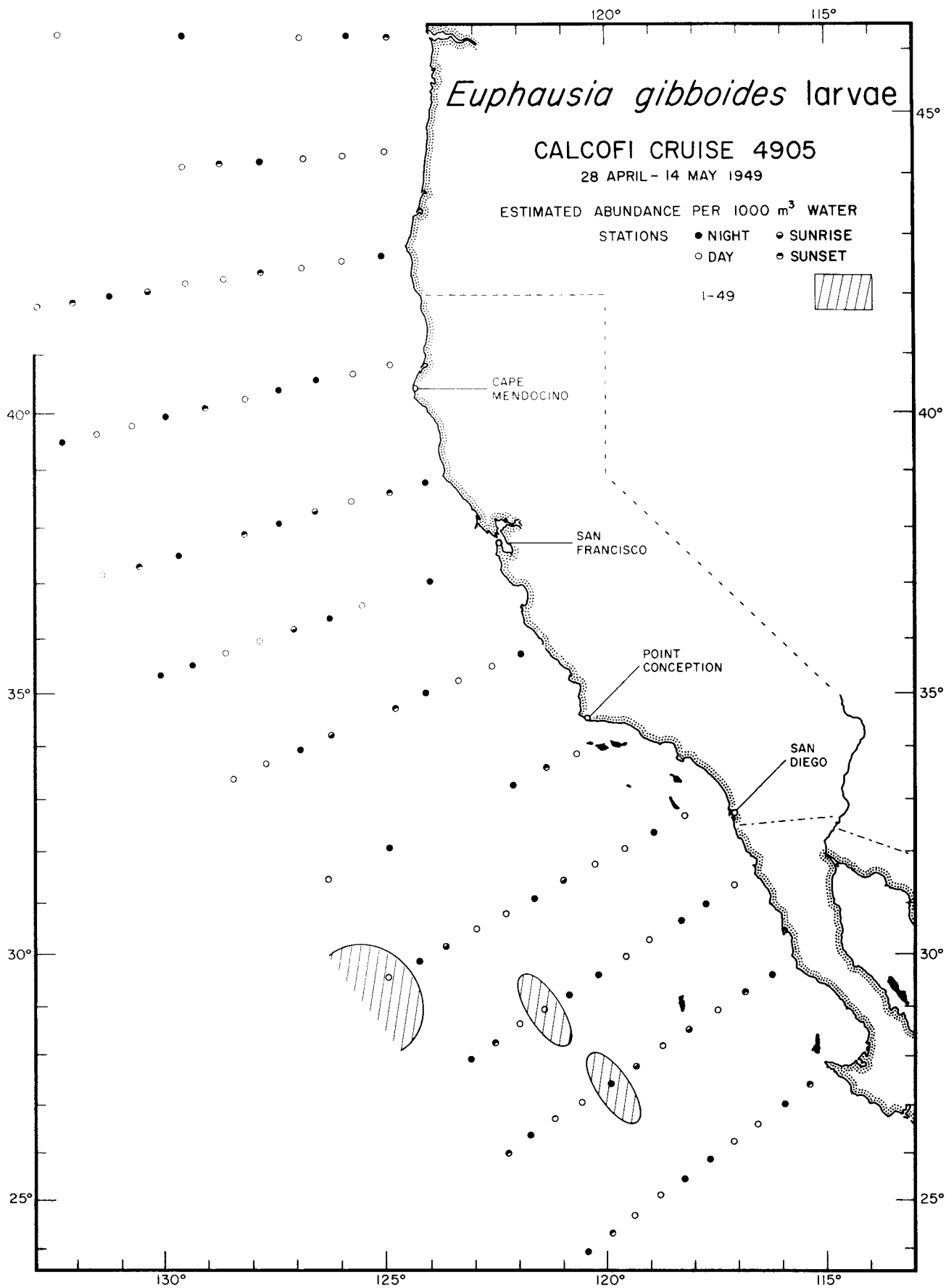


Euphausiacea
Euphausia gibboides total
4903

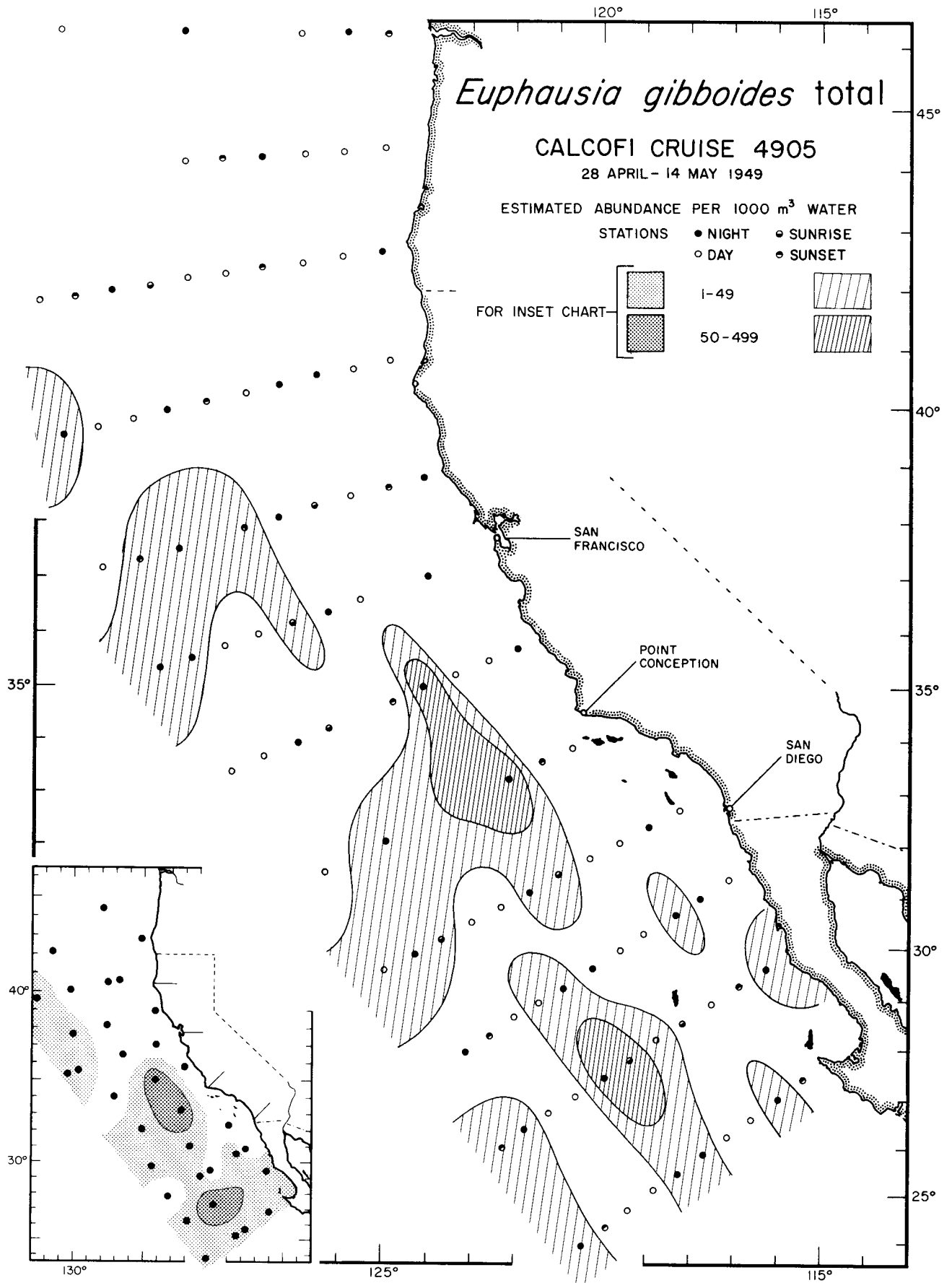


* No larvae found

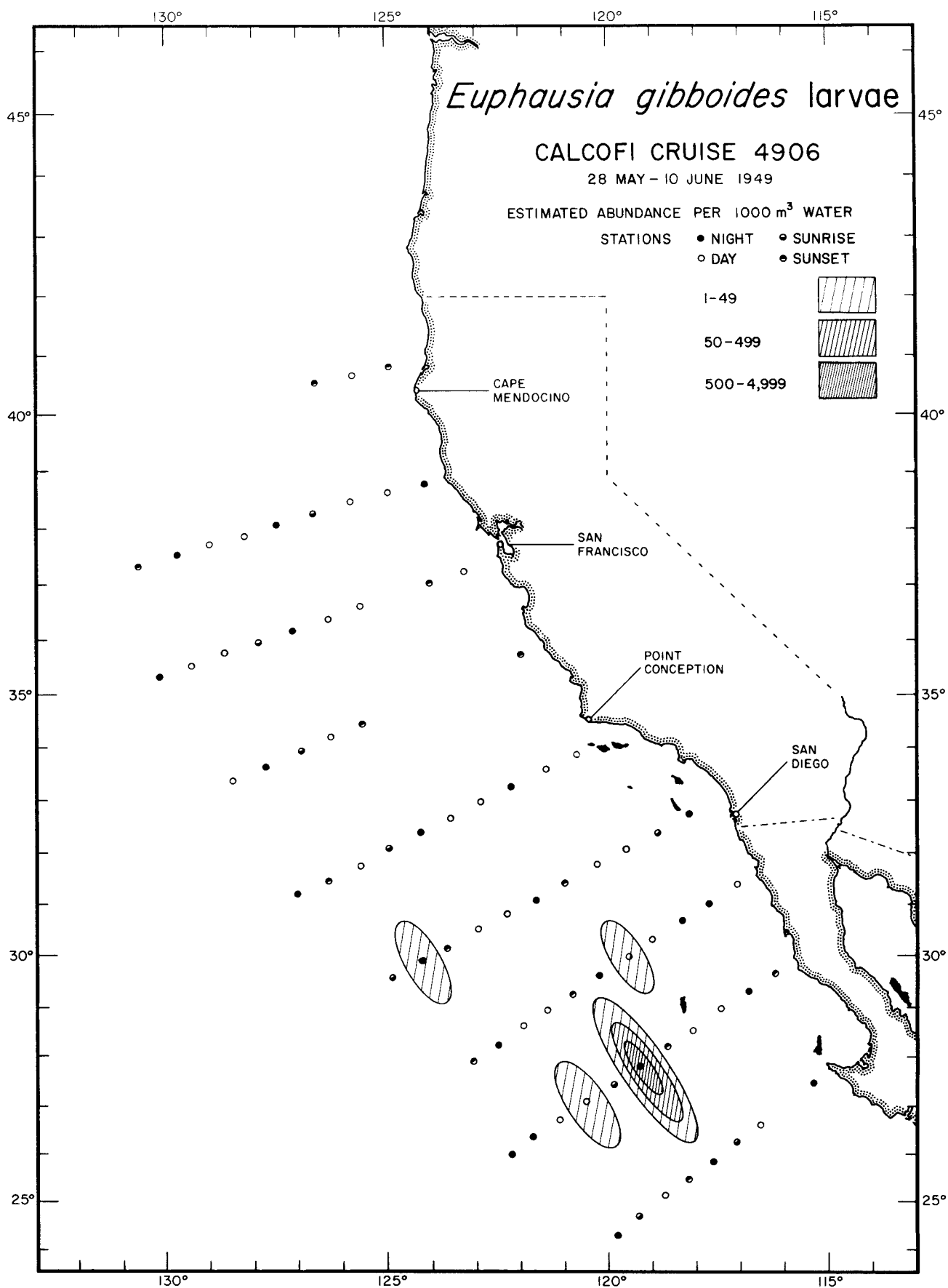
Euphausiacea
Euphausia gibboides total
4904



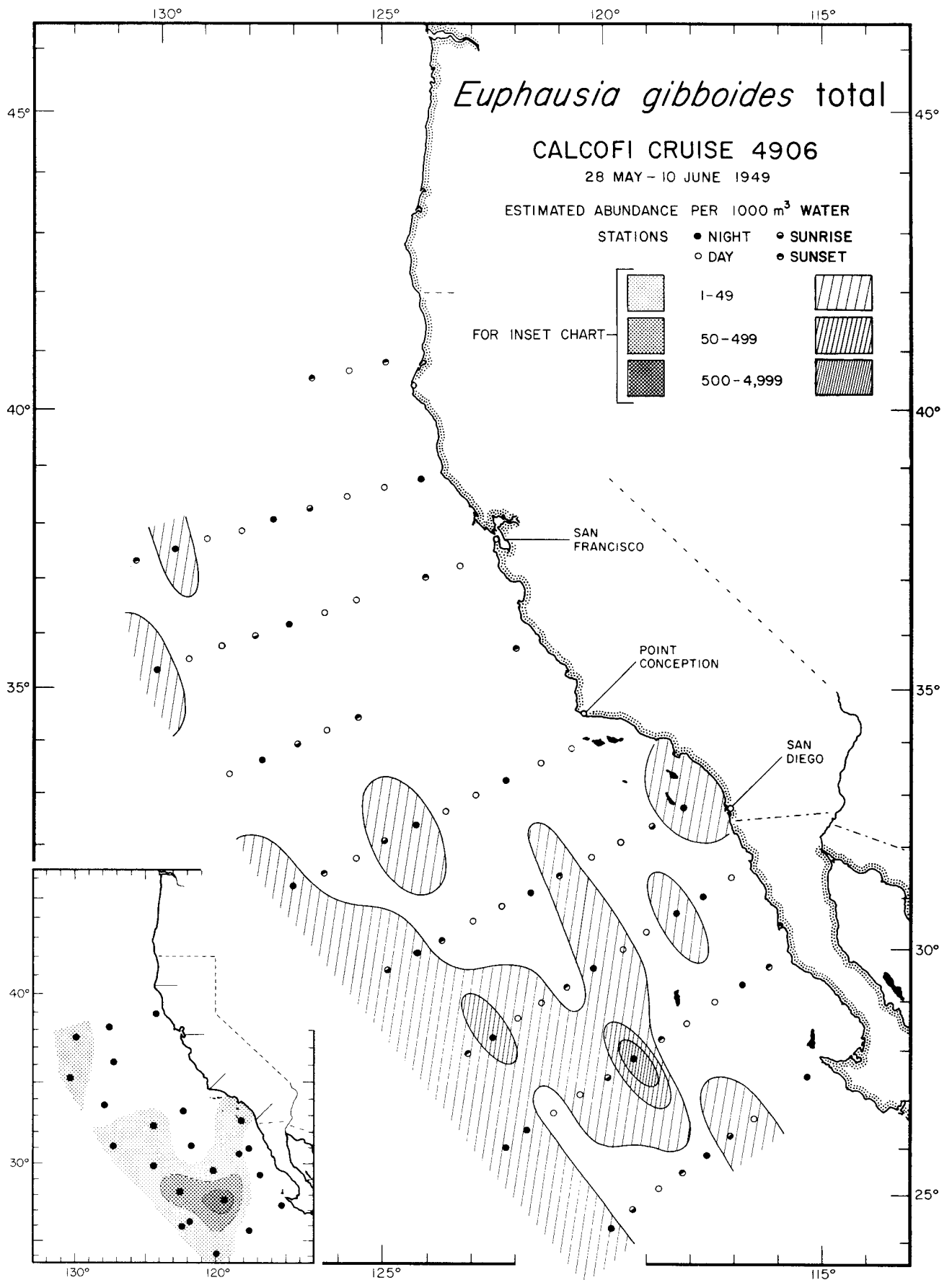
Euphausiacea
Euphausia gibboides larvae
4905



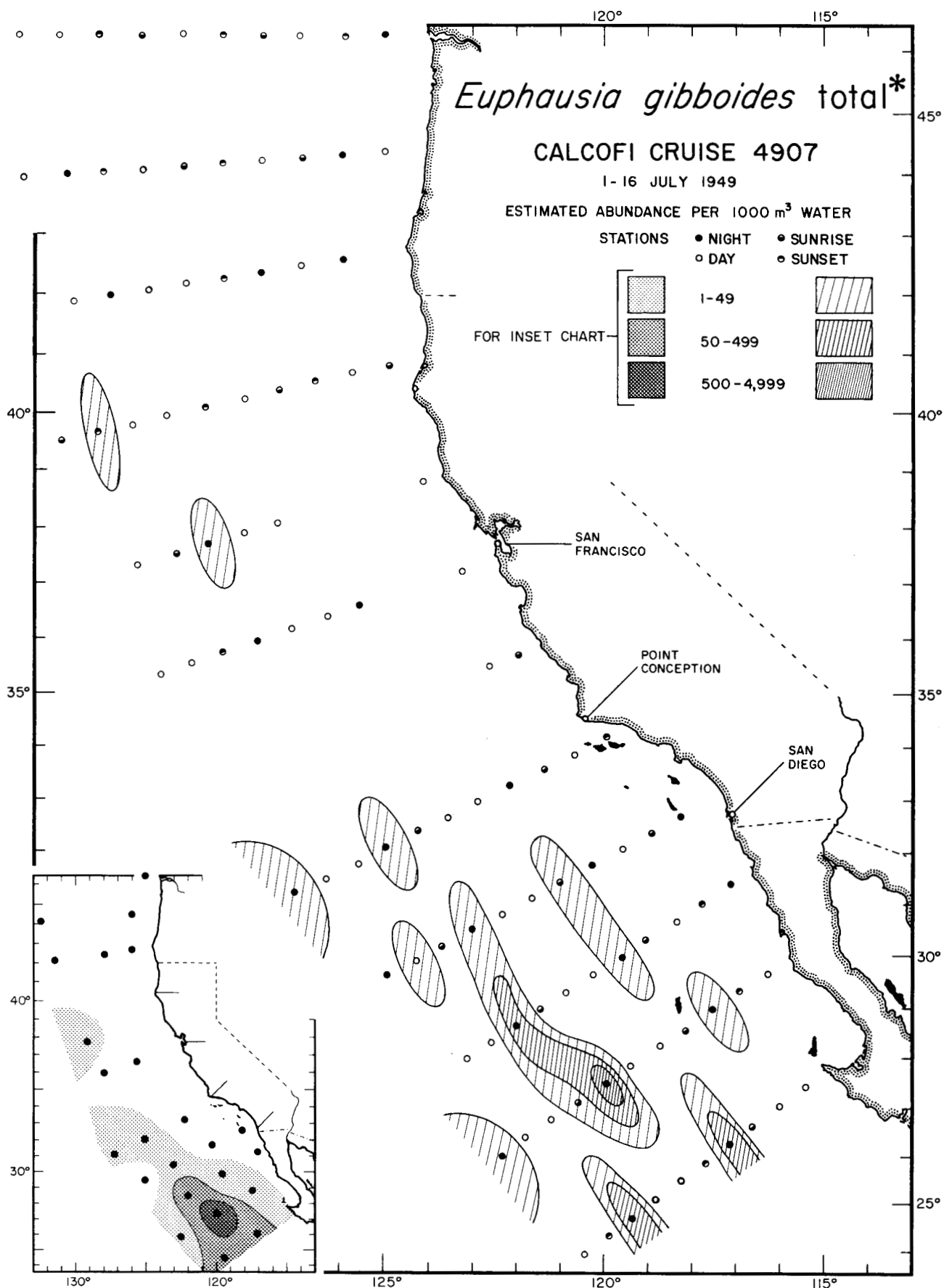
Euphausiacea
Euphausia gibboides total
4905



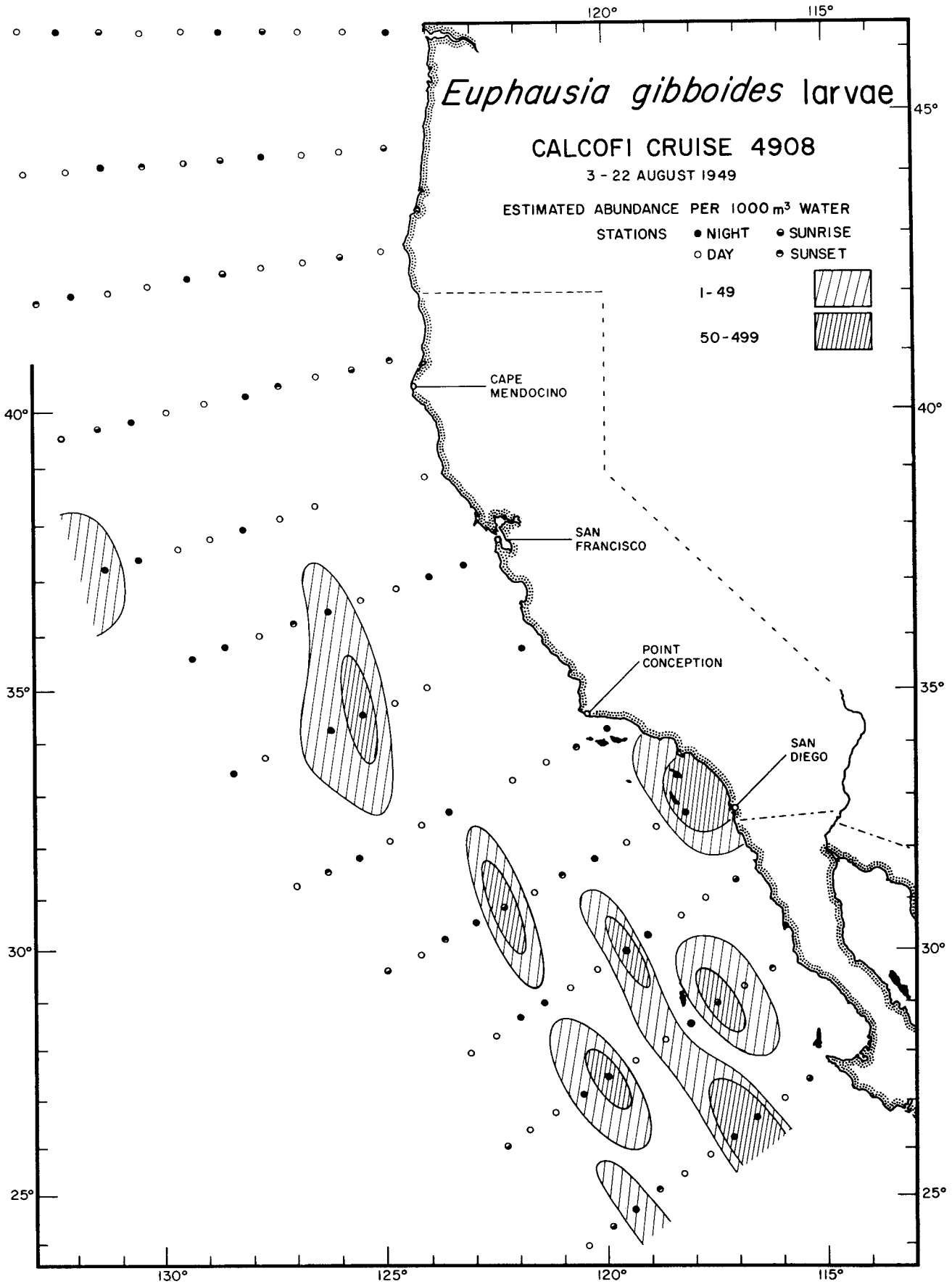
Euphausiacea
Euphausia gibboides larvae
4906



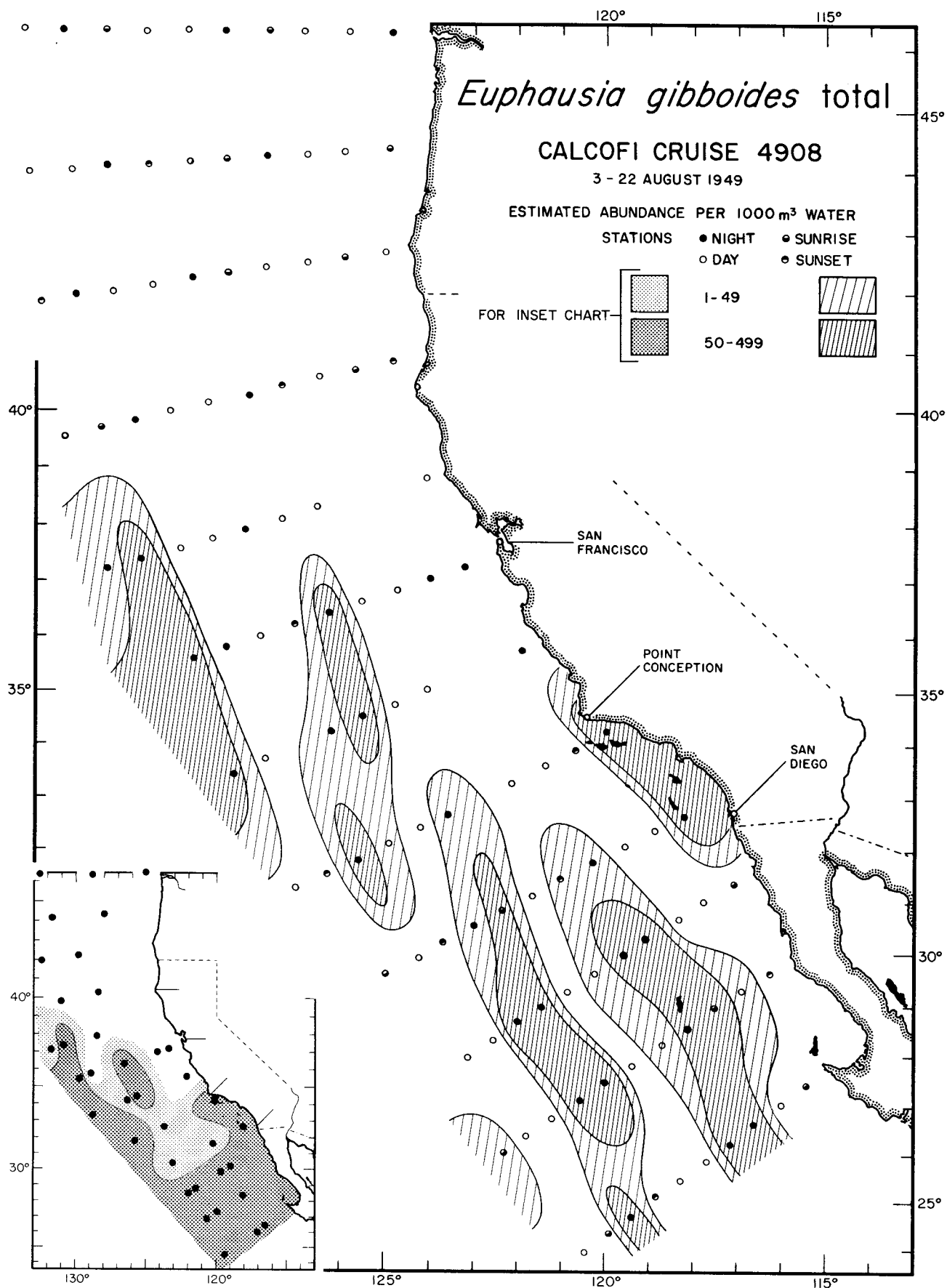
Euphausiacea
Euphausia gibboides total
4906



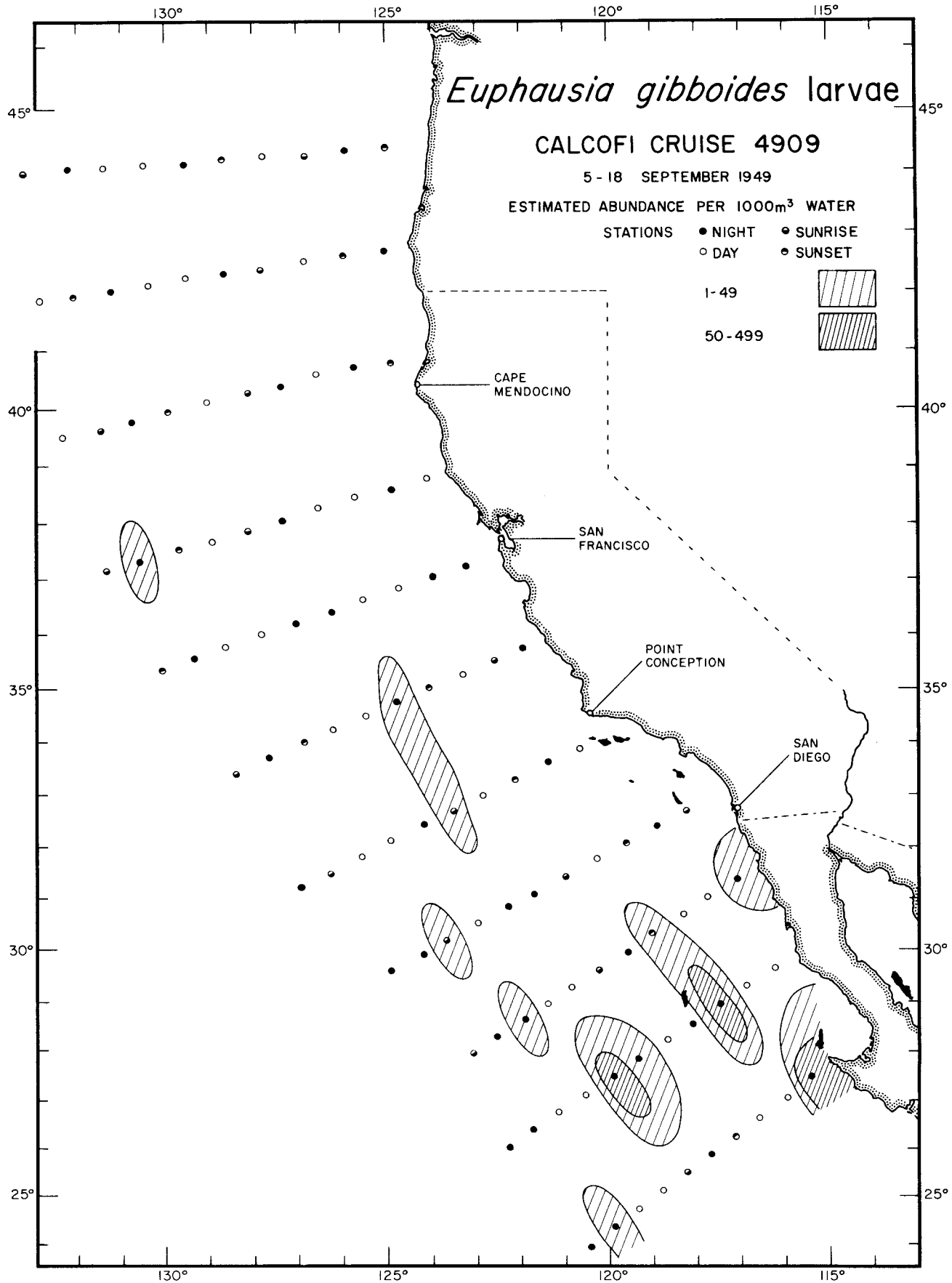
* No larvae found



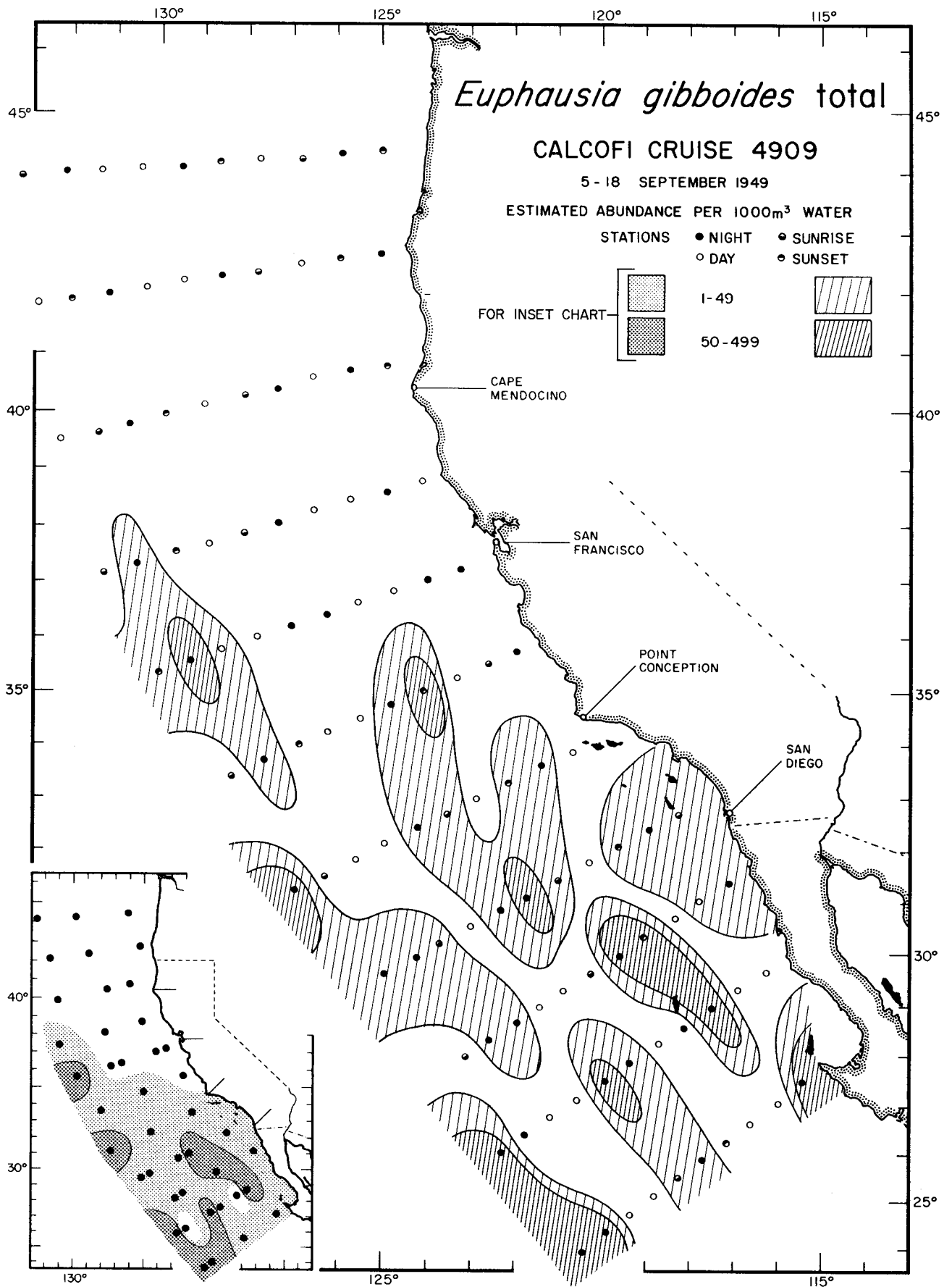
Euphausiacea
Euphausia gibboides larvae
4908



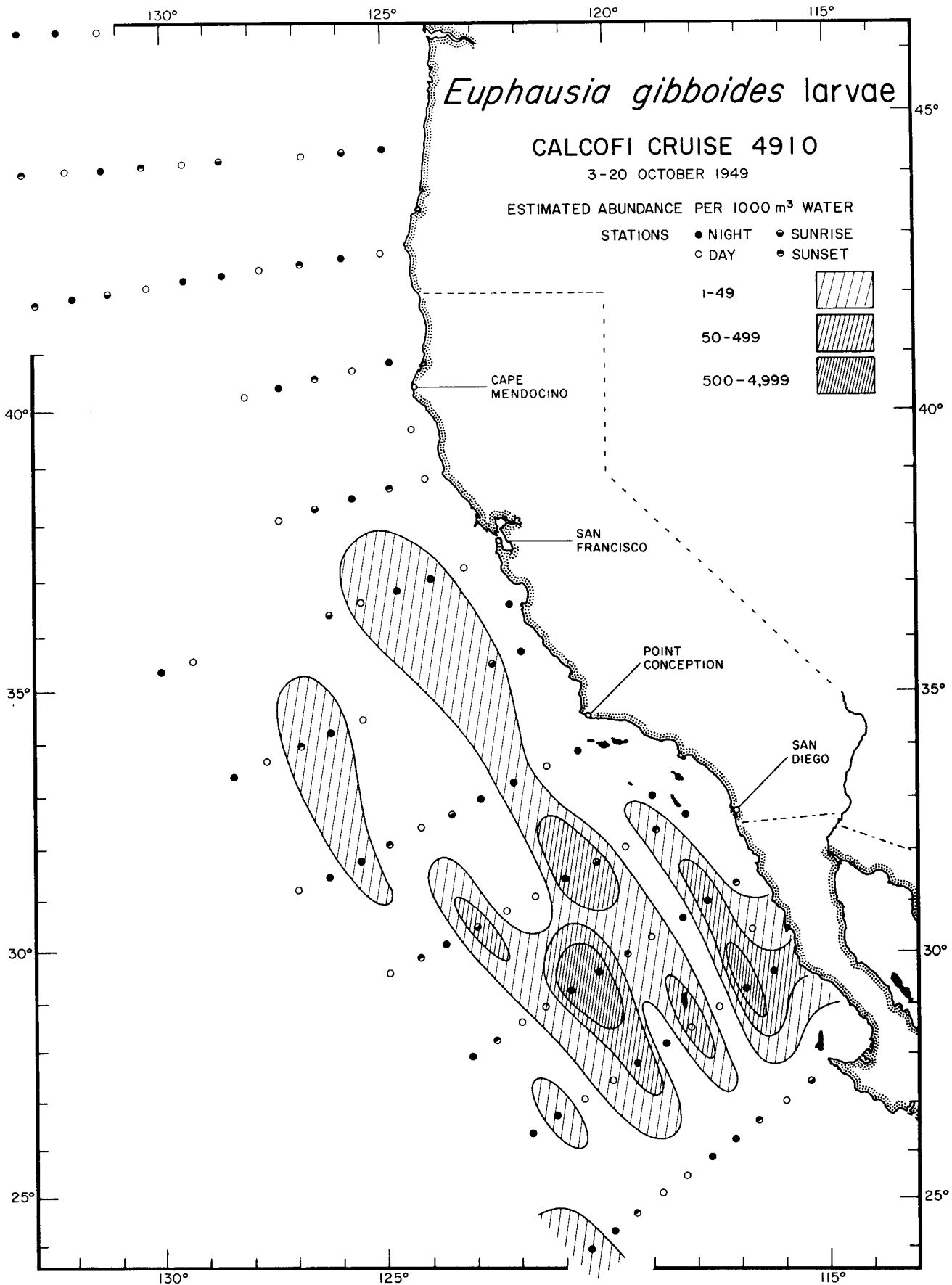
Euphausiacea
Euphausia gibboides total
4908



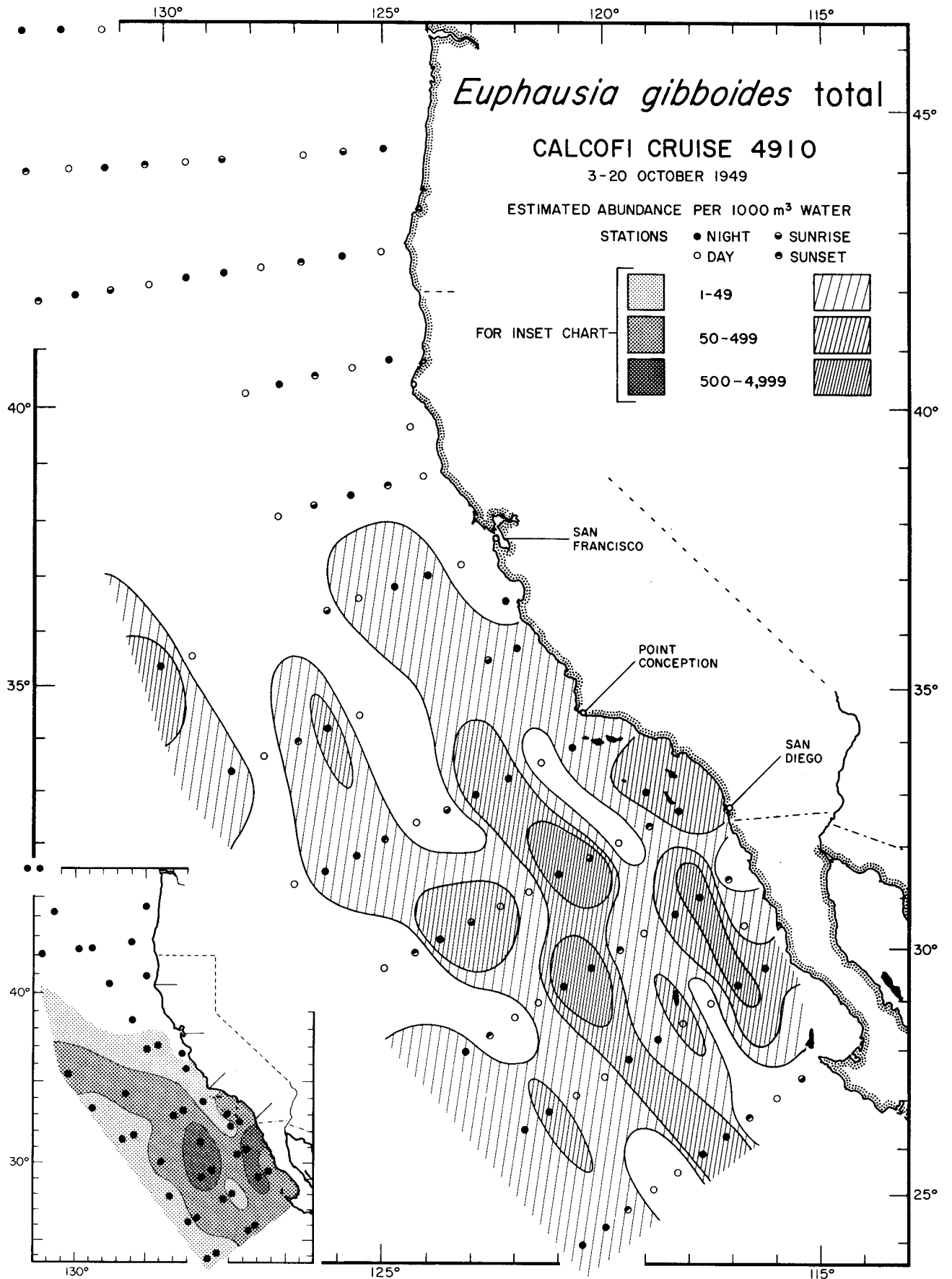
Euphausiacea
Euphausia gibboides larvae
 4909



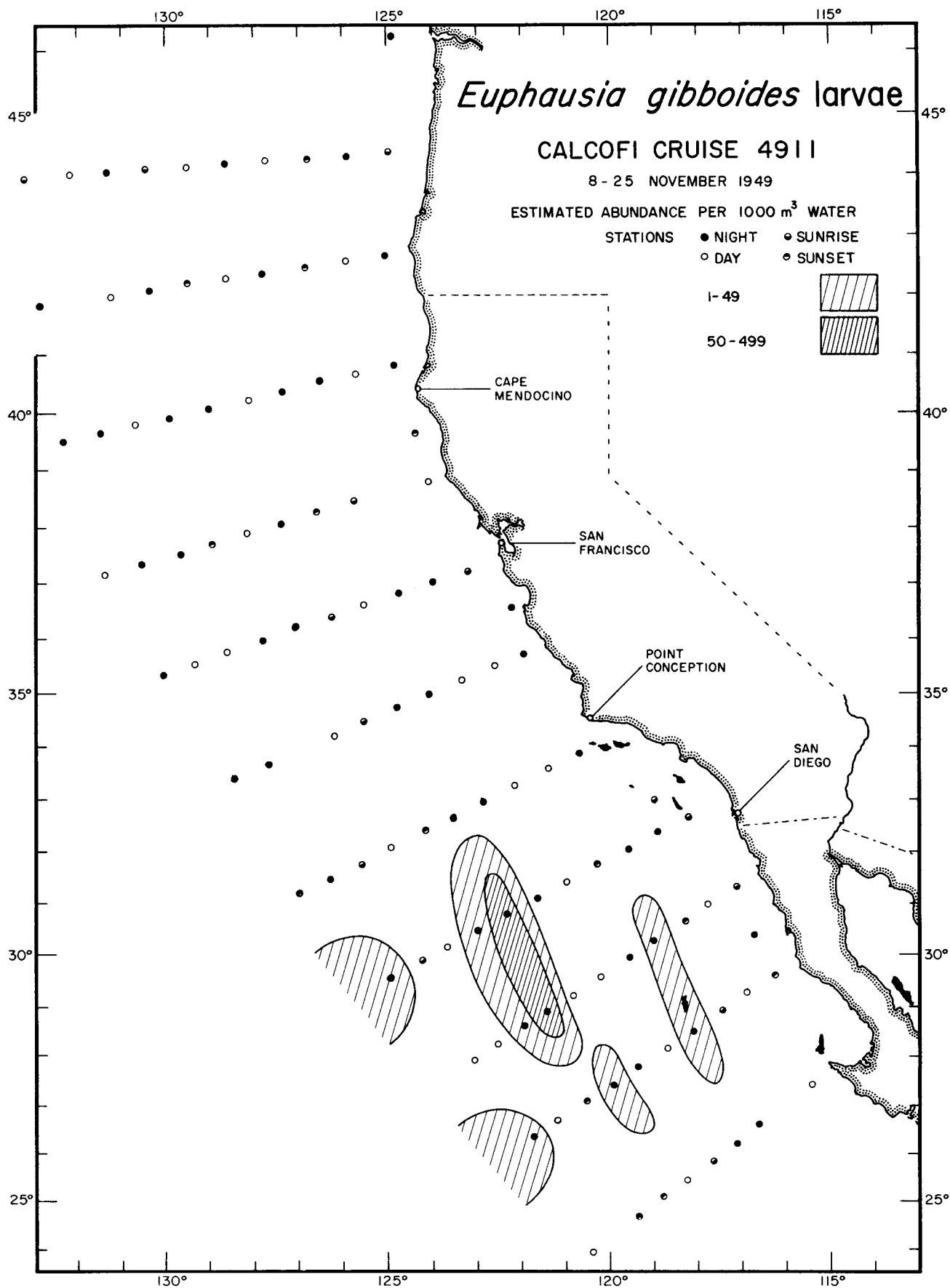
Euphausiacea
Euphausia gibboides total
4909



Euphausiacea
Euphausia gibboides larvae
4910

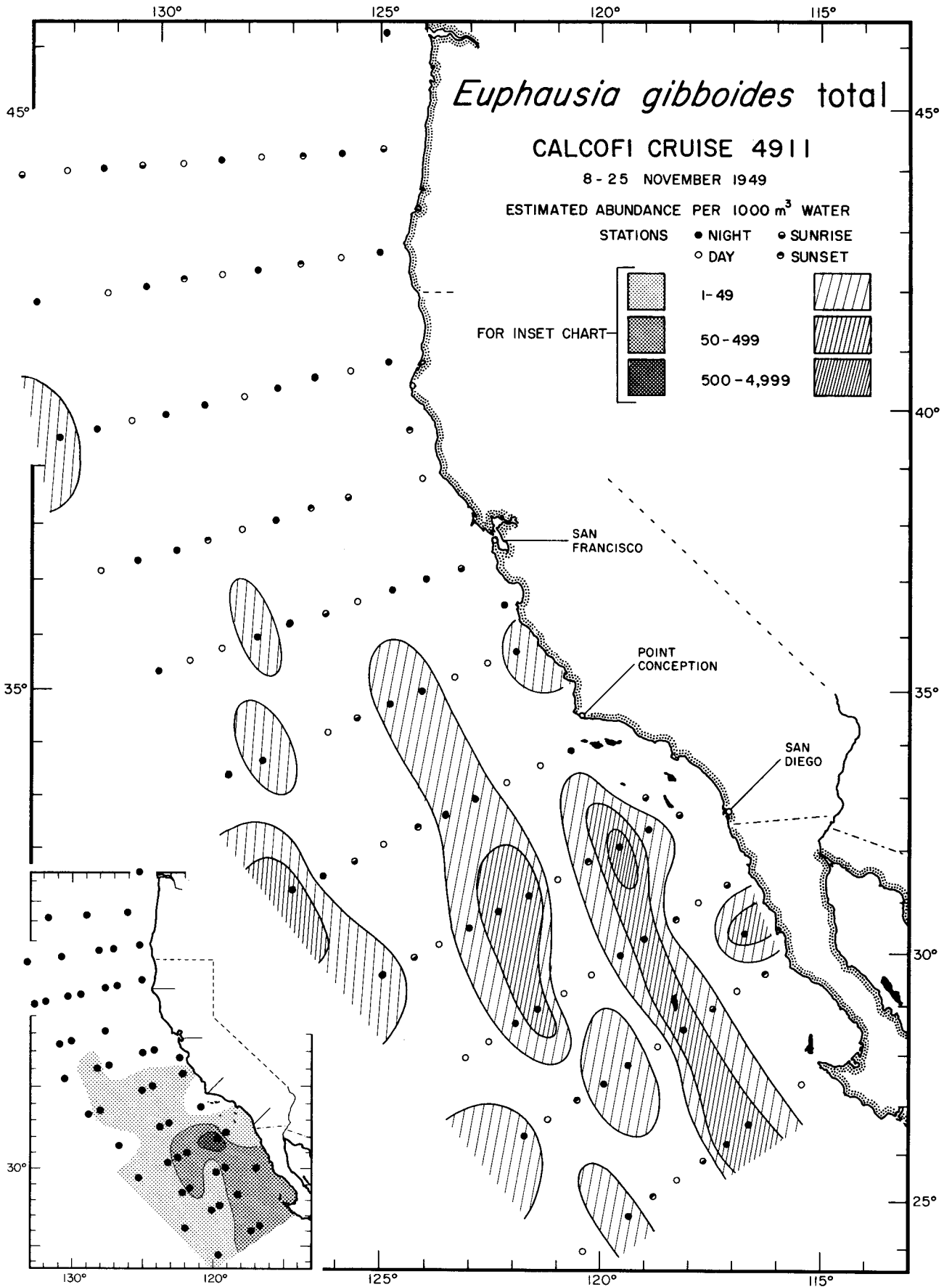


Euphausiacea
Euphausia gibboides total
4910

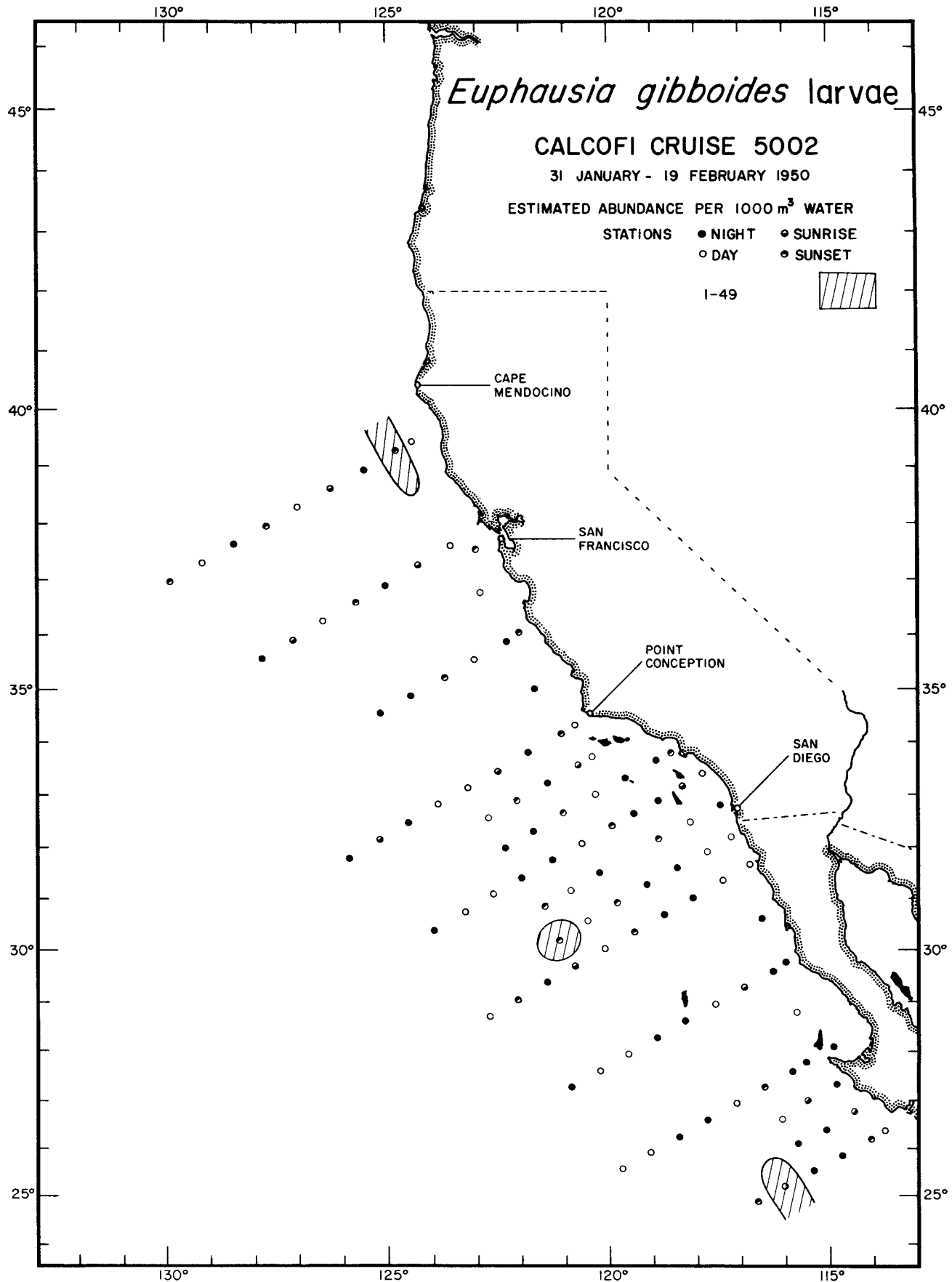


Euphausiacea
Euphausia gibboides larvae

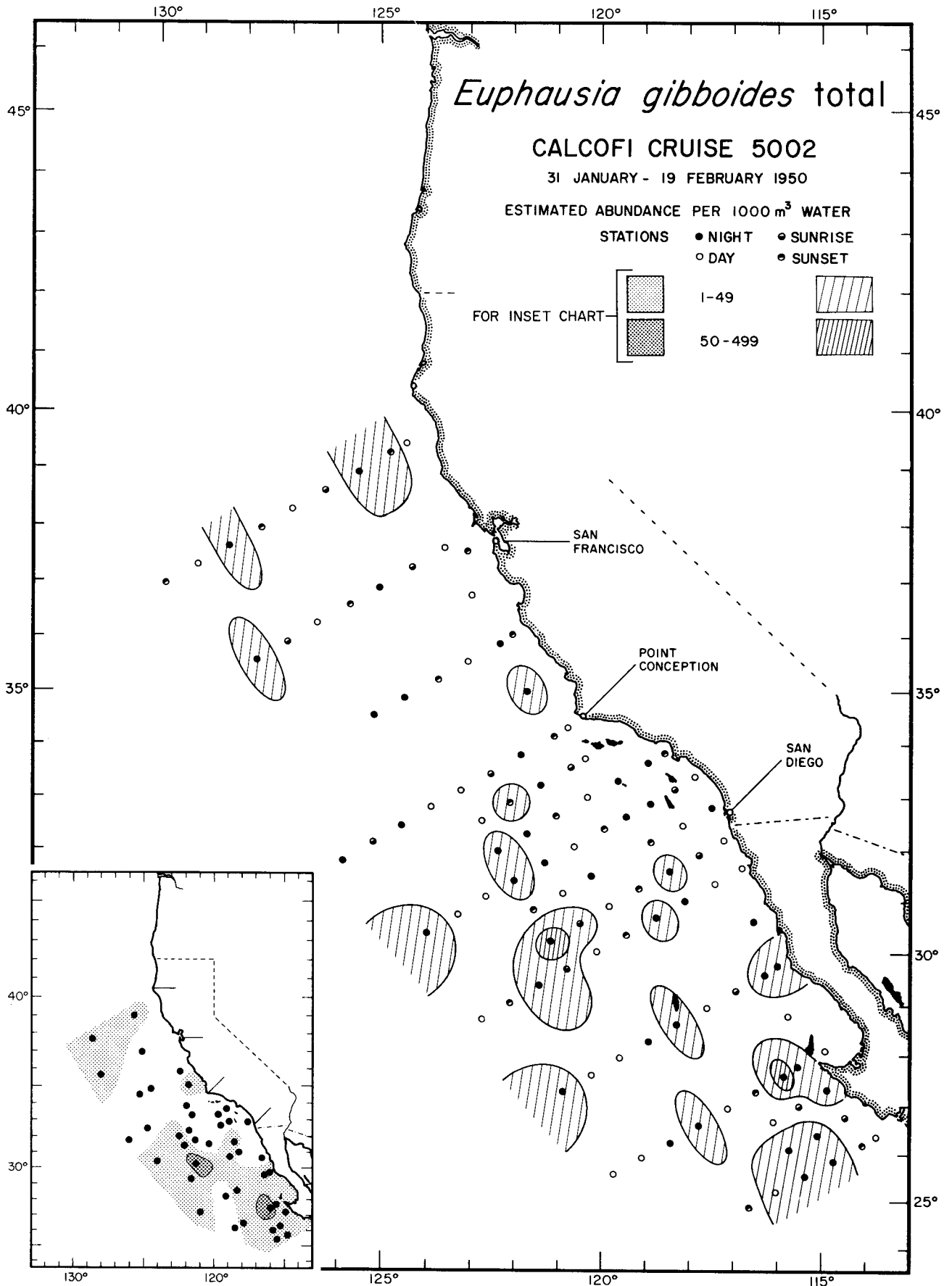
4911



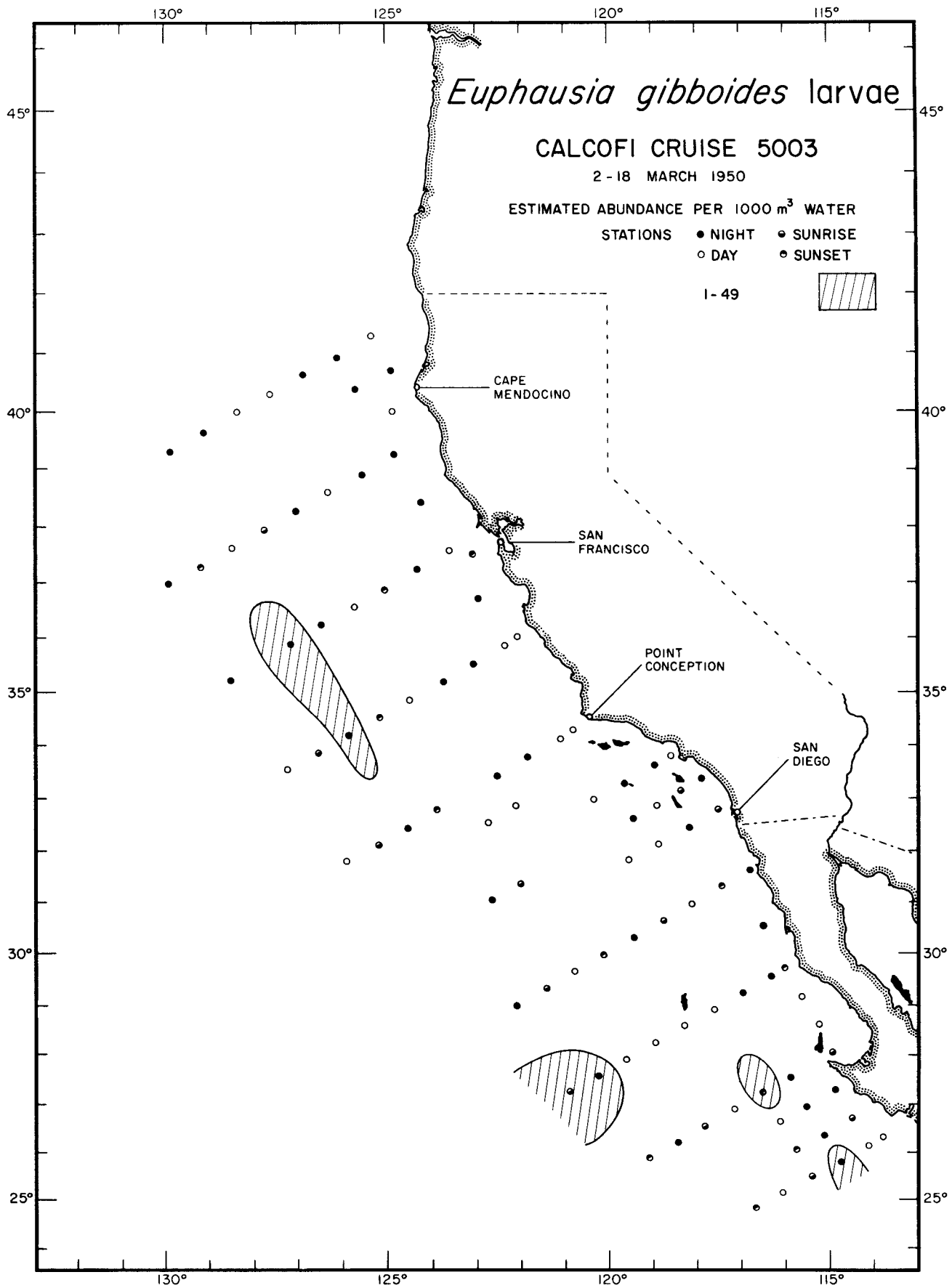
Euphausiacea
Euphausia gibboides total
4911



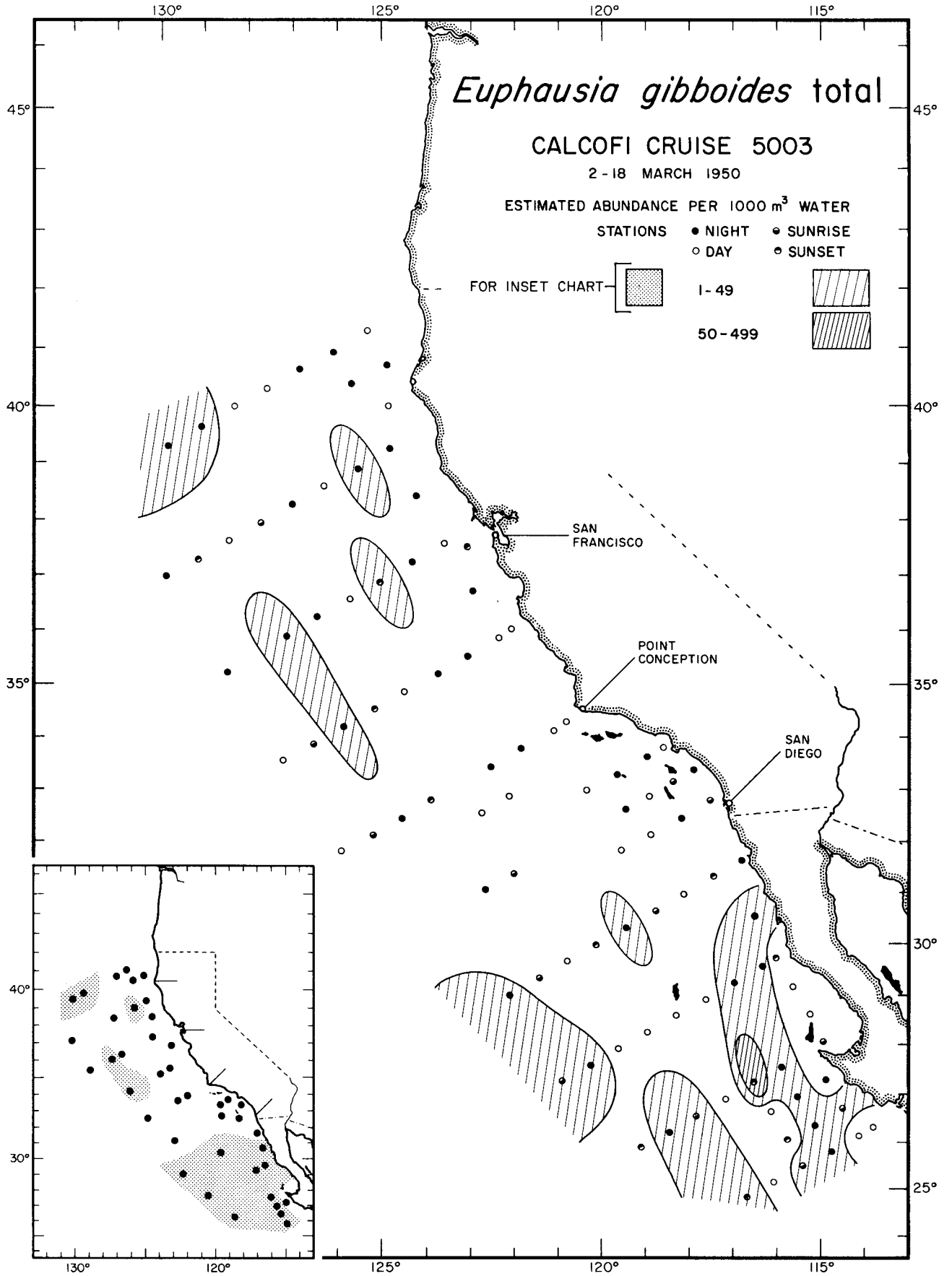
Euphausiacea
Euphausia gibboides larvae
 5002



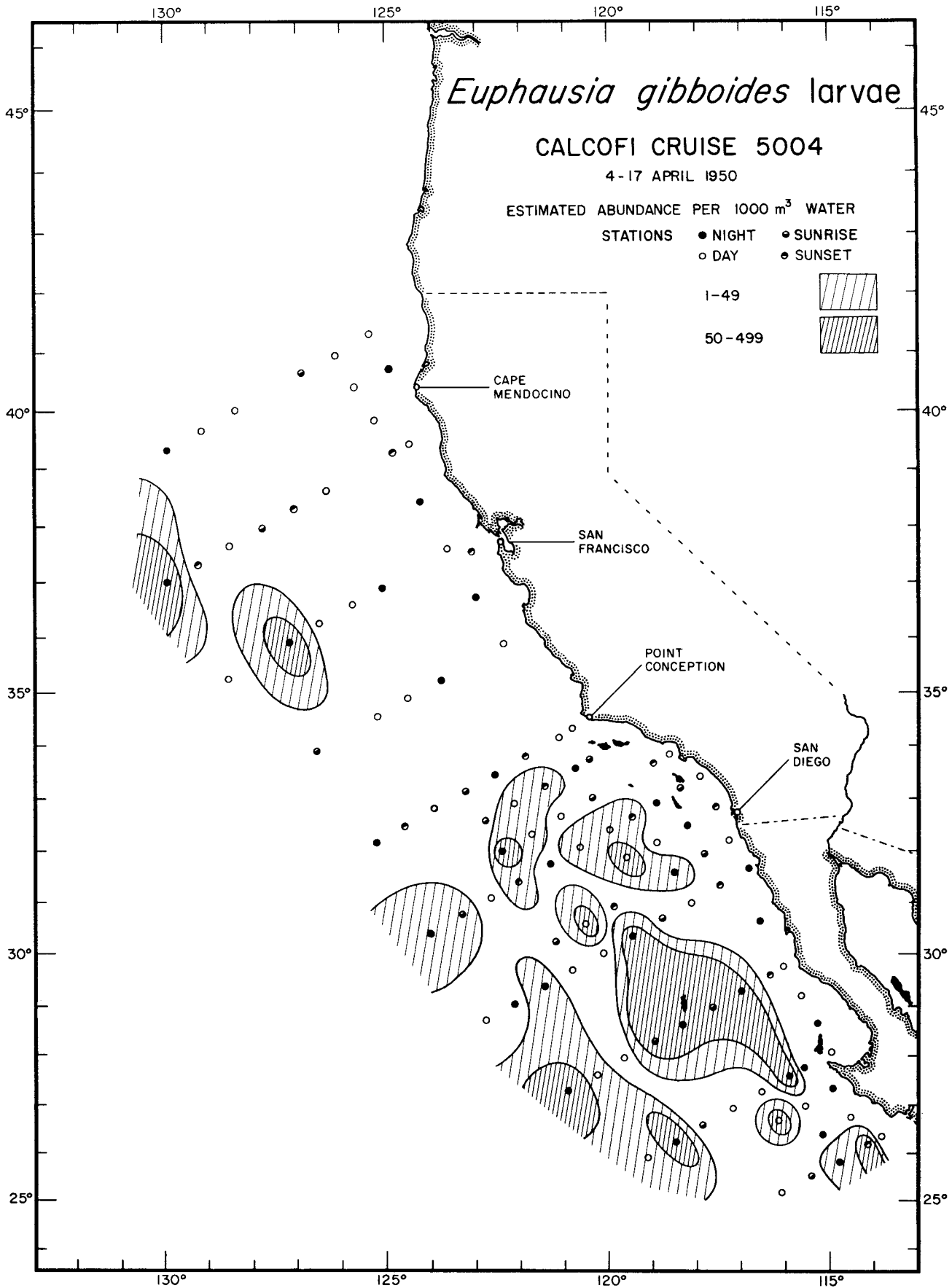
Euphausiacea
Euphausia gibboides total
5002



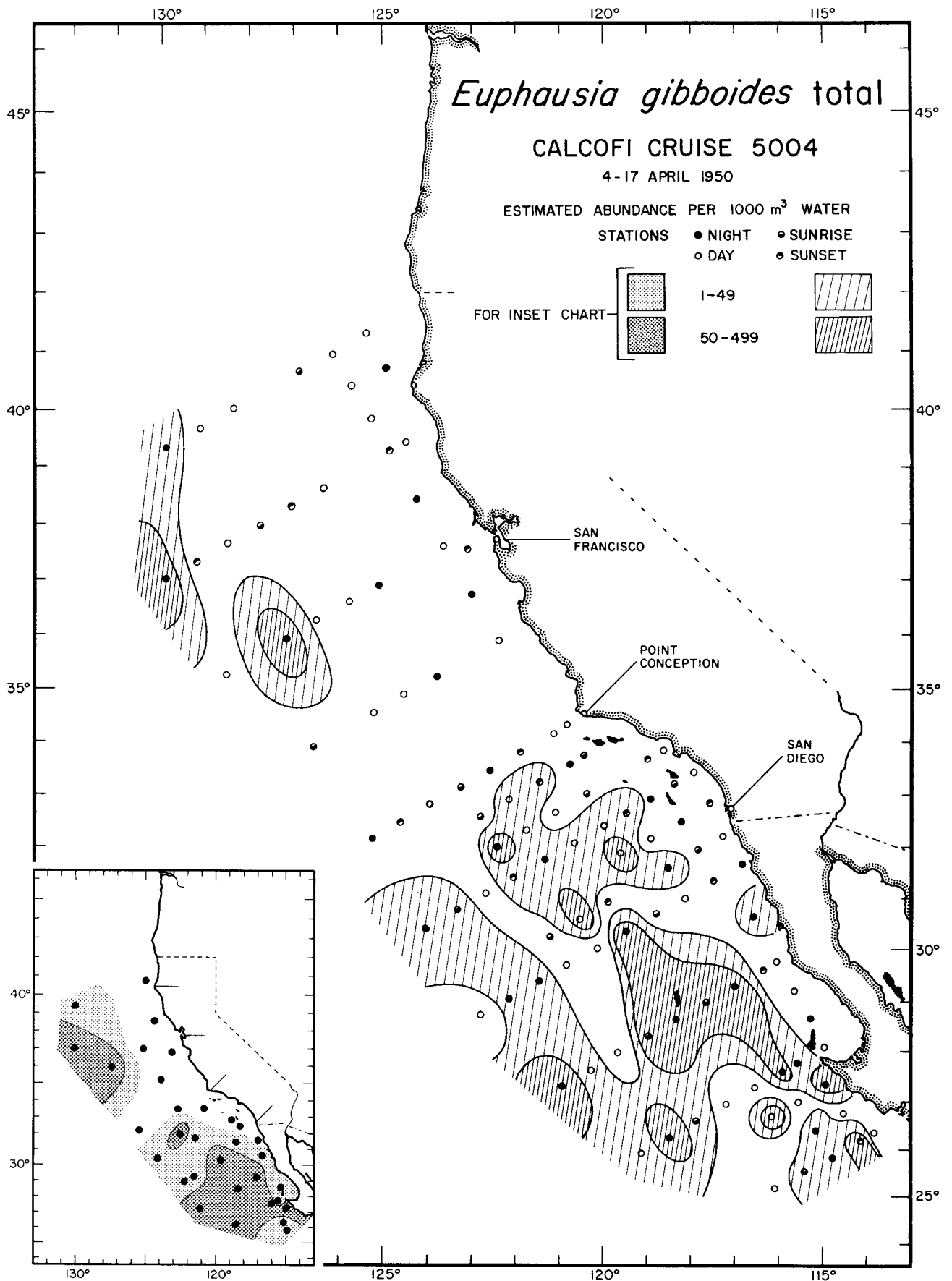
Euphausiacea
Euphausia gibboides larvae
5003



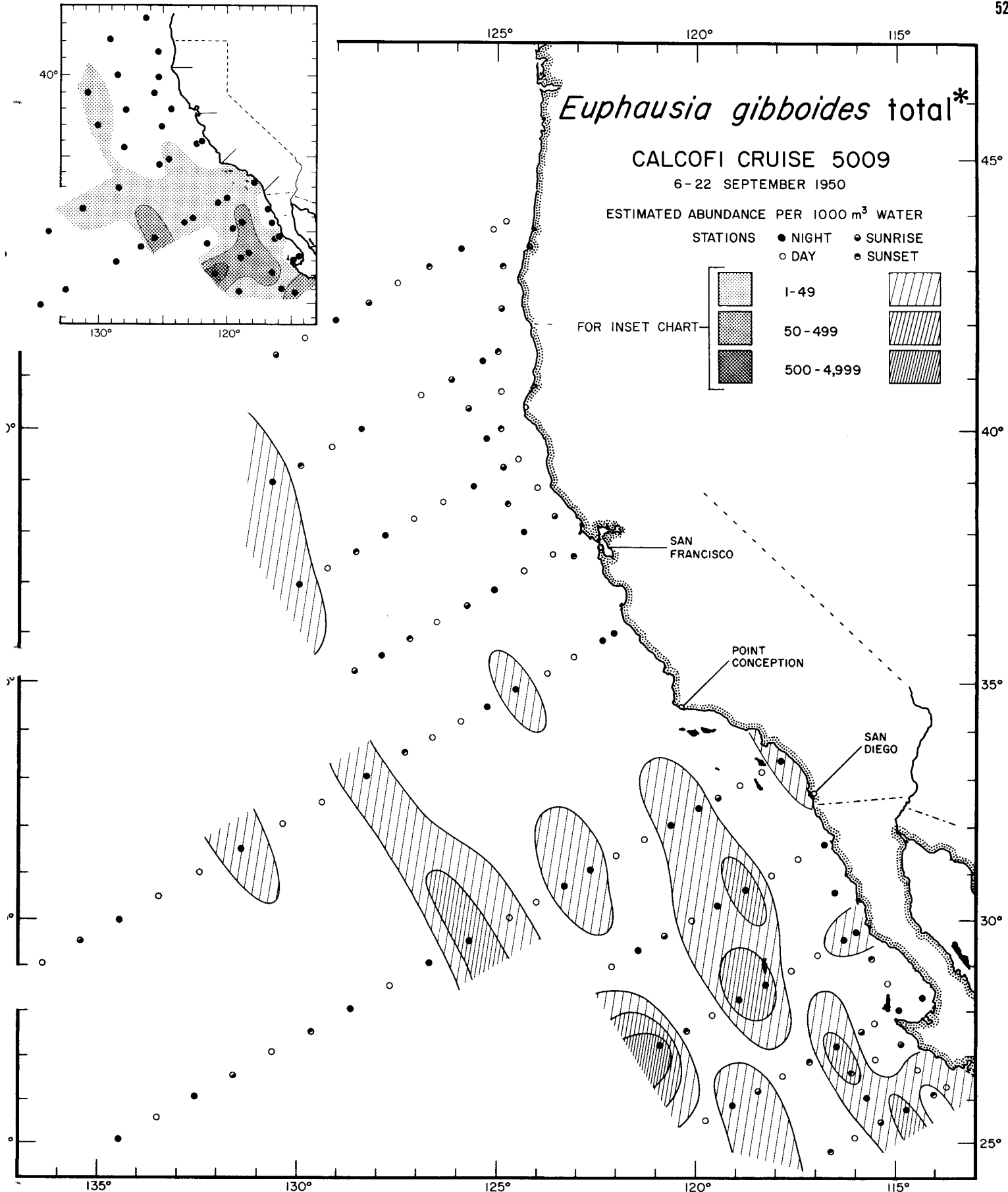
Euphausiacea
Euphausia gibboides total
 5003



Euphausiacea
Euphausia gibboides larvae
5004

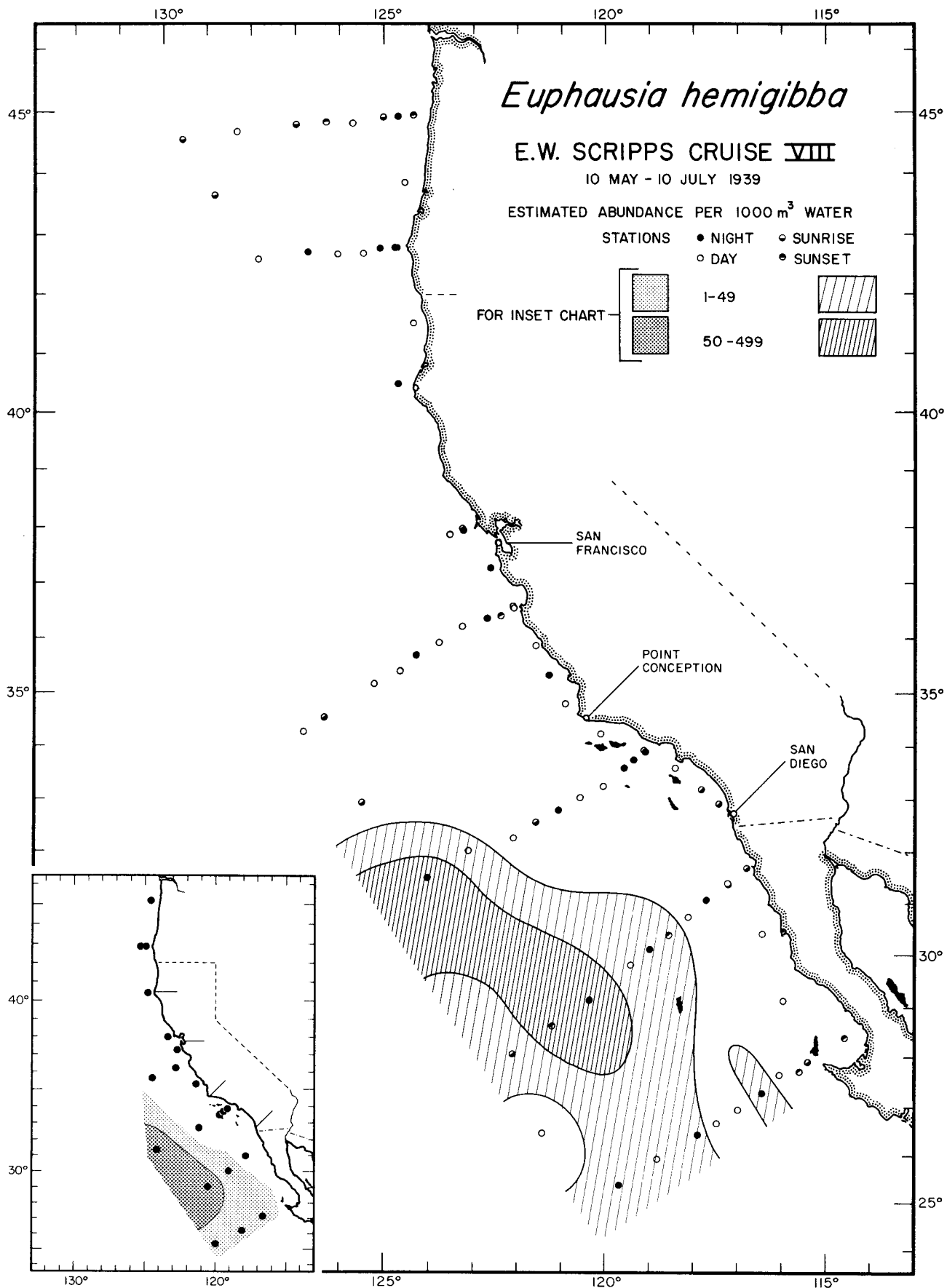


Euphausiacea
Euphausia gibboides total
5004

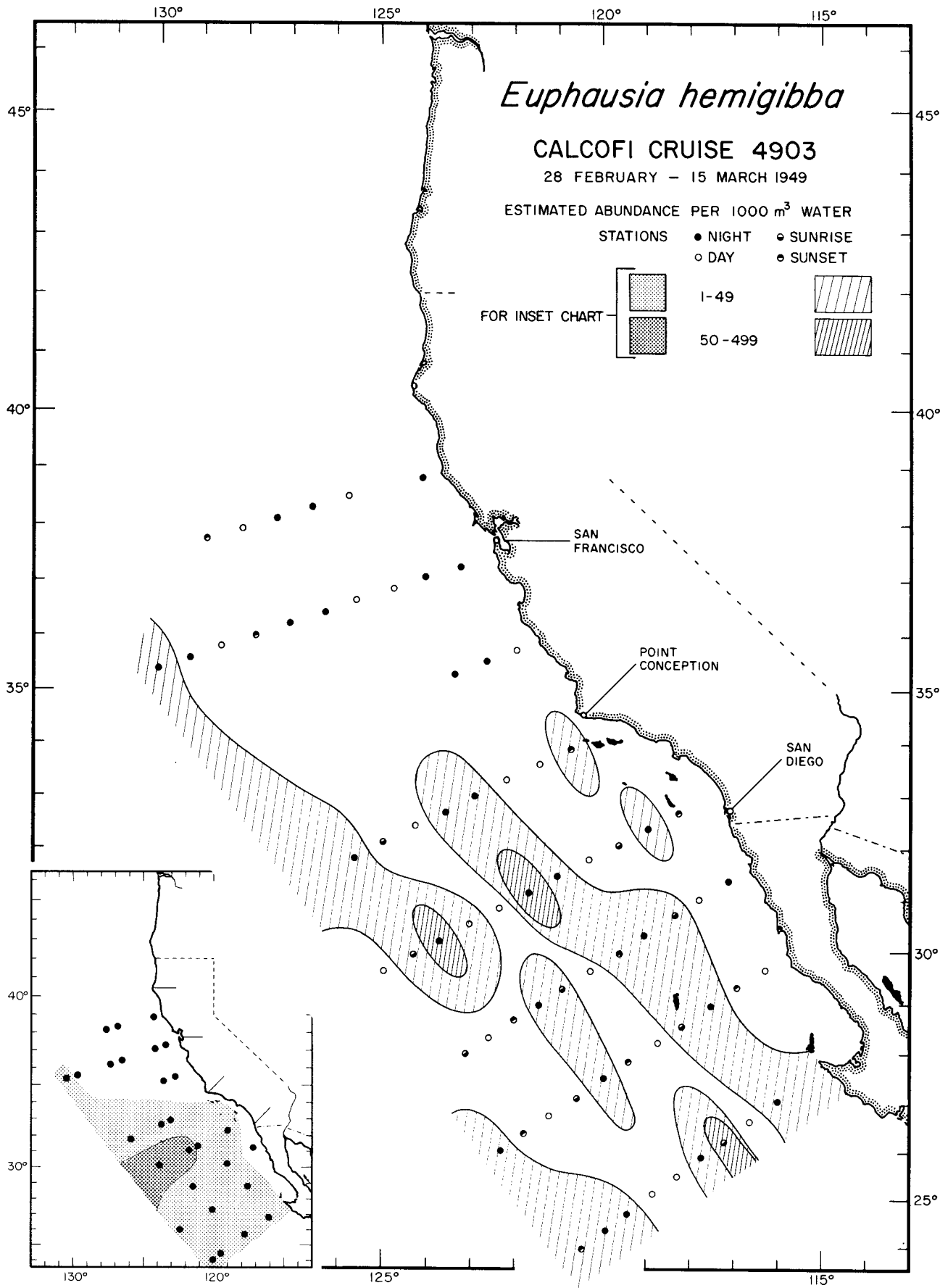


* No larvae found

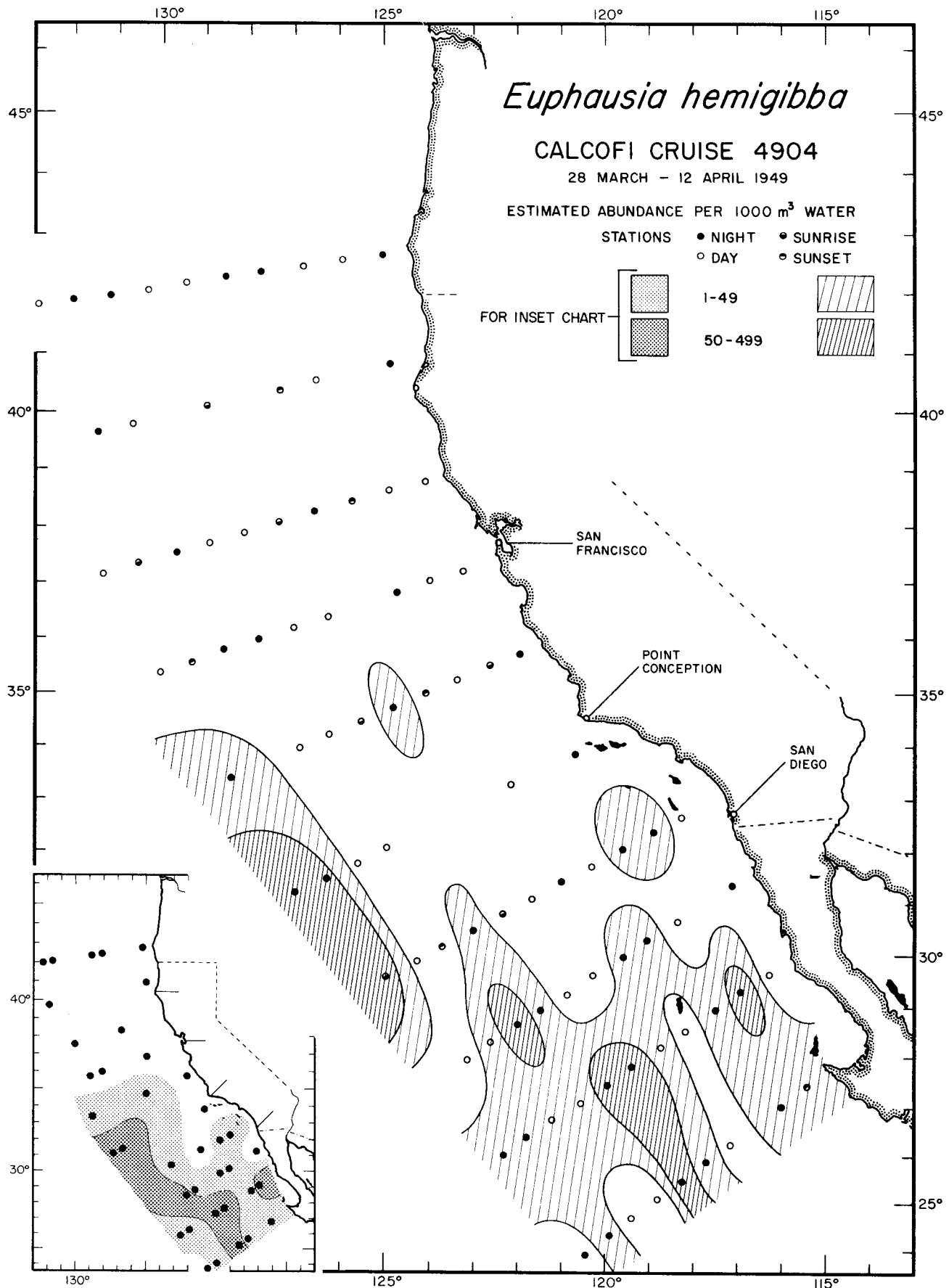
Euphausiacea
Euphausia gibboides total
5009



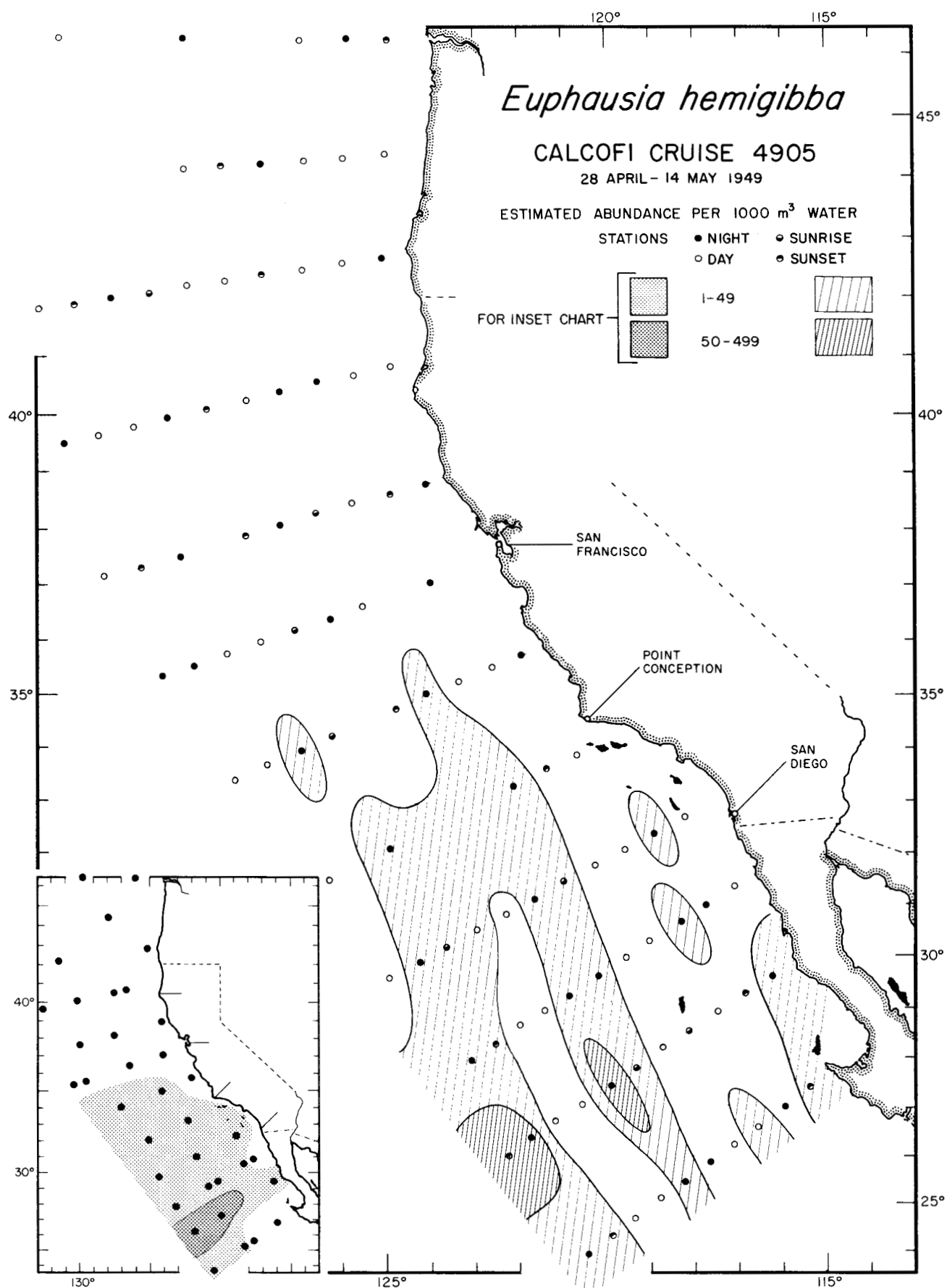
Euphausiacea
Euphausia hemigibba
E. W. SCRIPPS CRUISE VIII



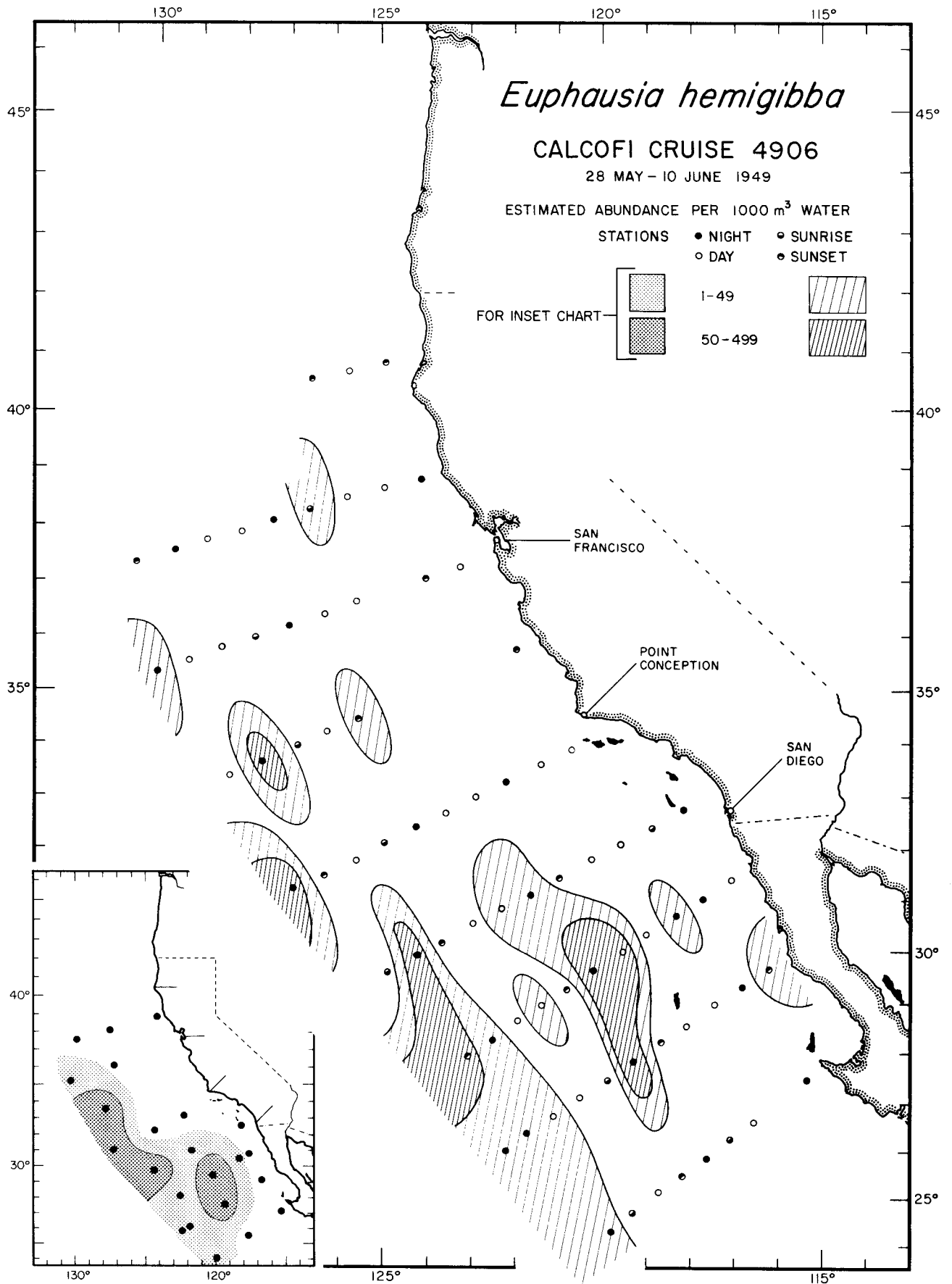
Euphausiacea
Euphausia hemigibba
4903



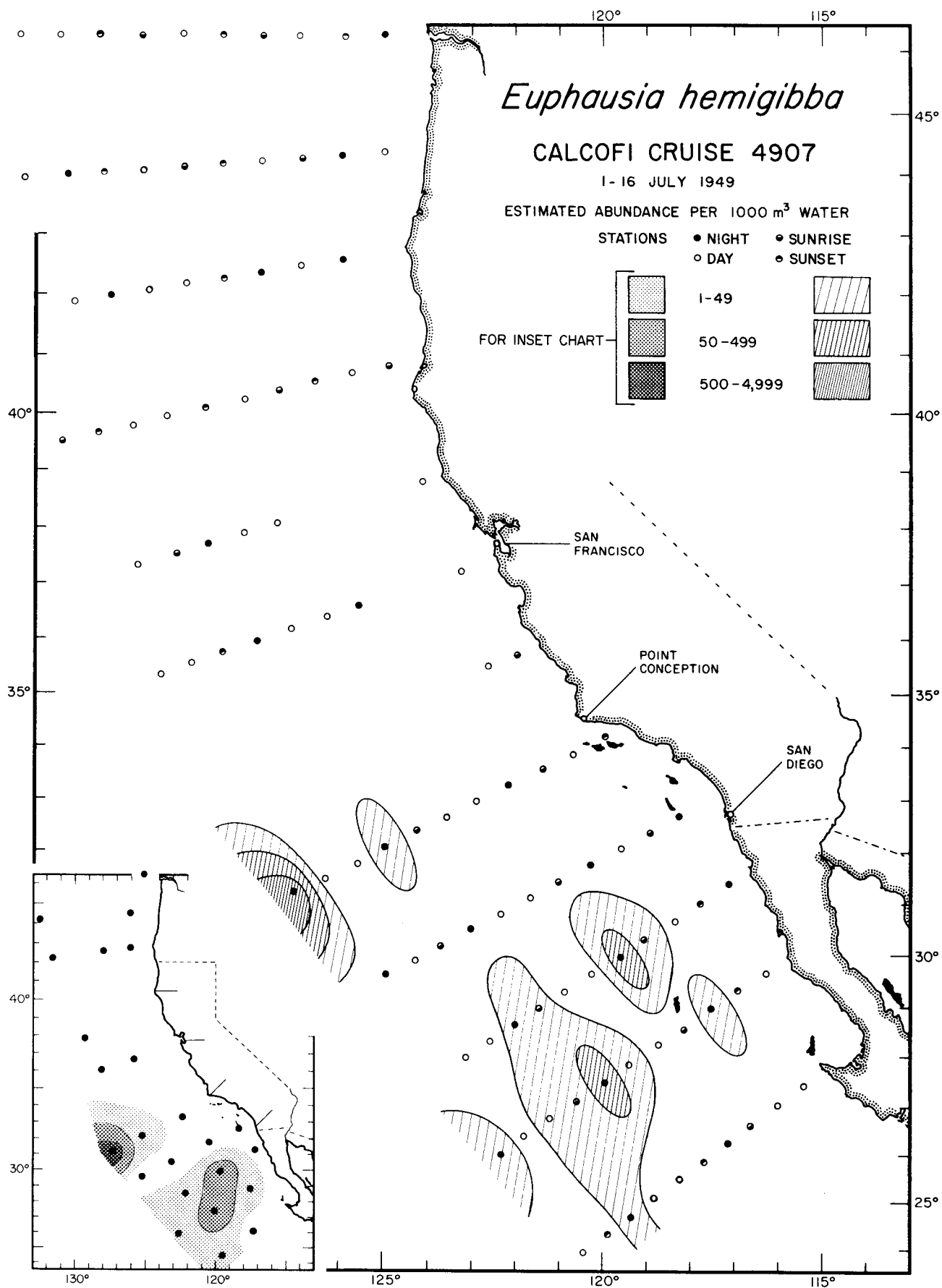
Euphausiacea
Euphausia hemigibba
4904



Euphausiacea
Euphausia hemigibba
4905

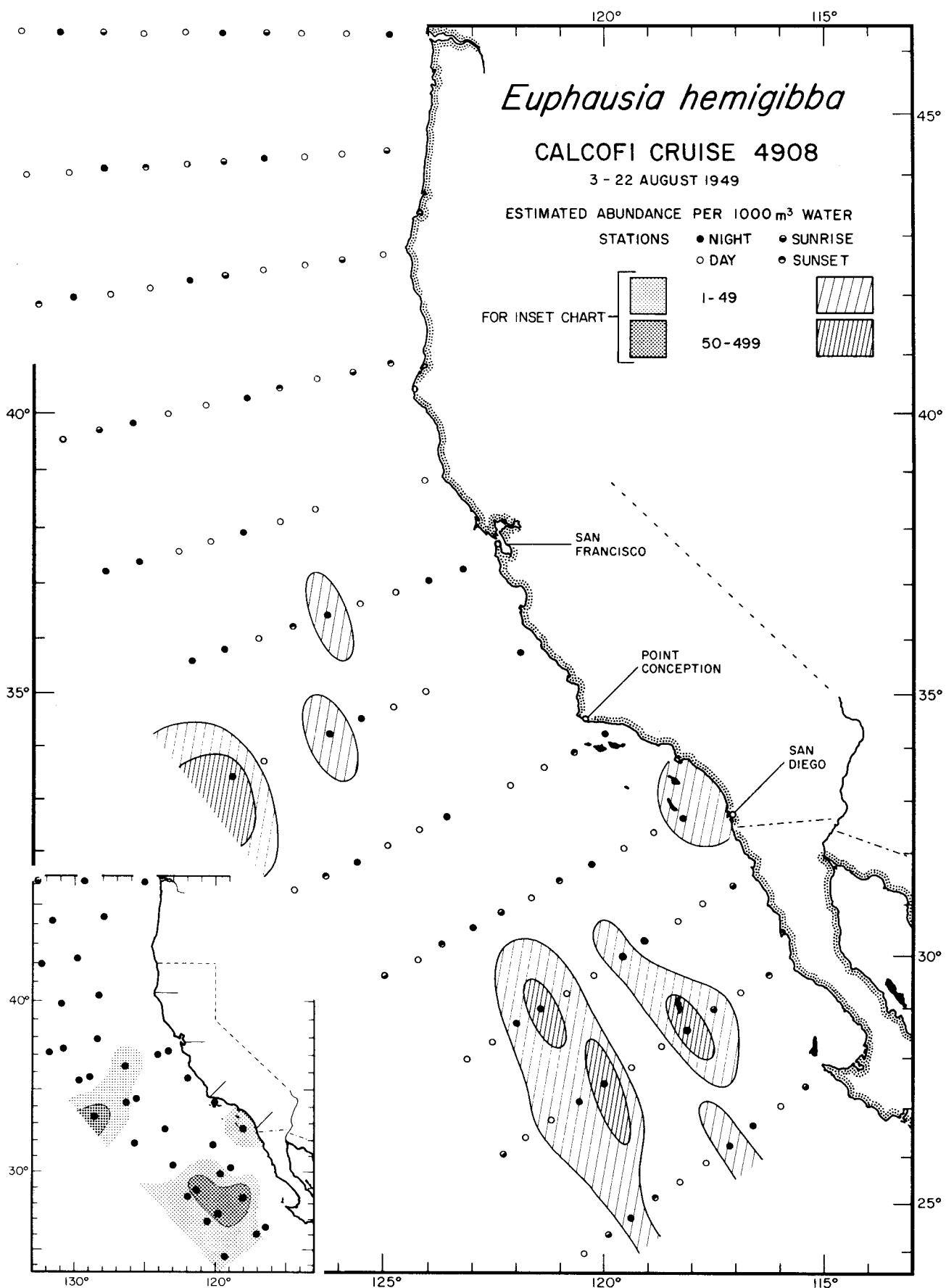


Euphausiacea
Euphausia hemigibba
4906

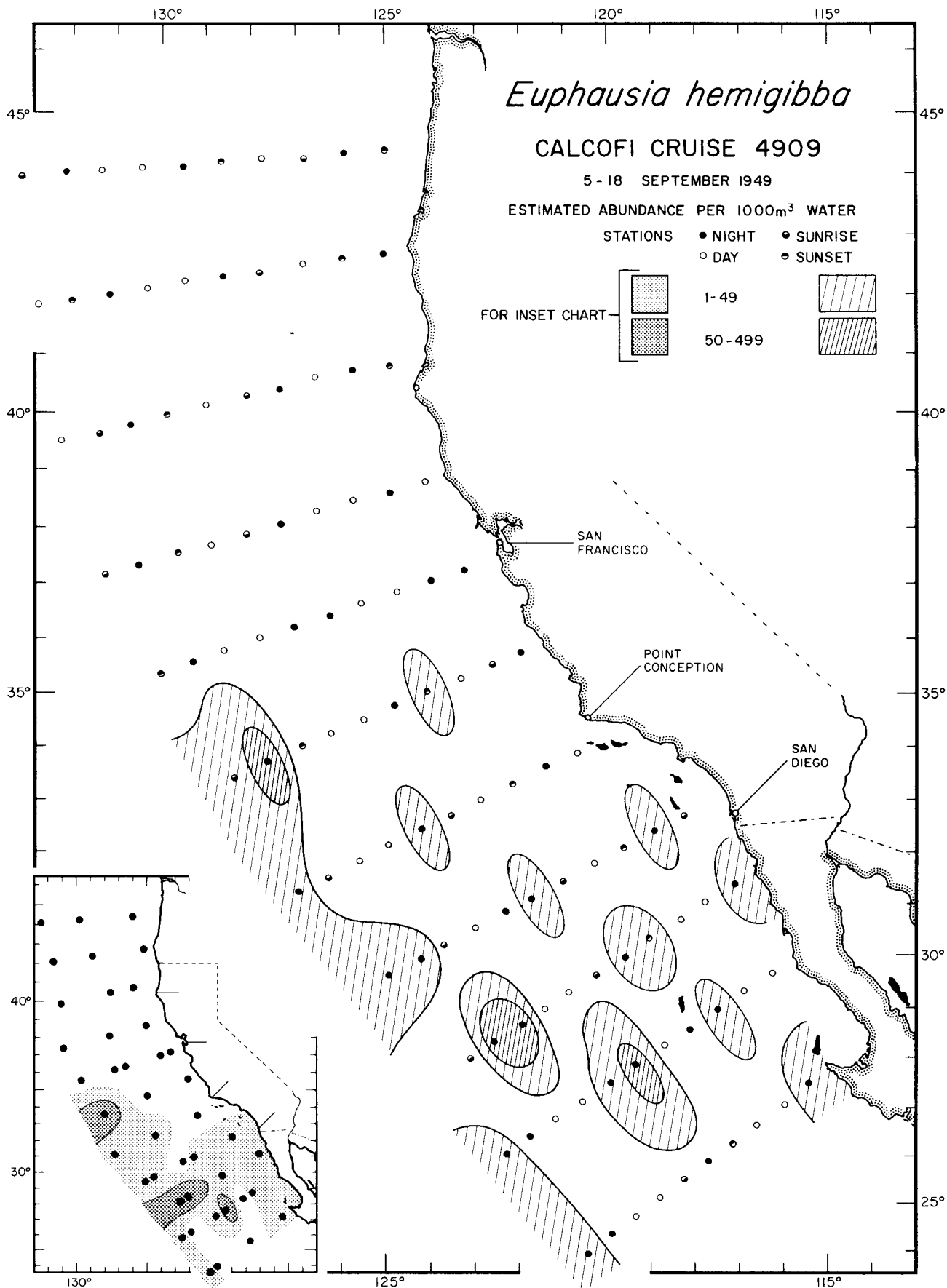


Euphausiacea
Euphausia hemigibba

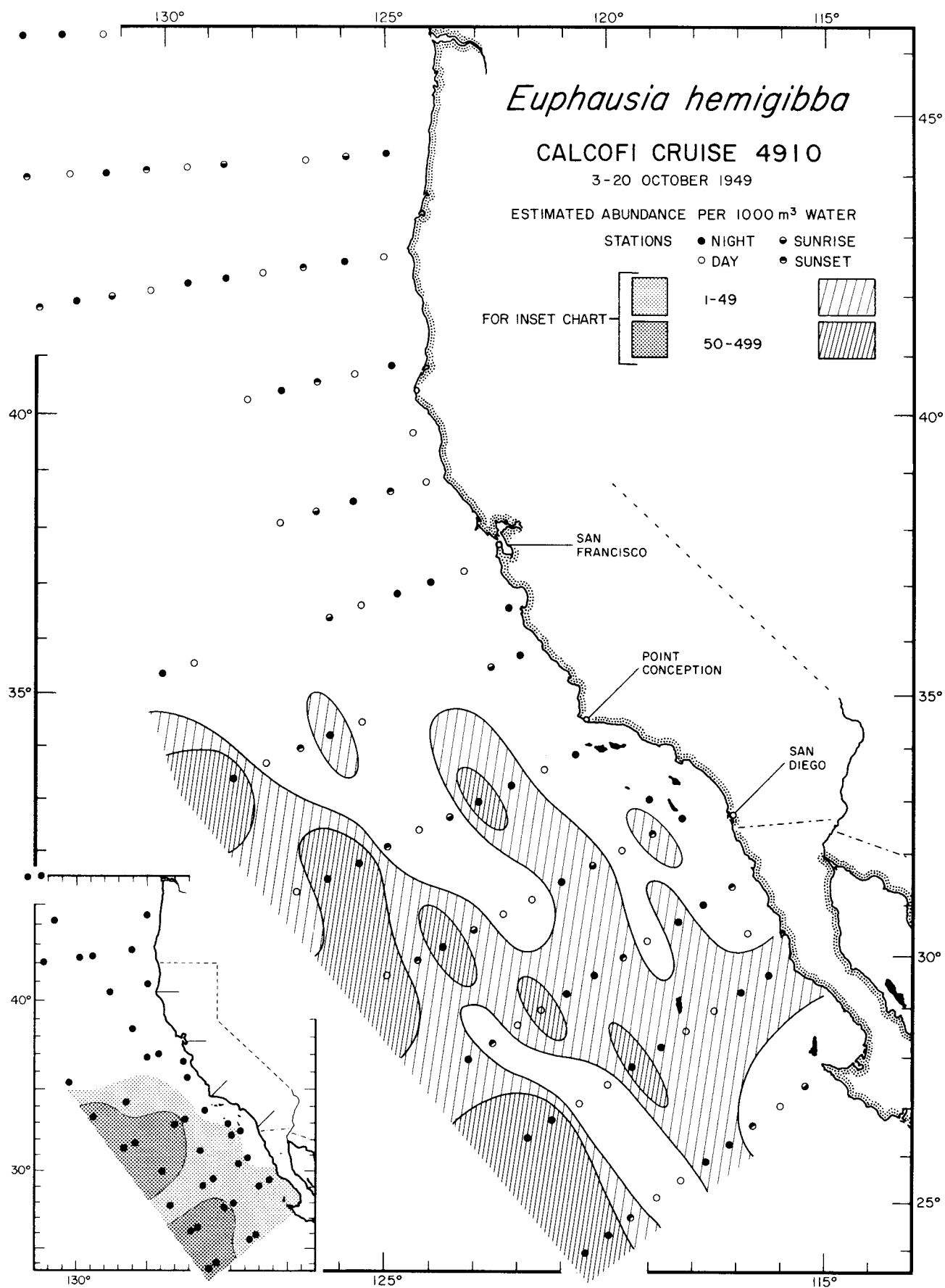
4907



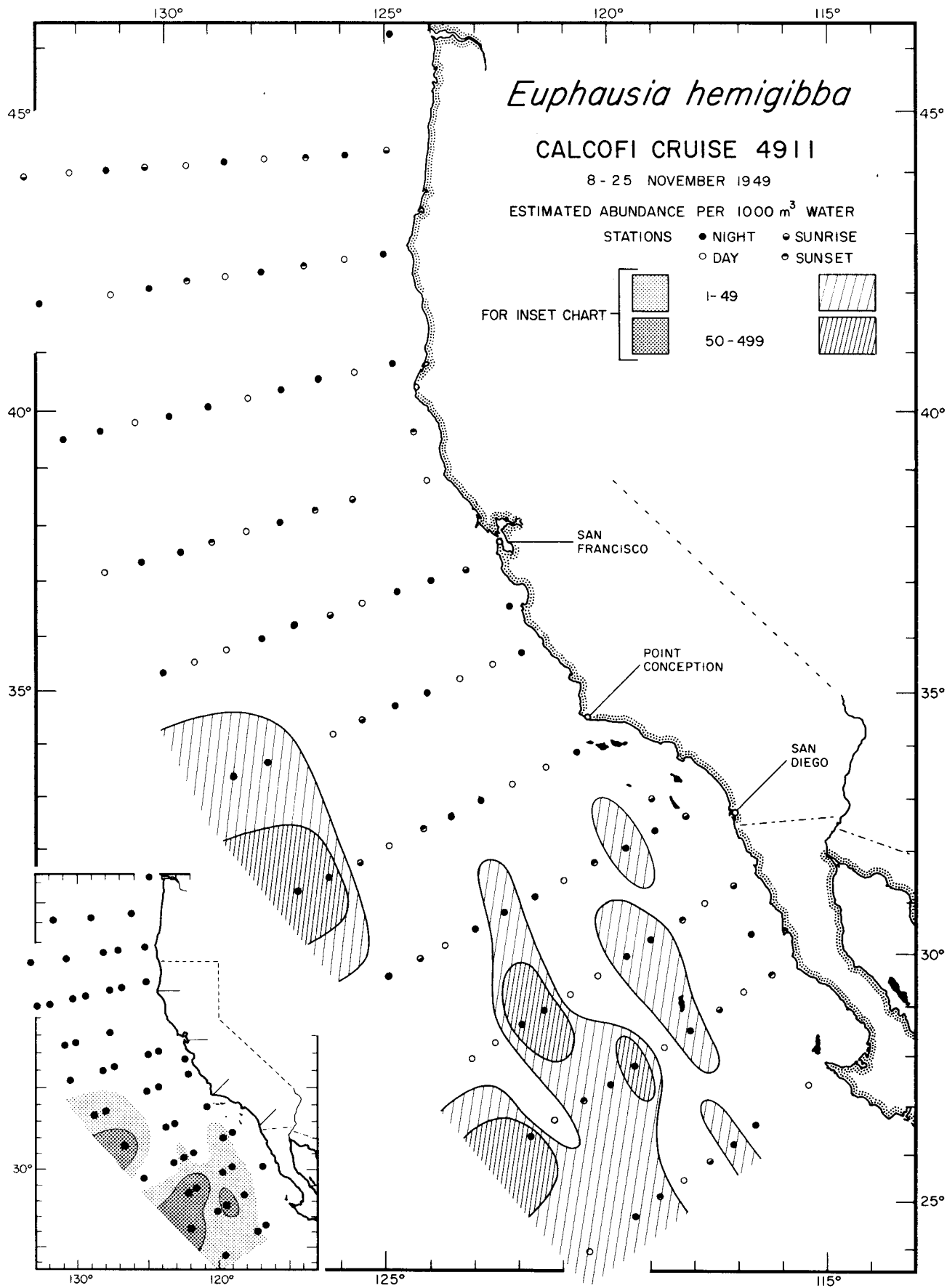
Euphausiacea
Euphausia hemigibba
4908



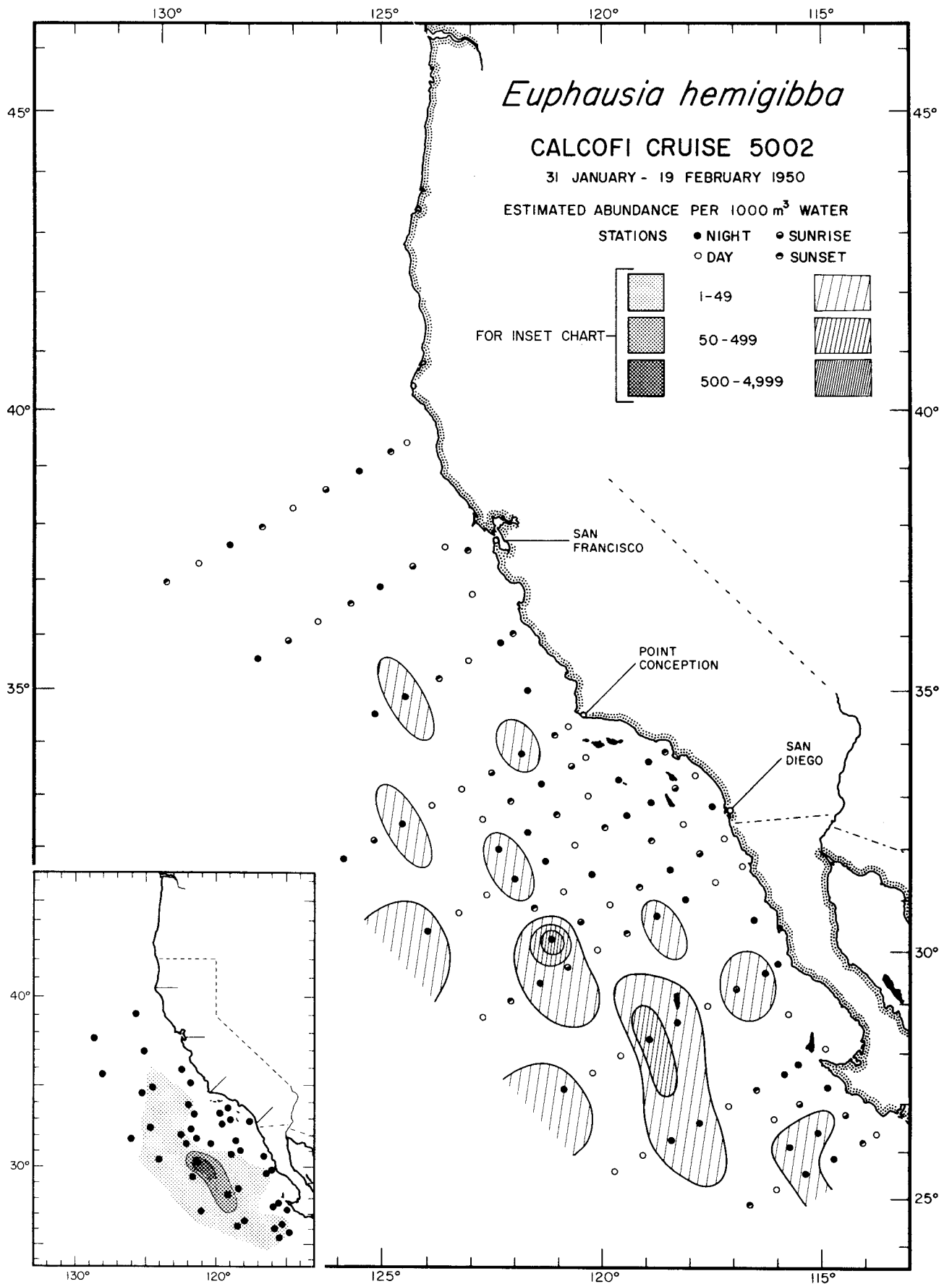
Euphausiacea
Euphausia hemigibba
4909



Euphausiacea
Euphausia hemigibba
4910

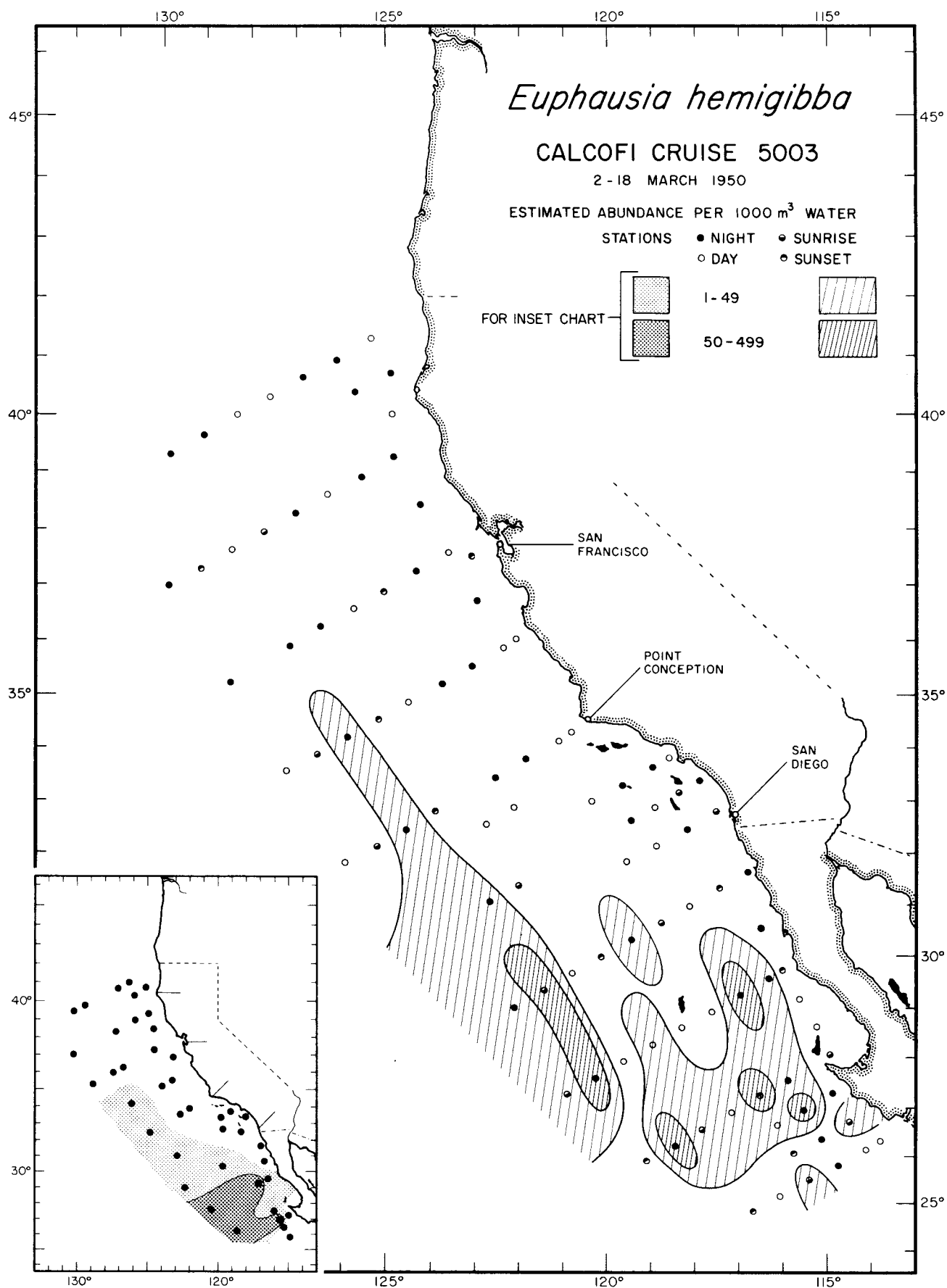


Euphausiacea
Euphausia hemigibba
4911

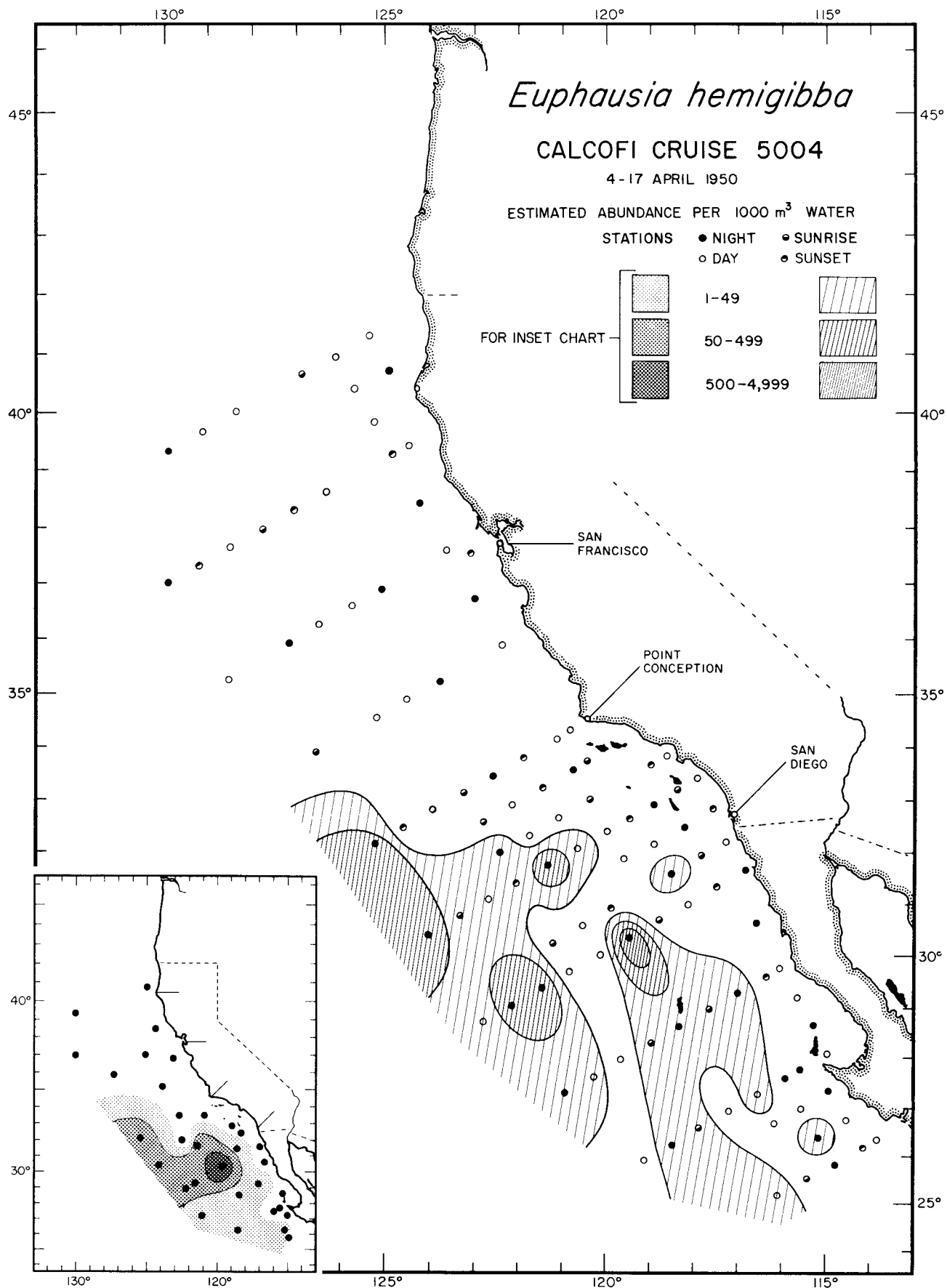


Euphausiacea
Euphausia hemigibba

5002



Euphausiacea
Euphausia hemigibba
5003



Euphausiacea
Euphausia hemigibba

5004

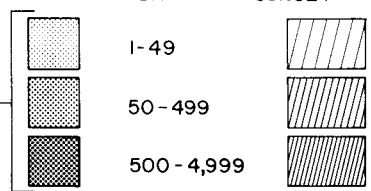
Euphausia hemigibba

CALCOFI CRUISE 5009

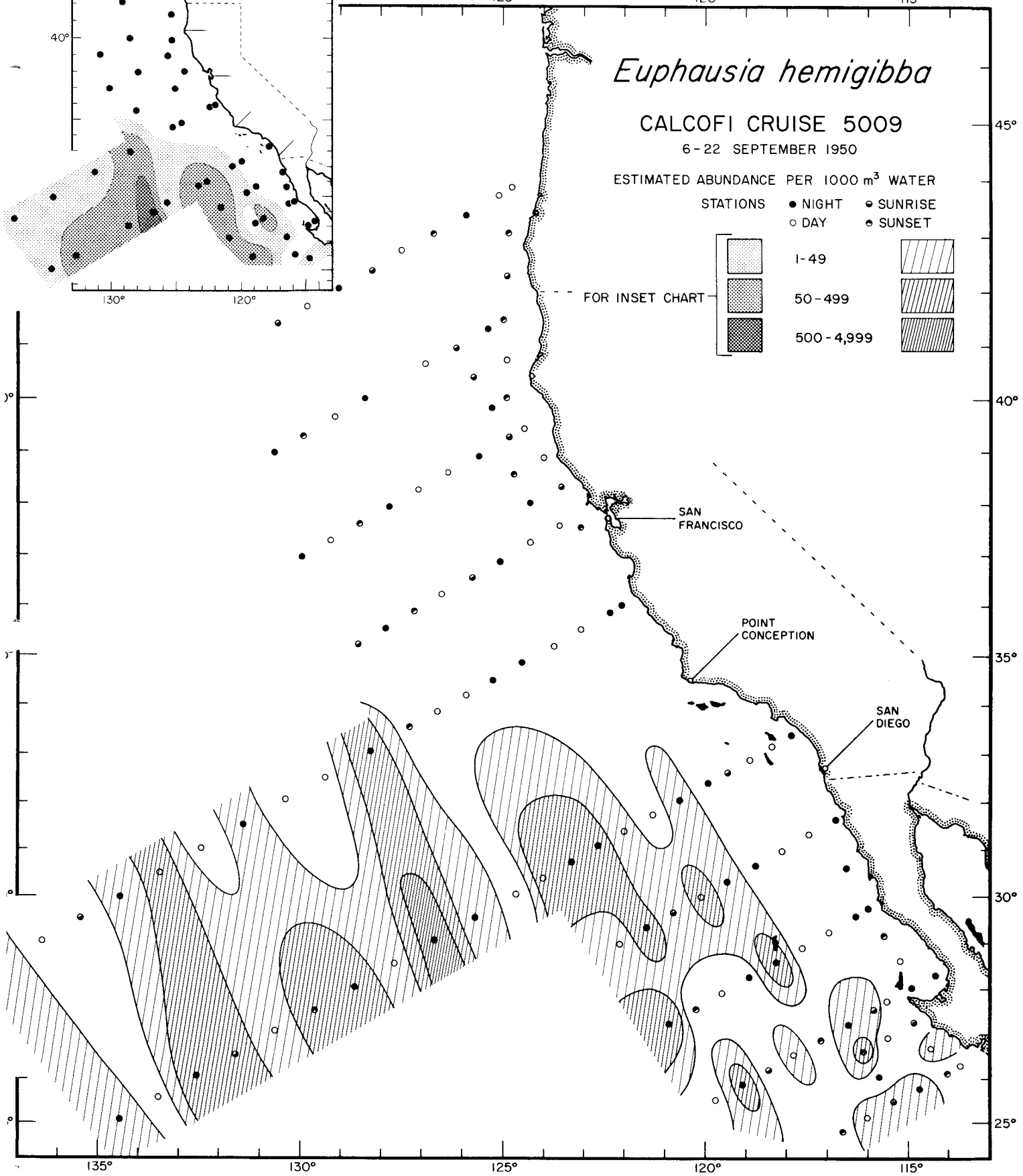
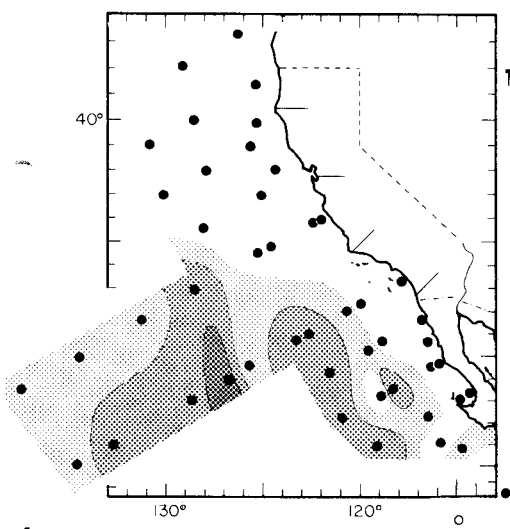
6-22 SEPTEMBER 1950

ESTIMATED ABUNDANCE PER 1000 m³ WATER

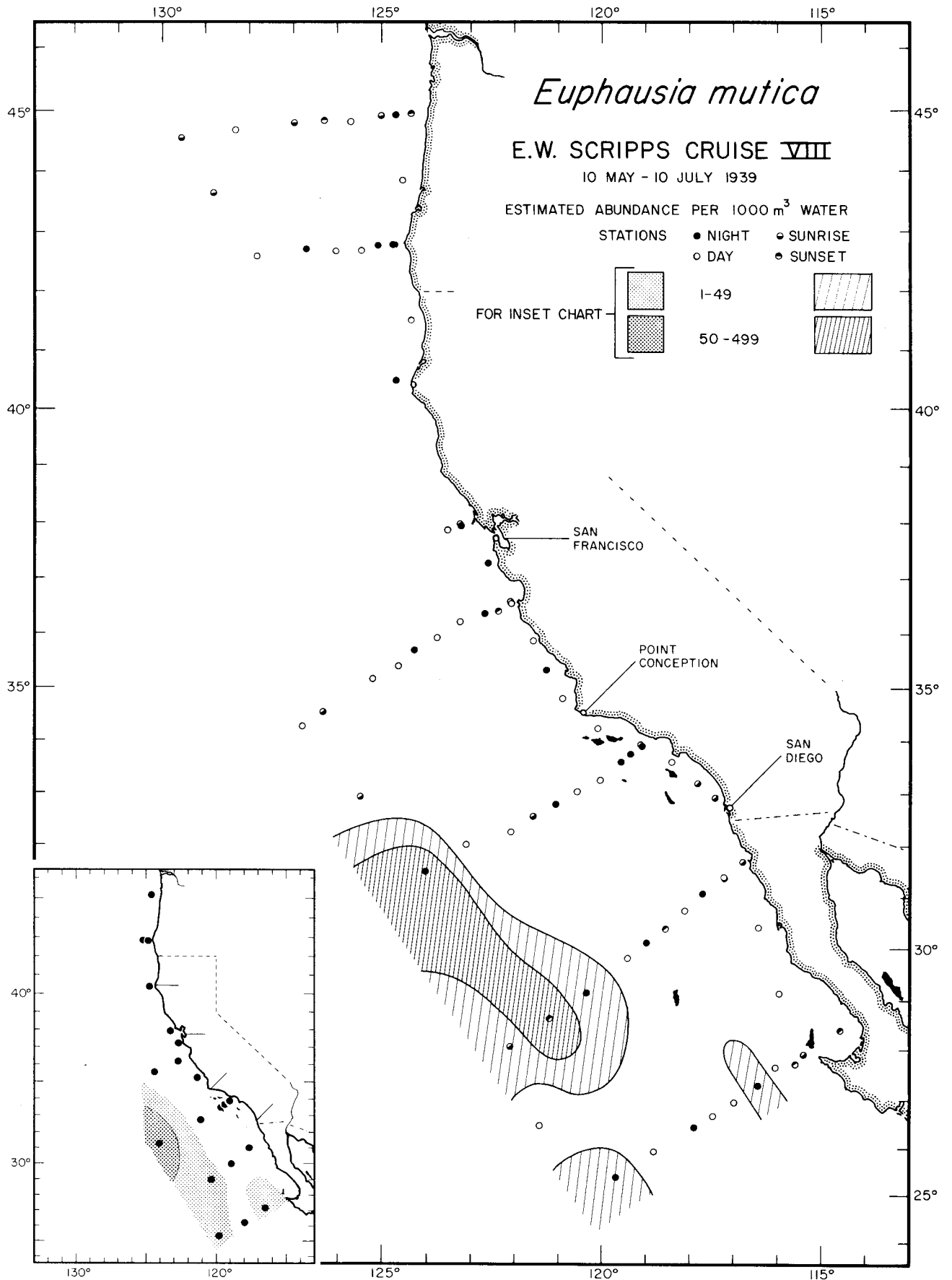
STATIONS ● NIGHT ○ DAY ● SUNRISE ● SUNSET



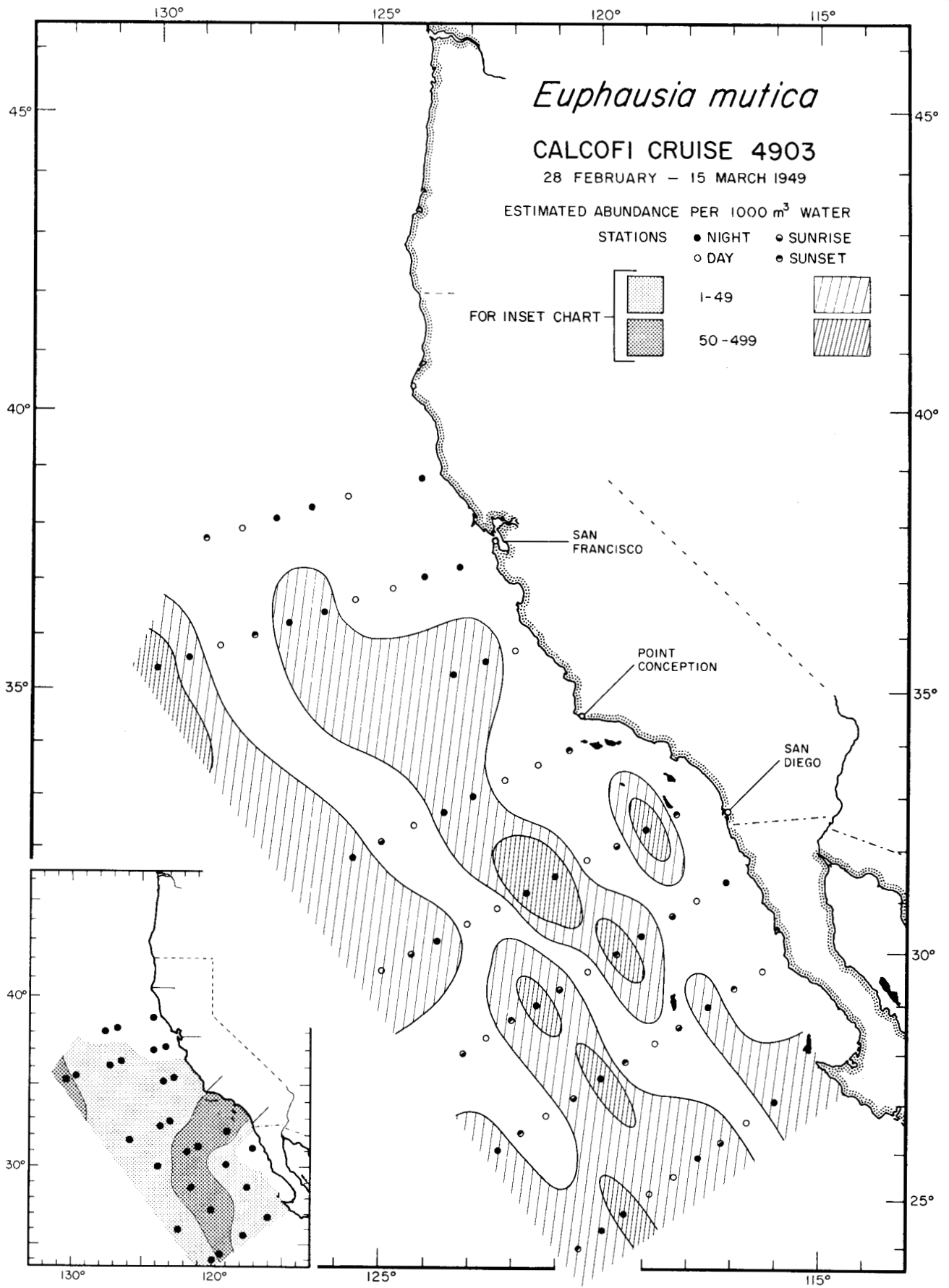
FOR INSET CHART



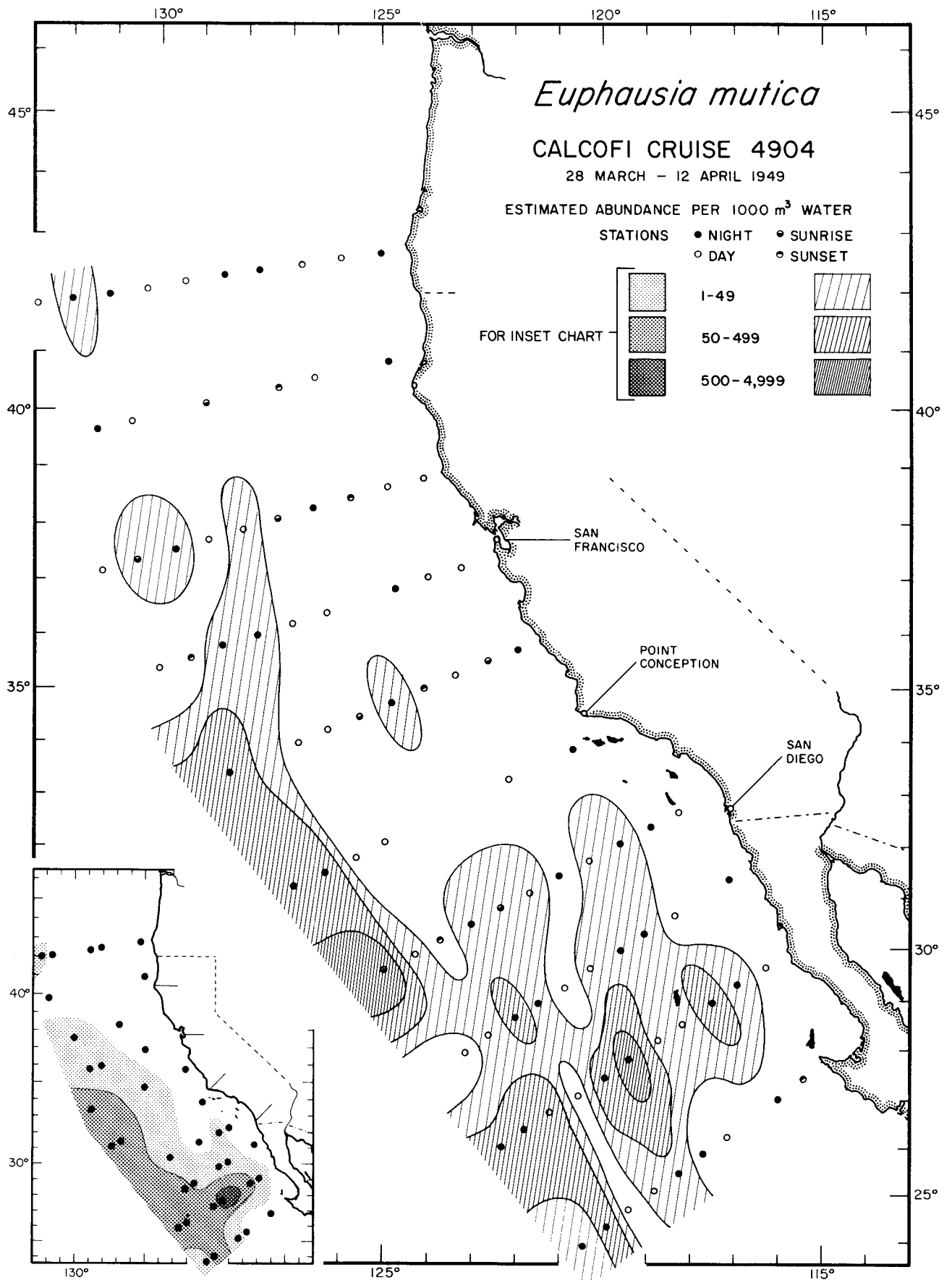
Euphausiacea
Euphausia hemigibba
 5009



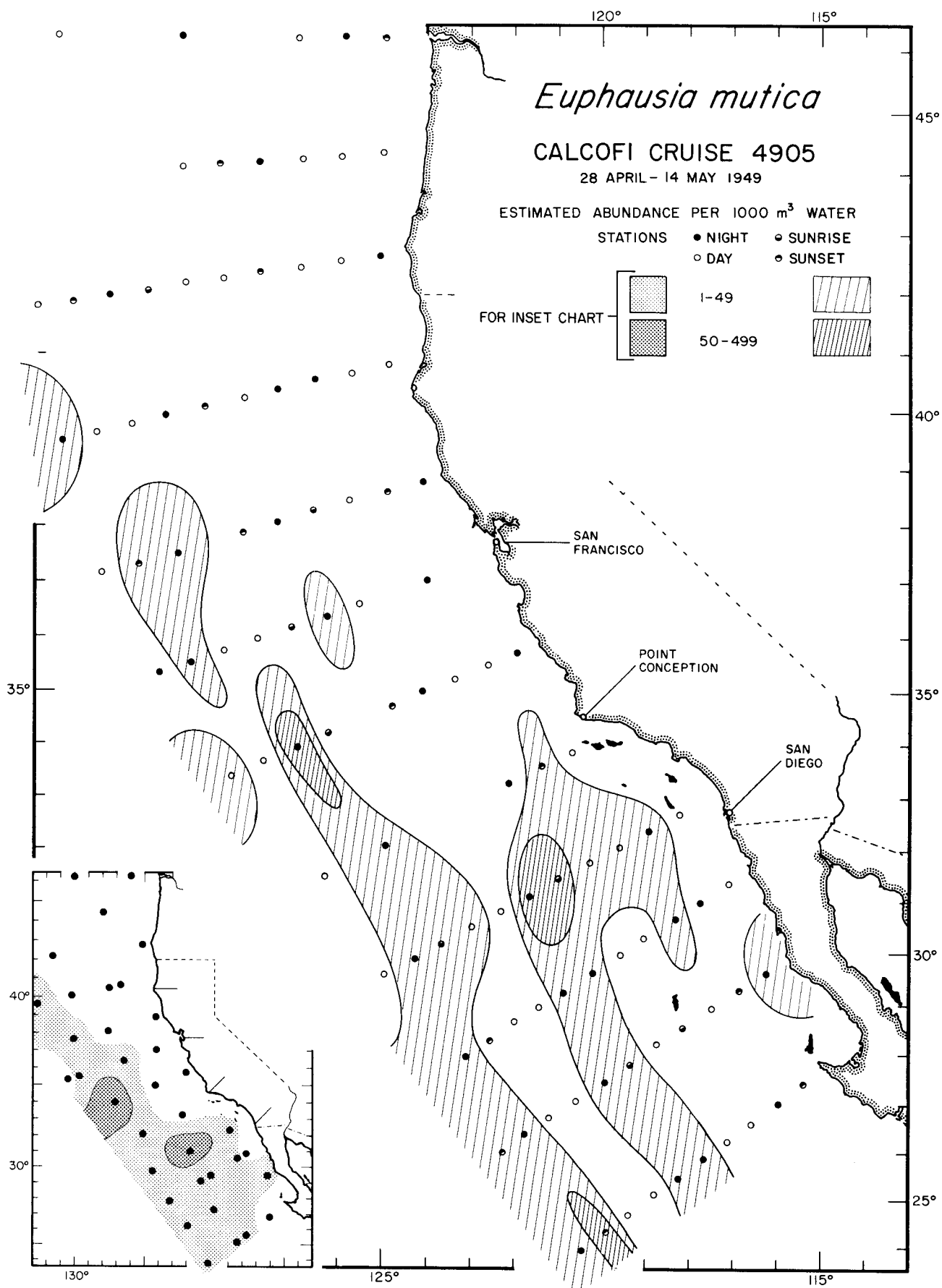
Euphausiacea
Euphausia mutica
E. W. SCRIPPS CRUISE VIII



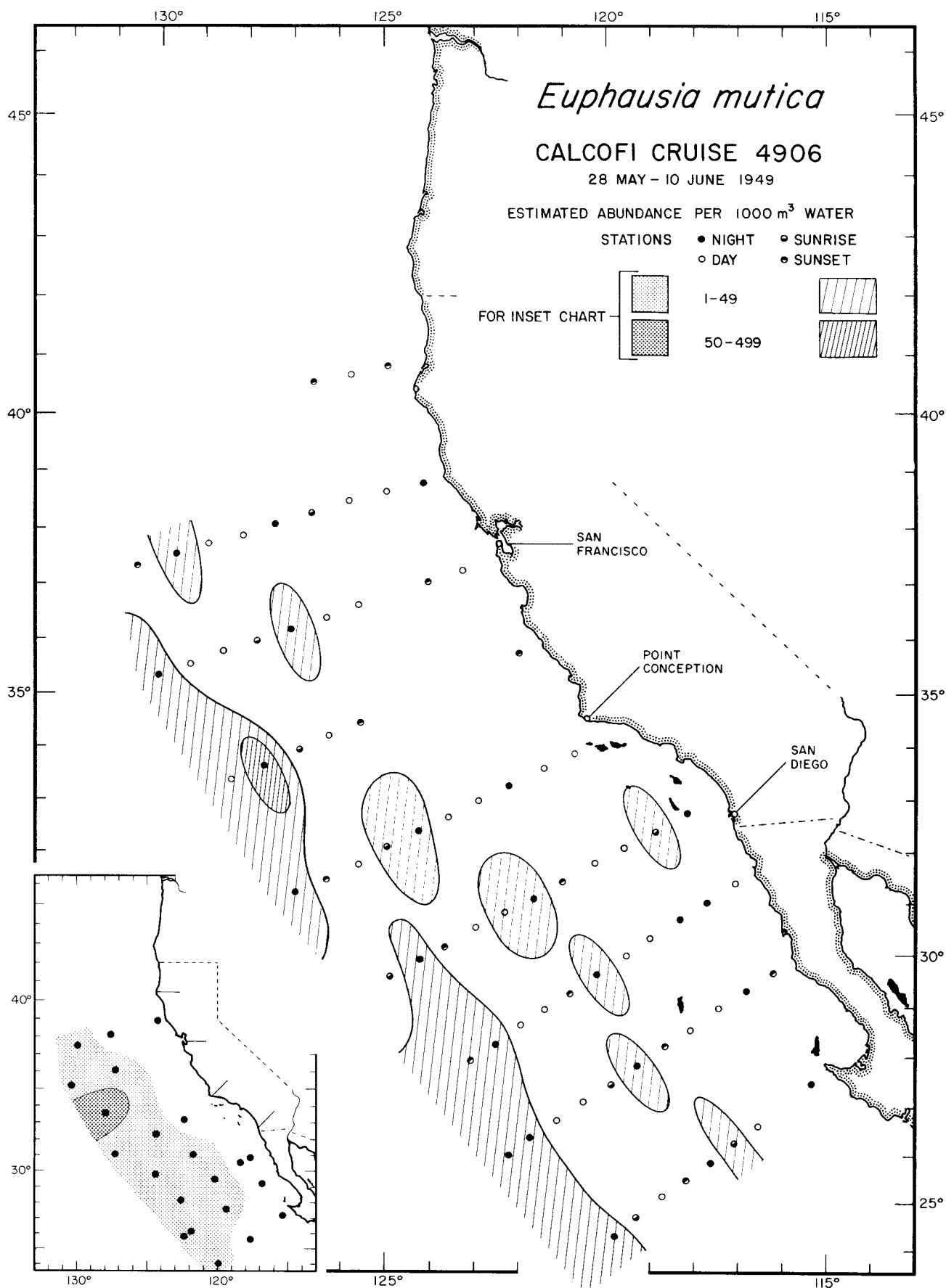
Euphausiacea
Euphausia mutica
4903



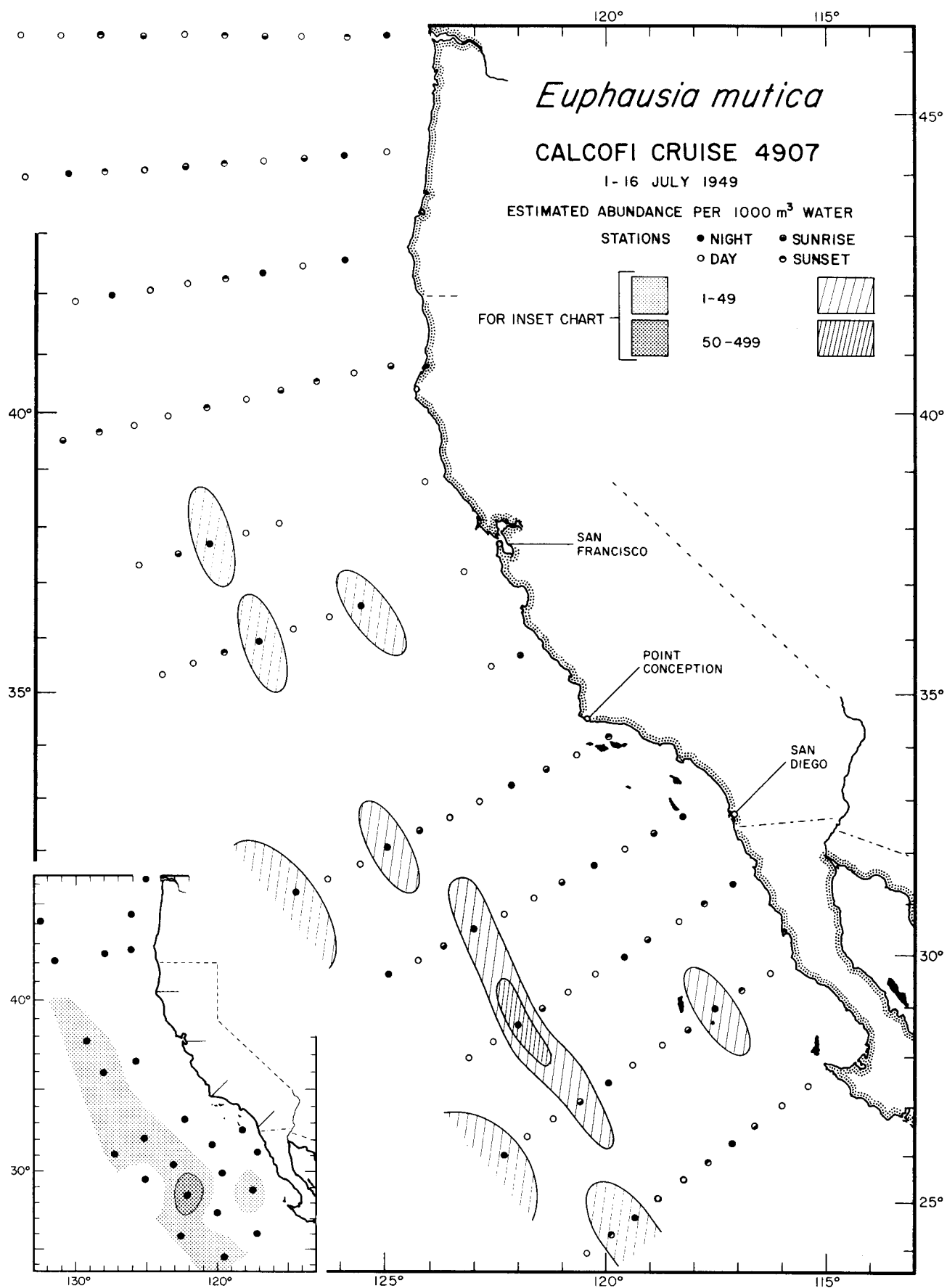
Euphausiacea
Euphausia mutica
4904



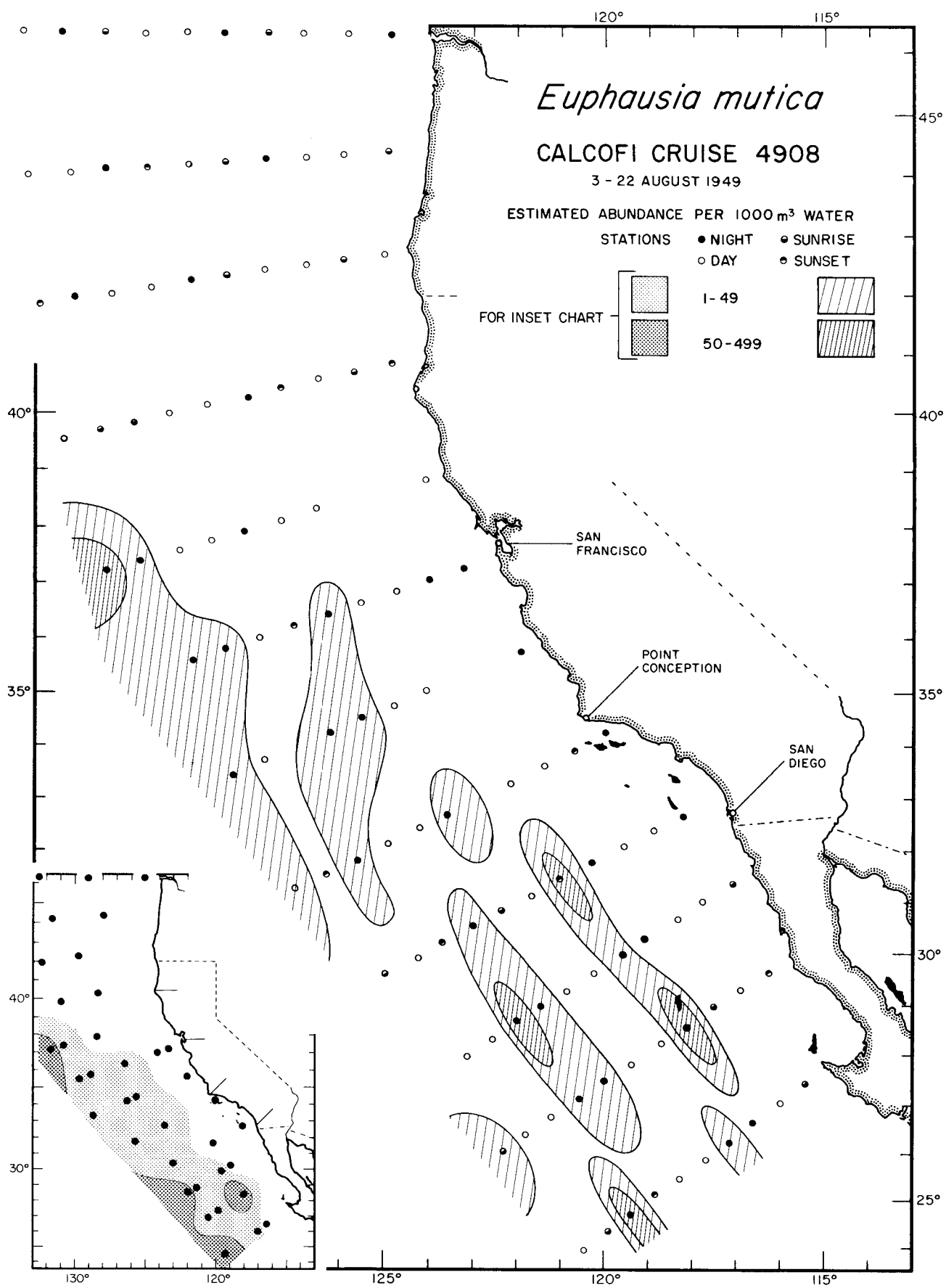
Euphausiacea
Euphausia mutica
4905



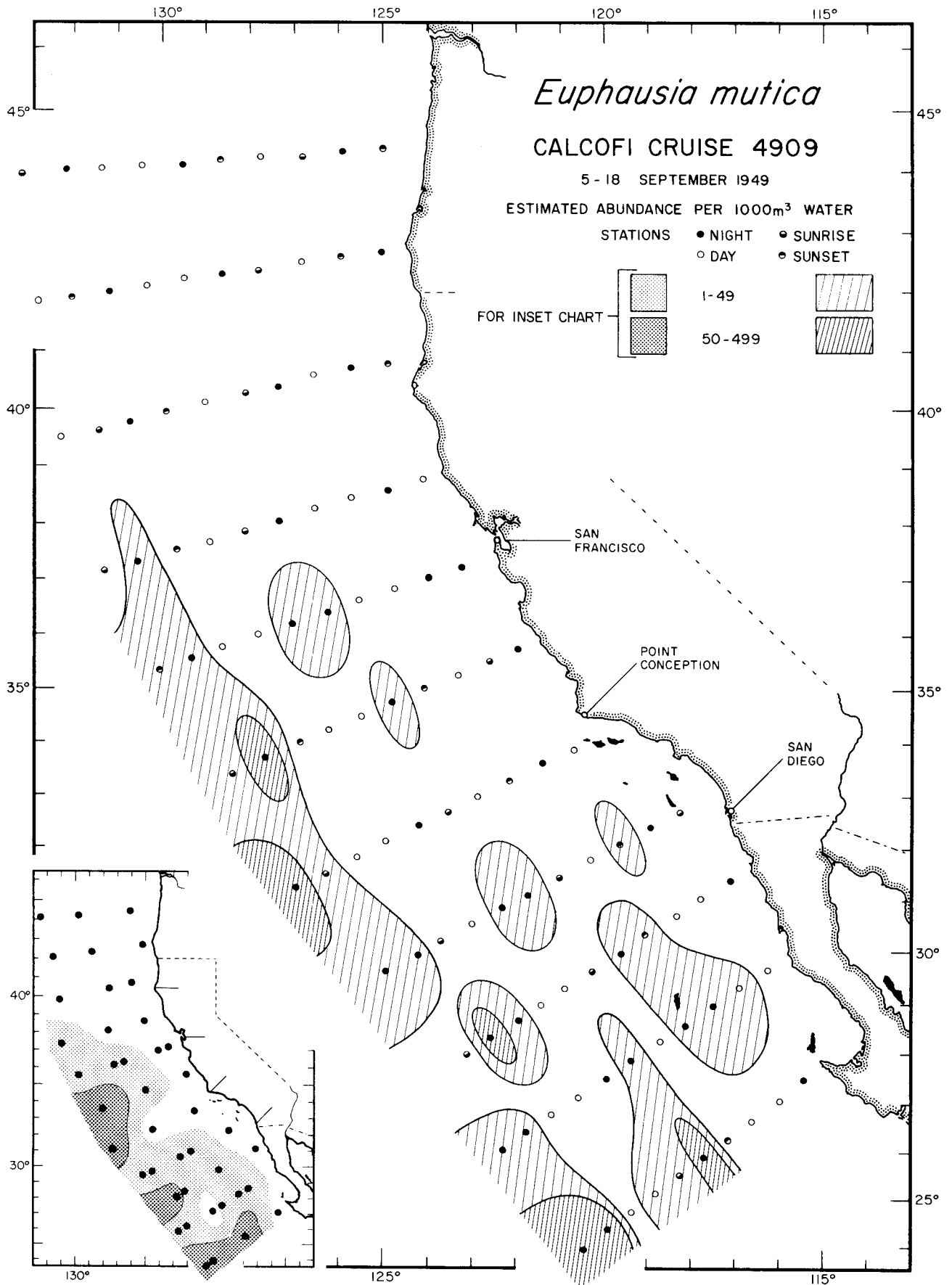
Euphausiacea
Euphausia mutica
4906



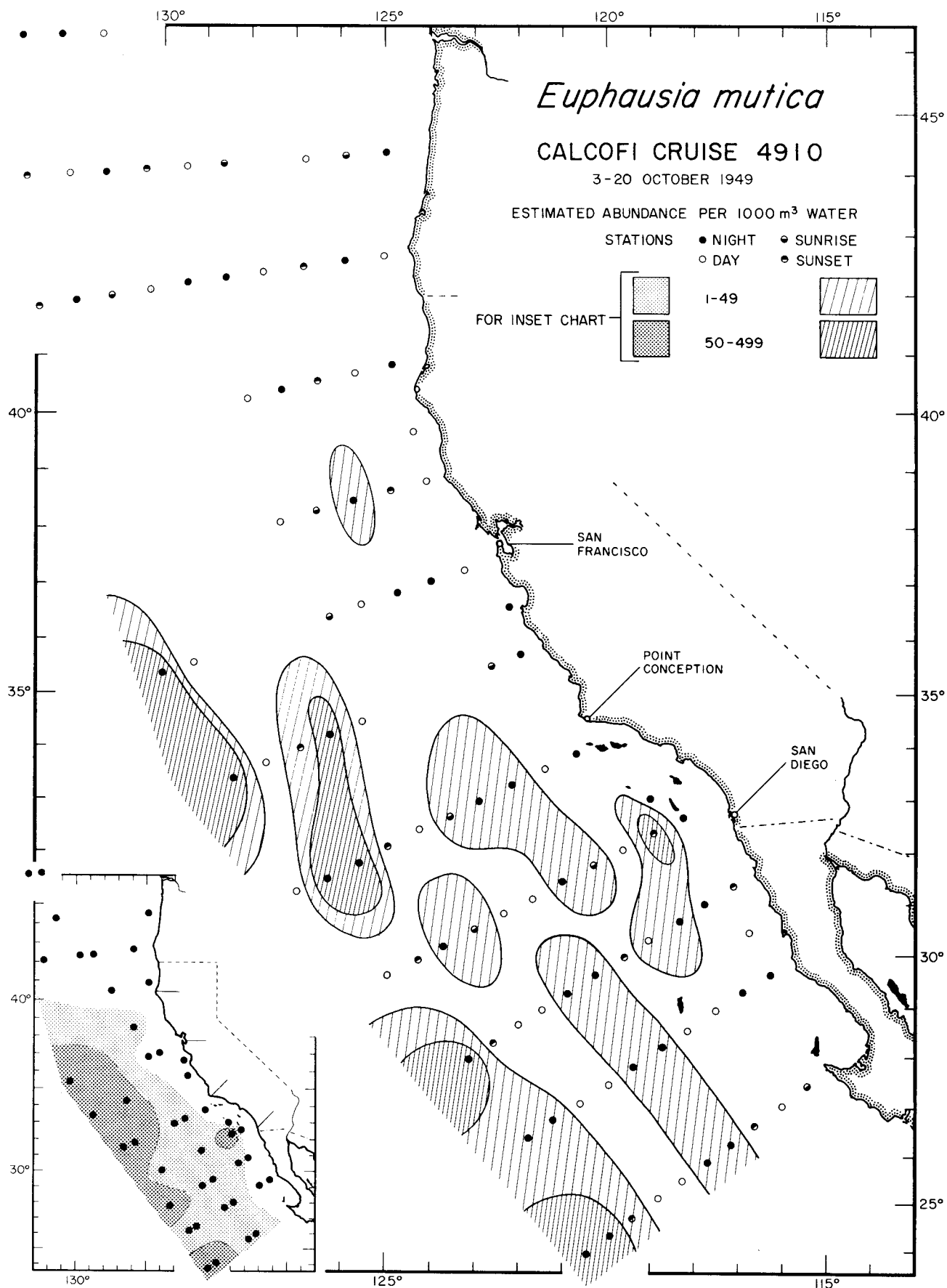
Euphausiacea
Euphausia mutica
4907



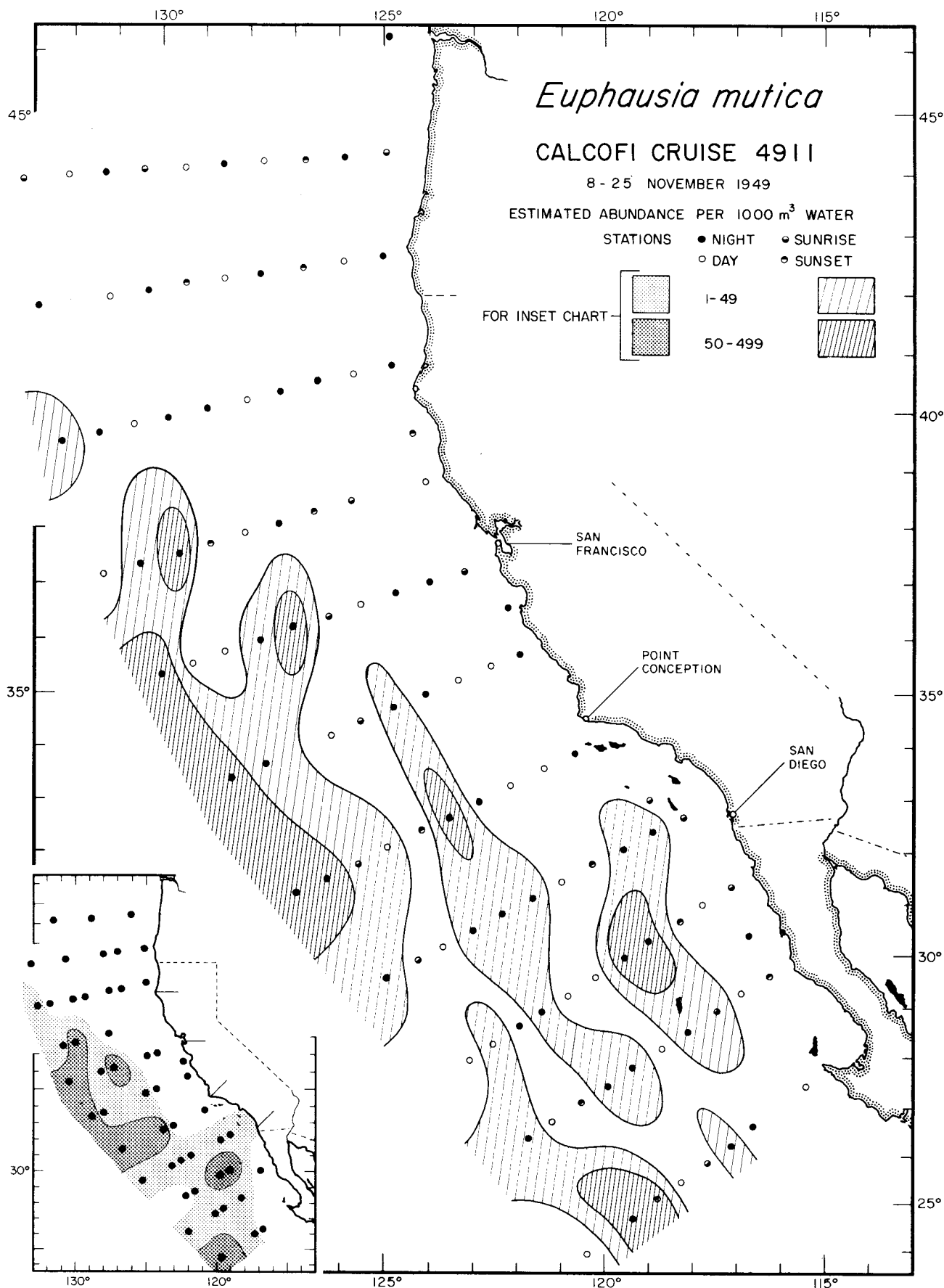
Euphausiacea
Euphausia mutica
4908



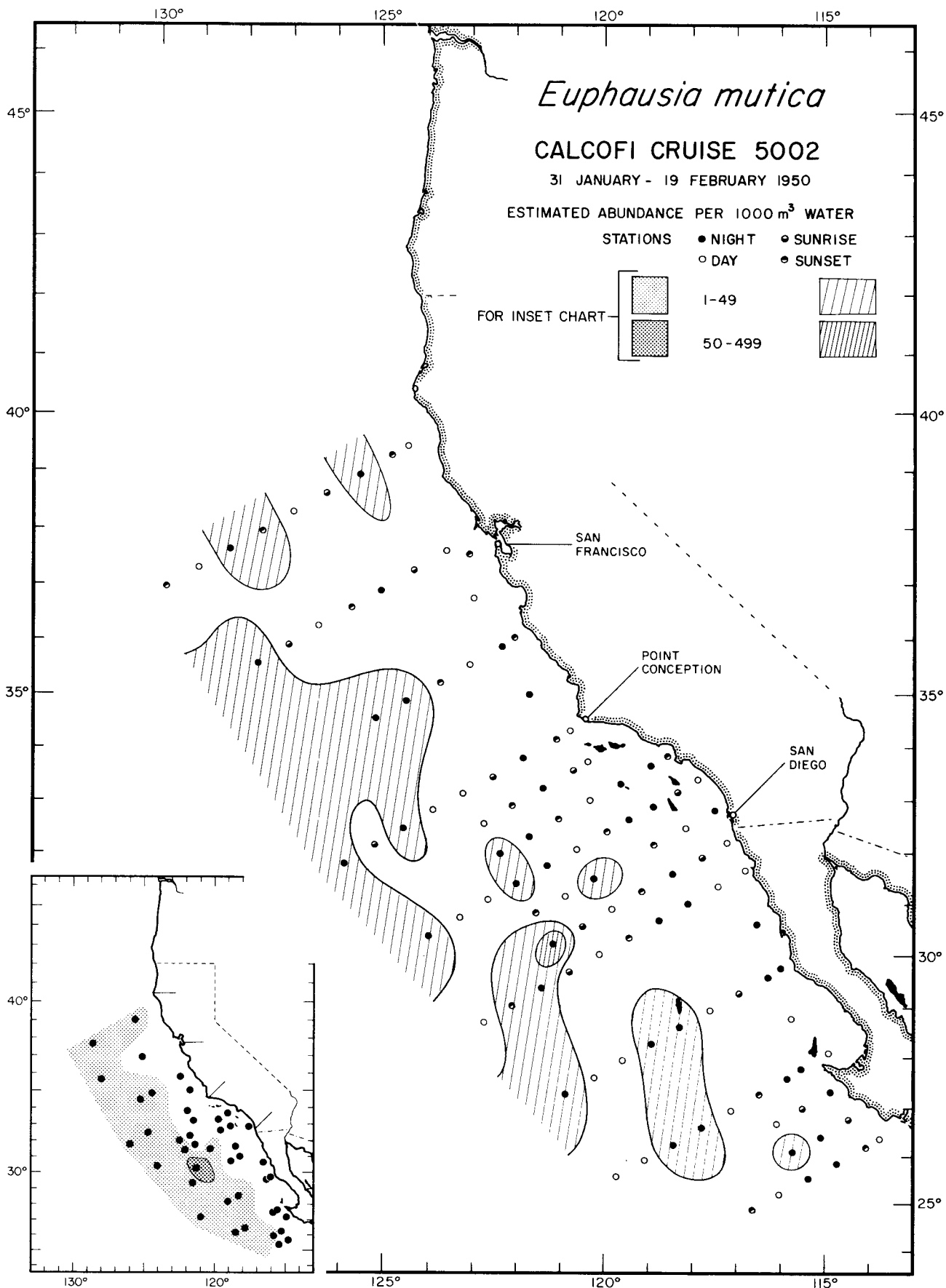
Euphausiacea
Euphausia mutica
4909



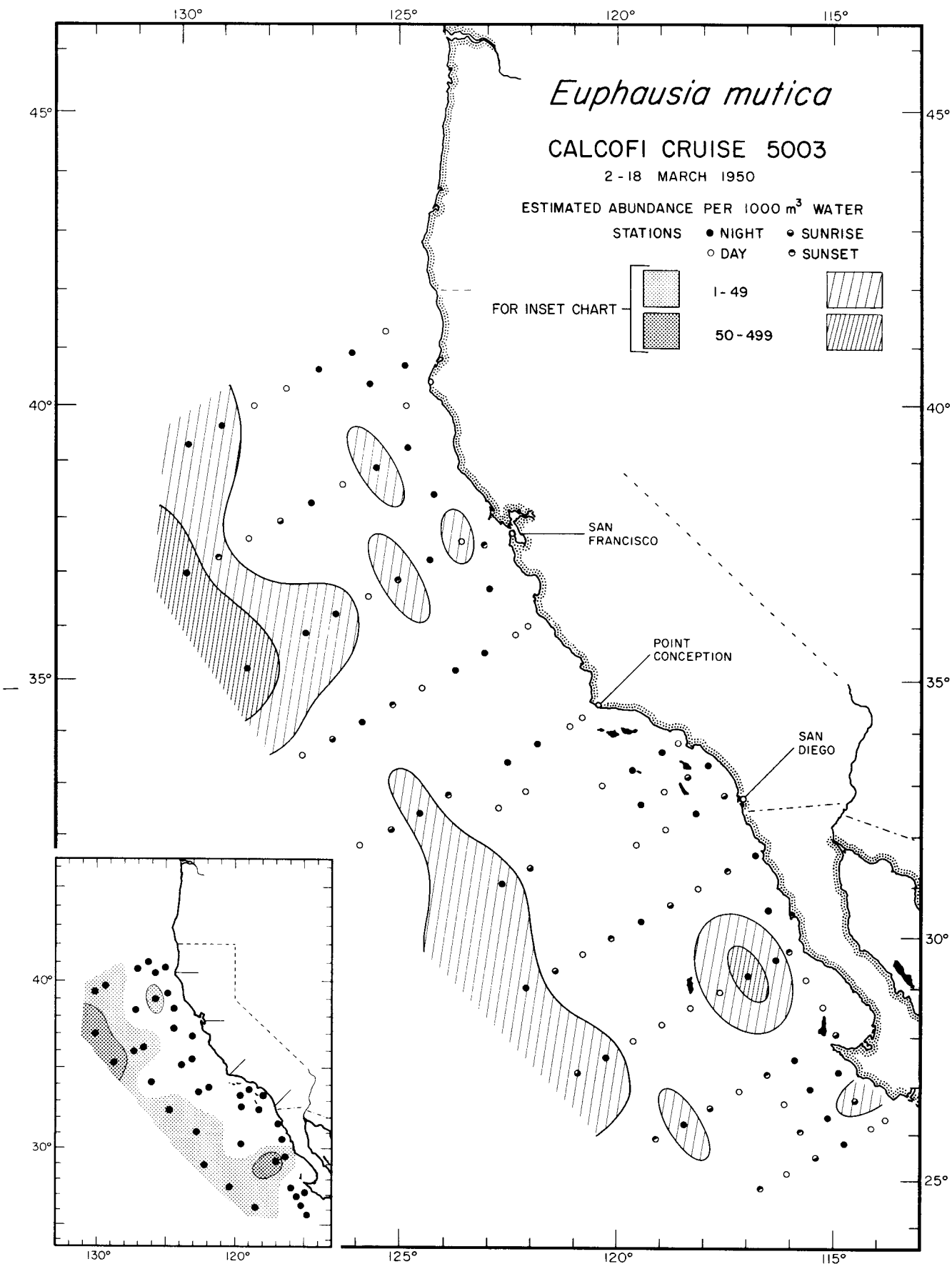
Euphausiacea
Euphausia mutica
4910



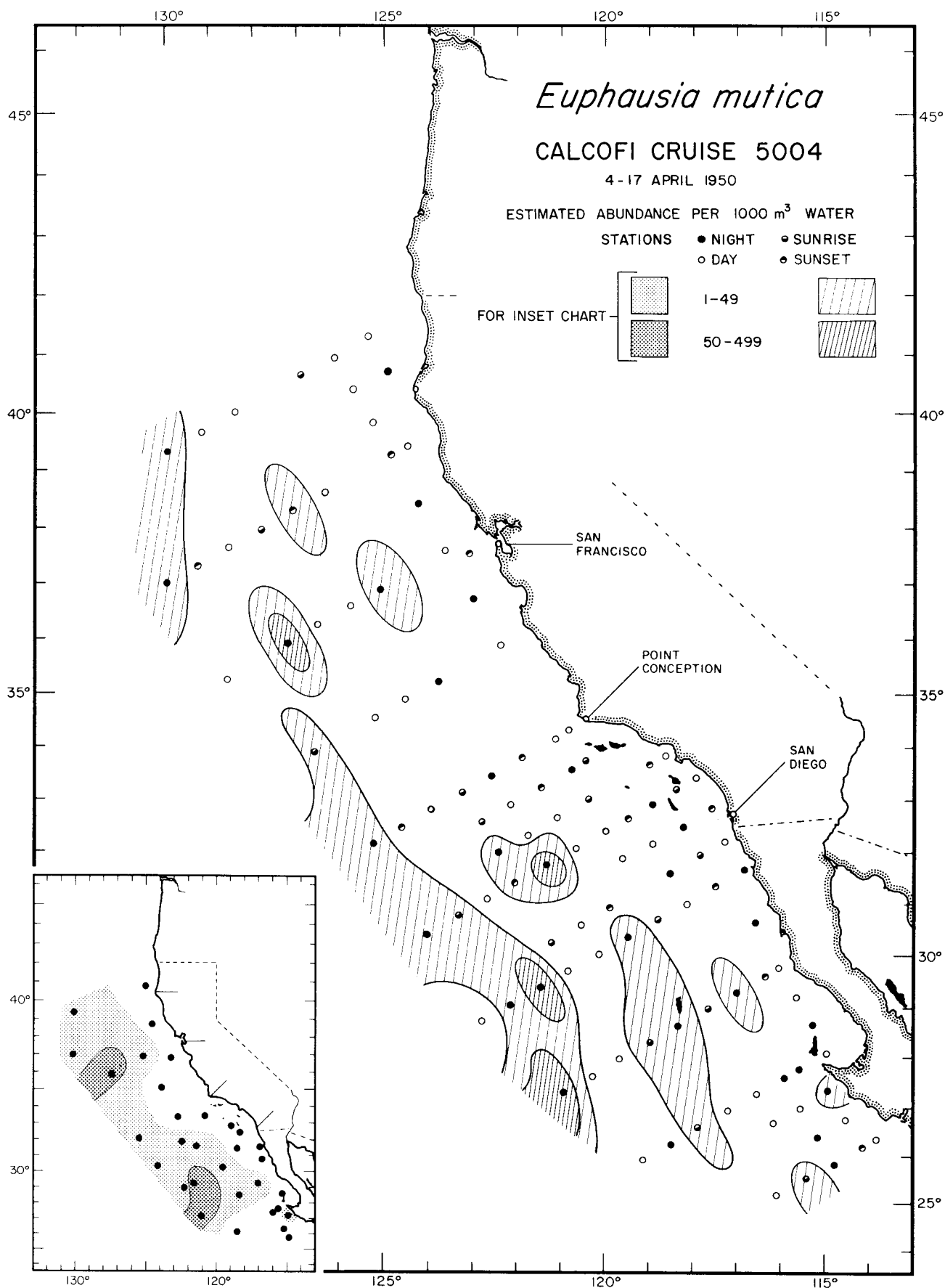
Euphausiacea
Euphausia mutica
4911



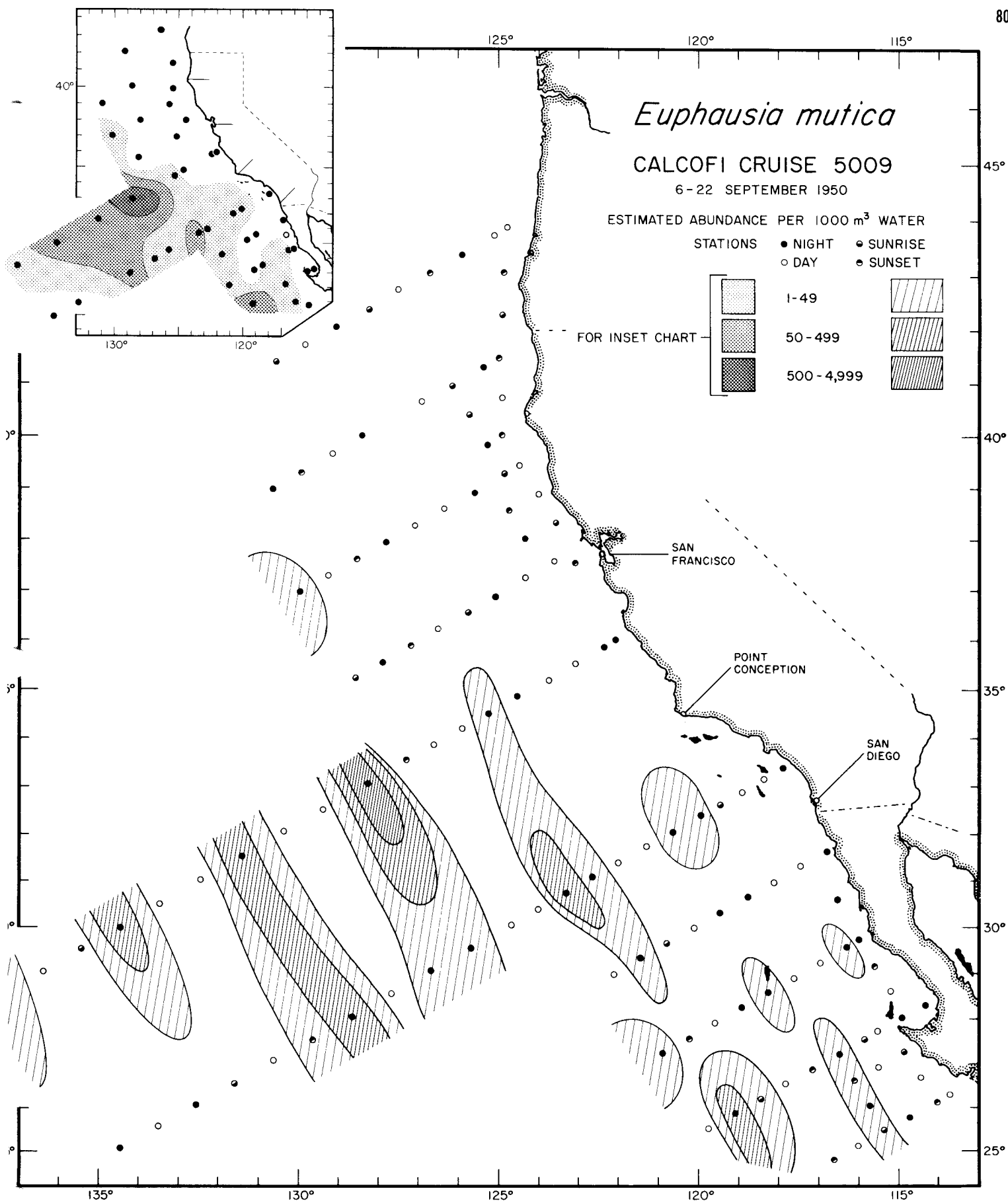
Euphausiacea
Euphausia mutica
 5002



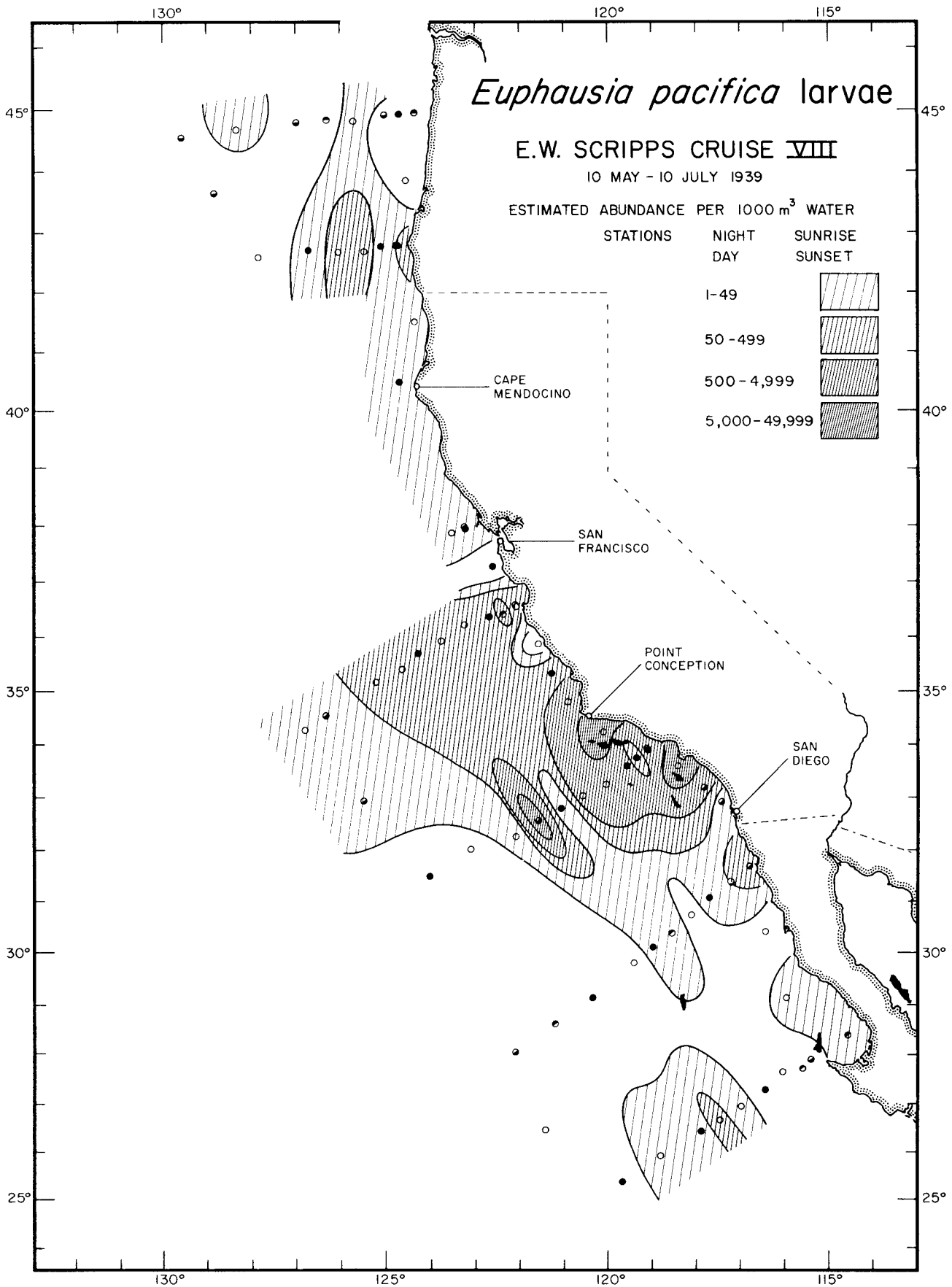
Euphausiacea
Euphausia mutica
5003



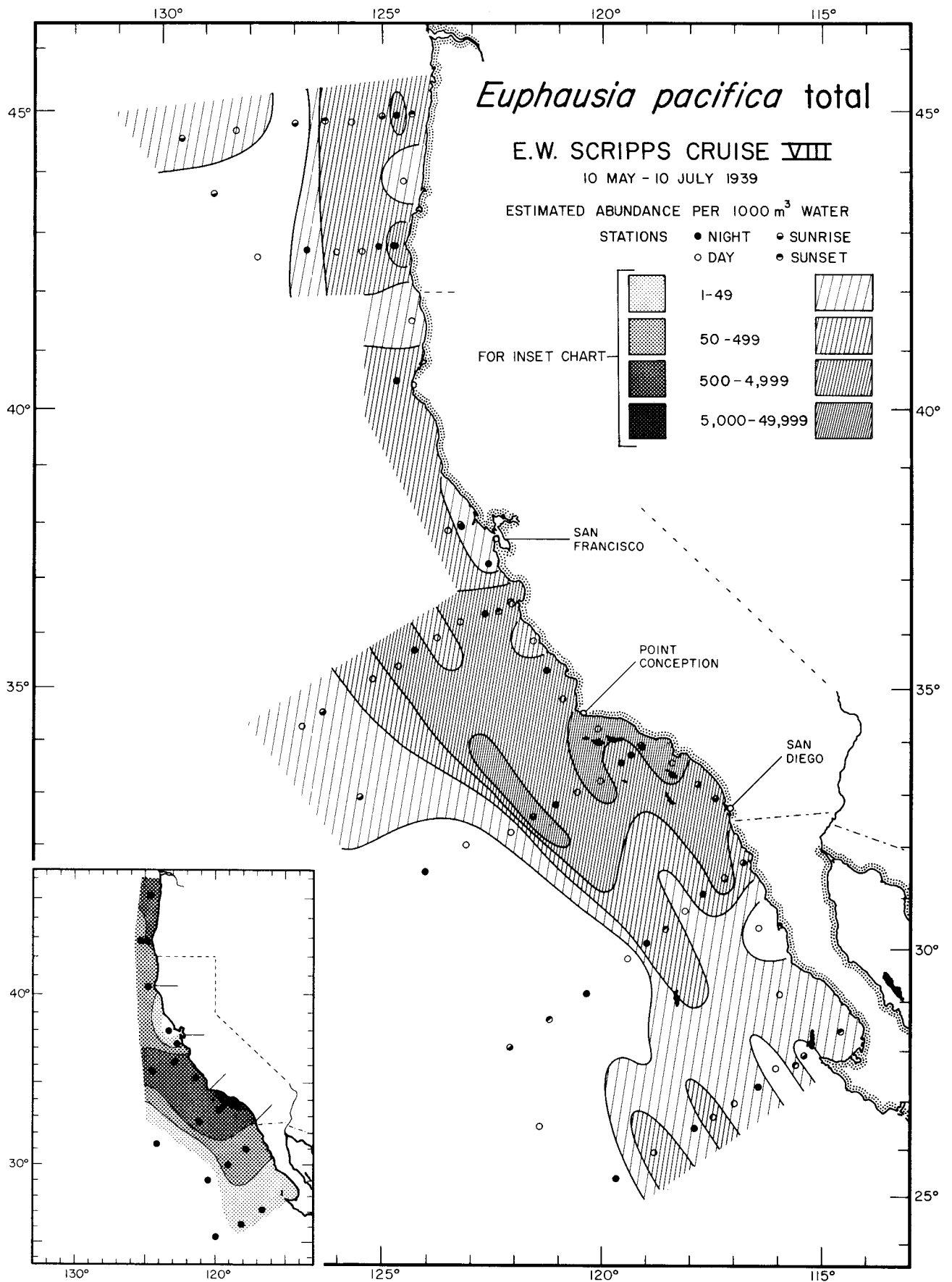
Euphausiacea
Euphausia mutica
5004



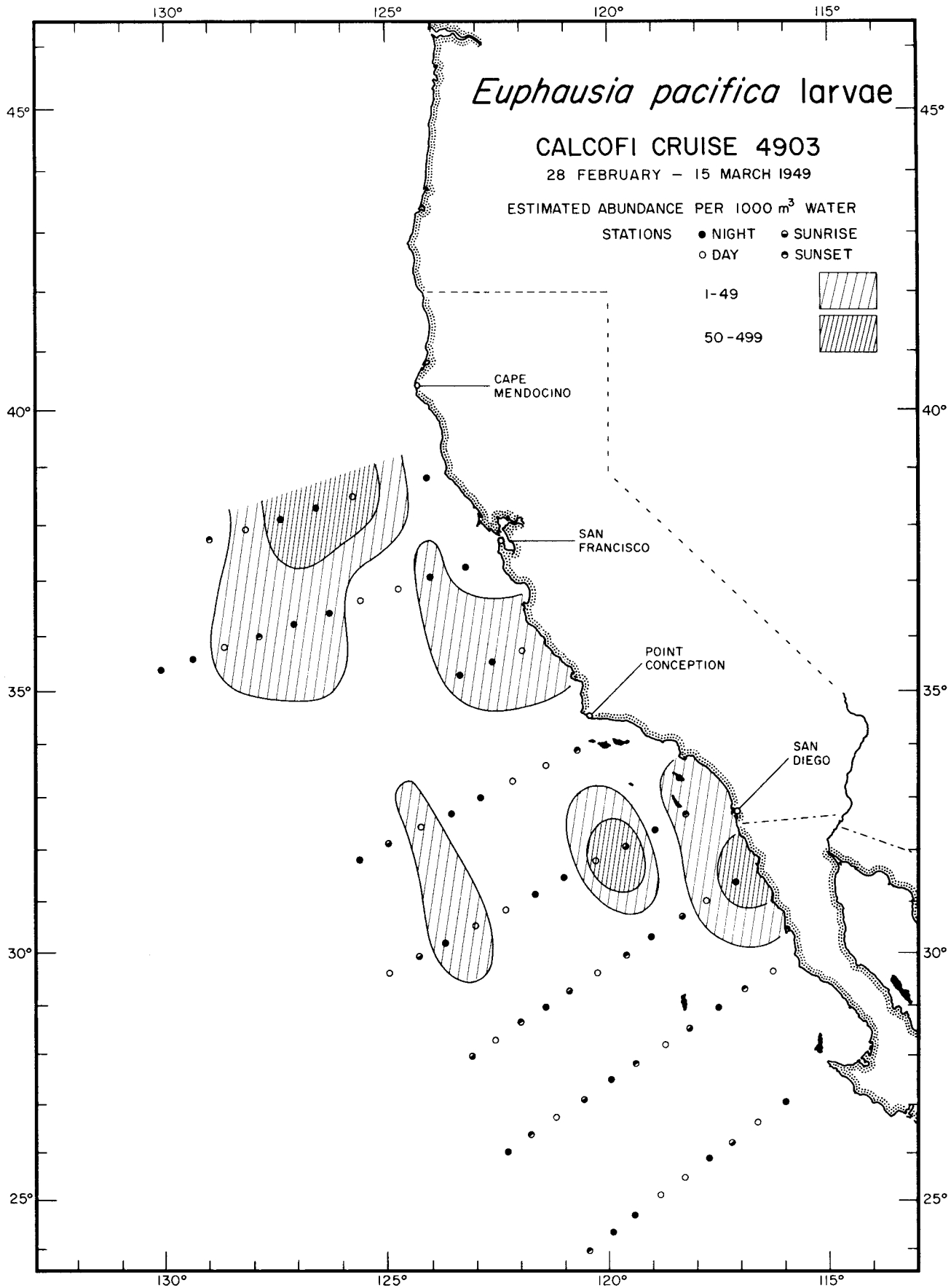
Euphausiacea
Euphausia mutica
 5009

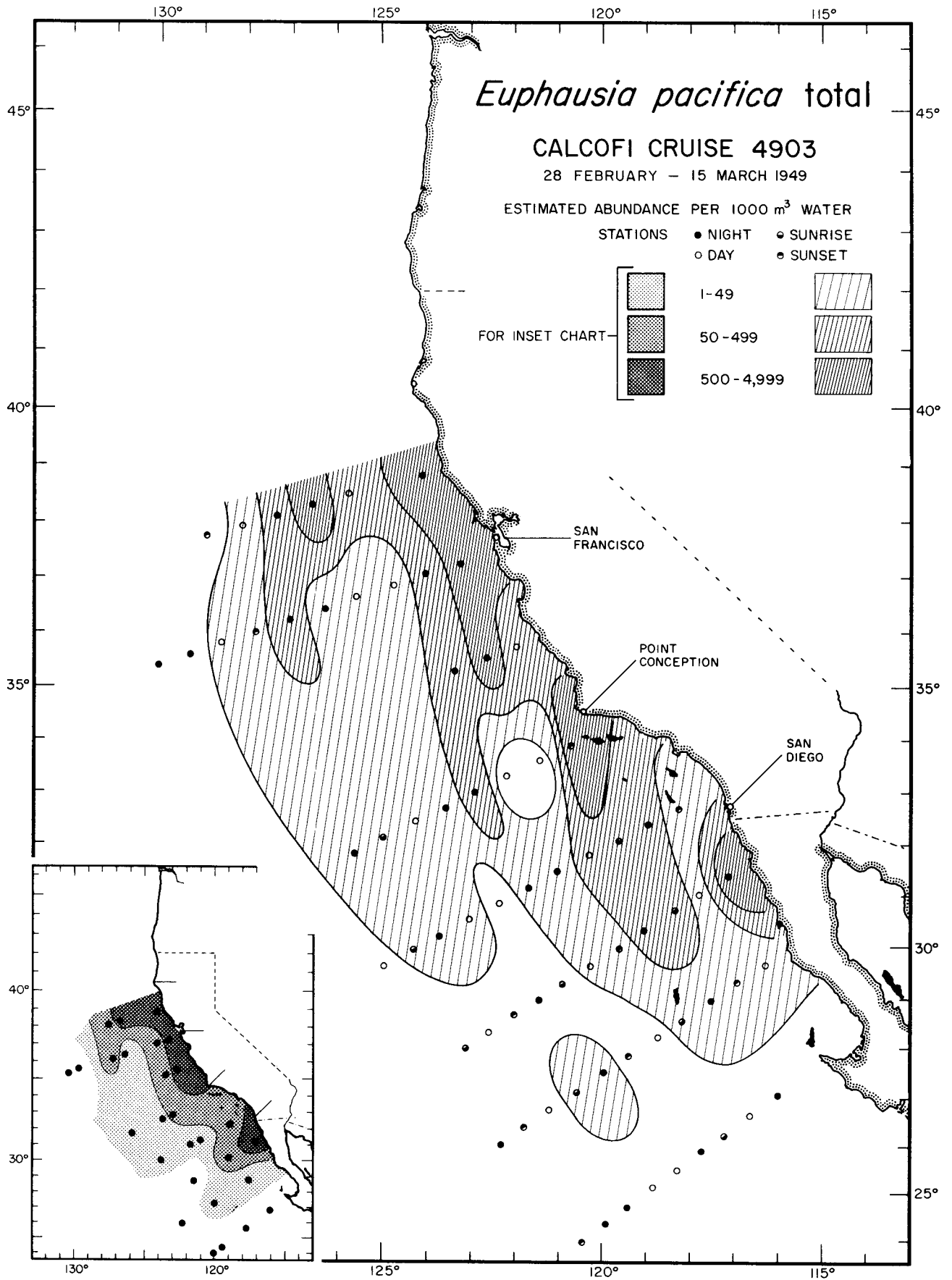


Euphausiacea
Euphausia pacifica larvae
E.W. SCRIPPS CRUISE VIII

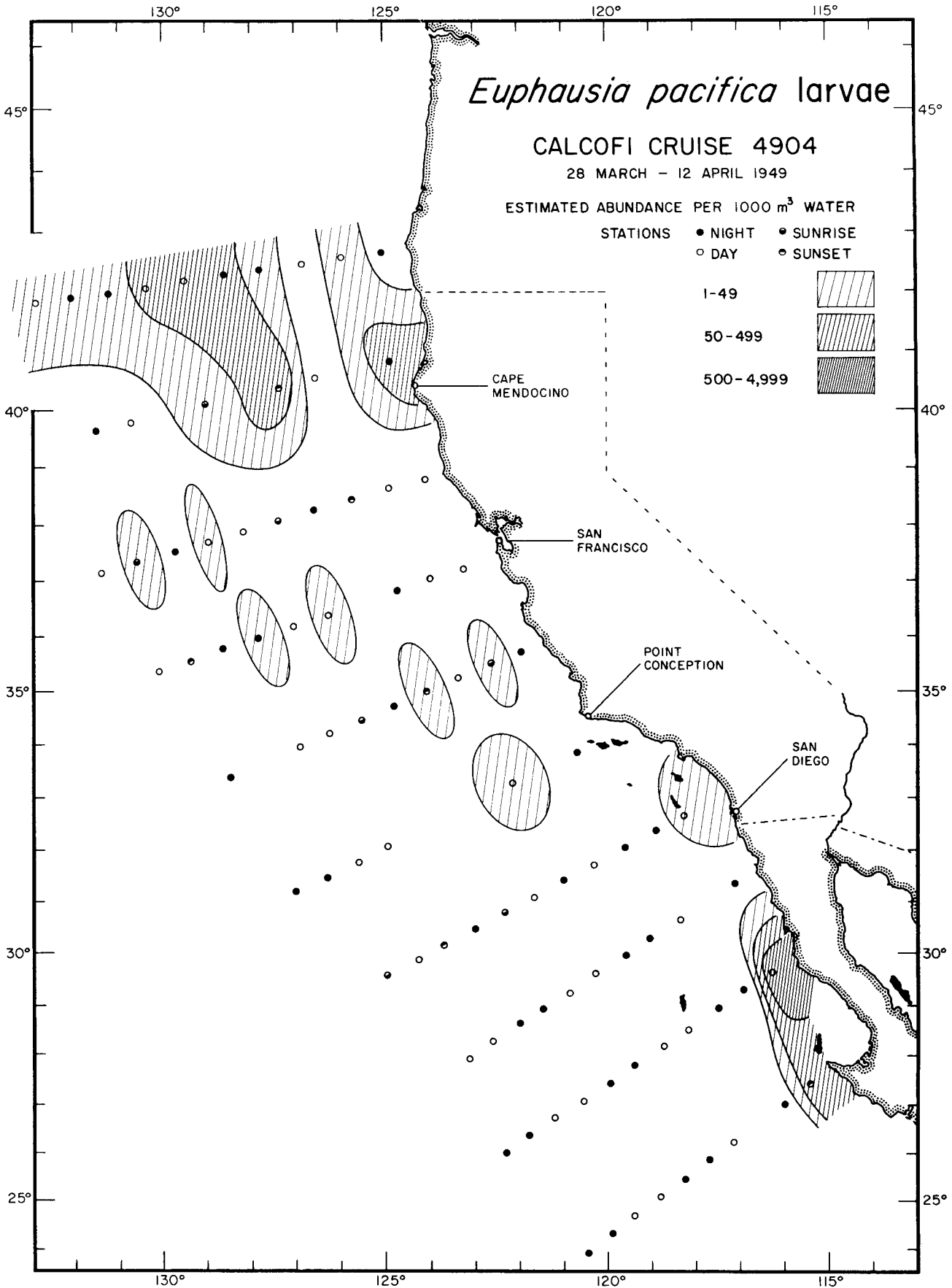


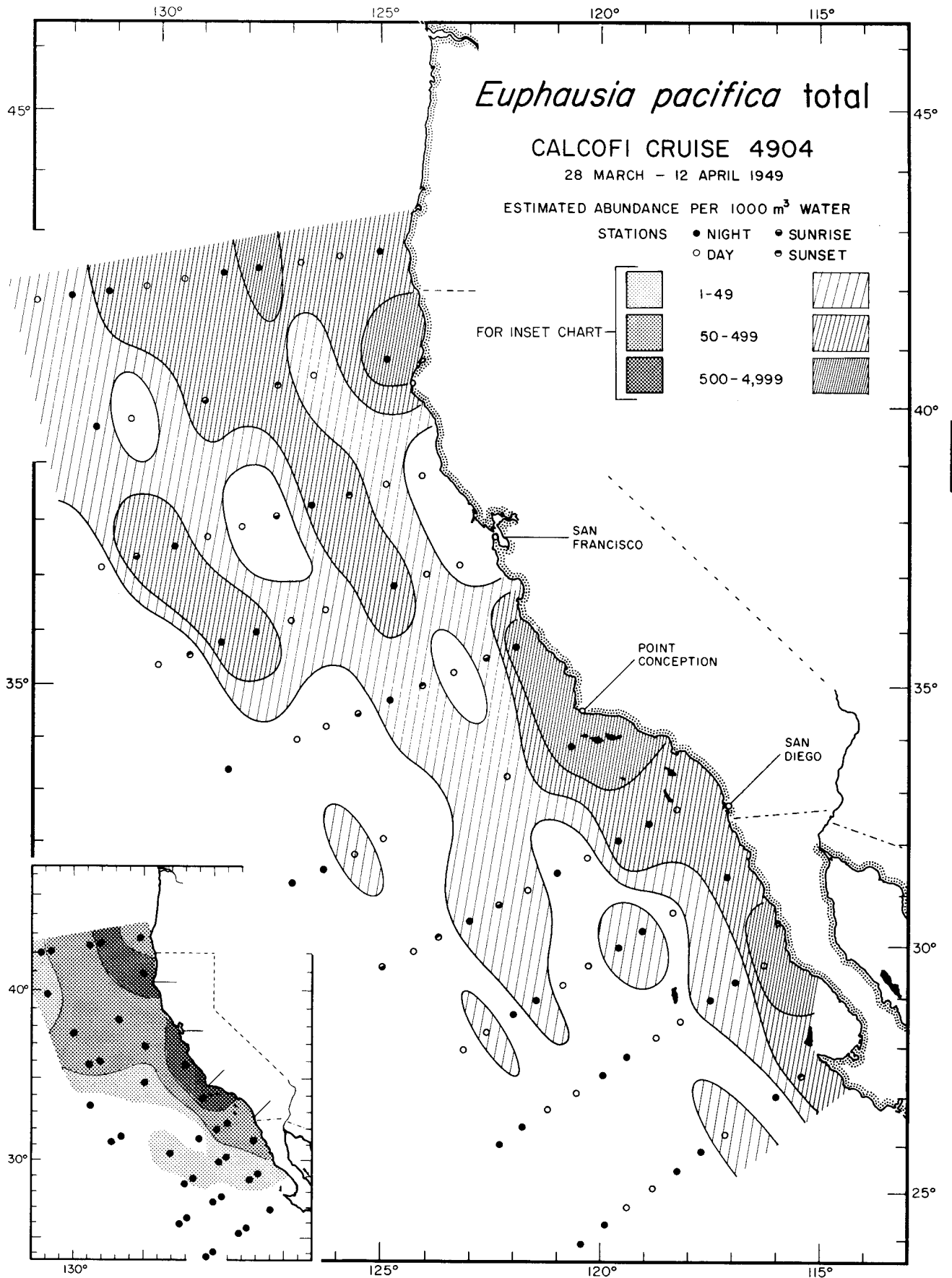
Euphausiacea
Euphausia pacifica total
E.W. SCRIPPS CRUISE VIII



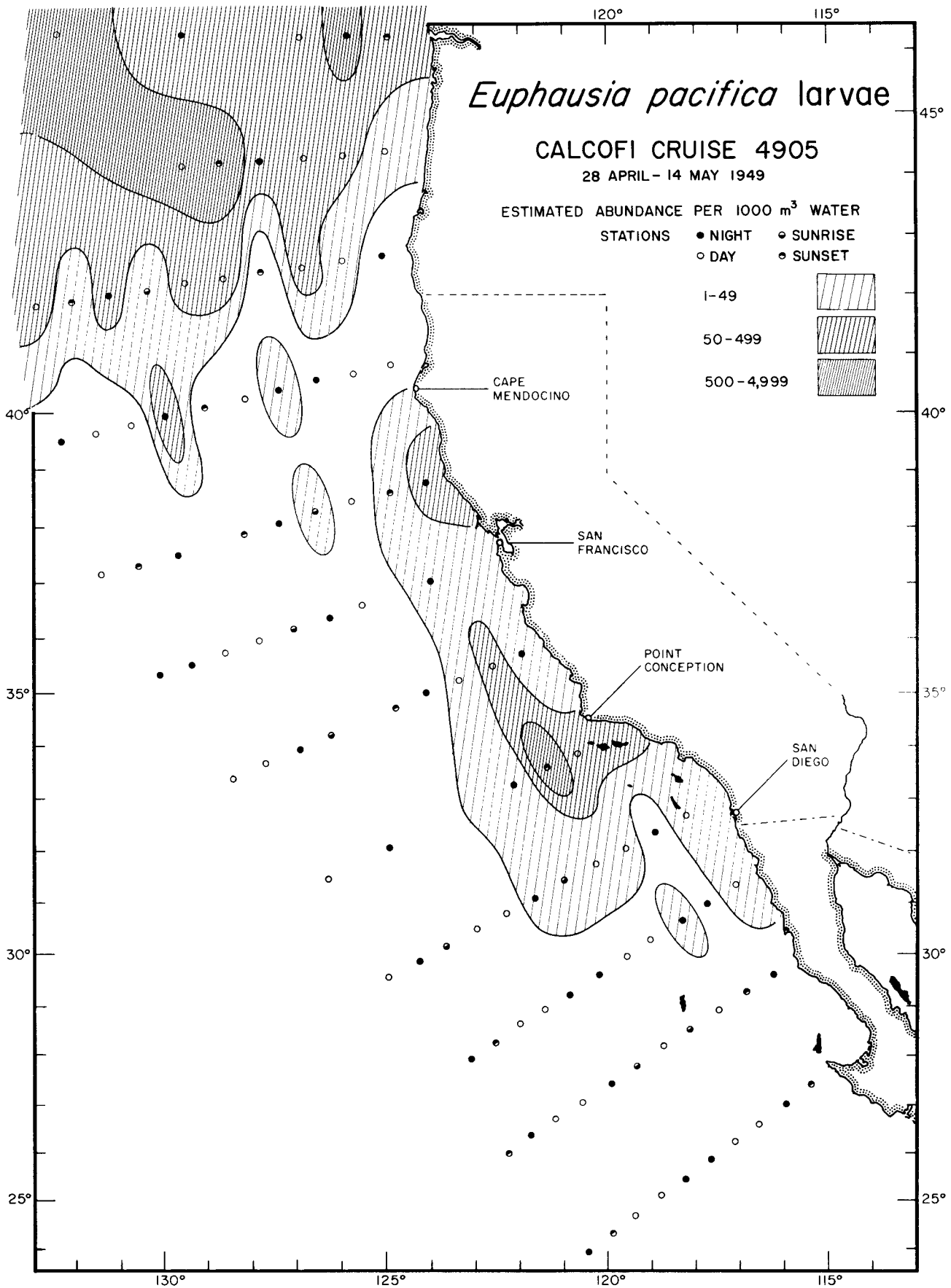


Euphausiacea
Euphausia pacifica total
4903

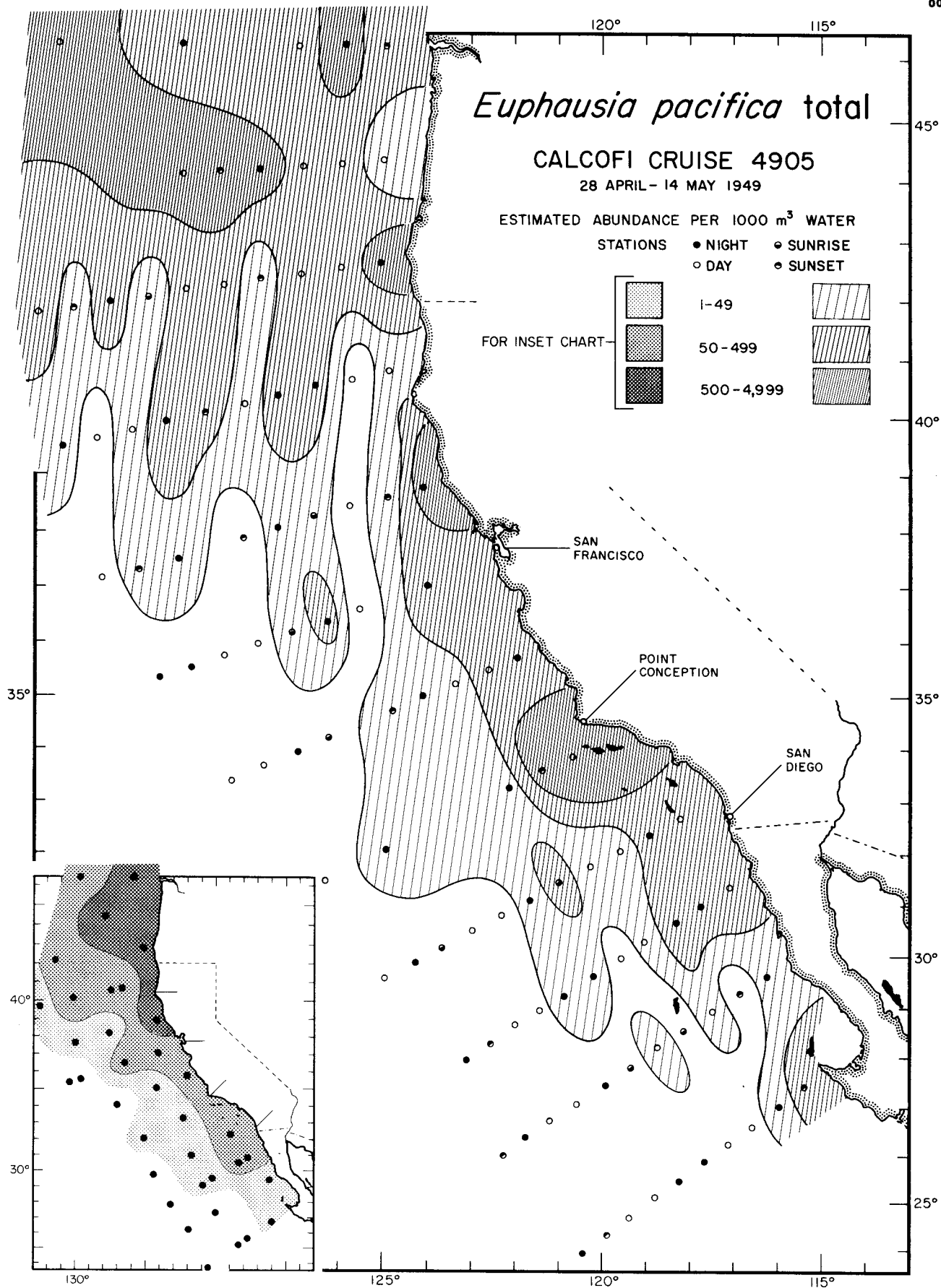




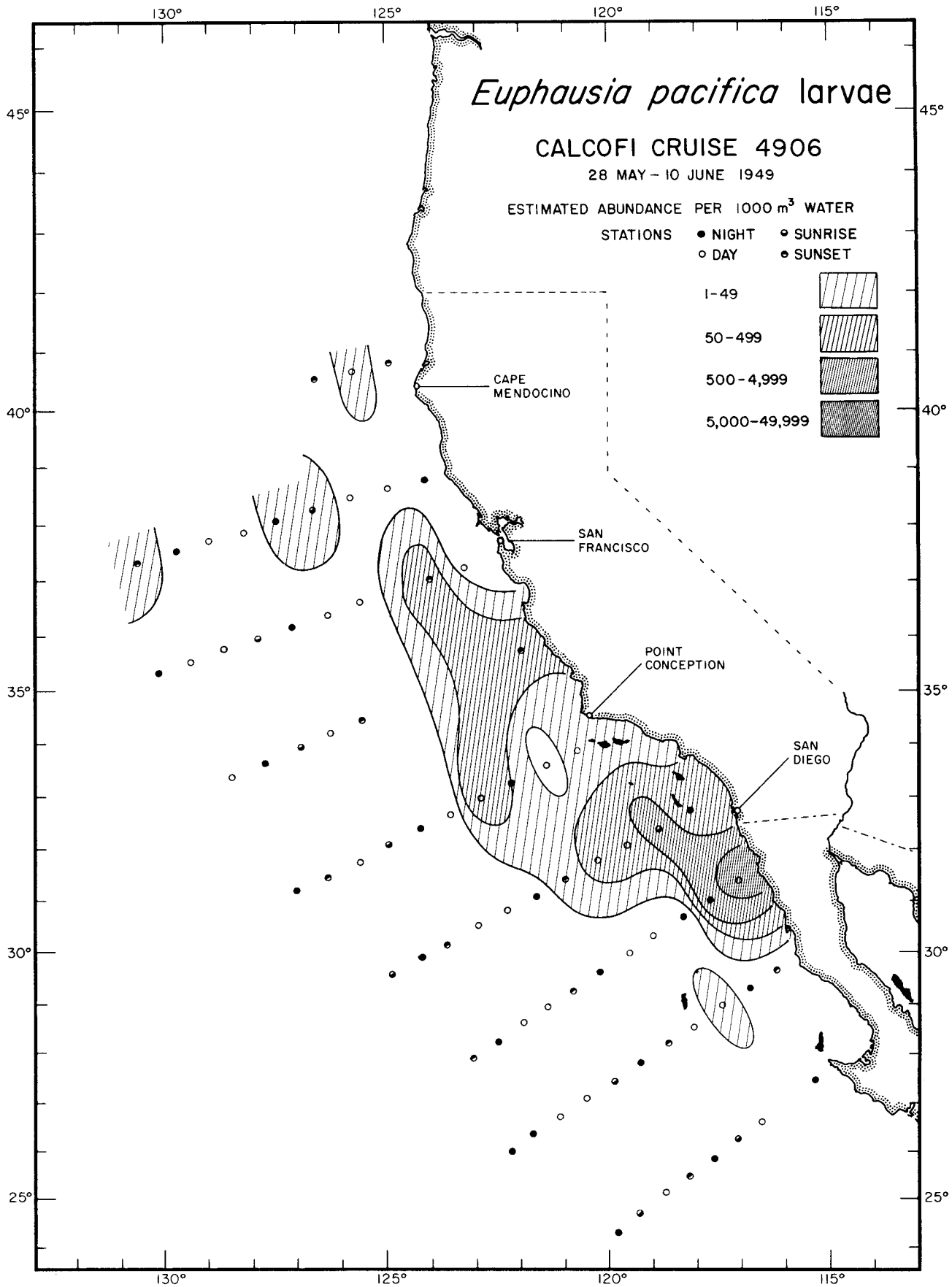
Euphausiacea
Euphausia pacifica total
4904

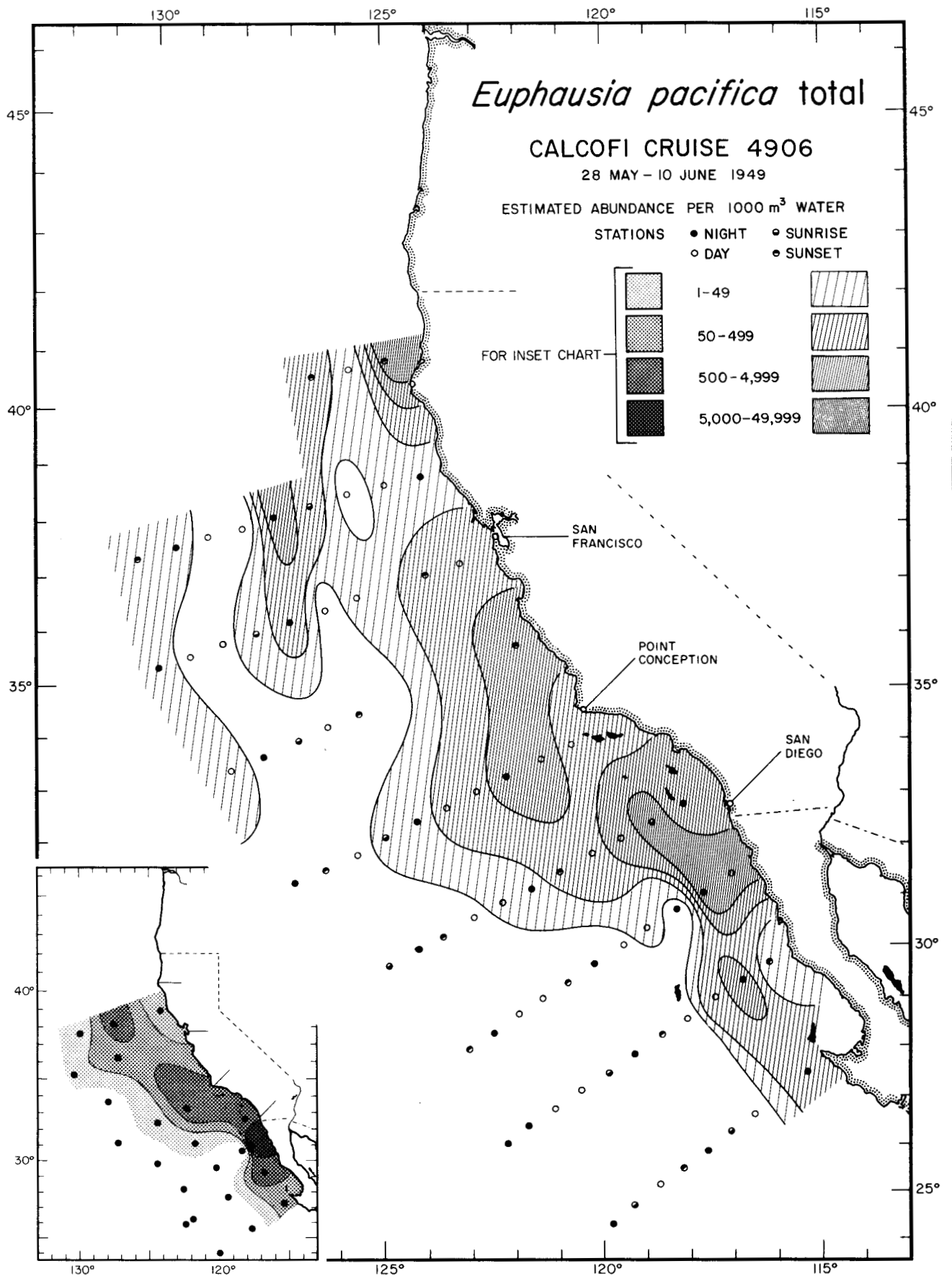


Euphausiacea
Euphausia pacifica larvae
4905

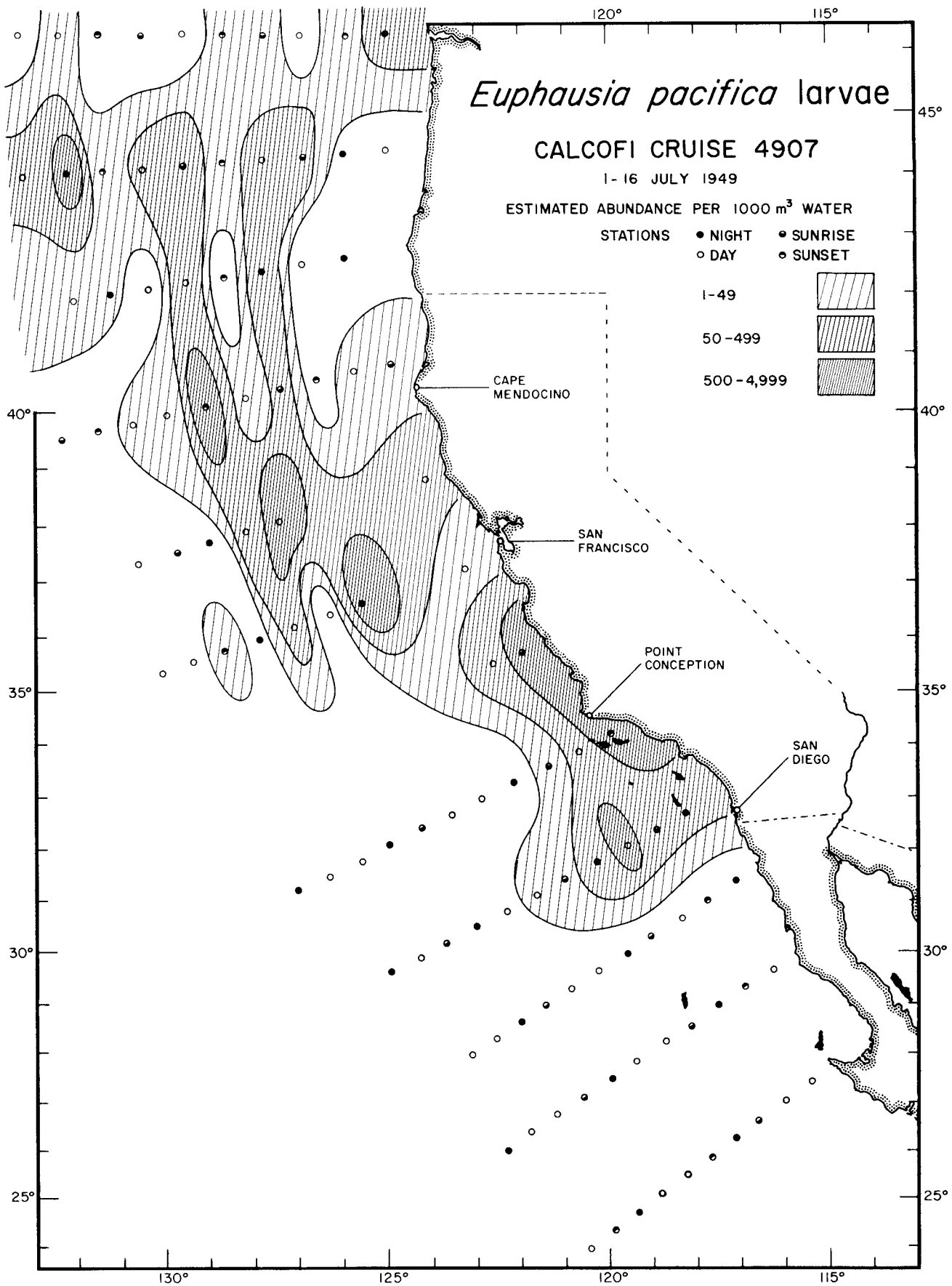


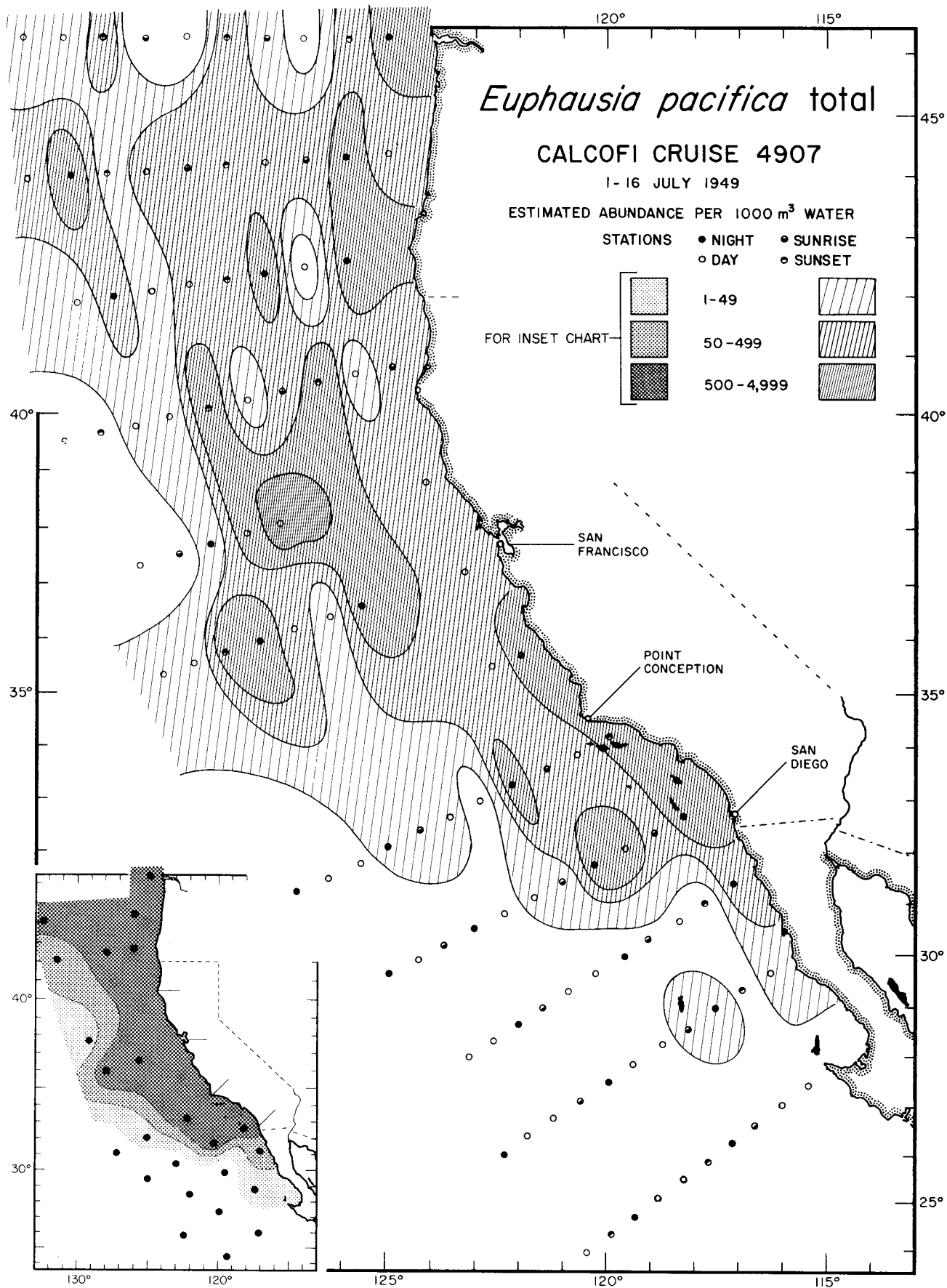
Euphausiacea
Euphausia pacifica total
4905



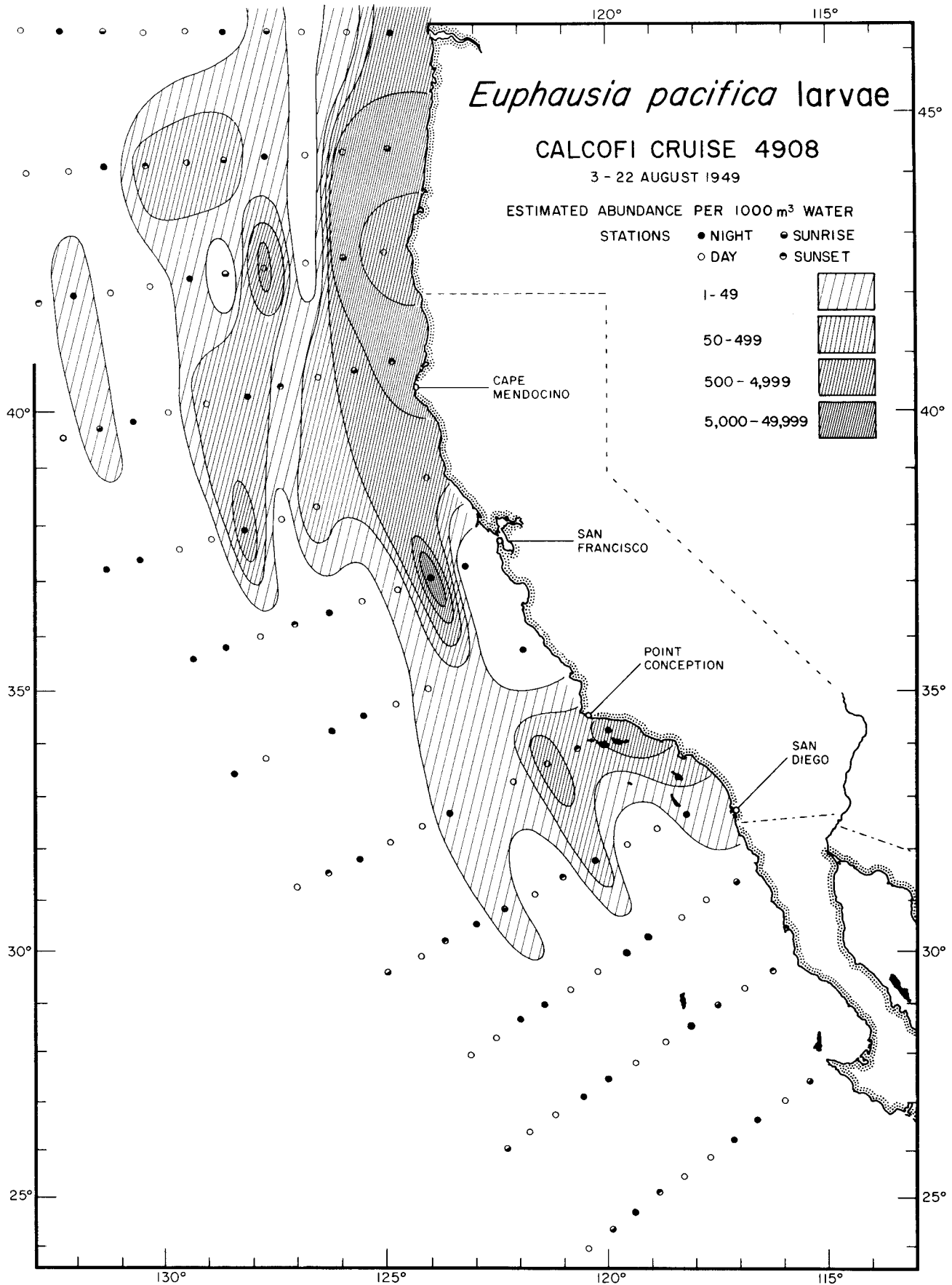


Euphausiacea
Euphausia pacifica total
4906

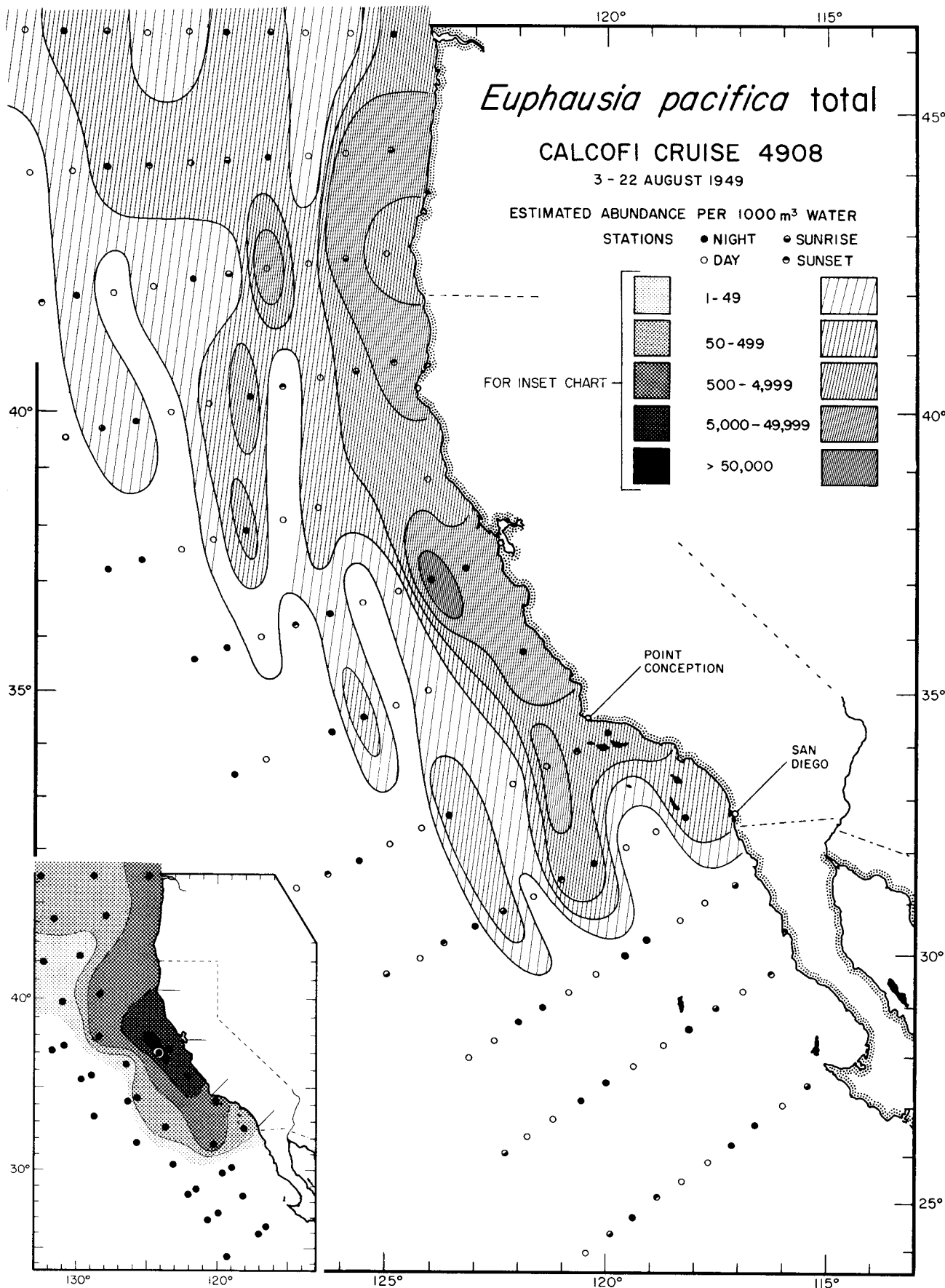




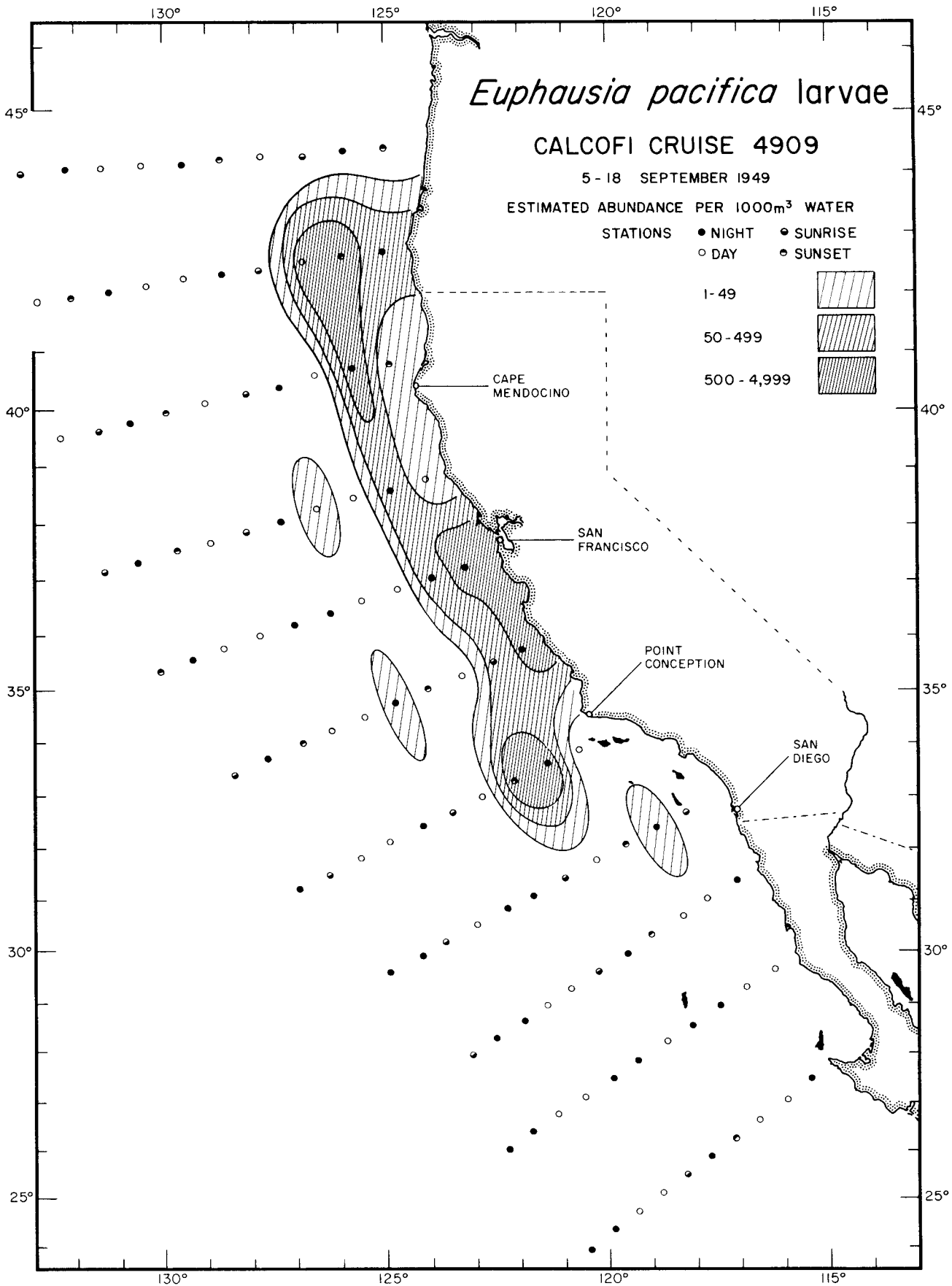
Euphausiacea
Euphausia pacifica total
4907



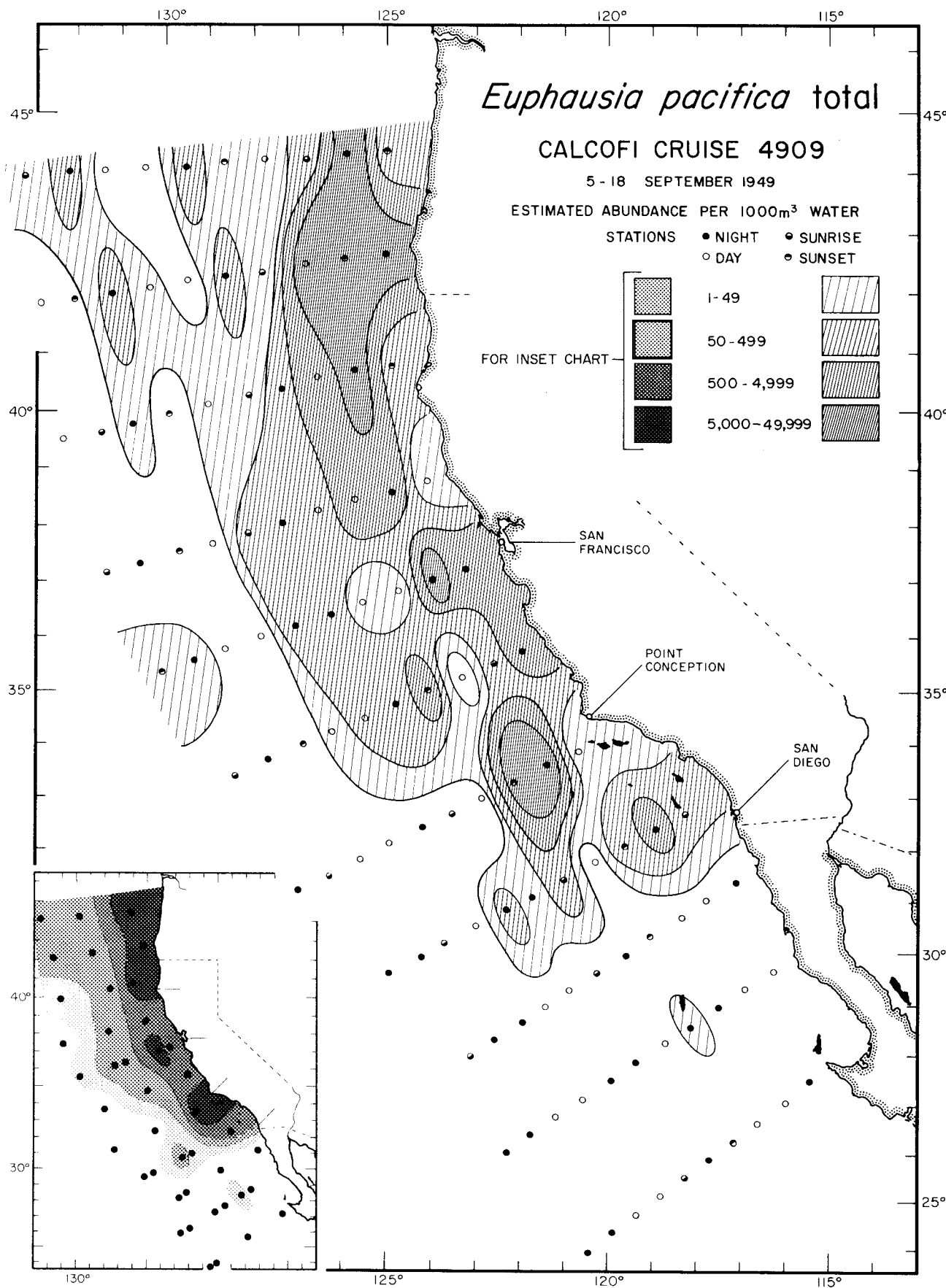
Euphausiacea
Euphausia pacifica larvae
4908



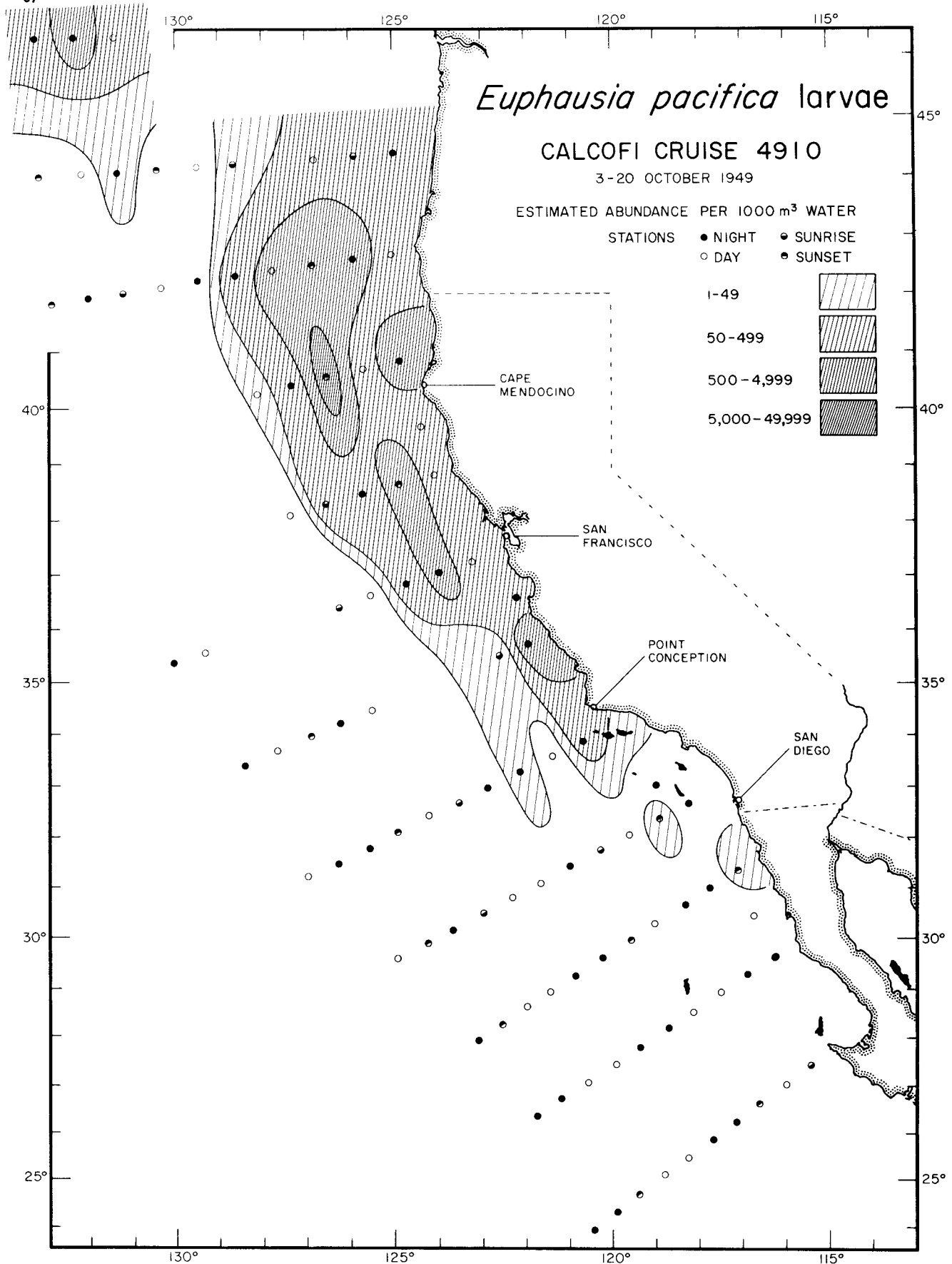
Euphausiacea
Euphausia pacifica total
4908



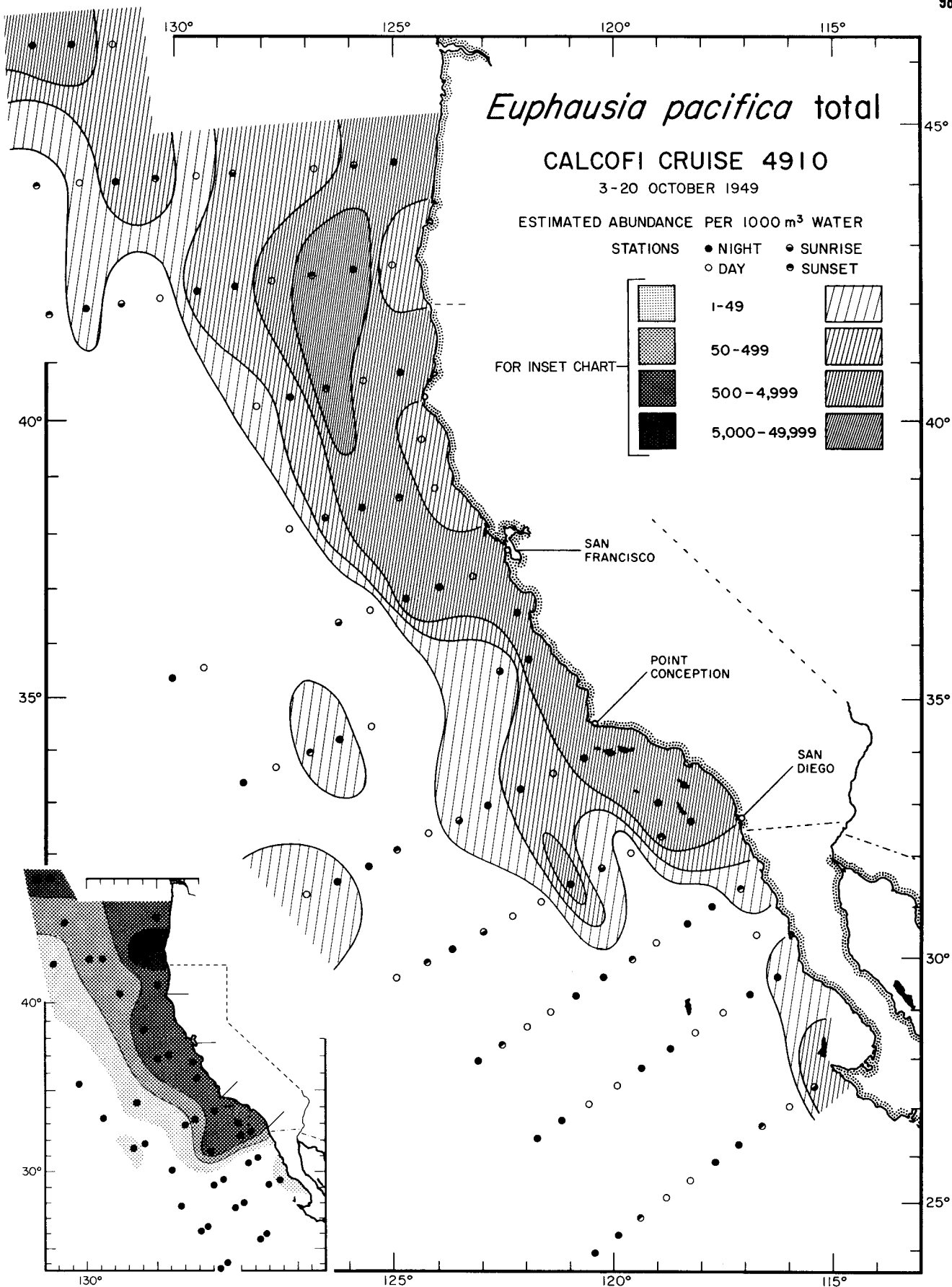
Euphausiacea
Euphausia pacifica larvae
4909



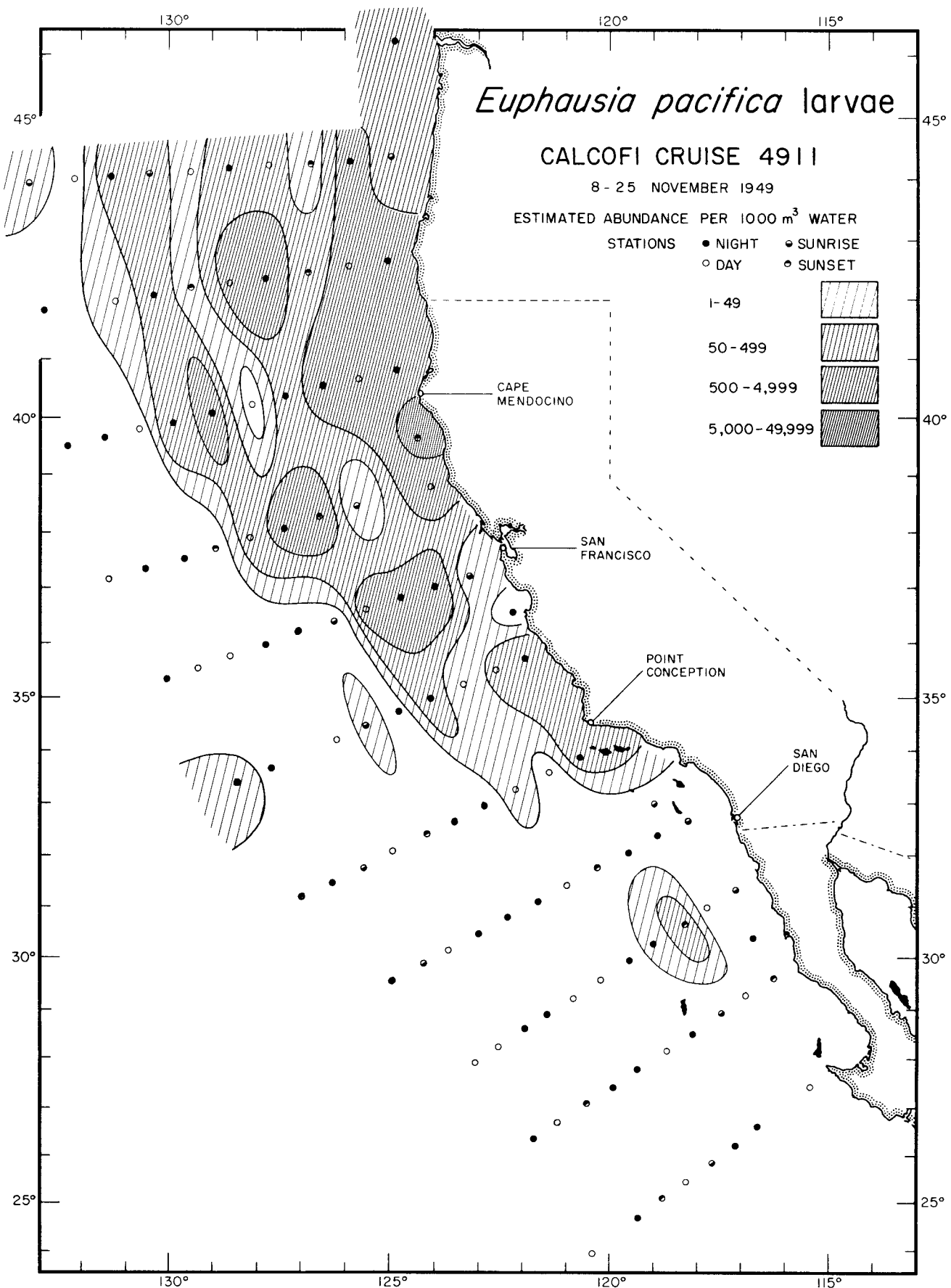
Euphausiacea
Euphausia pacifica total
4909



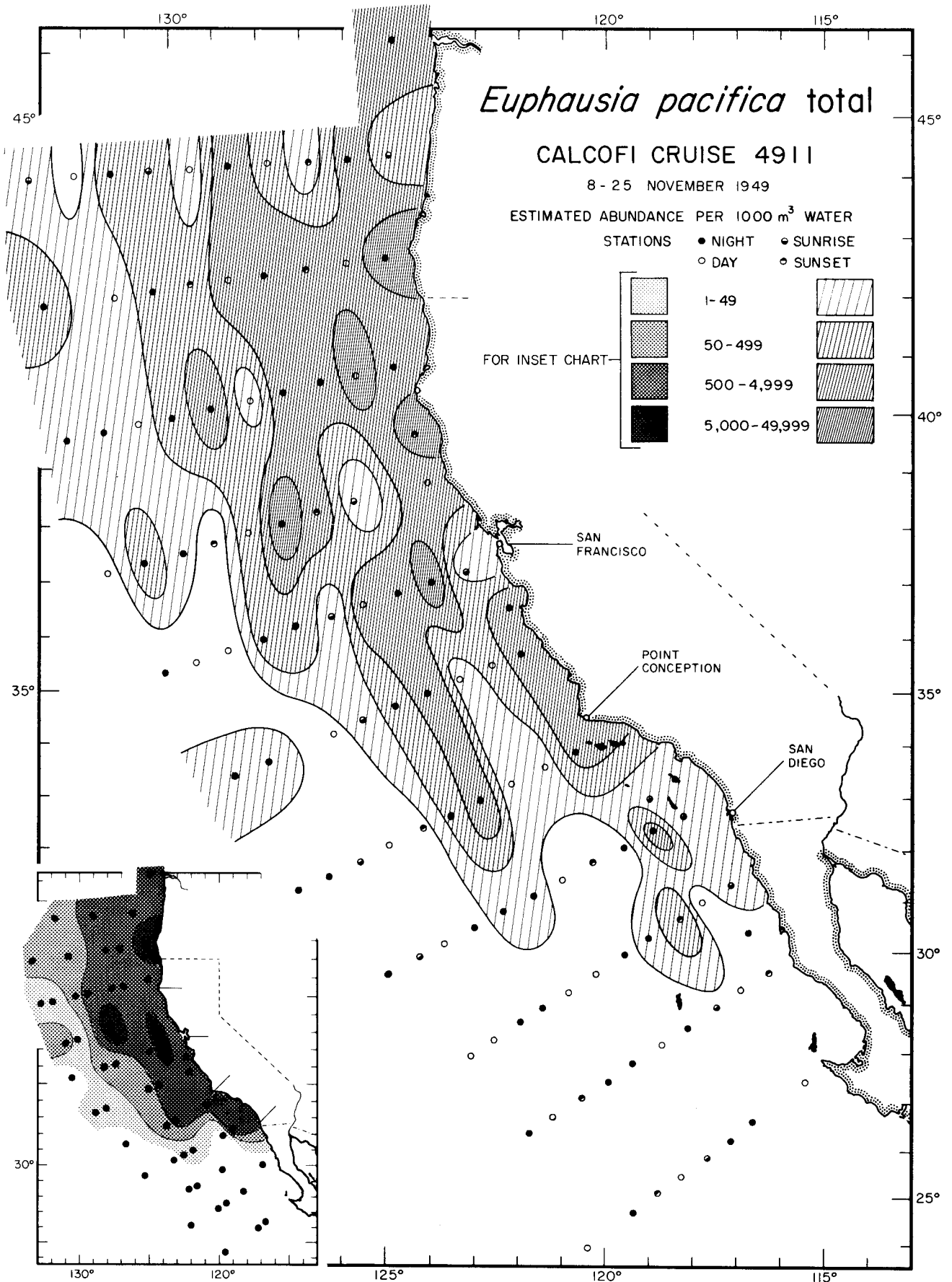
Euphausiacea
Euphausia pacifica larvae
 4910



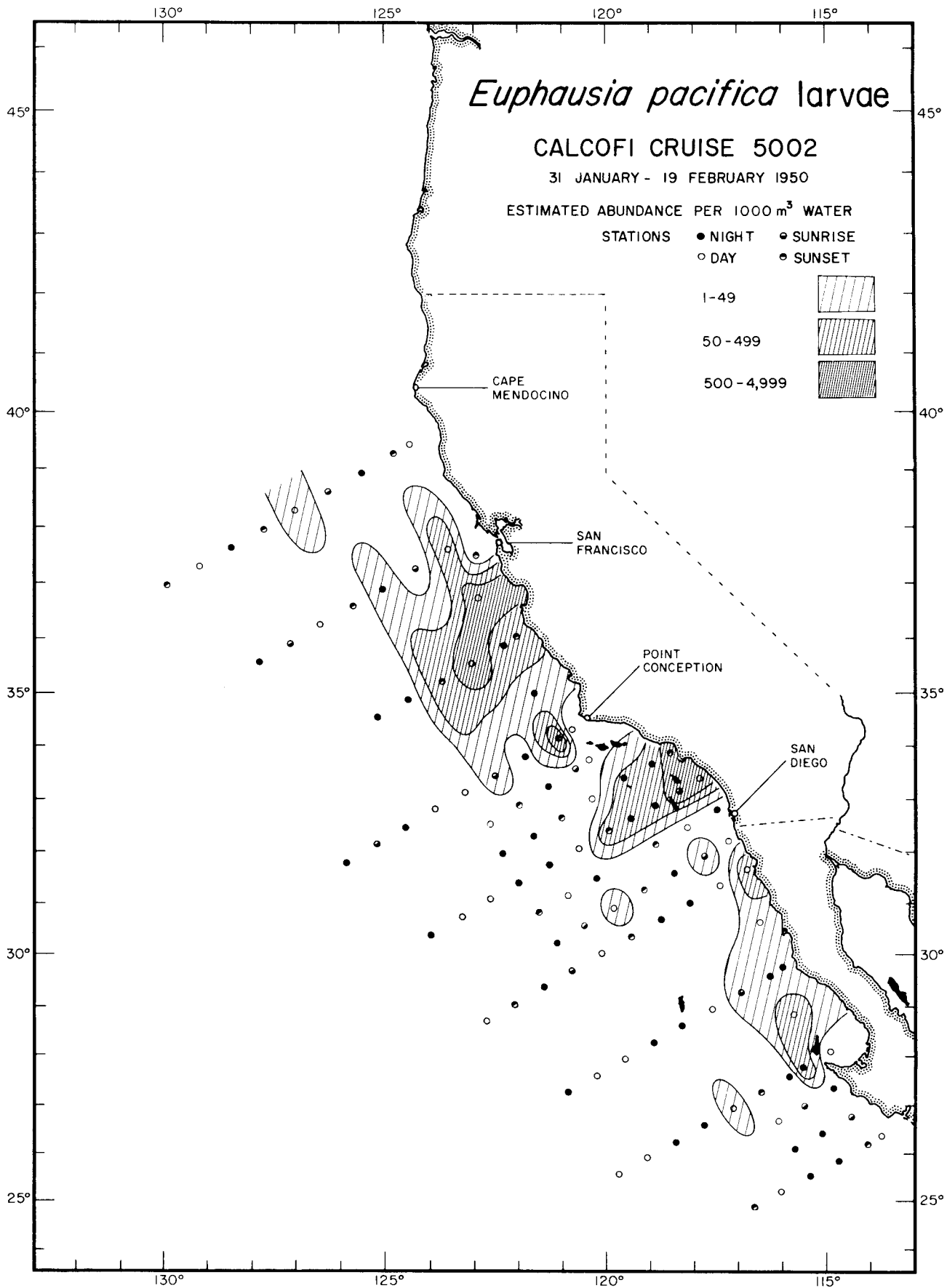
Euphausiacea
Euphausia pacifica total
 4910



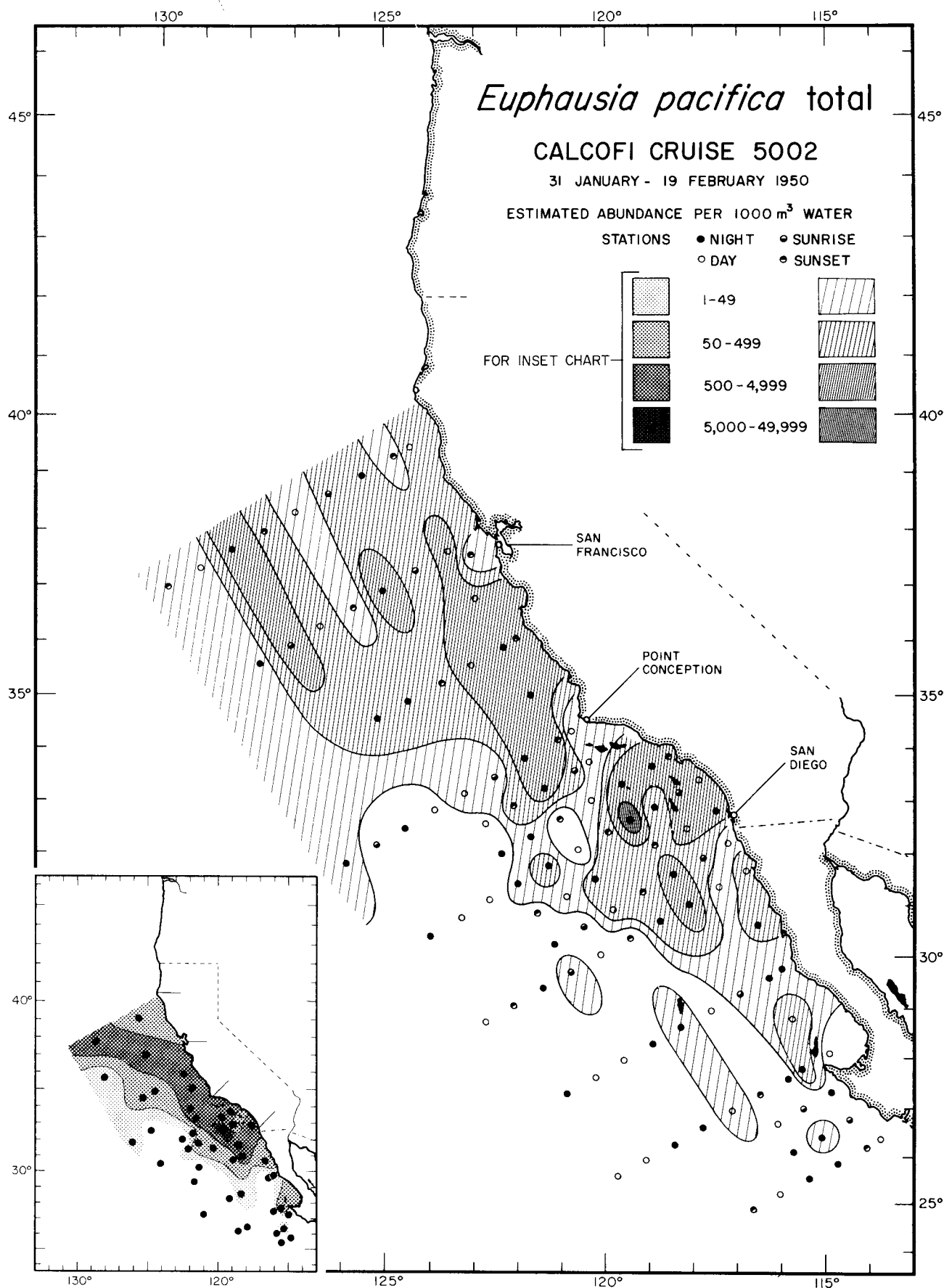
Euphausiacea
Euphausia pacifica larvae



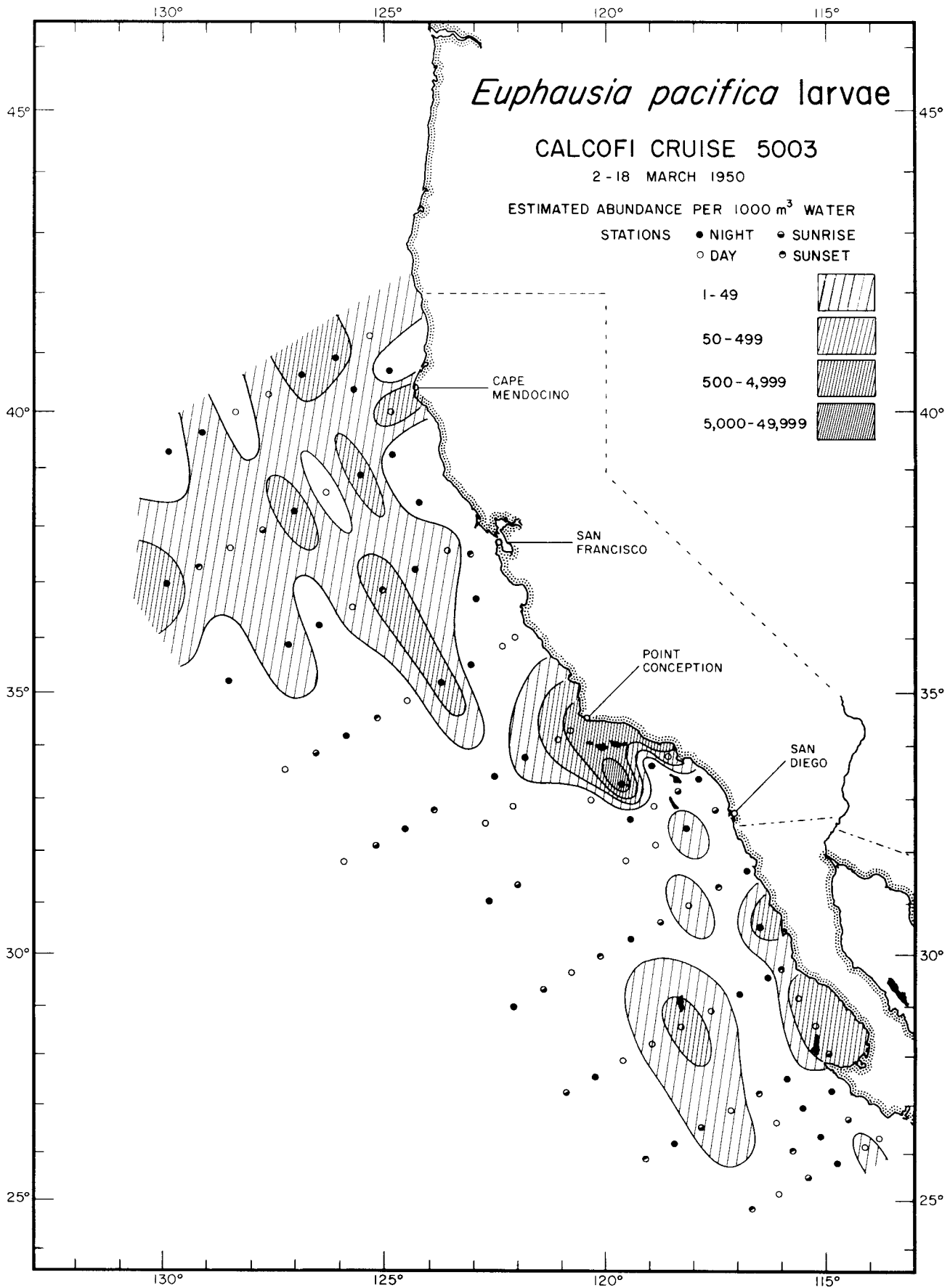
Euphausiacea
Euphausia pacifica total
4911



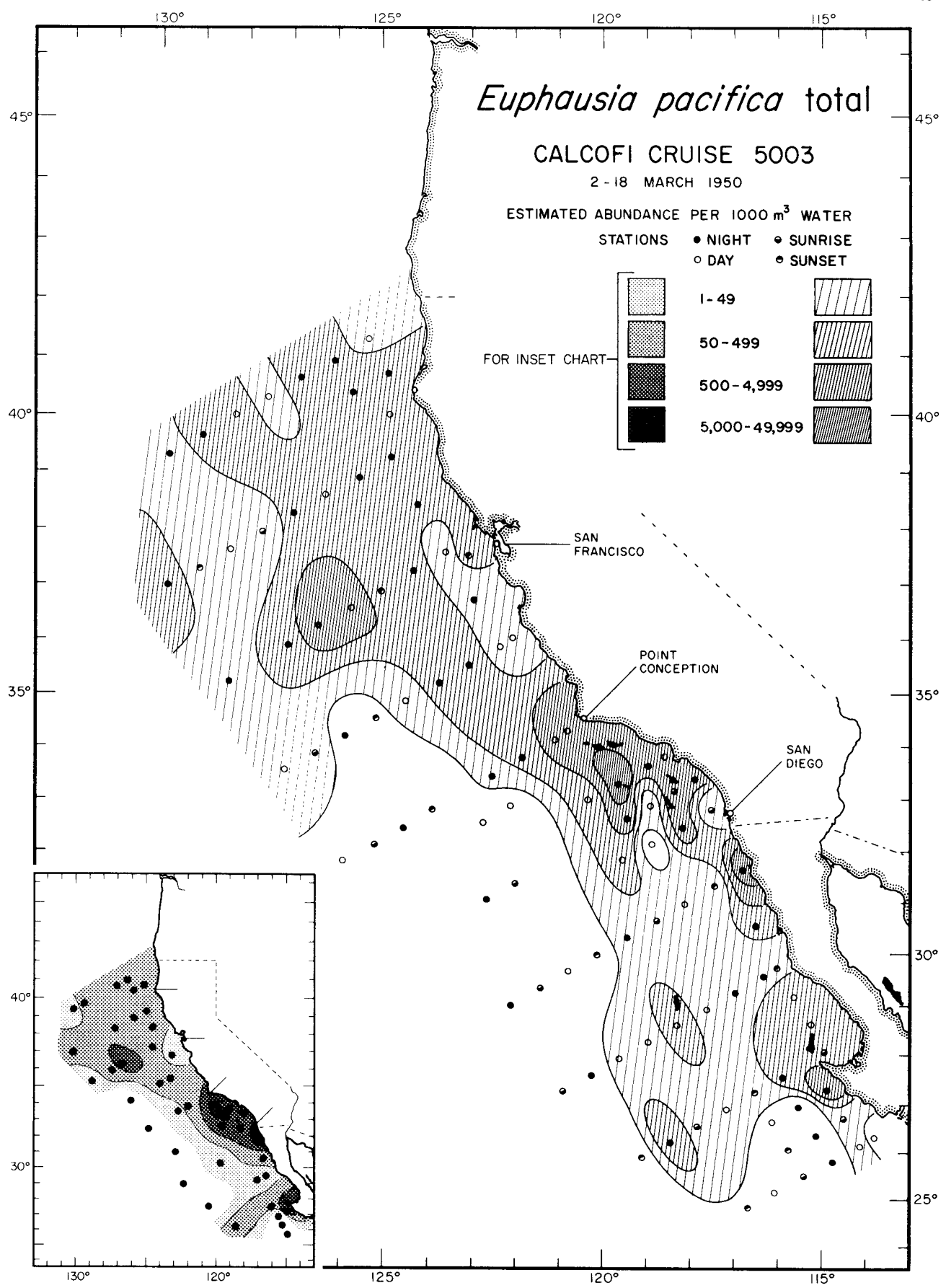
Euphausiacea
Euphausia pacifica larvae
5002



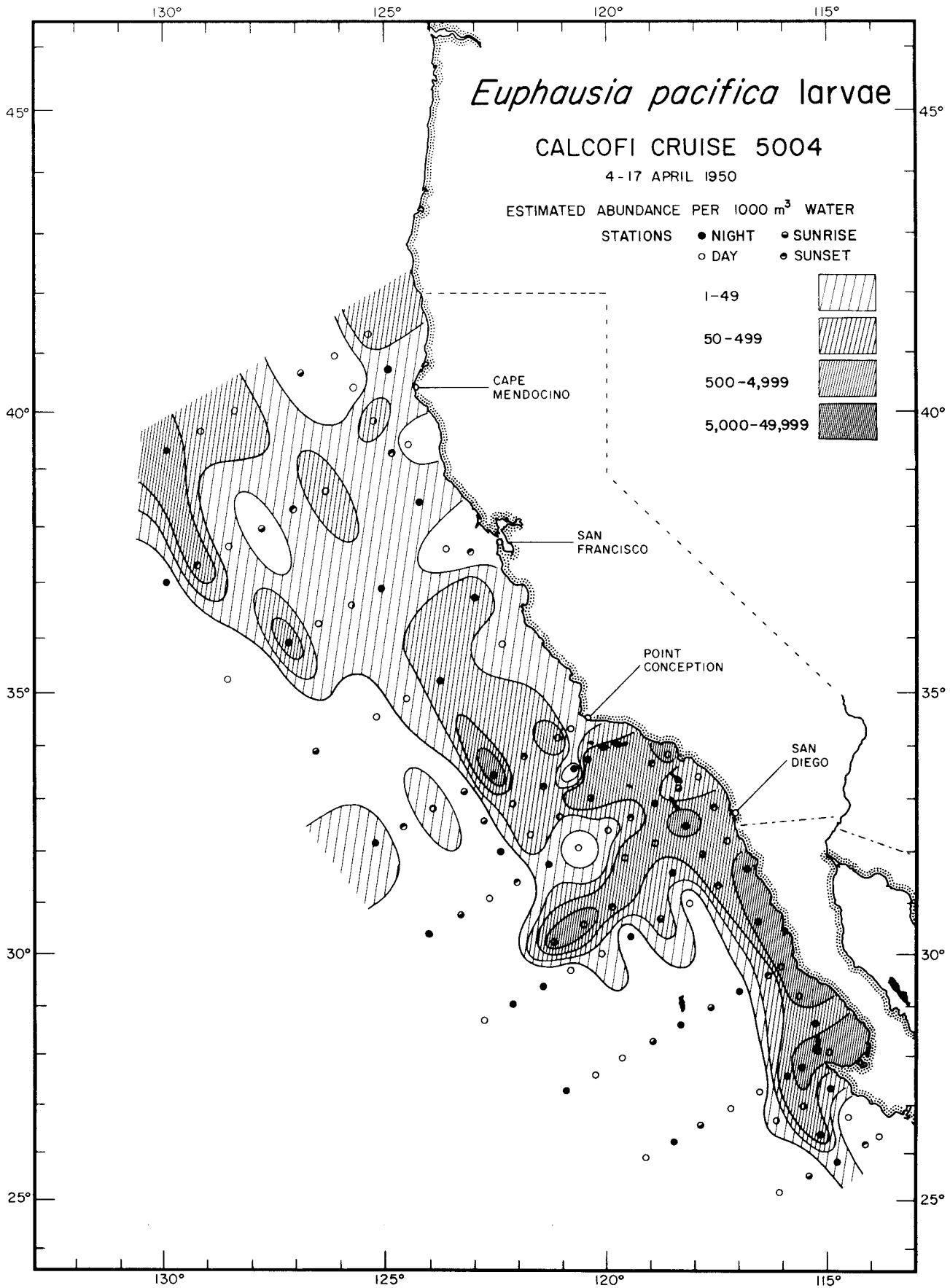
Euphausiacea
Euphausia pacifica total
 5002



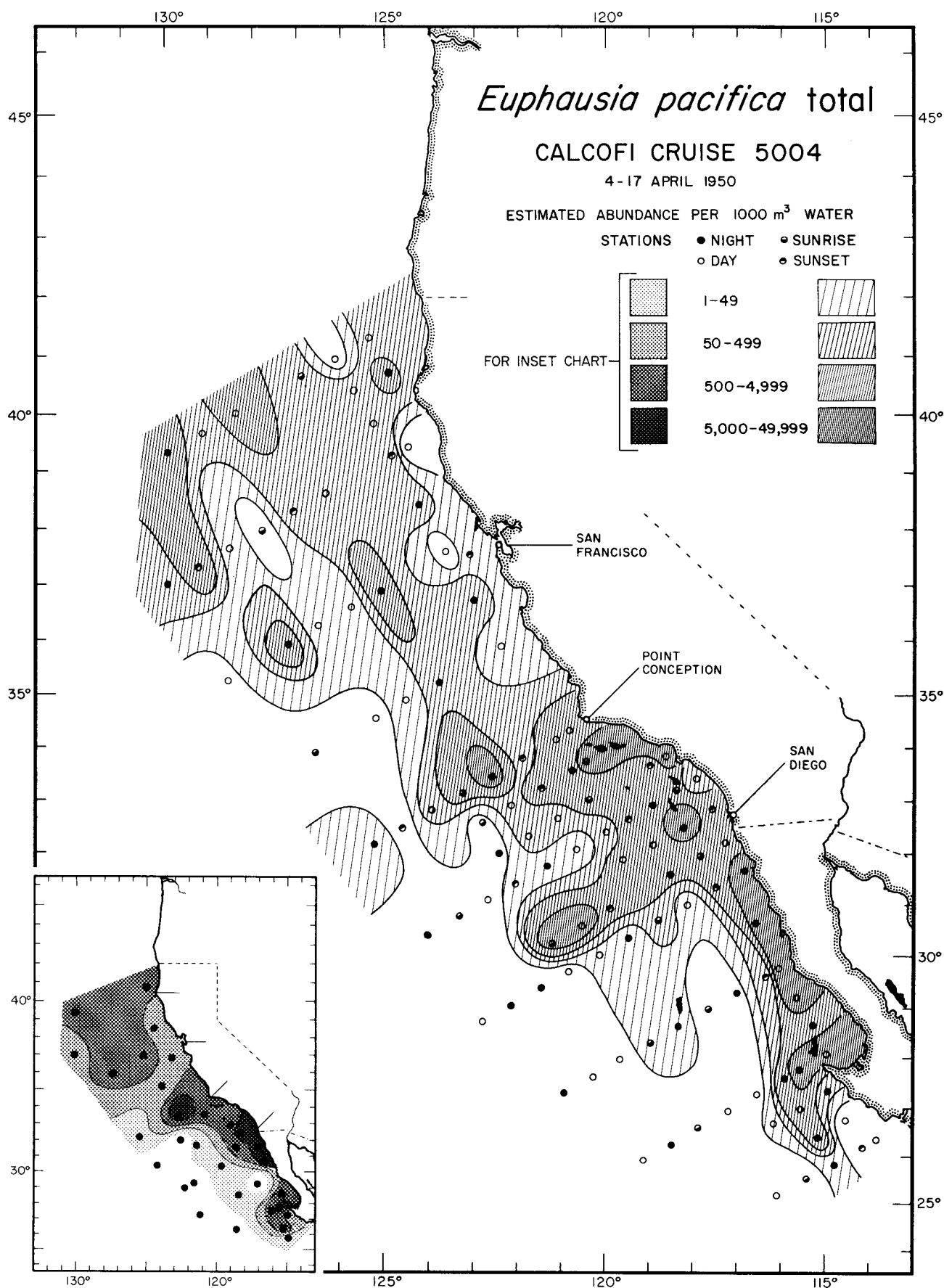
Euphausiacea
Euphausia pacifica larvae
5003



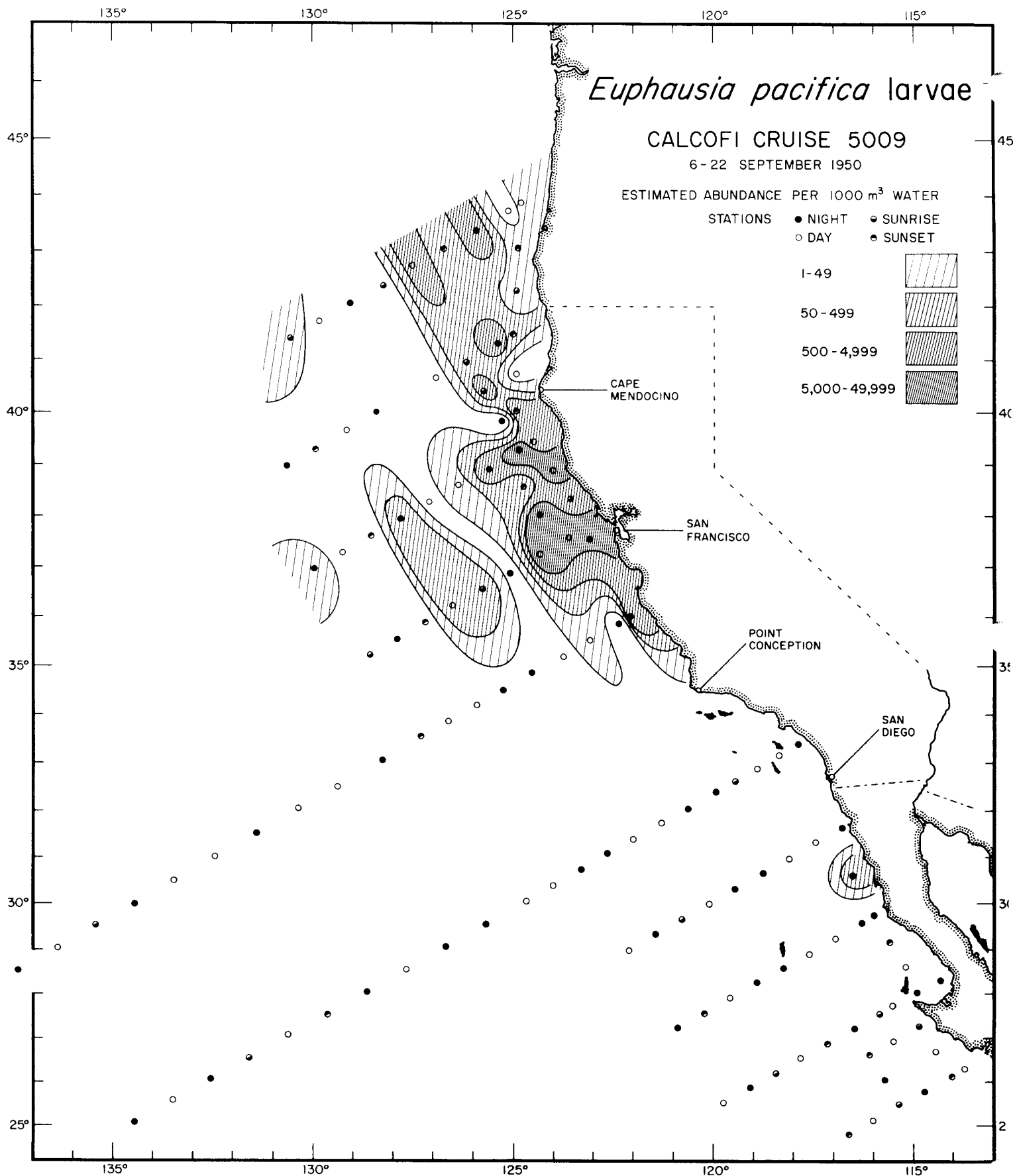
Euphausiacea
Euphausia pacifica total
5003



Euphausiacea
Euphausia pacifica larvae
5004



Euphausiacea
Euphausia pacifica total
5004



Euphausia pacifica larvae

CALCOFI CRUISE 5009

6-22 SEPTEMBER 1950

ESTIMATED ABUNDANCE PER 1000 m³ WATER

STATIONS ● NIGHT ○ DAY ● SUNRISE ○ SUNSET

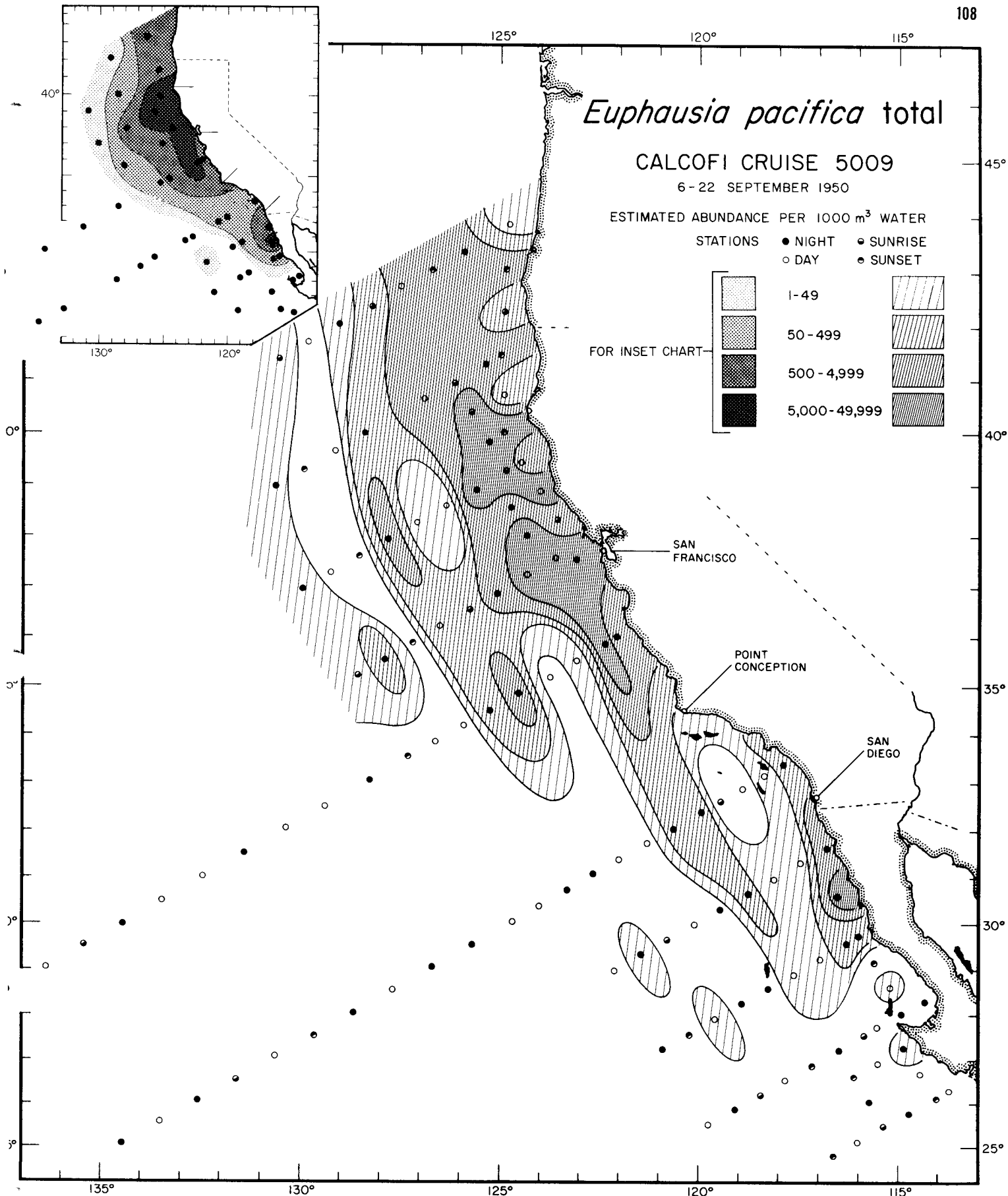
- 1-49
- 50-499
- 500-4,999
- 5,000-49,999

CAPE MENDOCINO

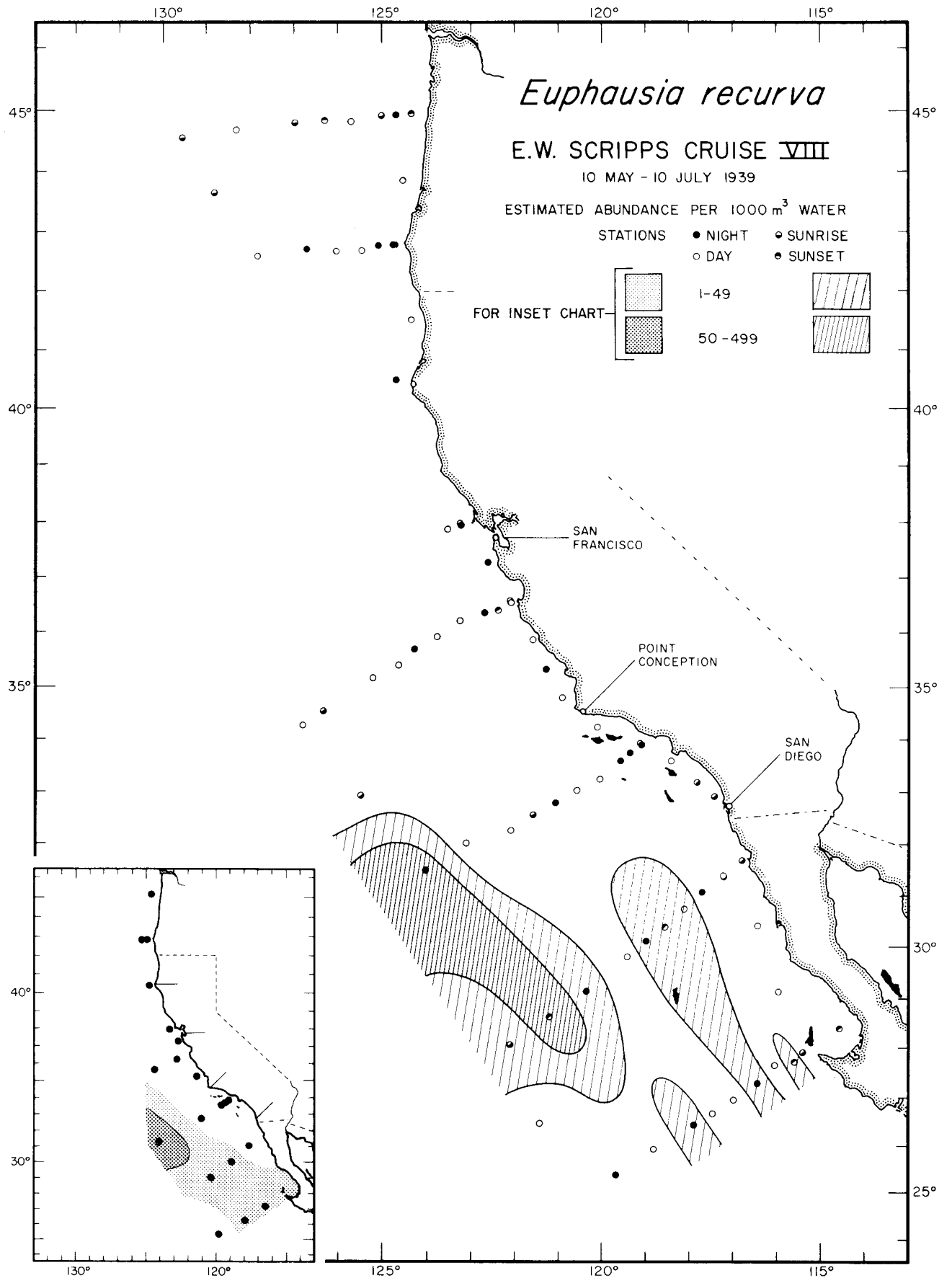
SAN FRANCISCO

POINT CONCEPTION

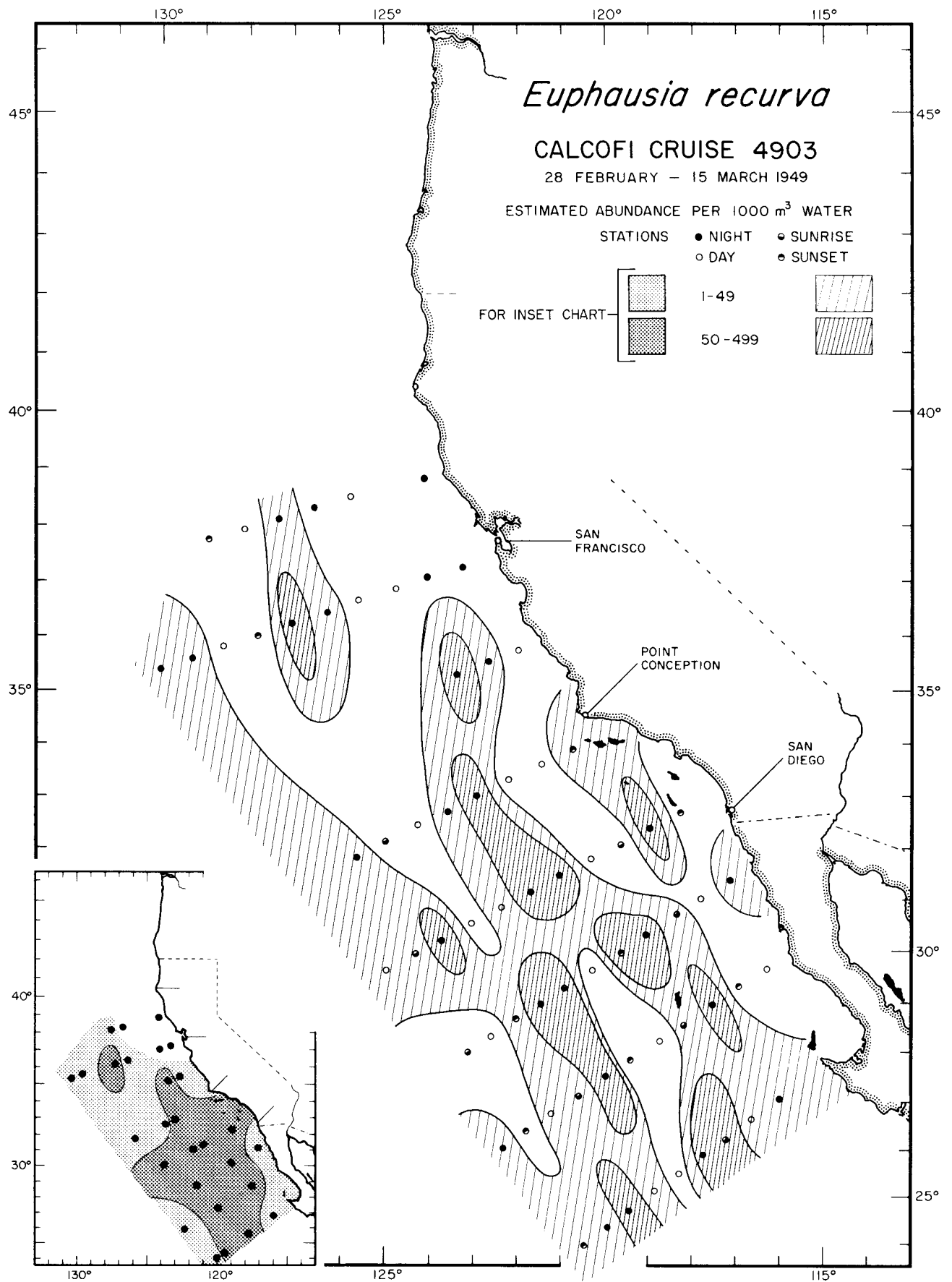
SAN DIEGO



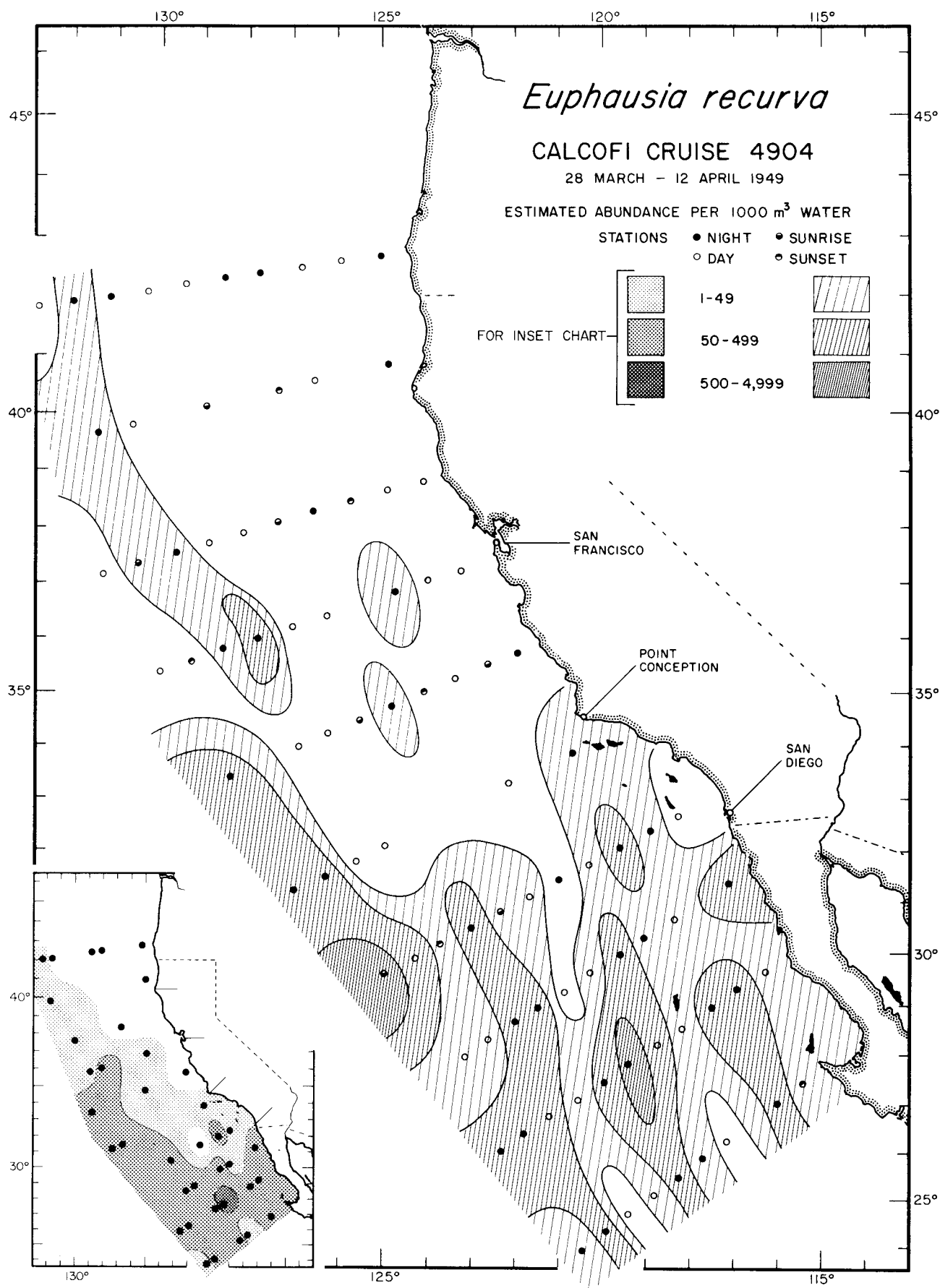
Euphausiacea
Euphausia pacifica total
 5009

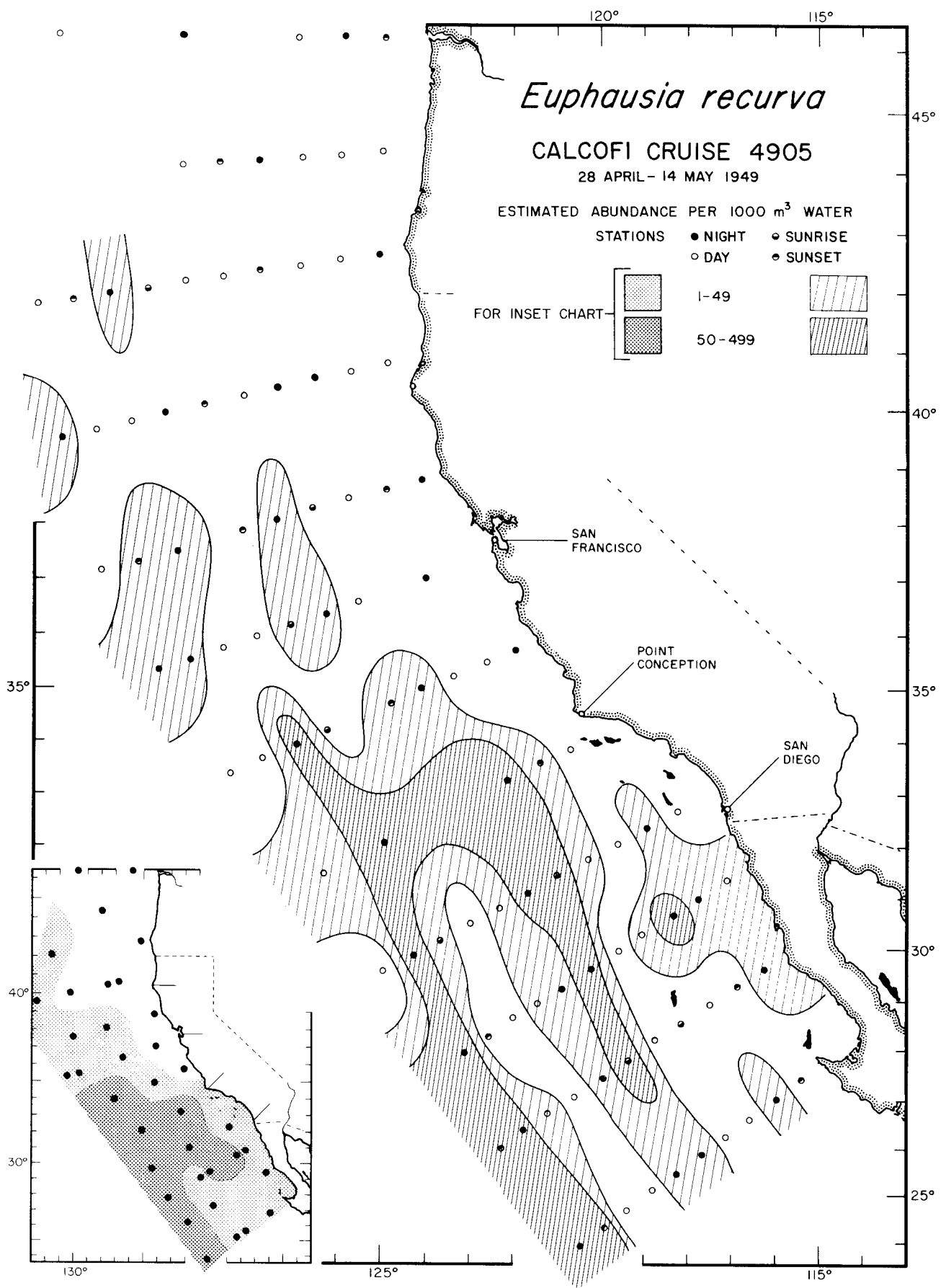


Euphausiacea
Euphausia recurva
E. W. SCRIPPS CRUISE VIII

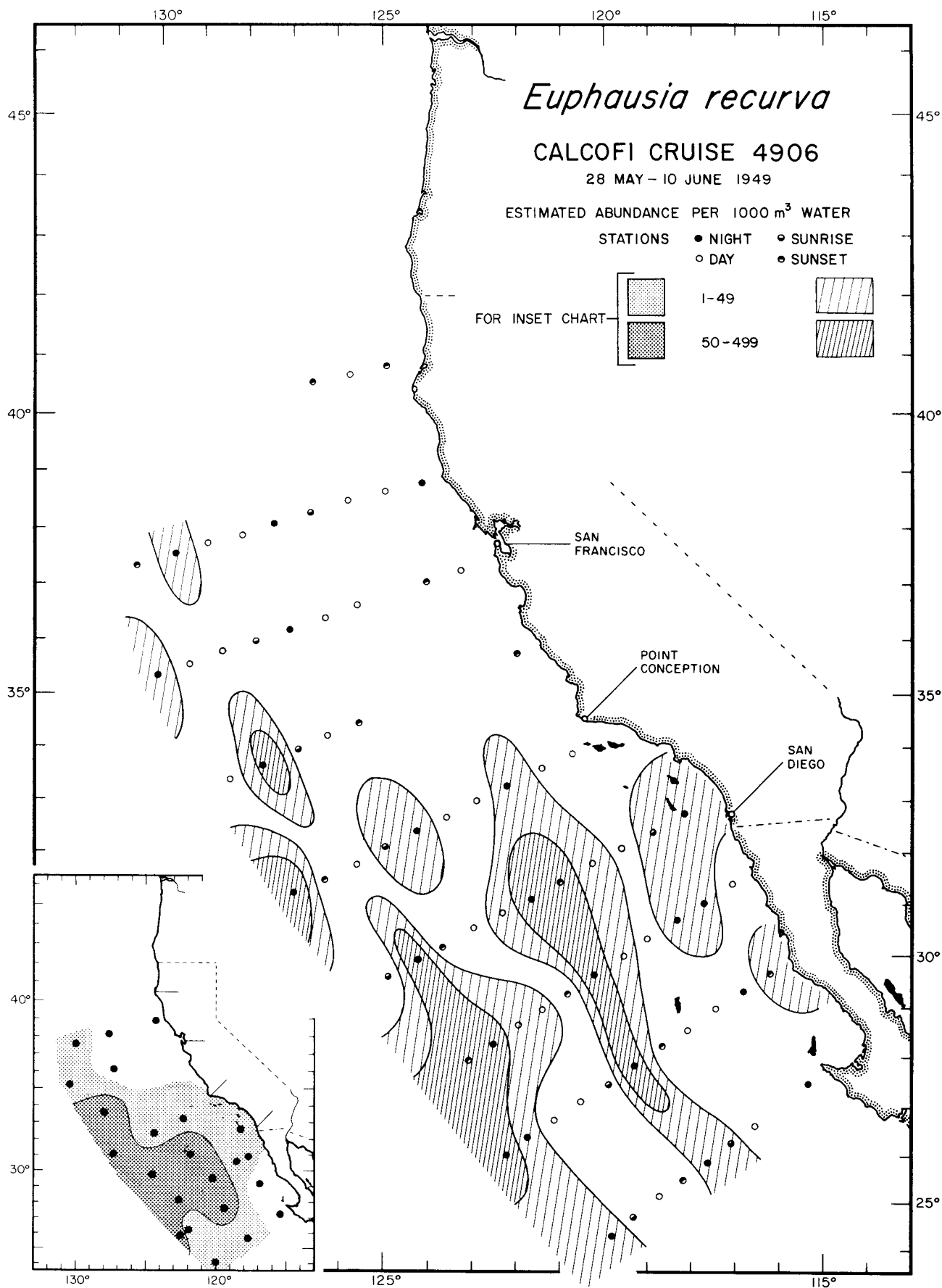


Euphausiacea
Euphausia recurva
4903

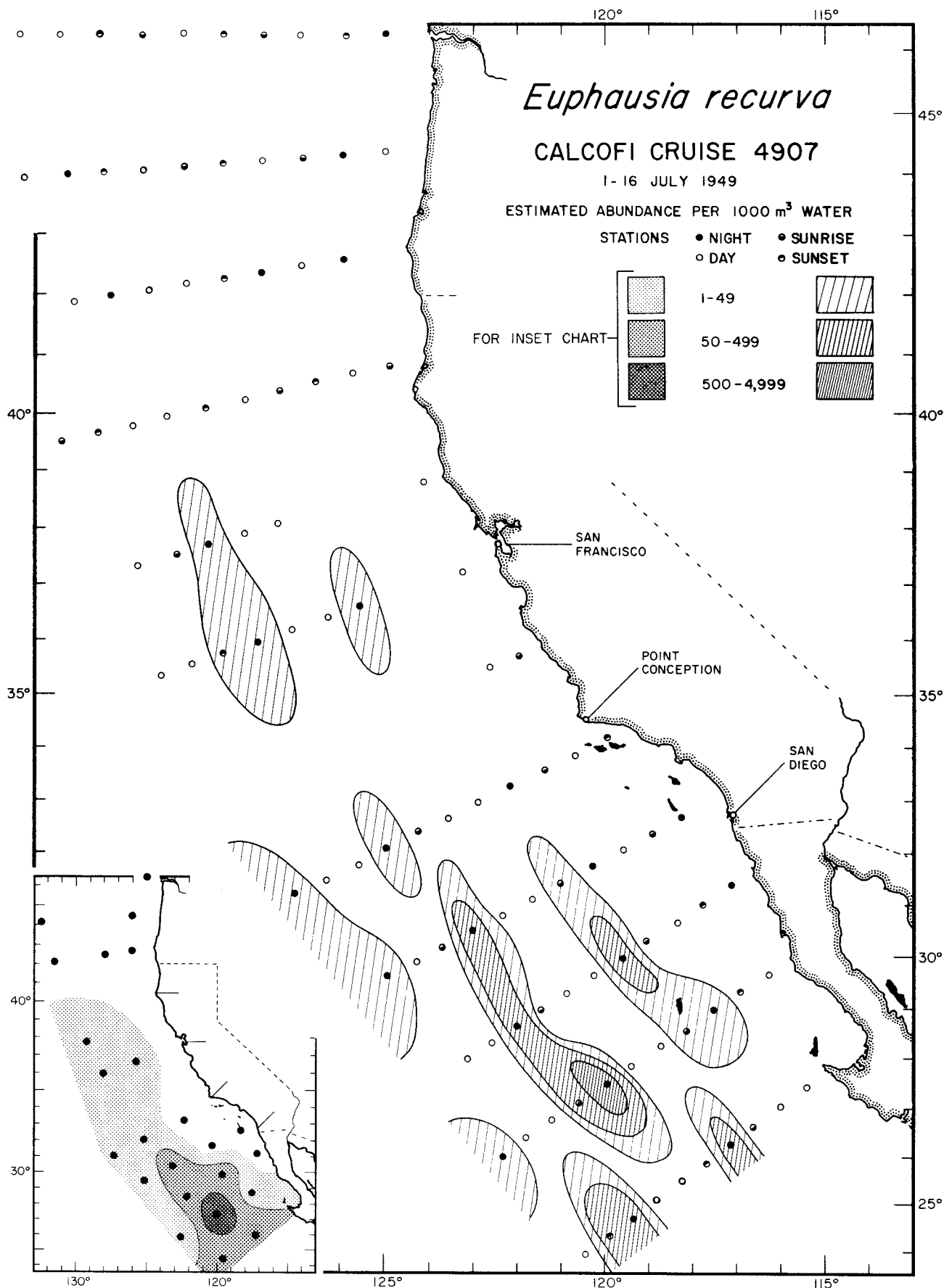




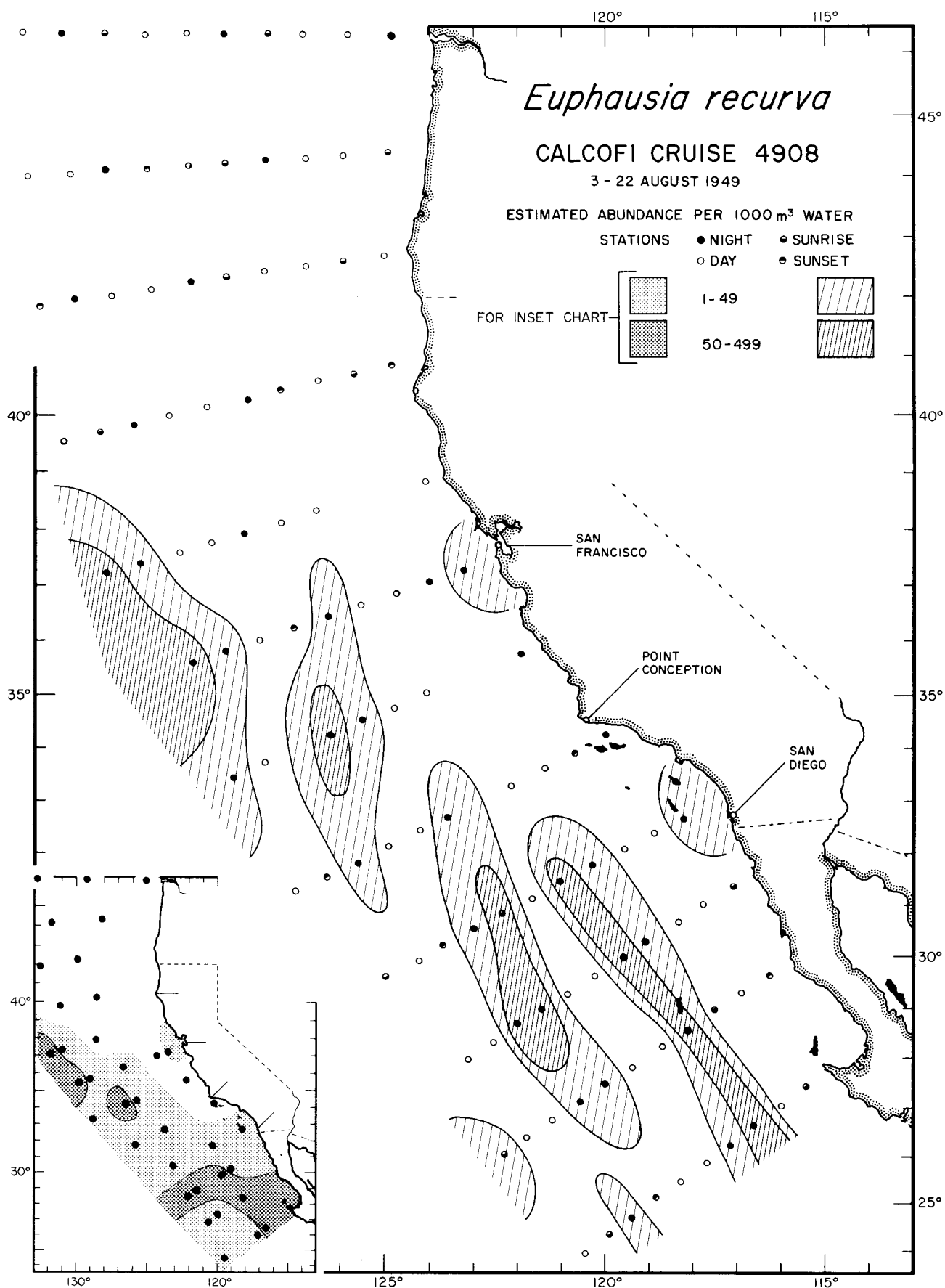
Euphausiacea
Euphausia recurva
4905



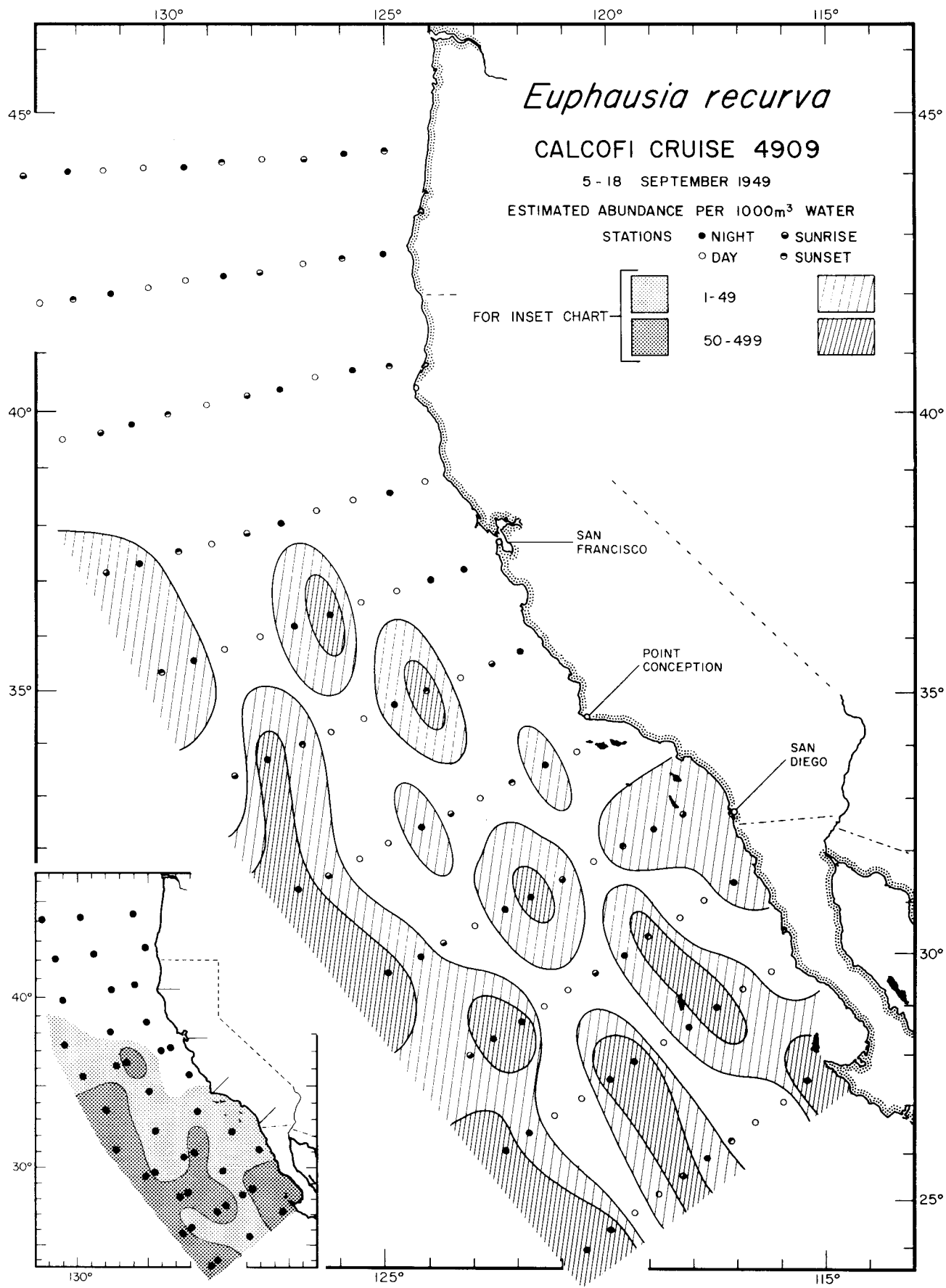
Euphausiacea
Euphausia recurva
4906



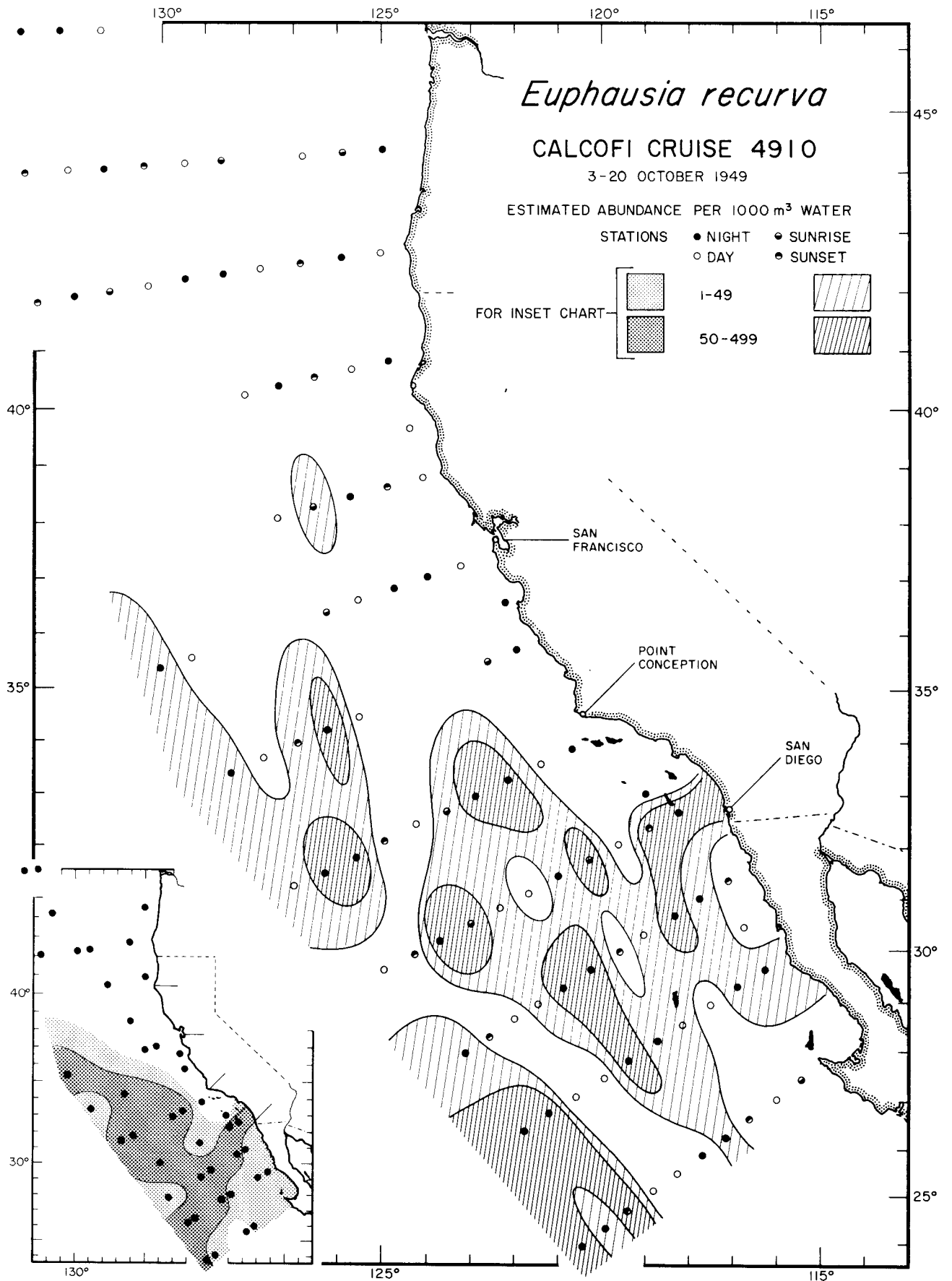
Euphausiacea
Euphausia recurva
4907



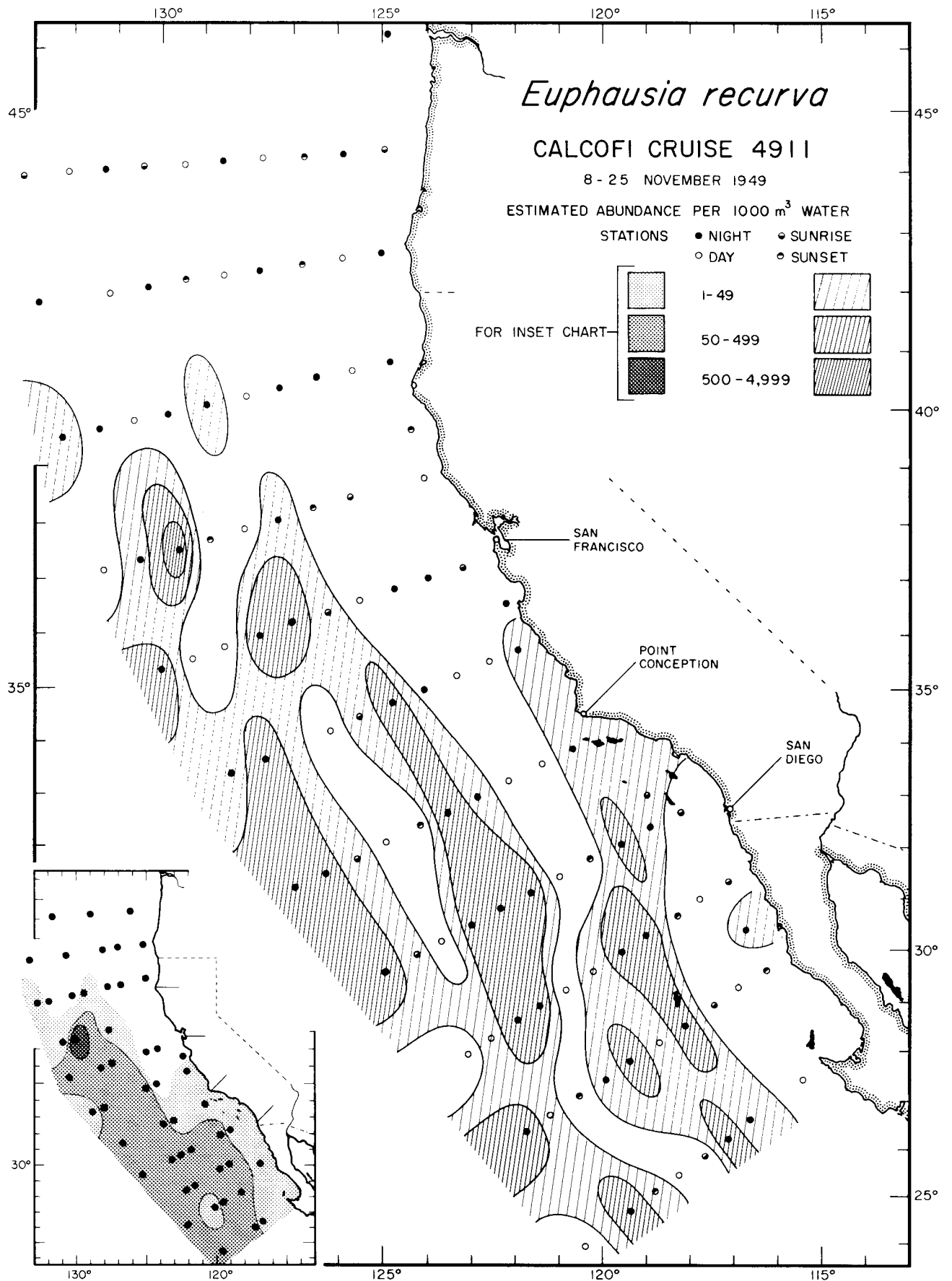
Euphausiacea
Euphausia recurva
4908

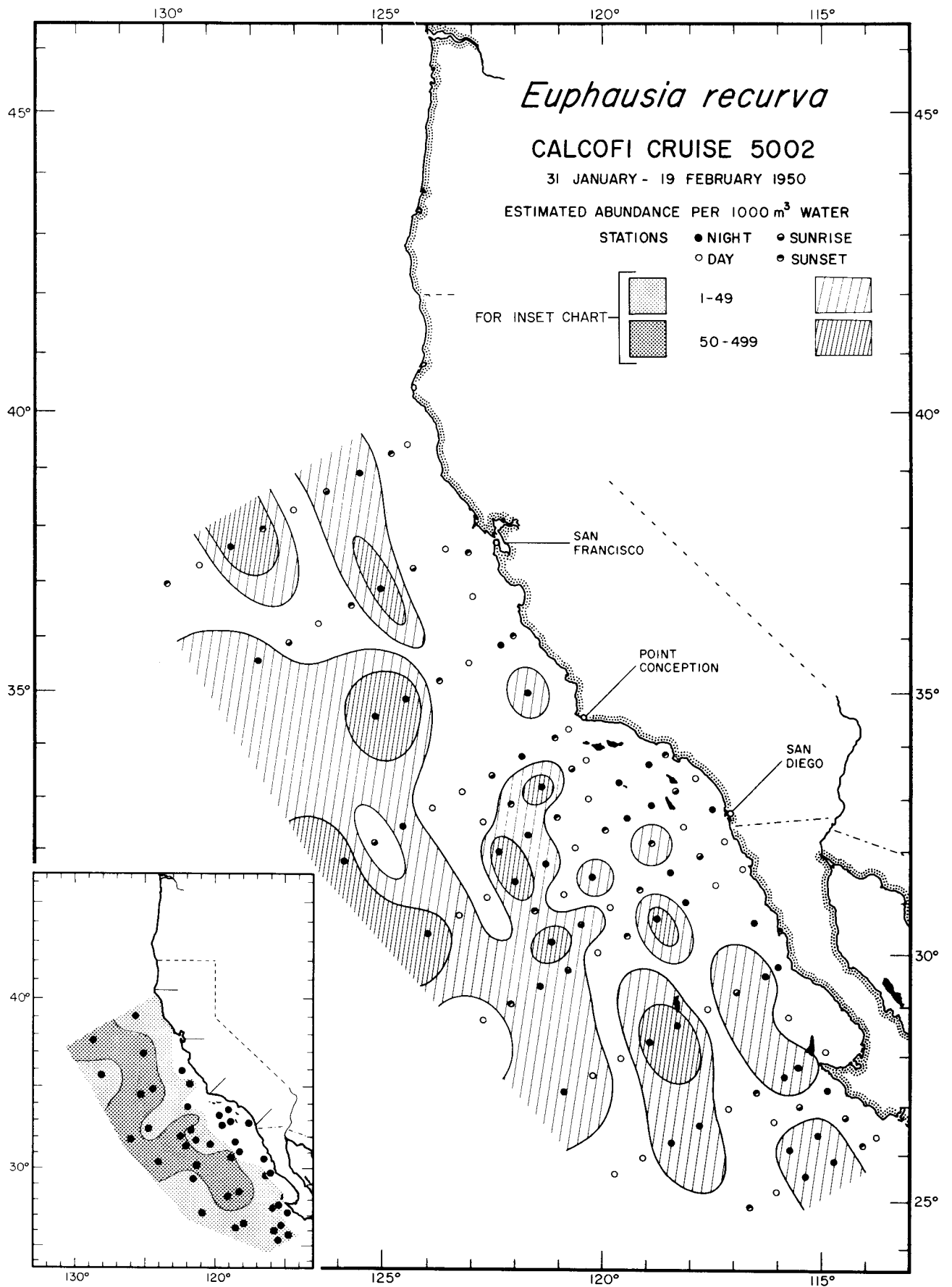


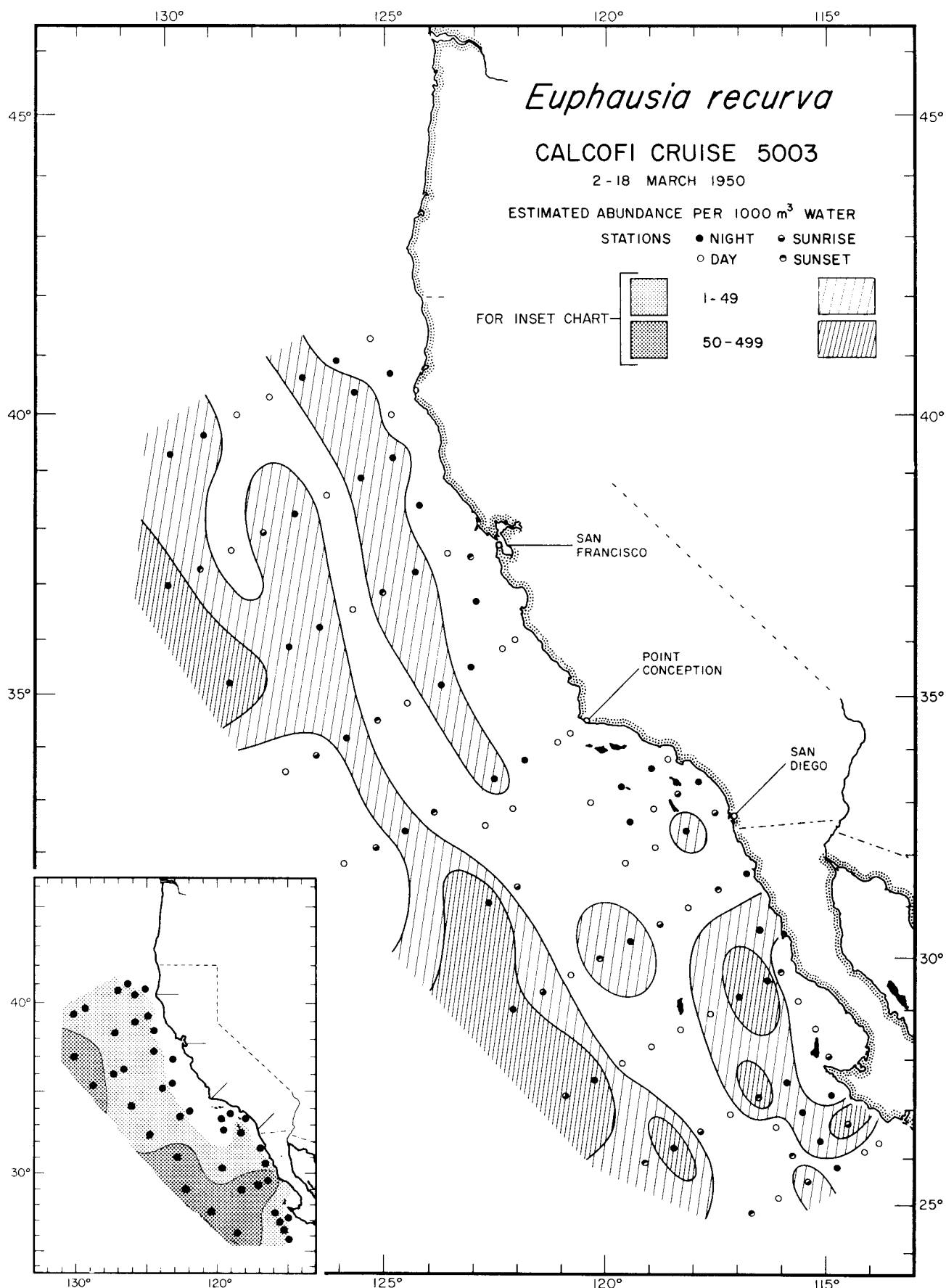
Euphausiacea
Euphausia recurva
4909



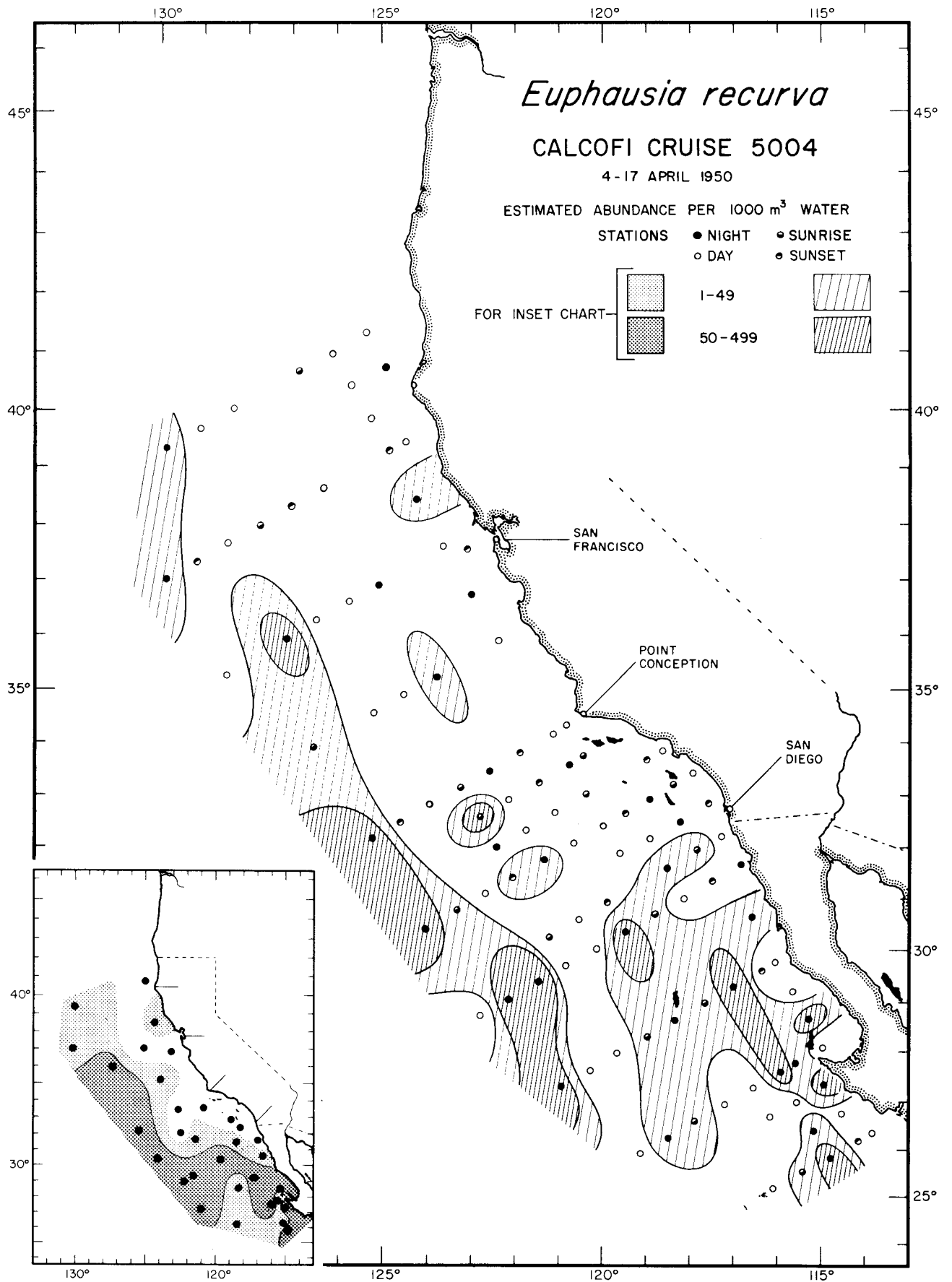
Euphausiacea
Euphausia recurva
 4910



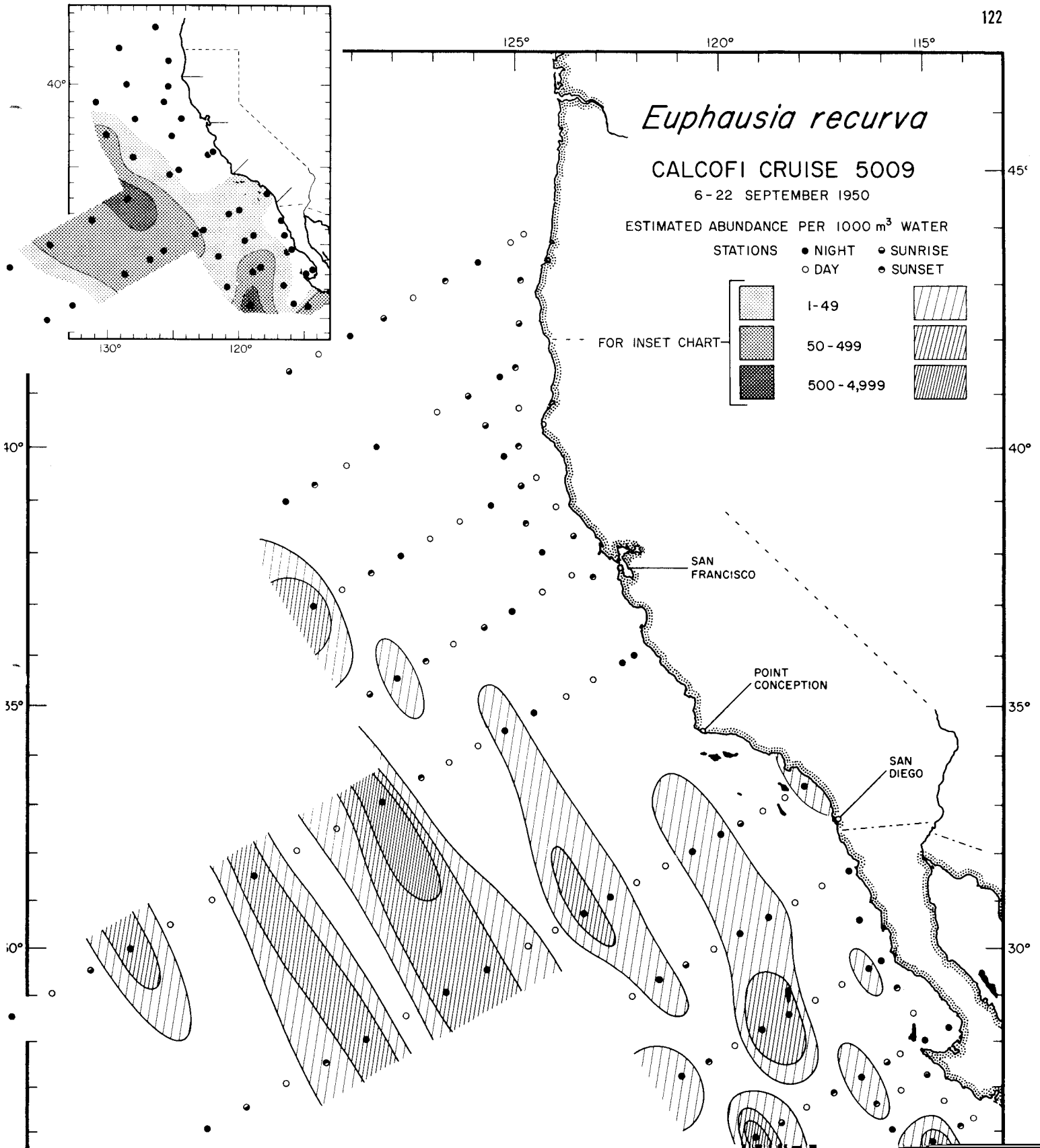


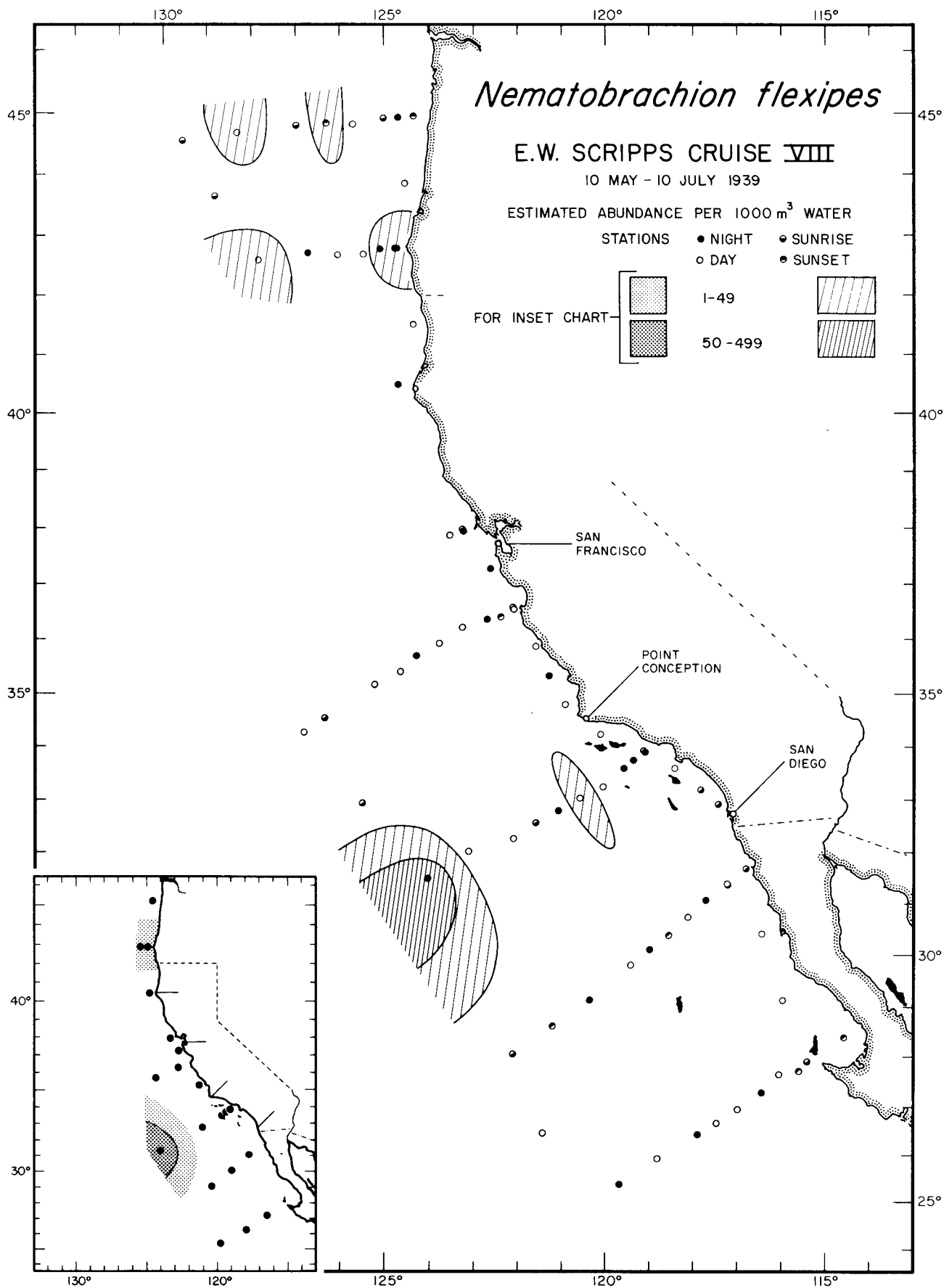


Euphausiacea
Euphausia recurva
5003

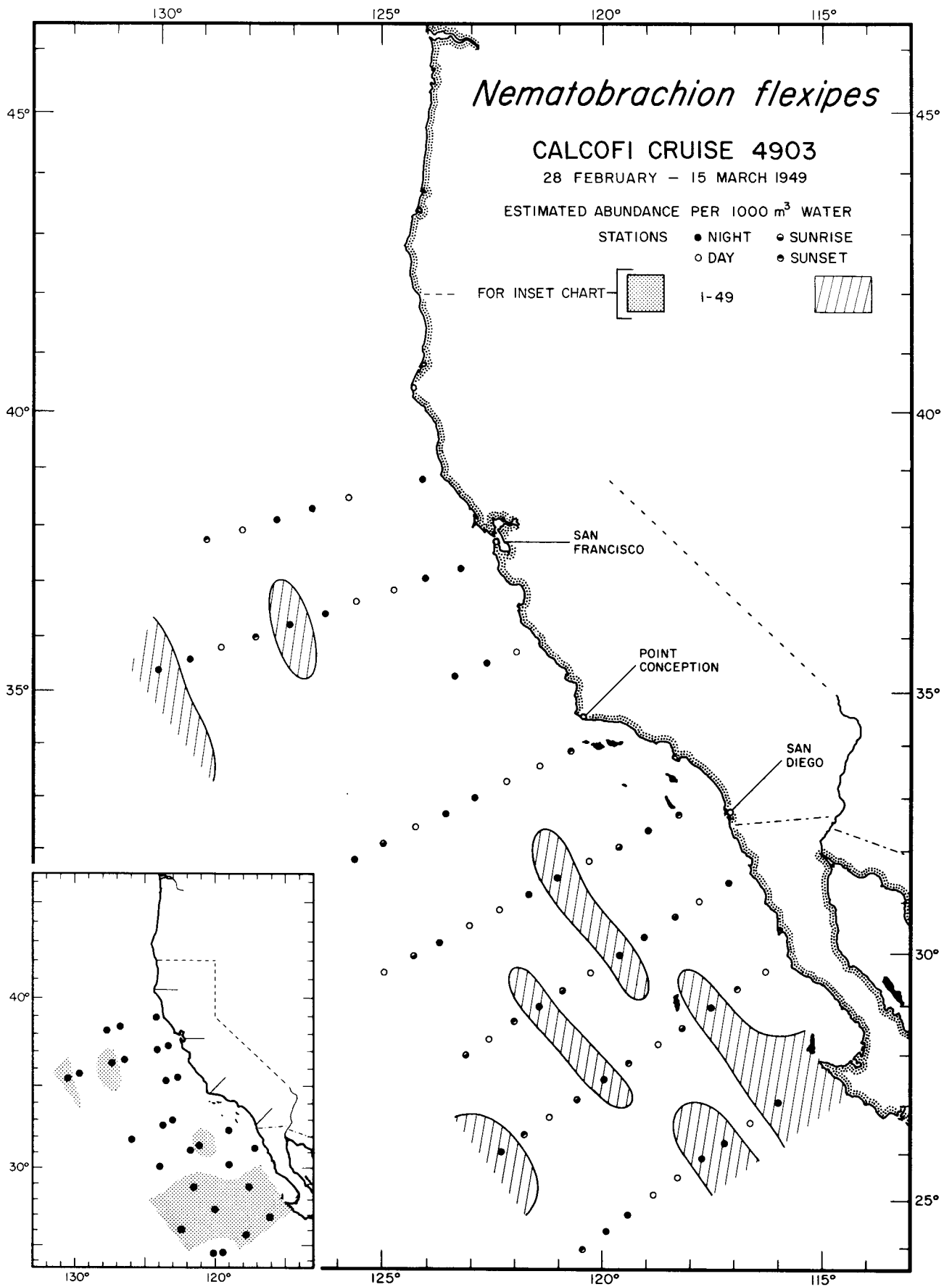


Euphausiacea
Euphausia recurva
5004

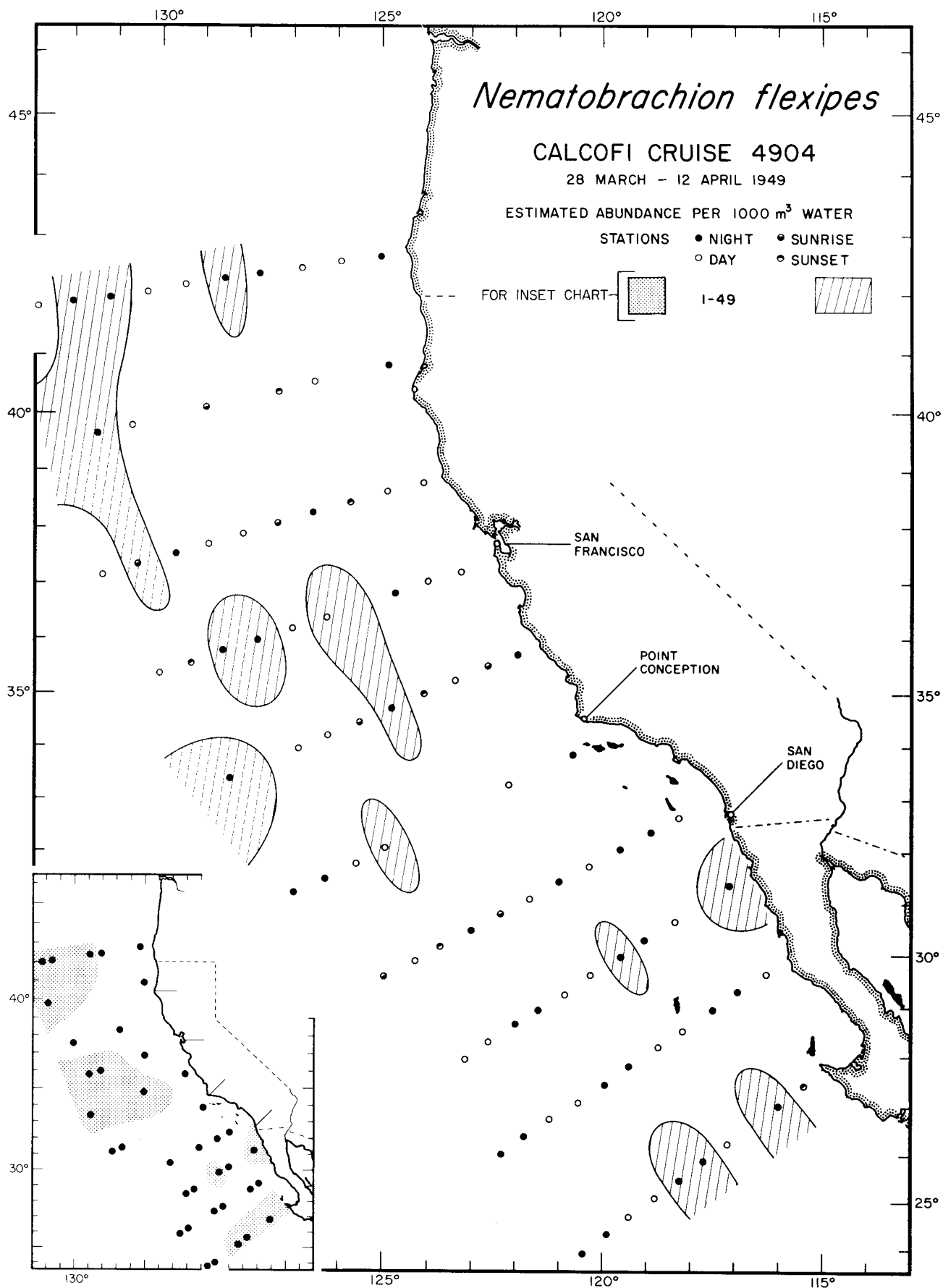




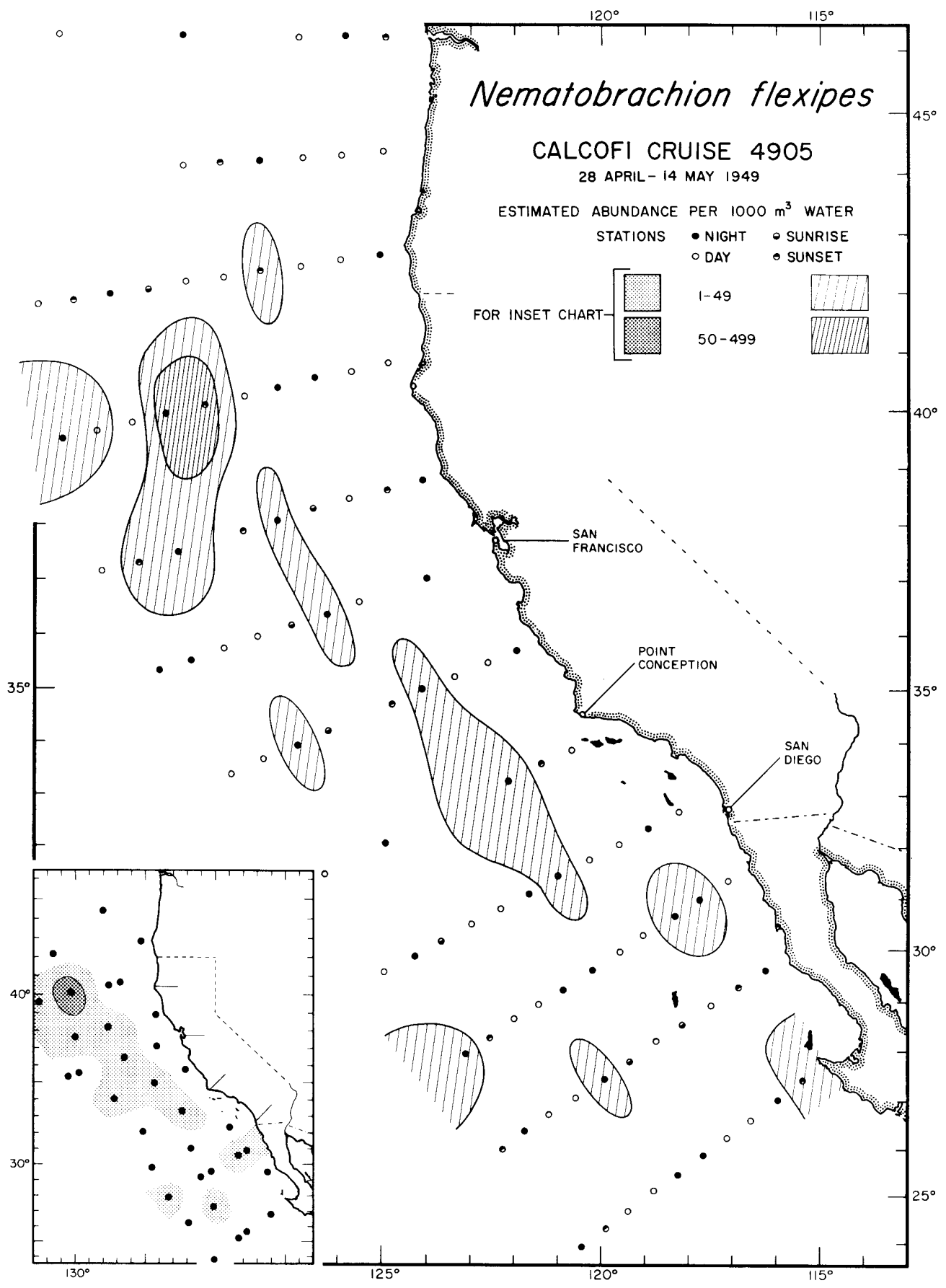
Euphausiacea
Nematobranchion flexipes
E. W. SCRIPPS CRUISE VIII



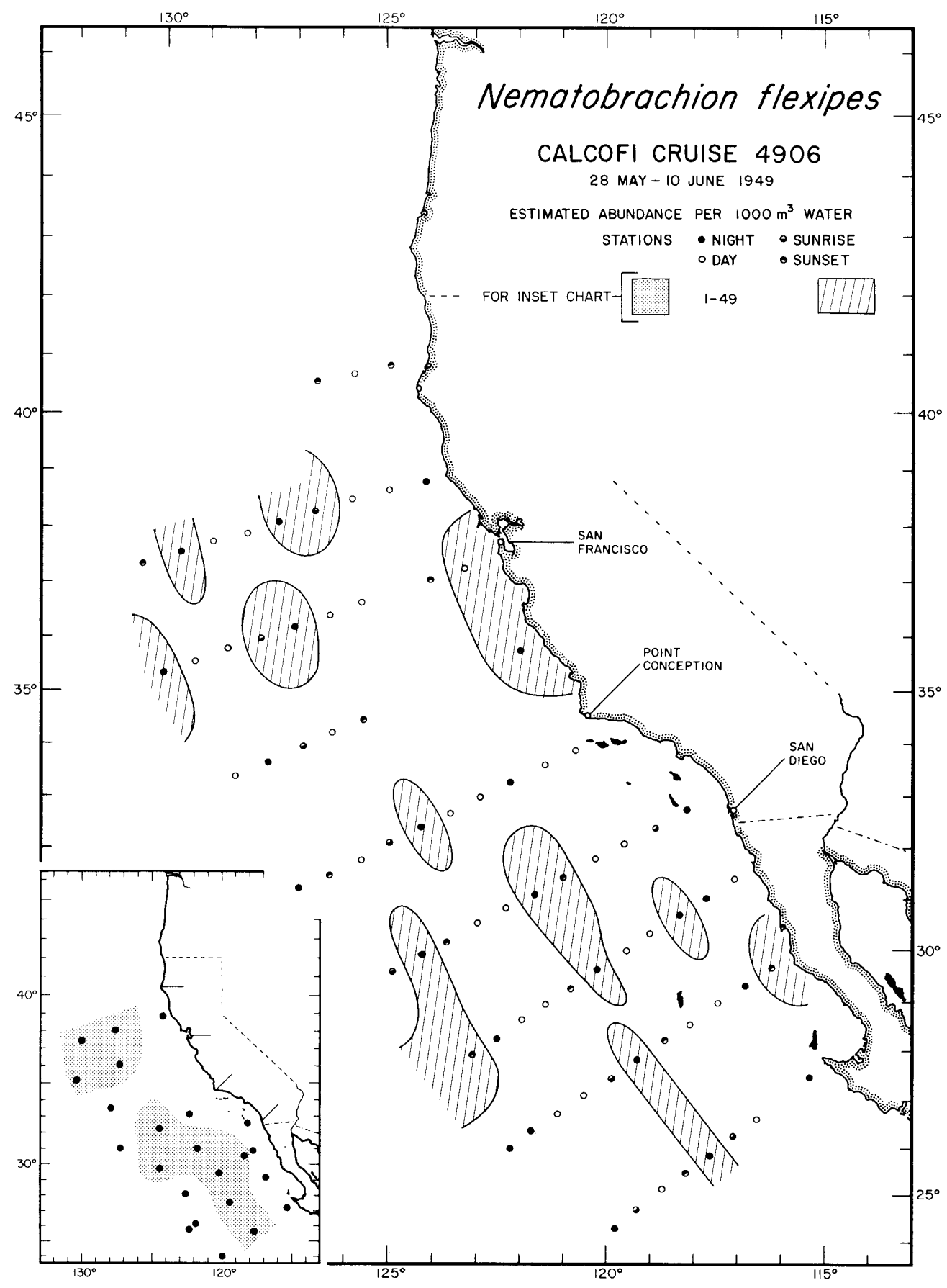
Euphausiacea
Nematobranchion flexipes
4903



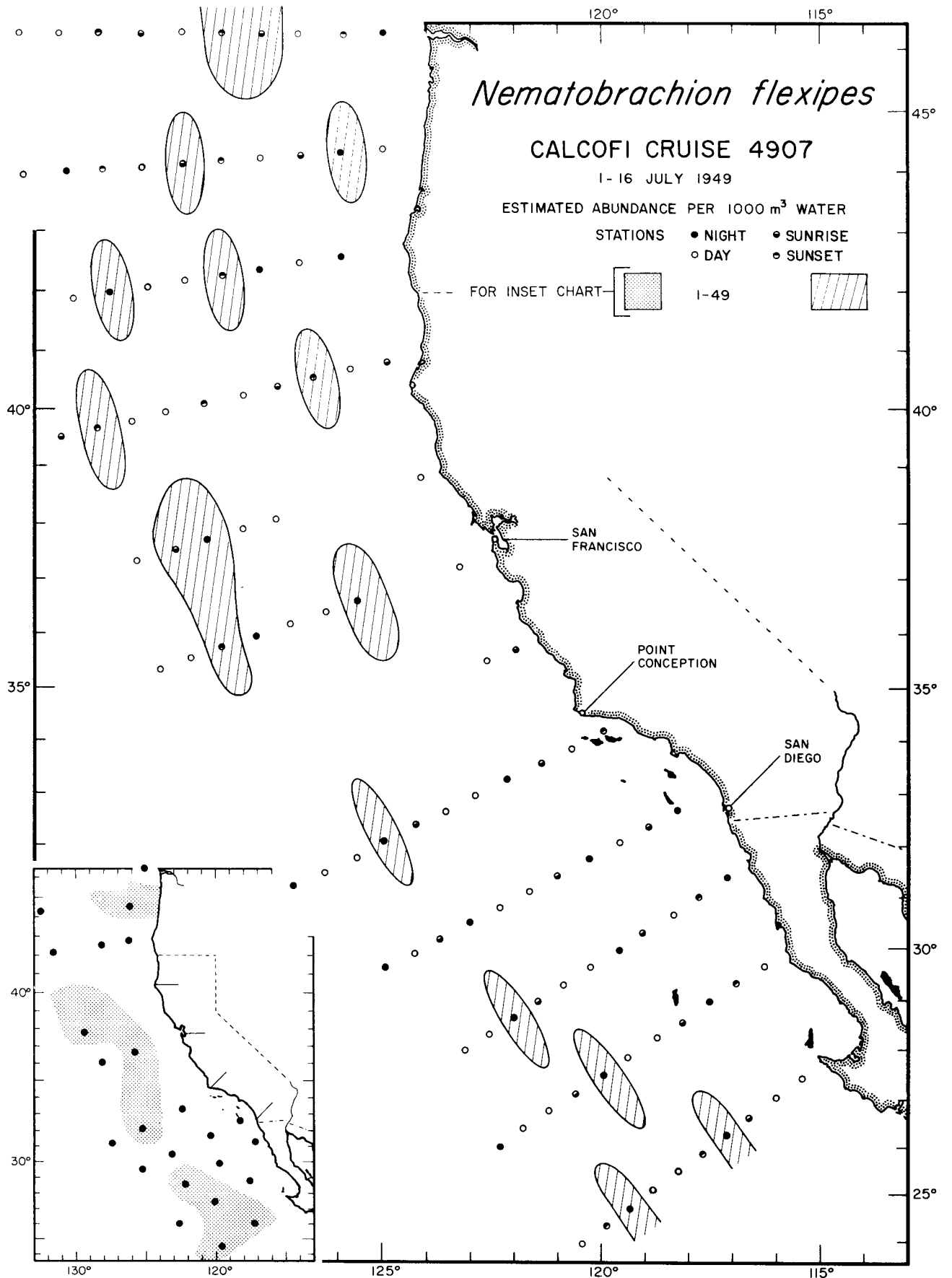
Euphausiacea
Nematobranchion flexipes
4904



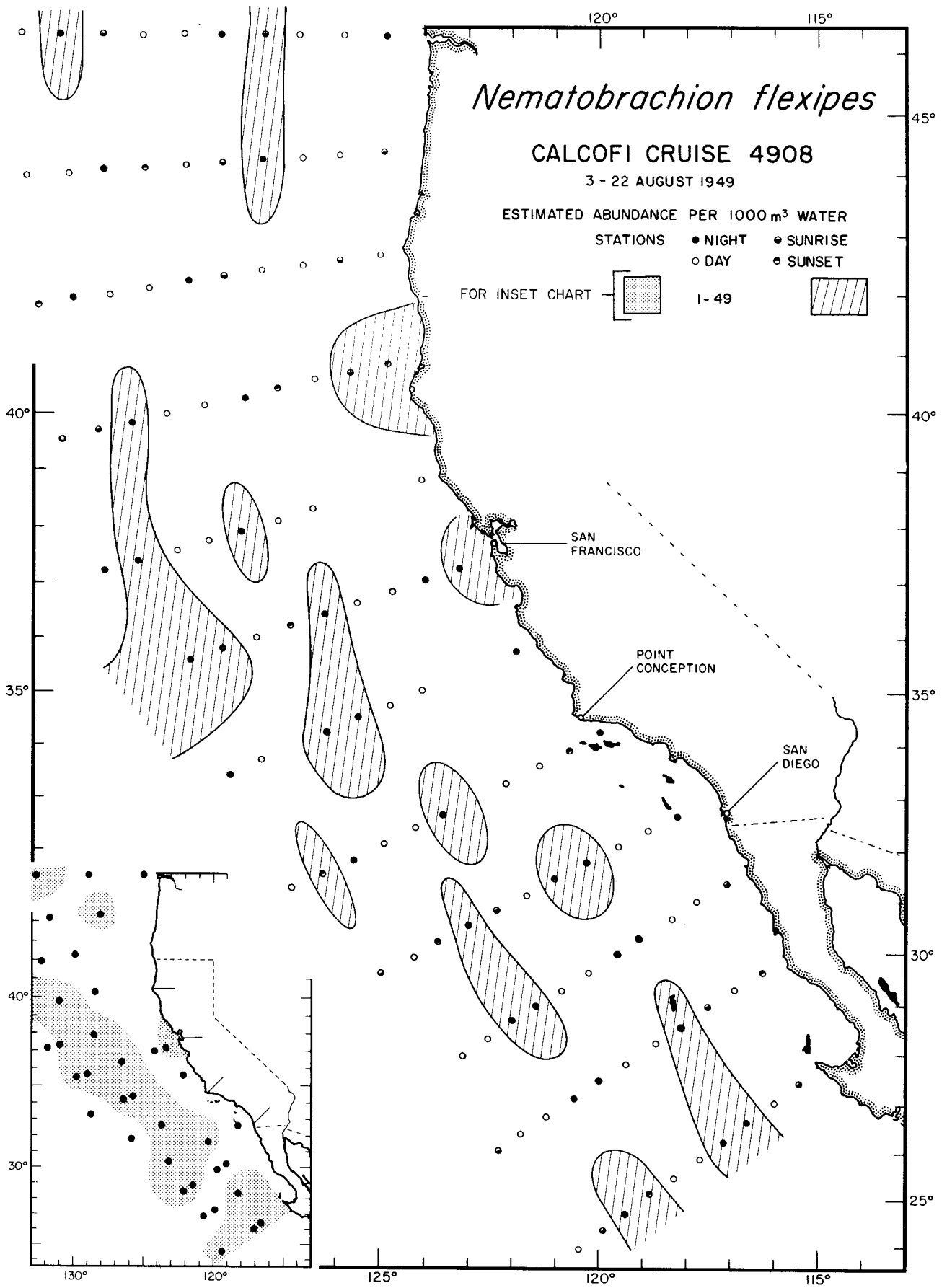
Euphausiacea
Nematobranchion flexipes
4905



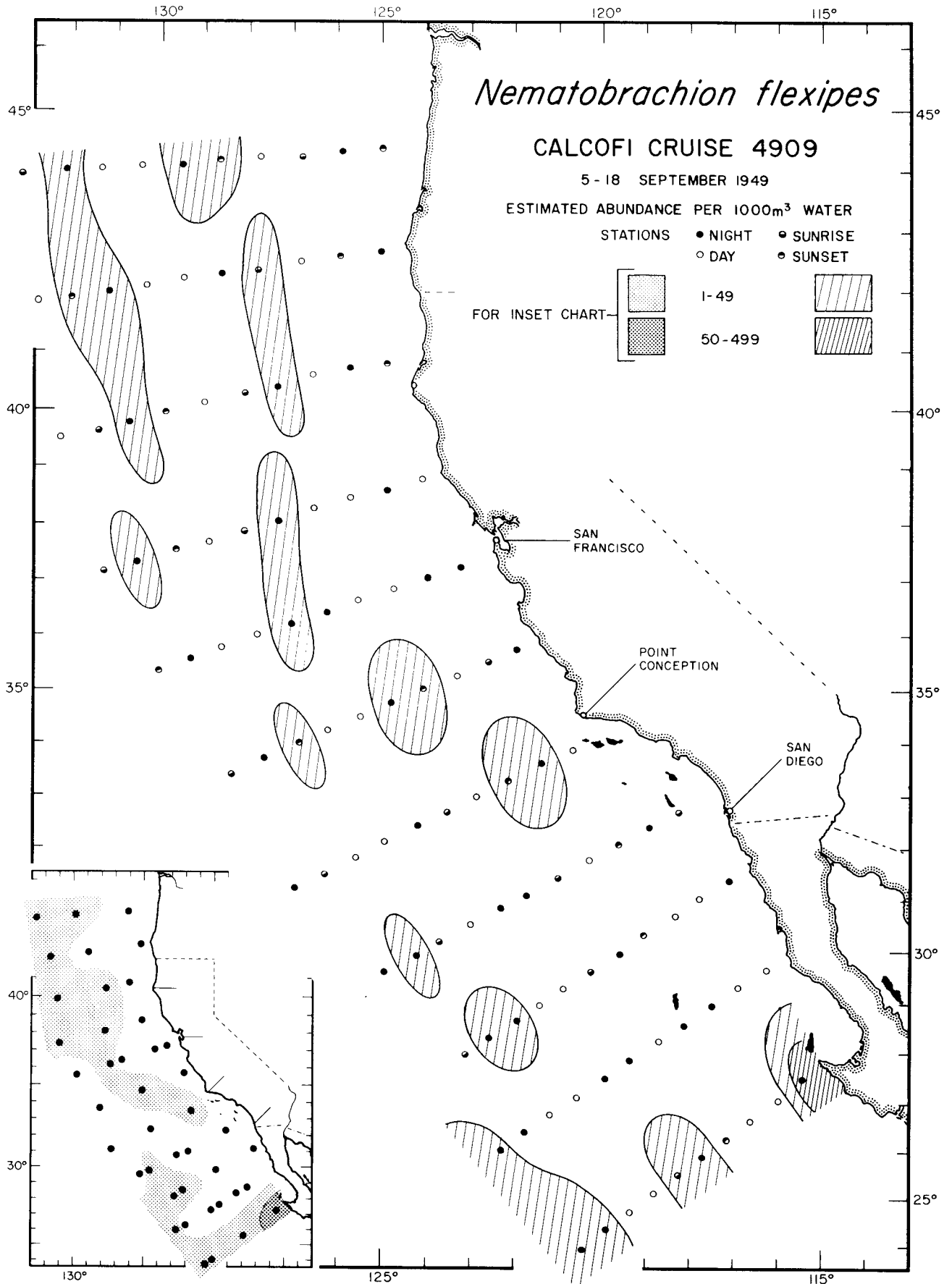
Euphausiacea
Nematobranchion flexipes
4906



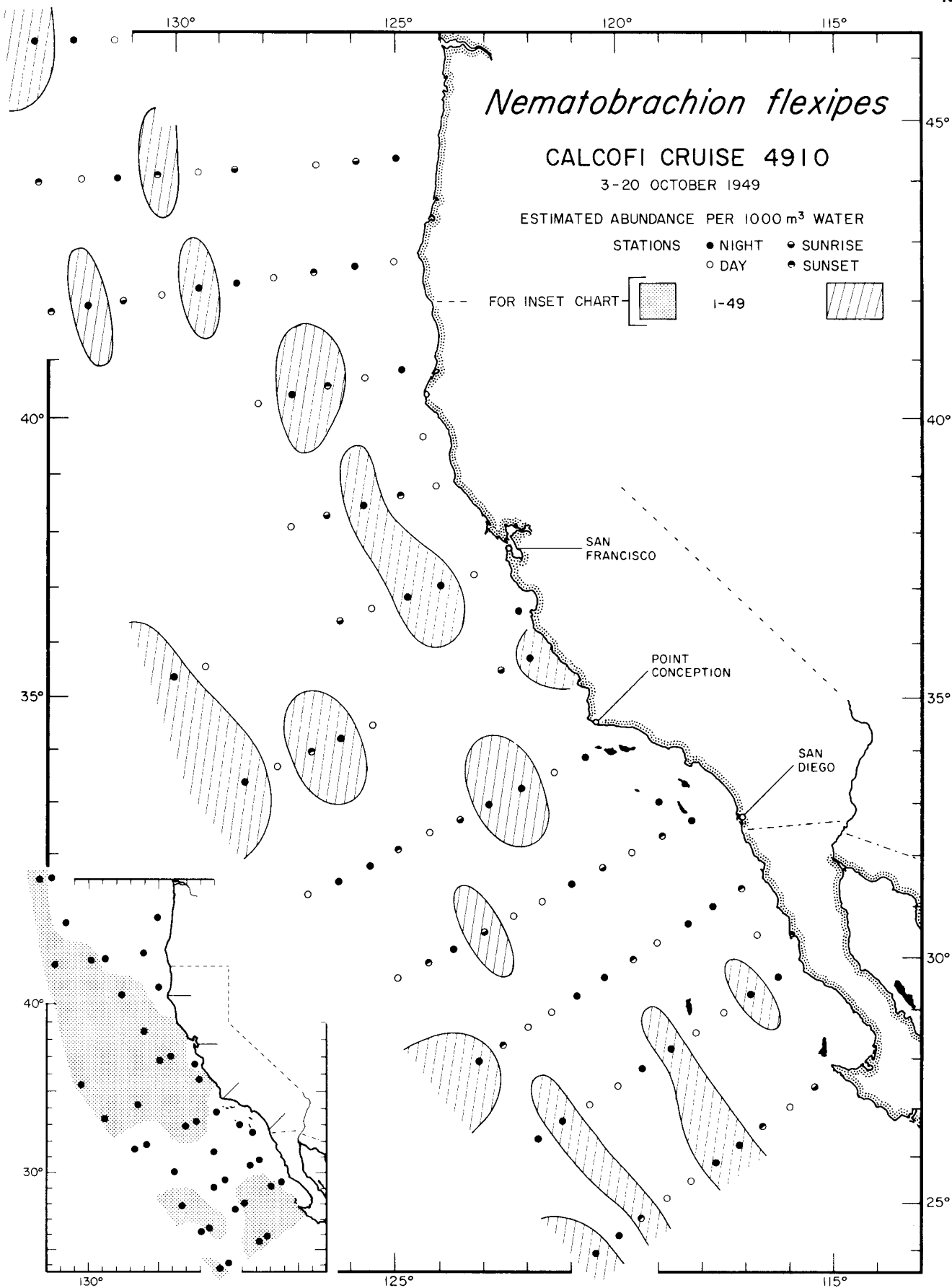
Euphausiacea
Nematobranchion flexipes
4907



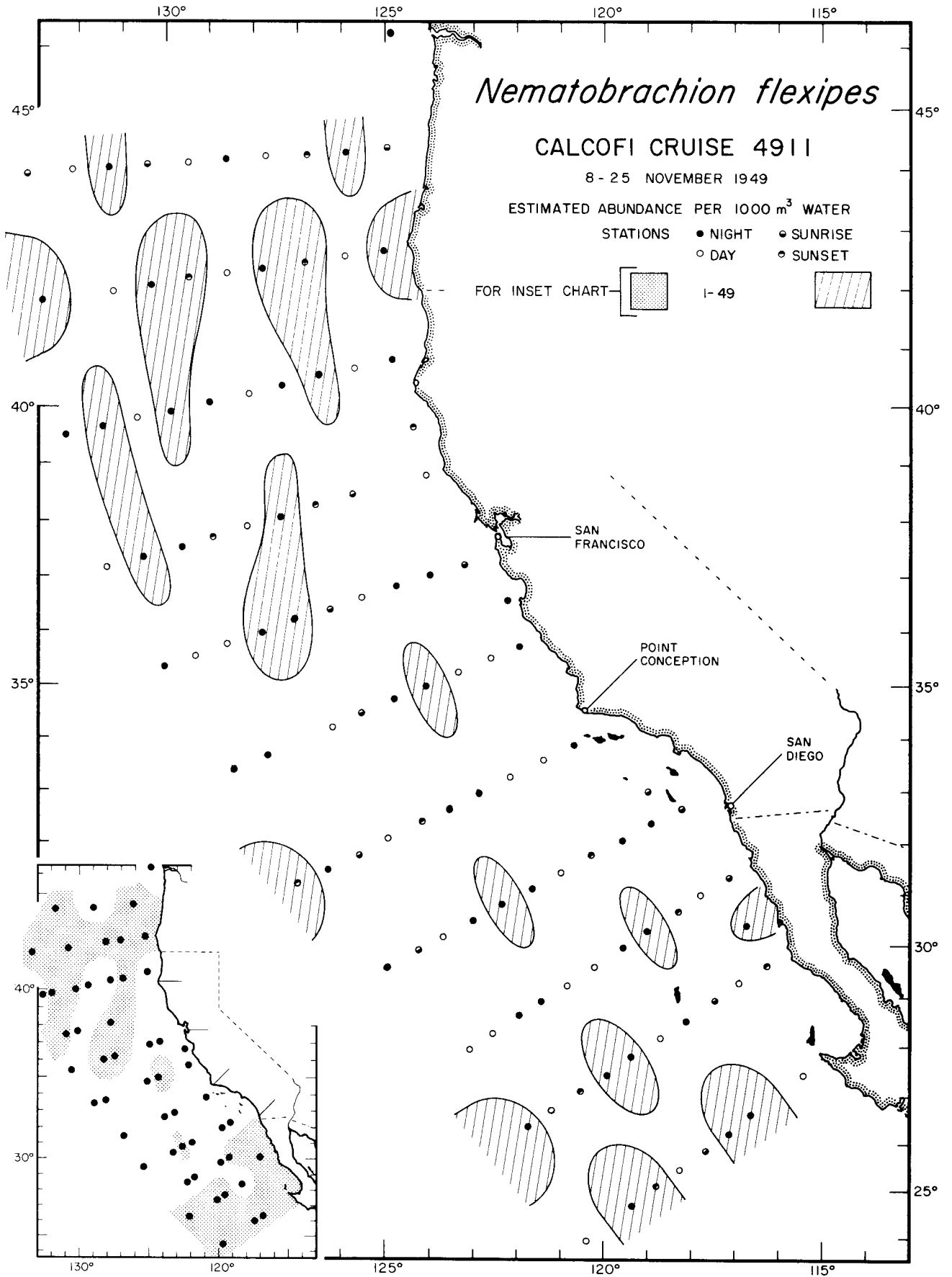
Euphausiacea
Nematobranchion flexipes
4908



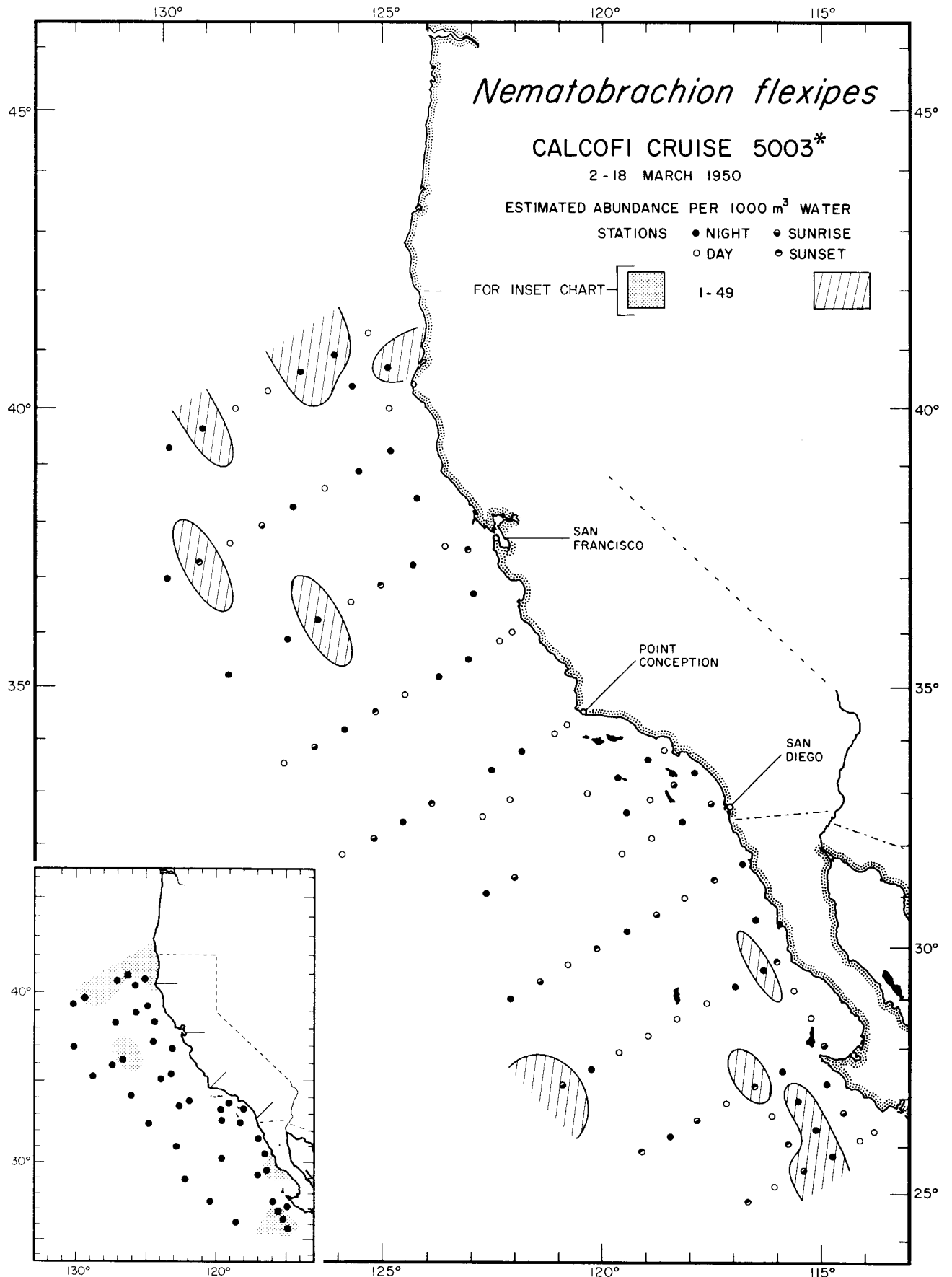
Euphausiacea
Nematobranchion flexipes
4909



Euphausiacea
Nematobranchion flexipes
4910

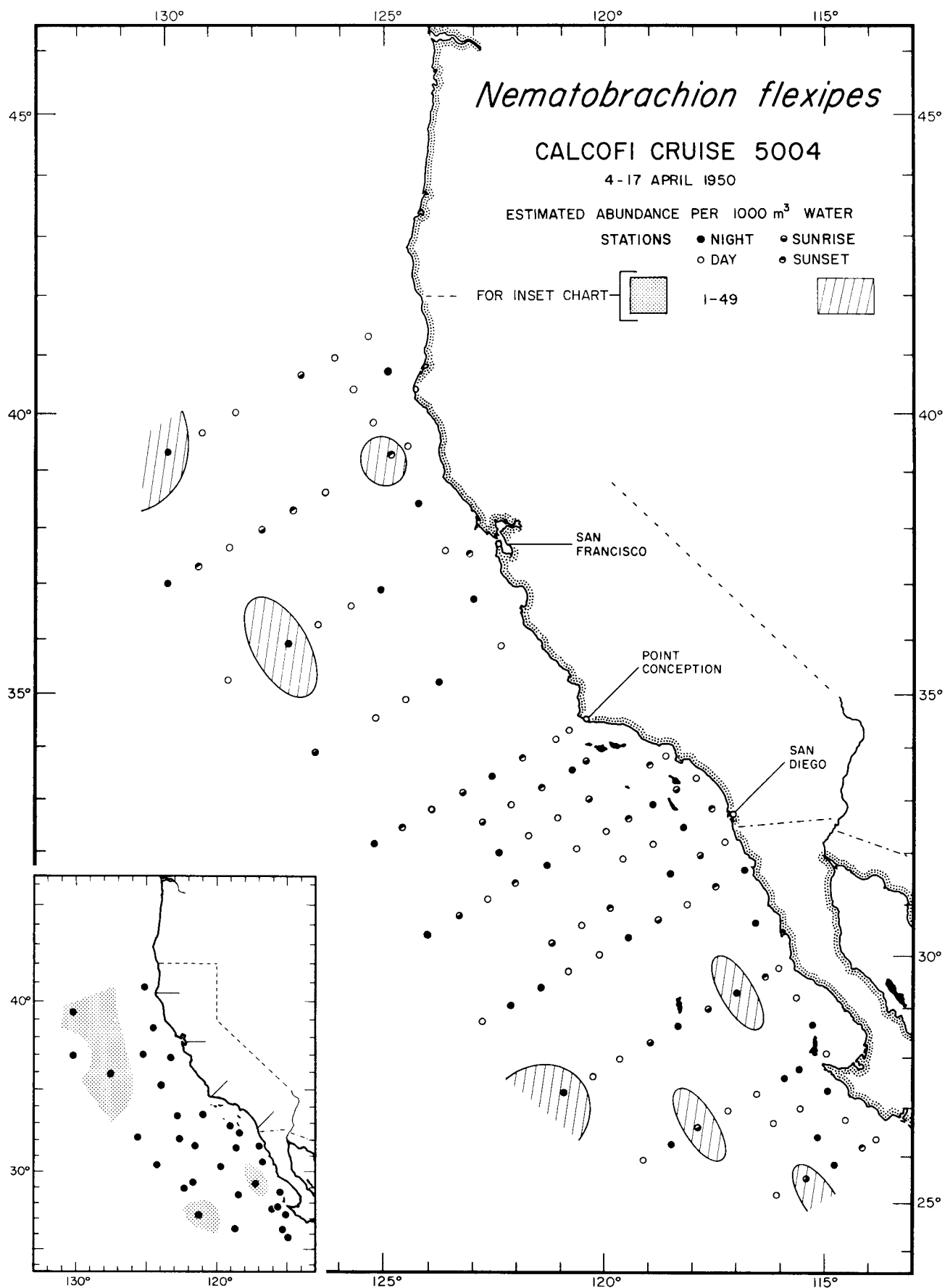


Euphausiacea
Nematobranchion flexipes
4911



* See Table 1 for Cruise 5002

Euphausiacea
Nematobranchion flexipes
5003



Euphausiacea
Nematobranchion flexipes
5004

Nematobranchion flexipes

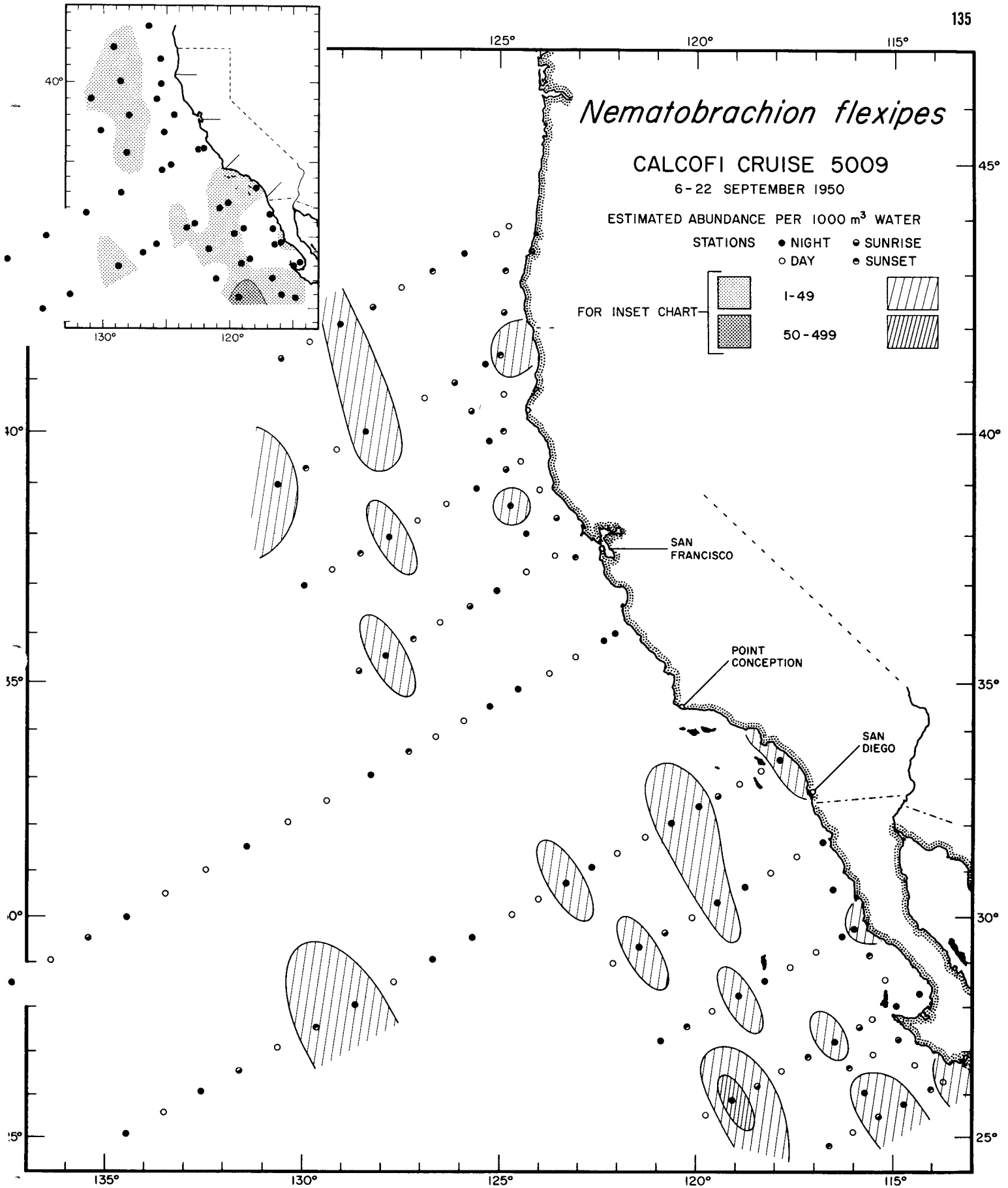
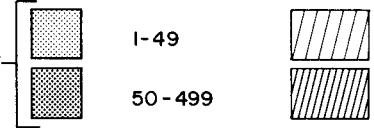
CALCOFI CRUISE 5009

6-22 SEPTEMBER 1950

ESTIMATED ABUNDANCE PER 1000 m³ WATER

STATIONS ● NIGHT ○ SUNRISE
○ DAY ● SUNSET

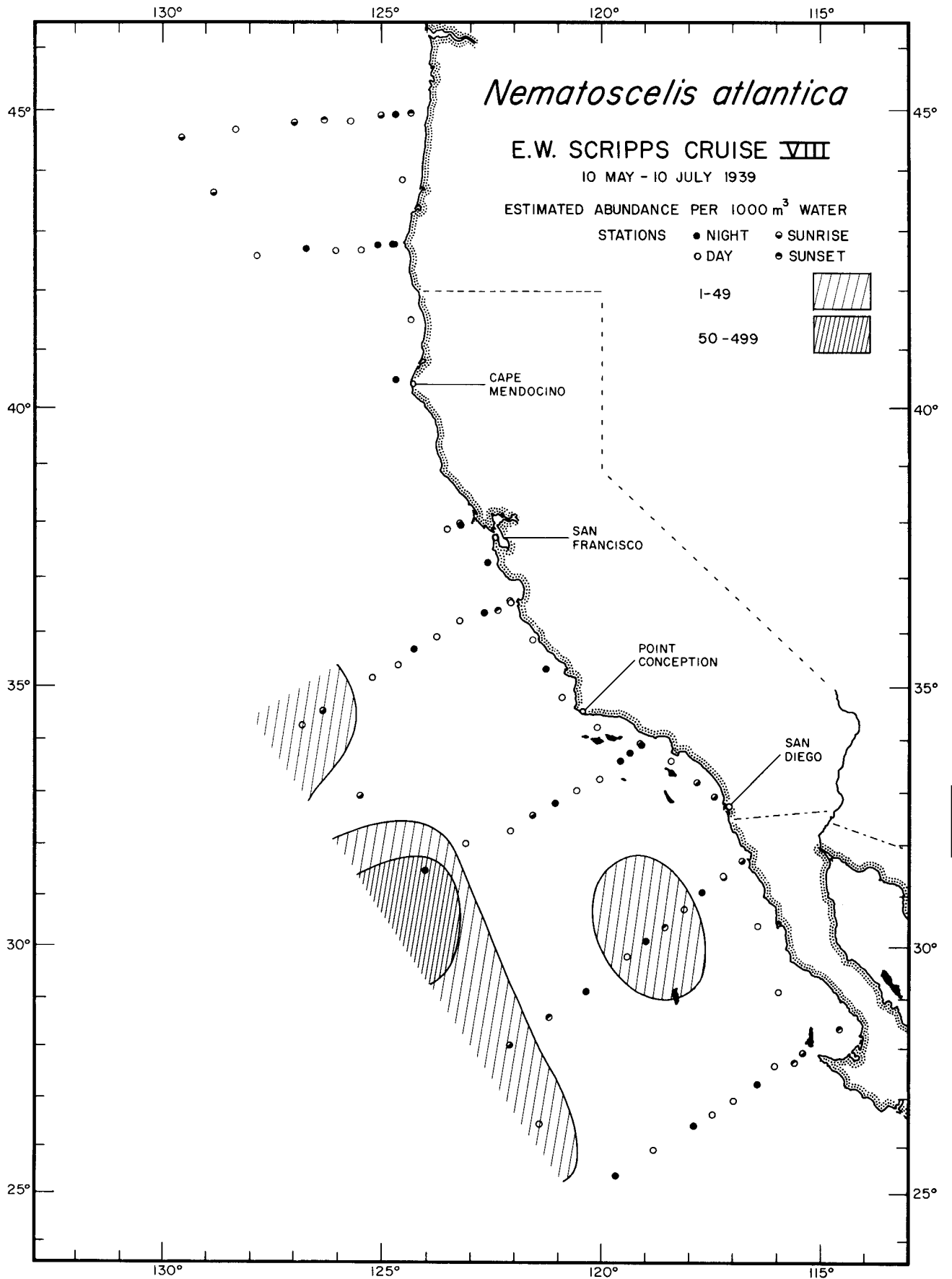
FOR INSET CHART



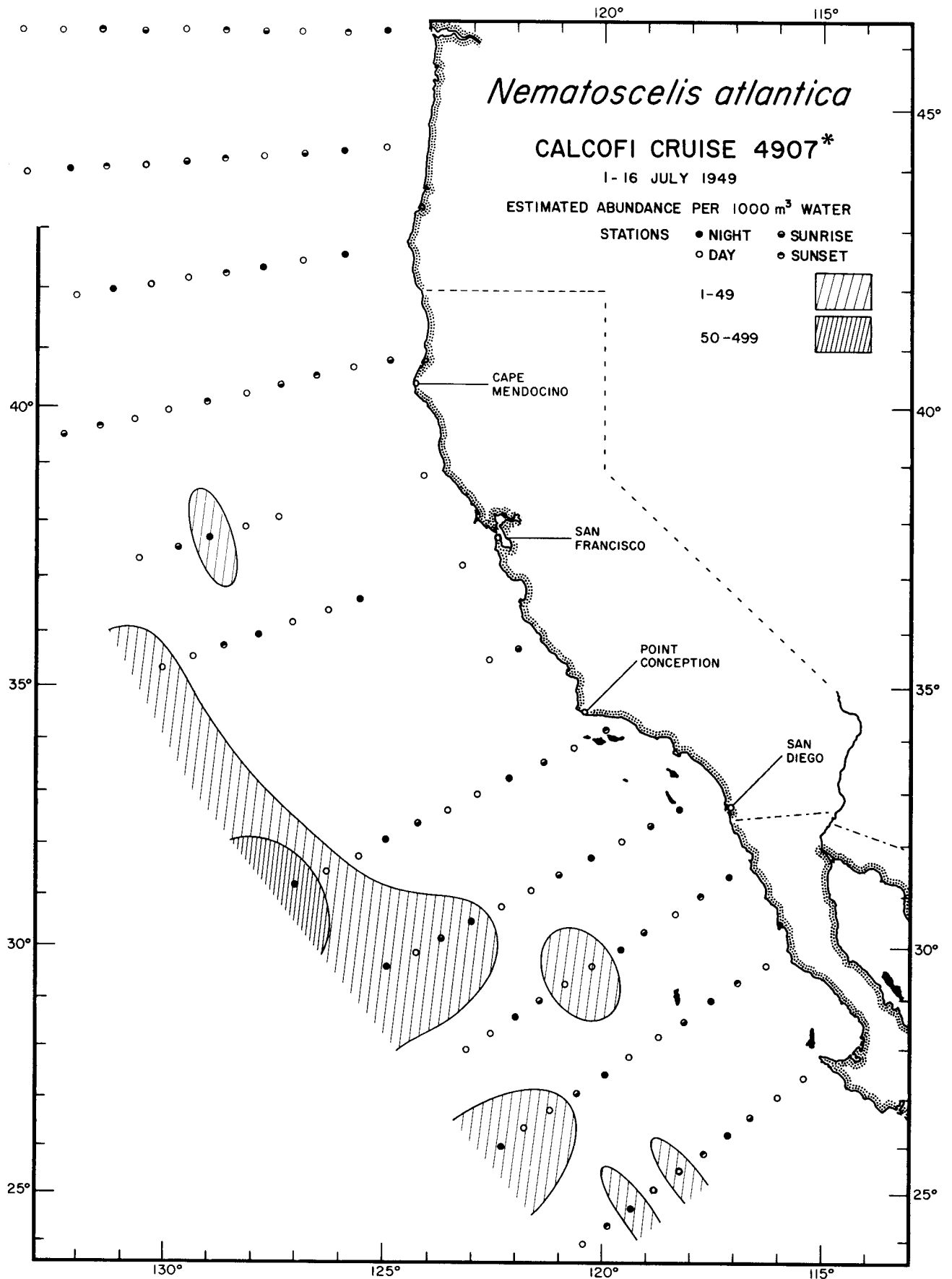
Euphausiacea

Nematobranchion flexipes

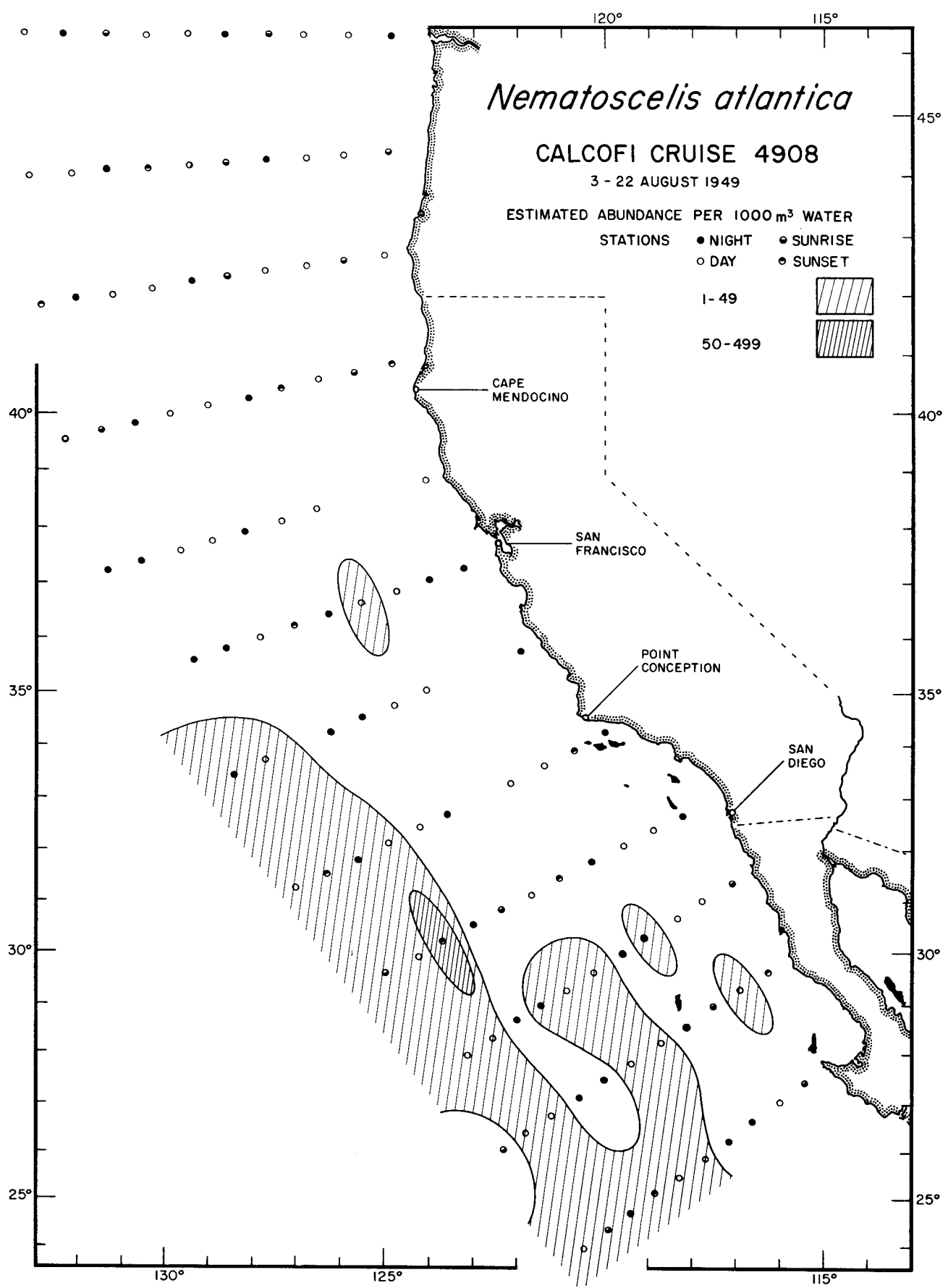
5009



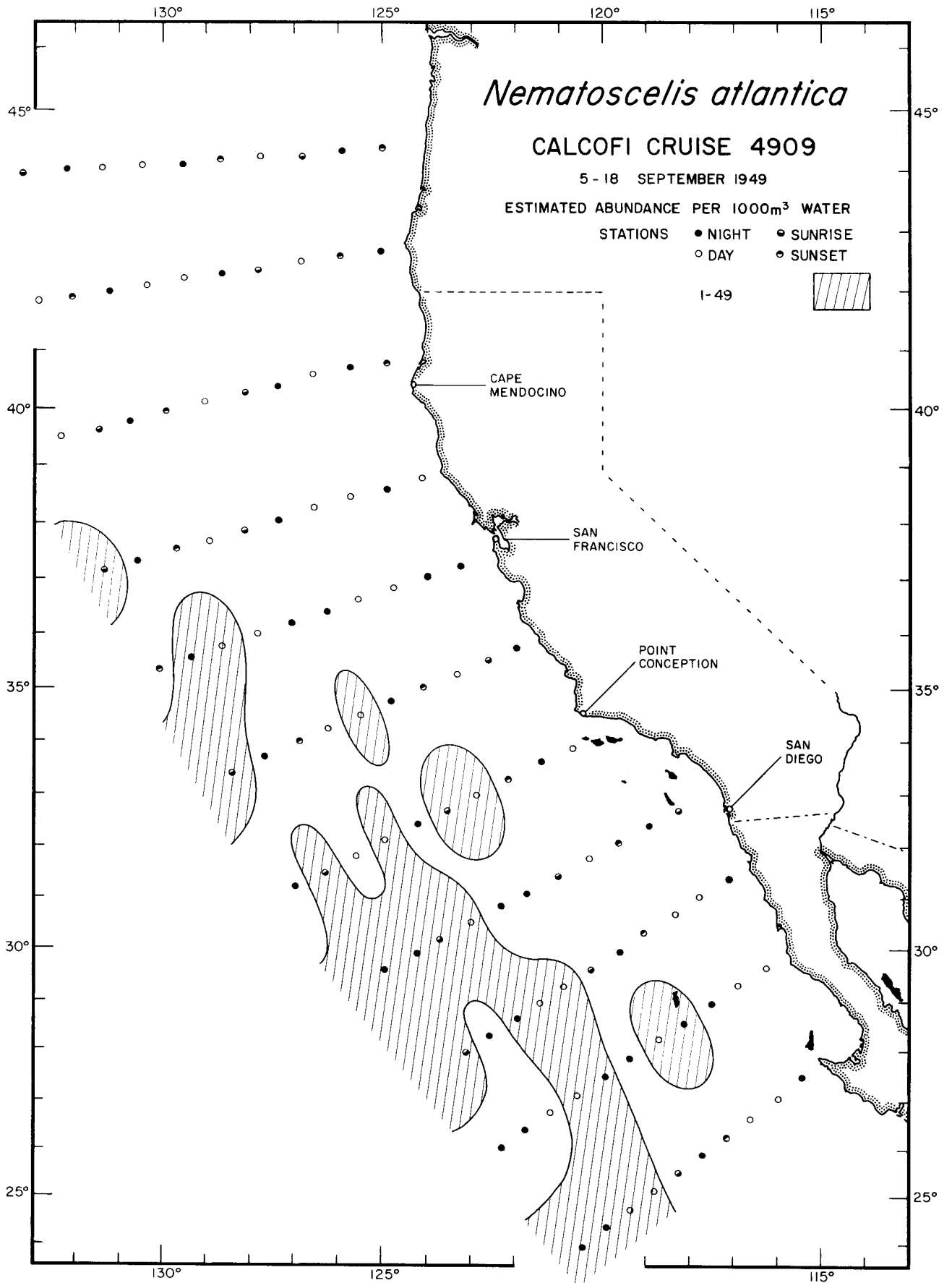
Euphausiacea
Nematoscelis atlantica
E. W. SCRIPPS CRUISE VIII



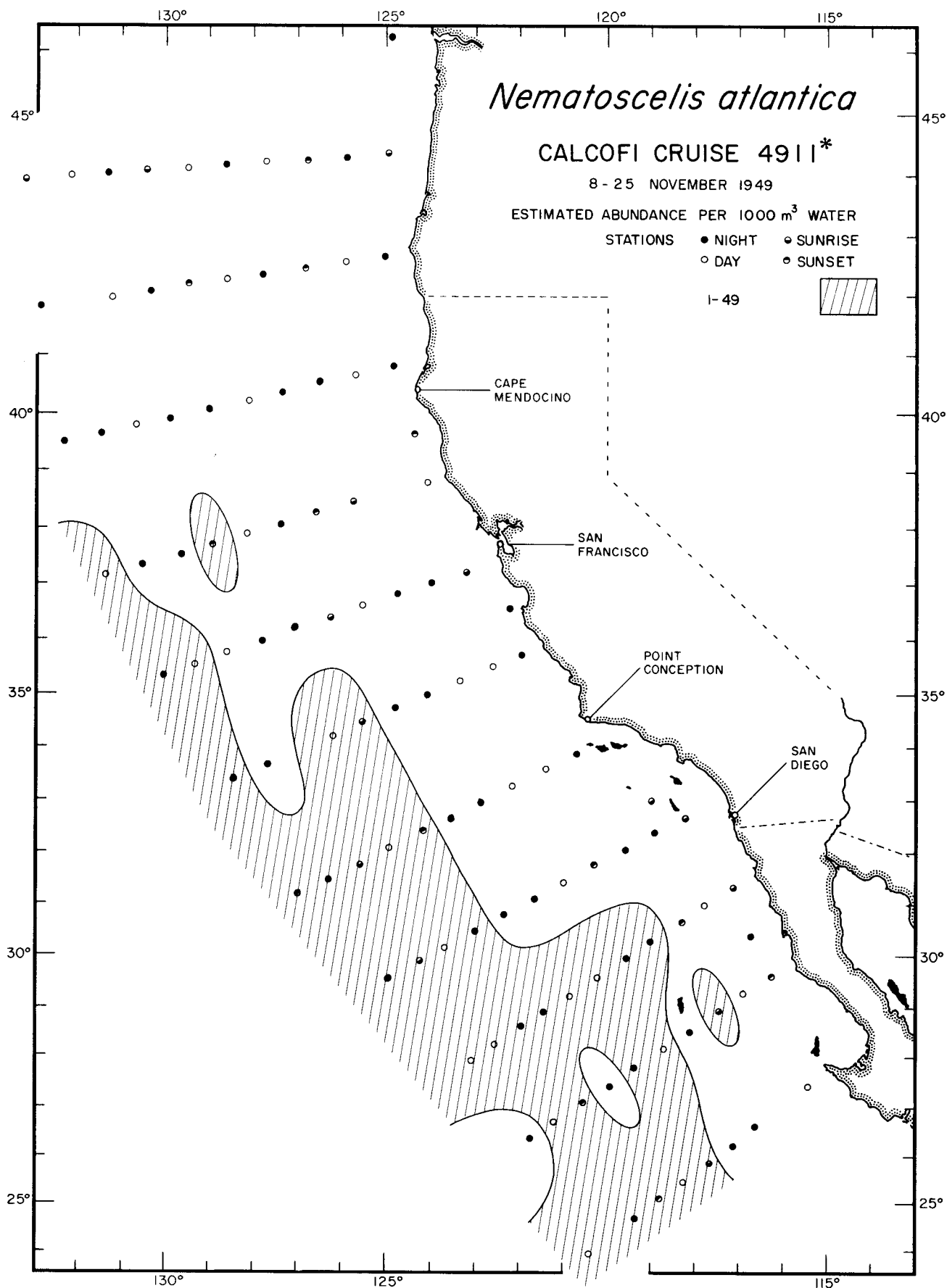
* See Table 1 for Cruises 4903, 4, 5, 6



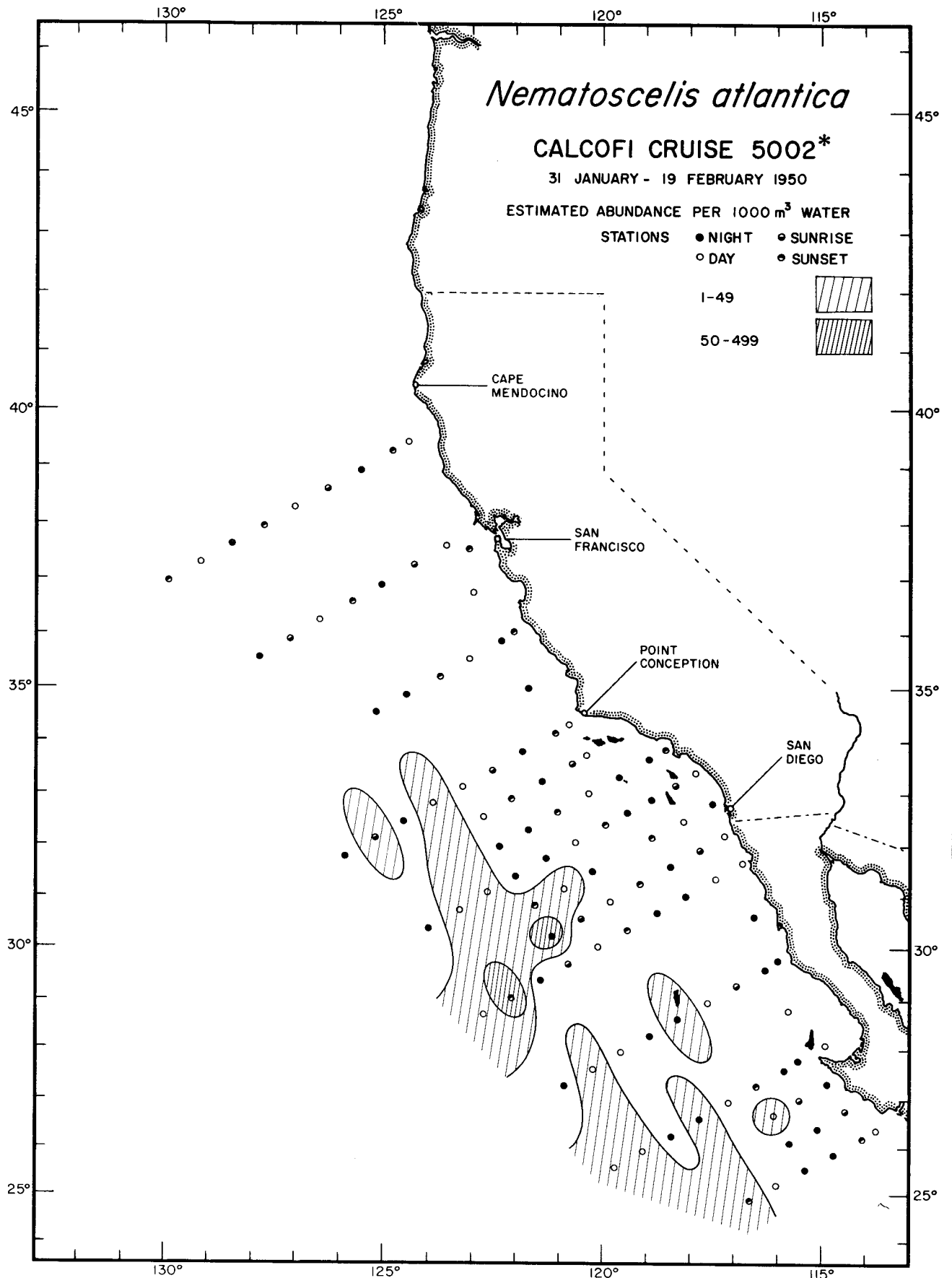
Euphausiacea
Nematoscelis atlantica
4908



Euphausiacea
Nematoscelis atlantica
4909



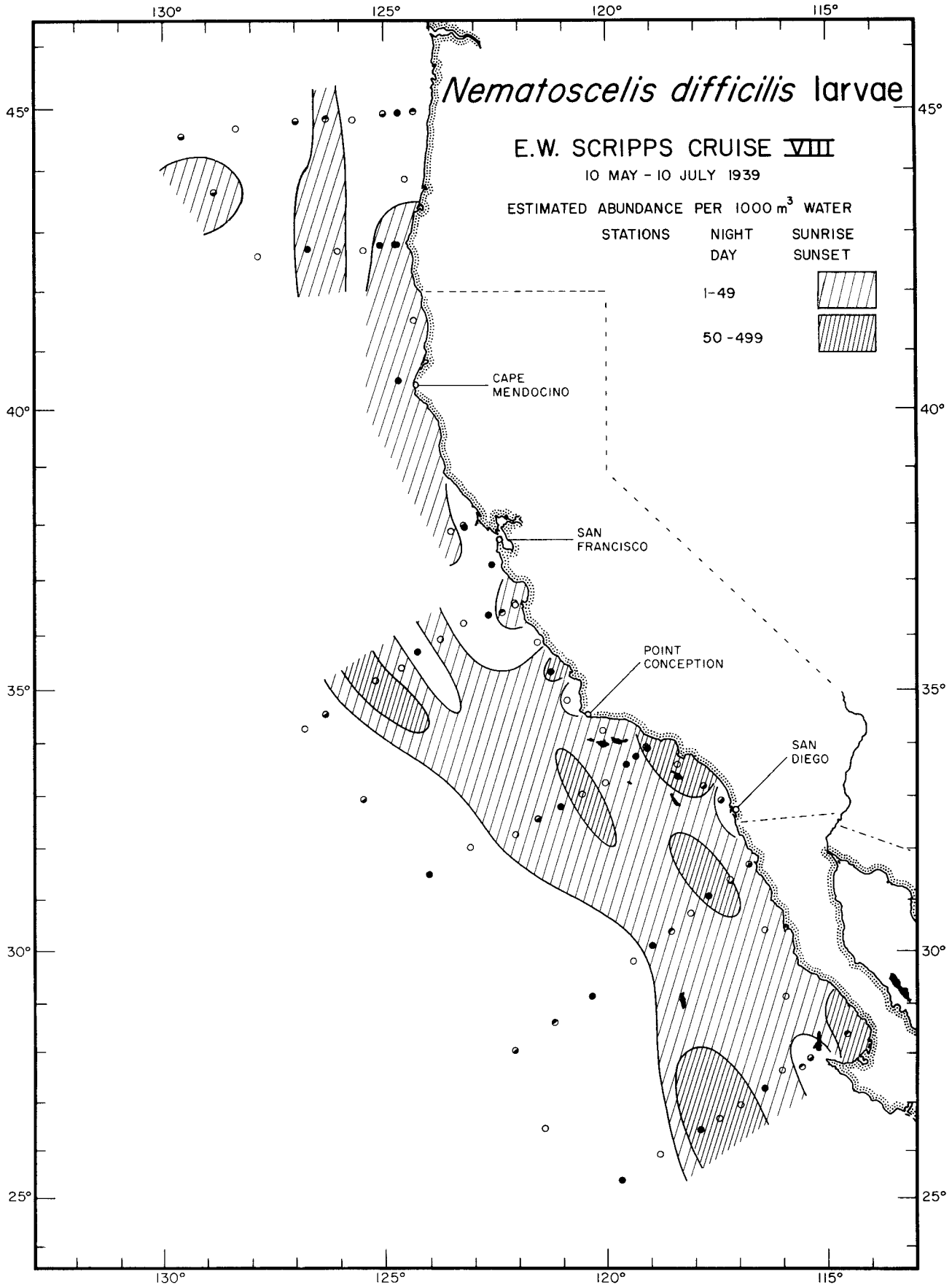
* See Table 1 for Cruise 4910



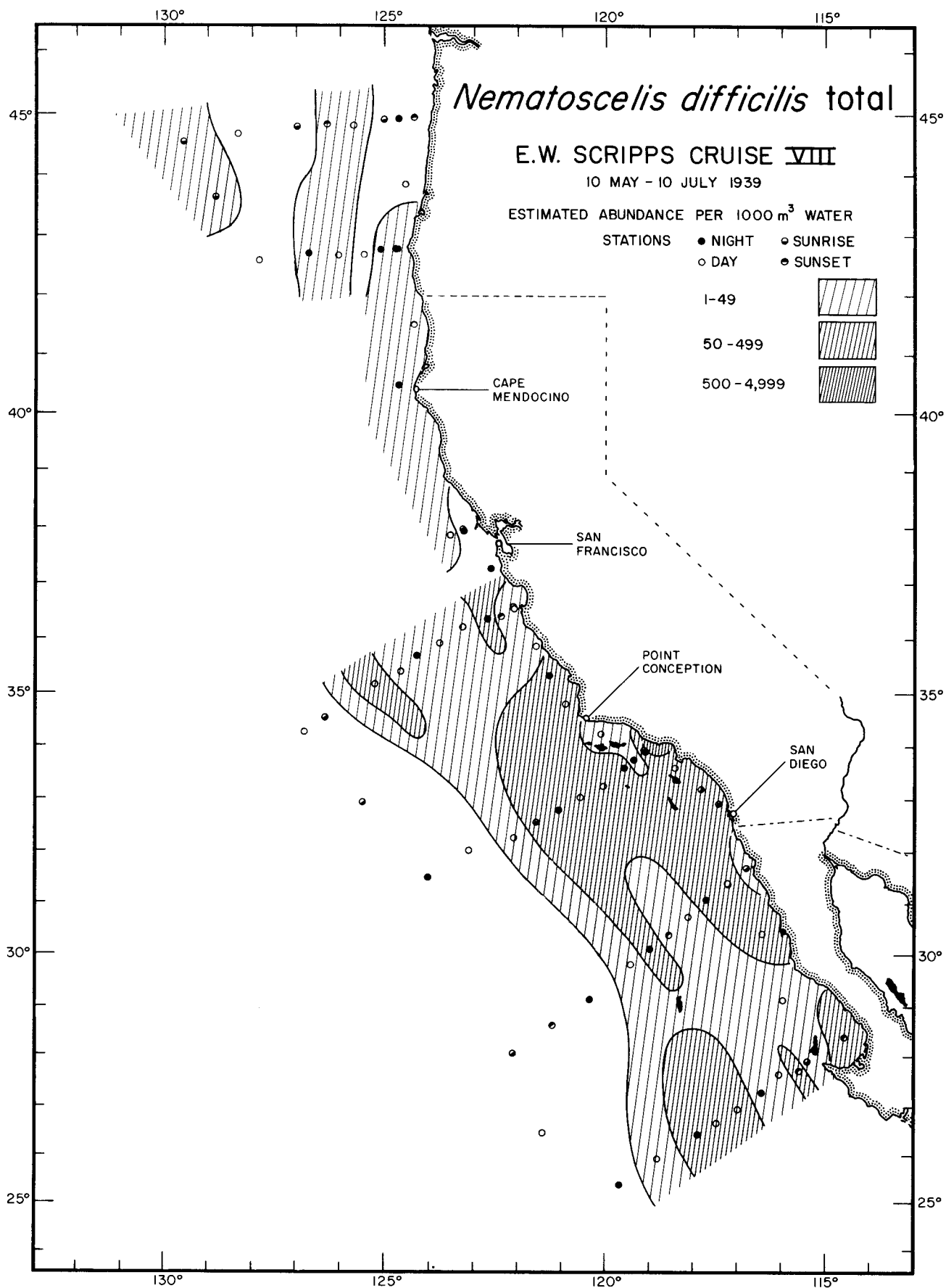
* See Table 1 for Cruises 5003, 4, 9

Euphausiacea
Nematoscelis atlantica

5002



Euphausiacea
Nematoscelis difficilis larvae
E. W. SCRIPPS CRUISE VIII



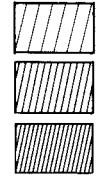
Nematoscelis difficilis total

E.W. SCRIPPS CRUISE VII
10 MAY - 10 JULY 1939

ESTIMATED ABUNDANCE PER 1000 m³ WATER

STATIONS ● NIGHT ○ SUNRISE
○ DAY ○ SUNSET

1-49
50-499
500-4,999



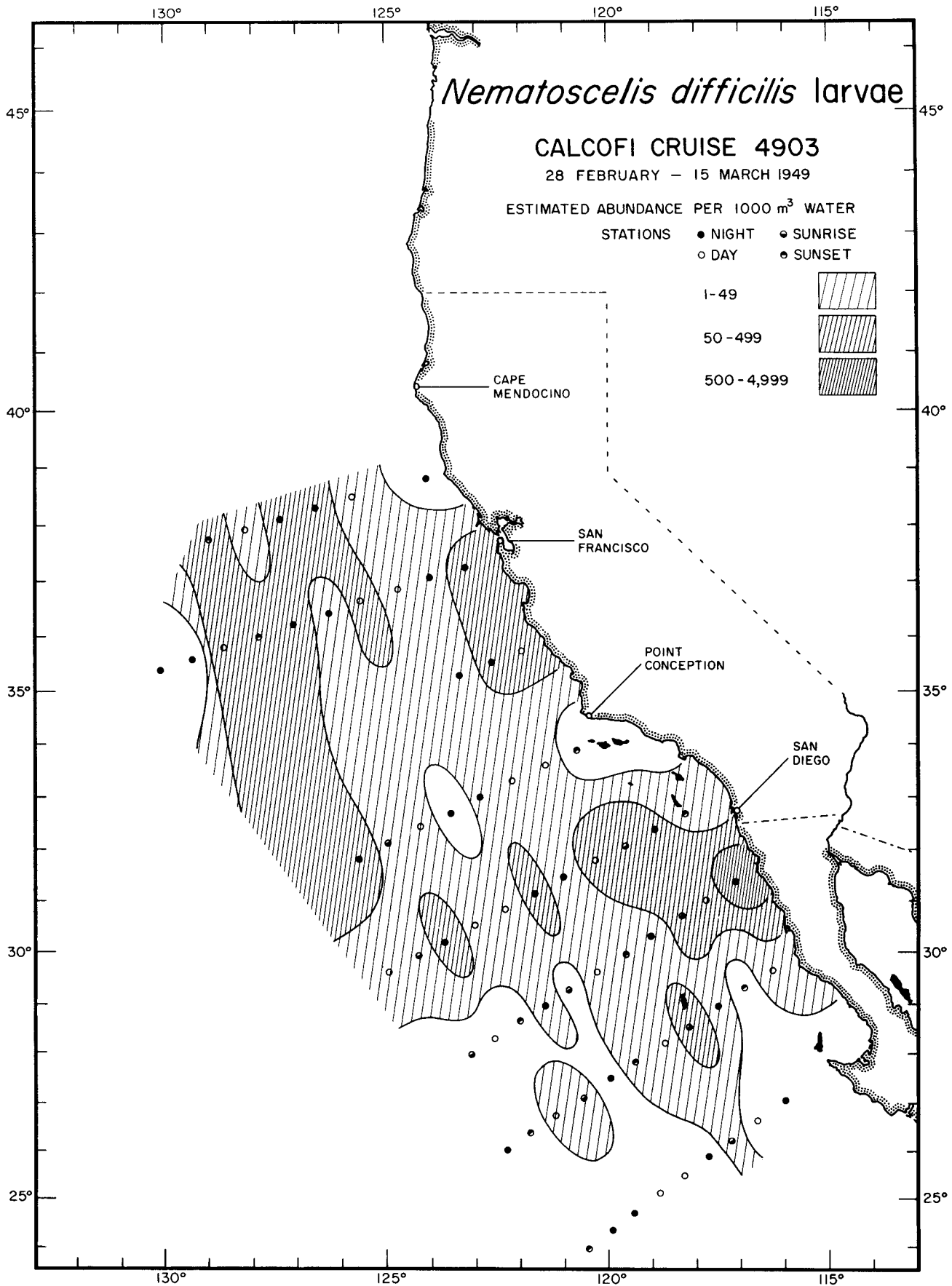
CAPE MENDOCINO

SAN FRANCISCO

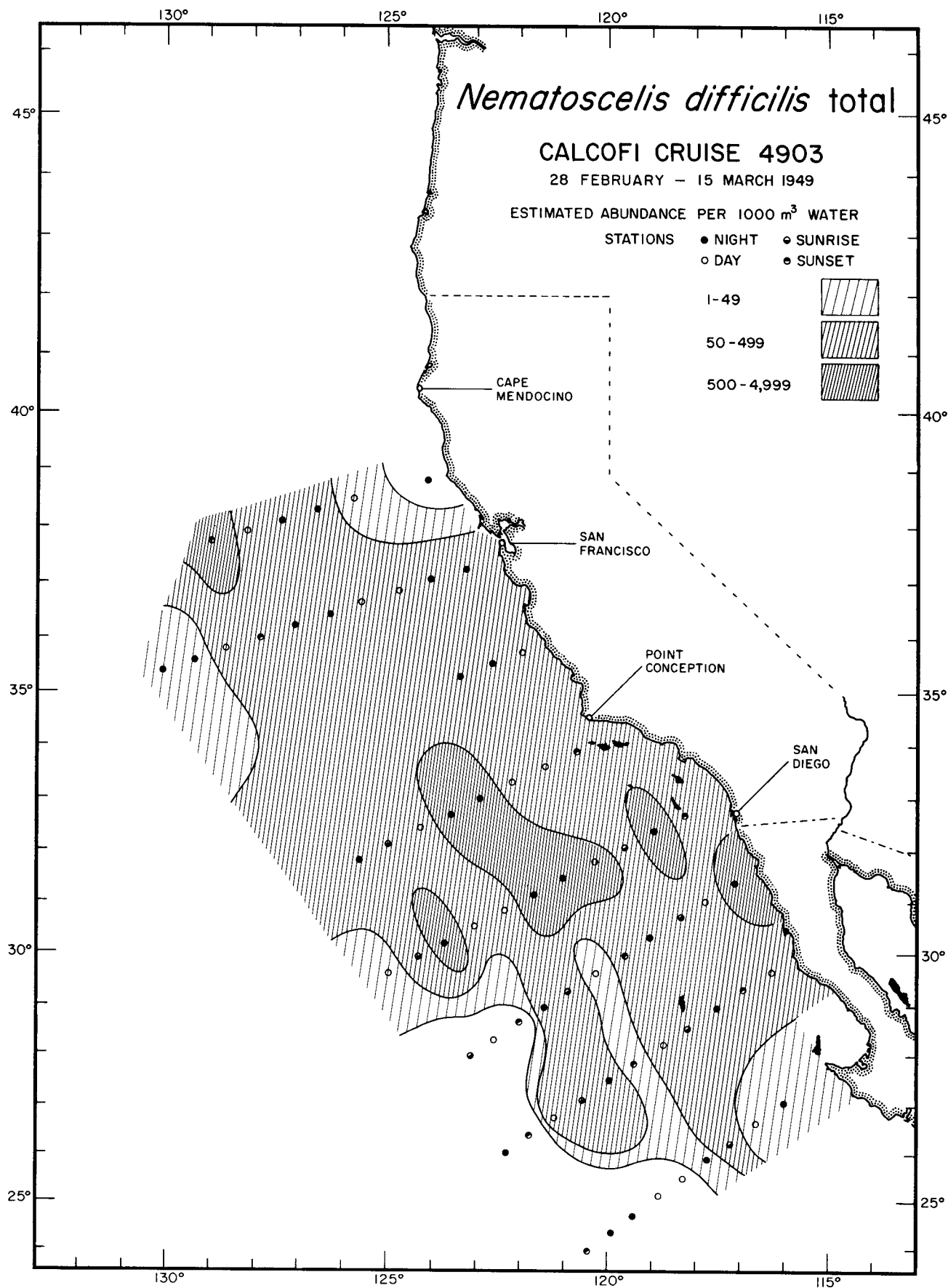
POINT CONCEPTION

SAN DIEGO

Euphausiacea
Nematoscelis difficilis total
E.W. SCRIPPS CRUISE VII



Euphausiacea
Nematoscelis difficilis larvae
4903



Nematoscelis difficilis total

CALCOFI CRUISE 4903

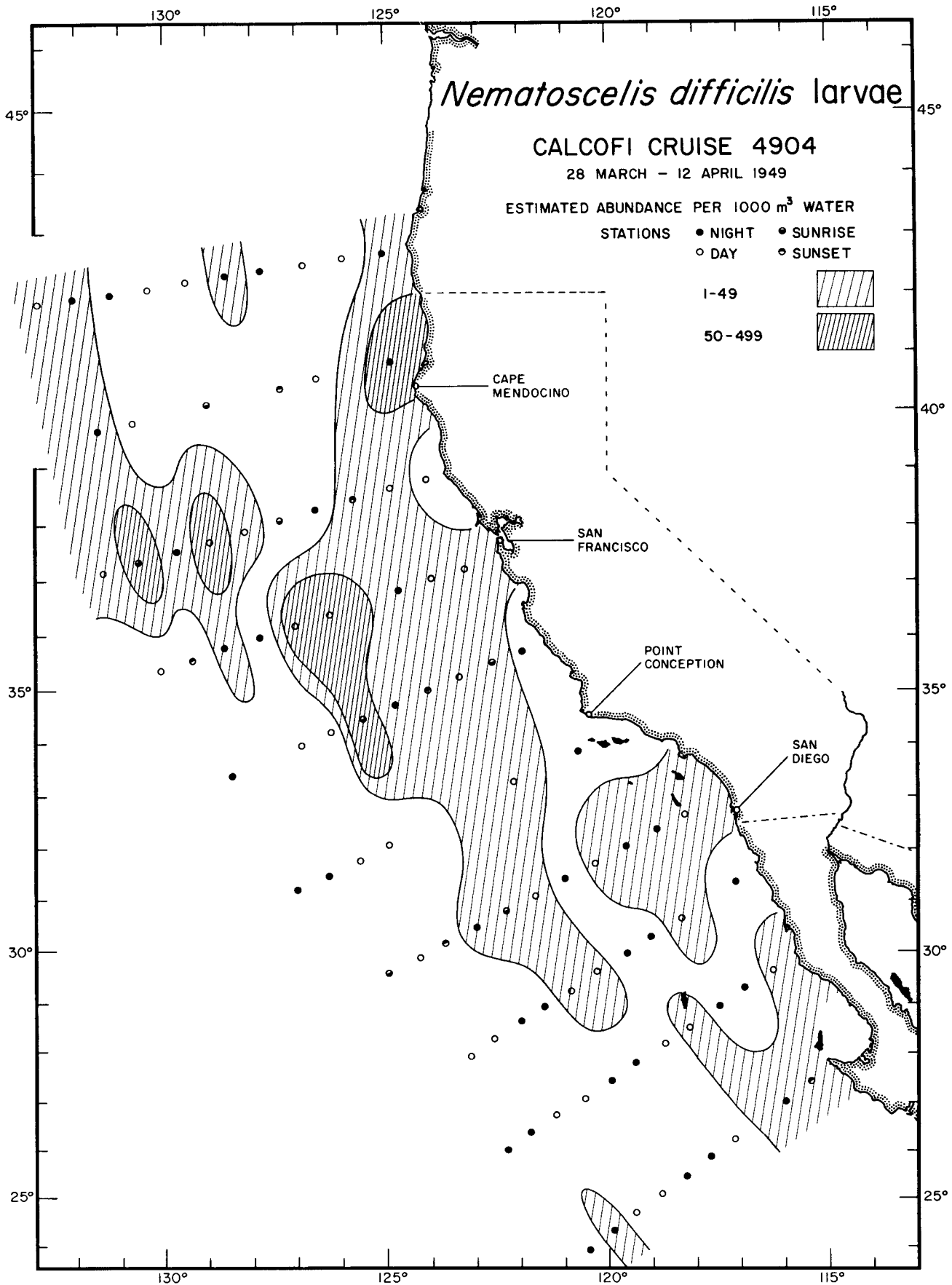
28 FEBRUARY - 15 MARCH 1949

ESTIMATED ABUNDANCE PER 1000 m³ WATER

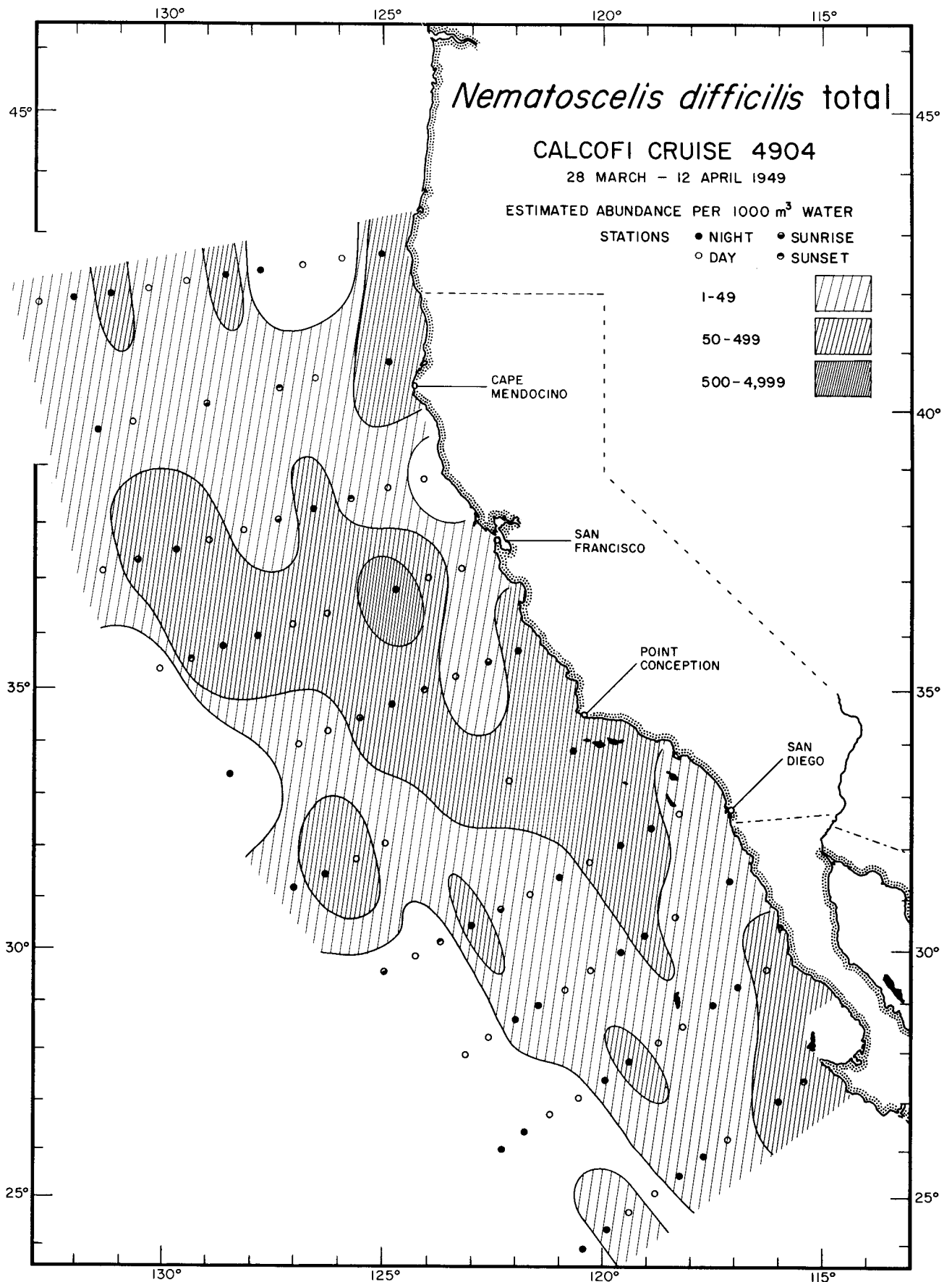
STATIONS ● NIGHT ○ SUNRISE
○ DAY ● SUNSET

1-49 [diagonal lines]
50-499 [cross-hatch]
500-4,999 [vertical lines]

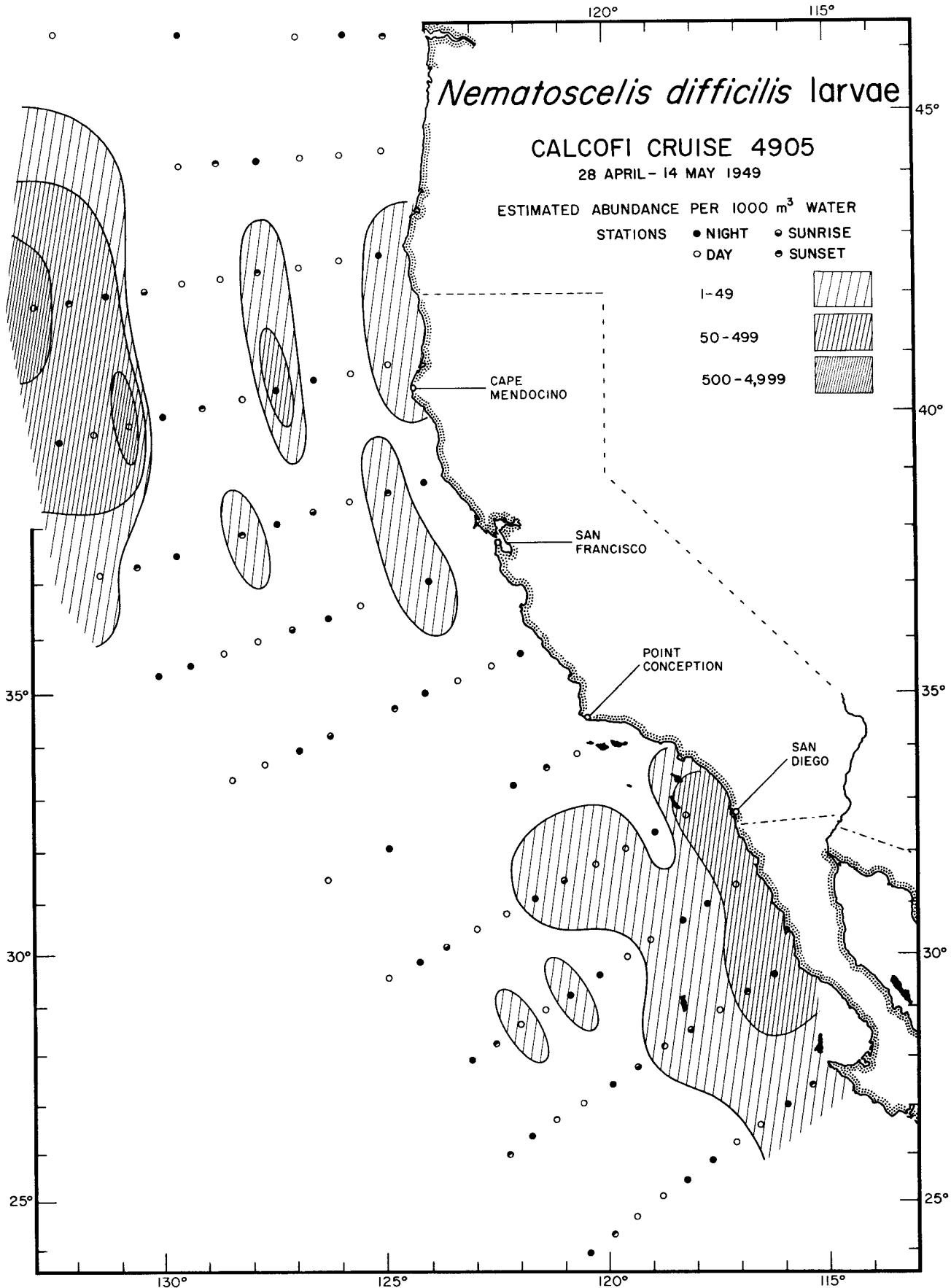
Euphausiacea
Nematoscelis difficilis total
4903



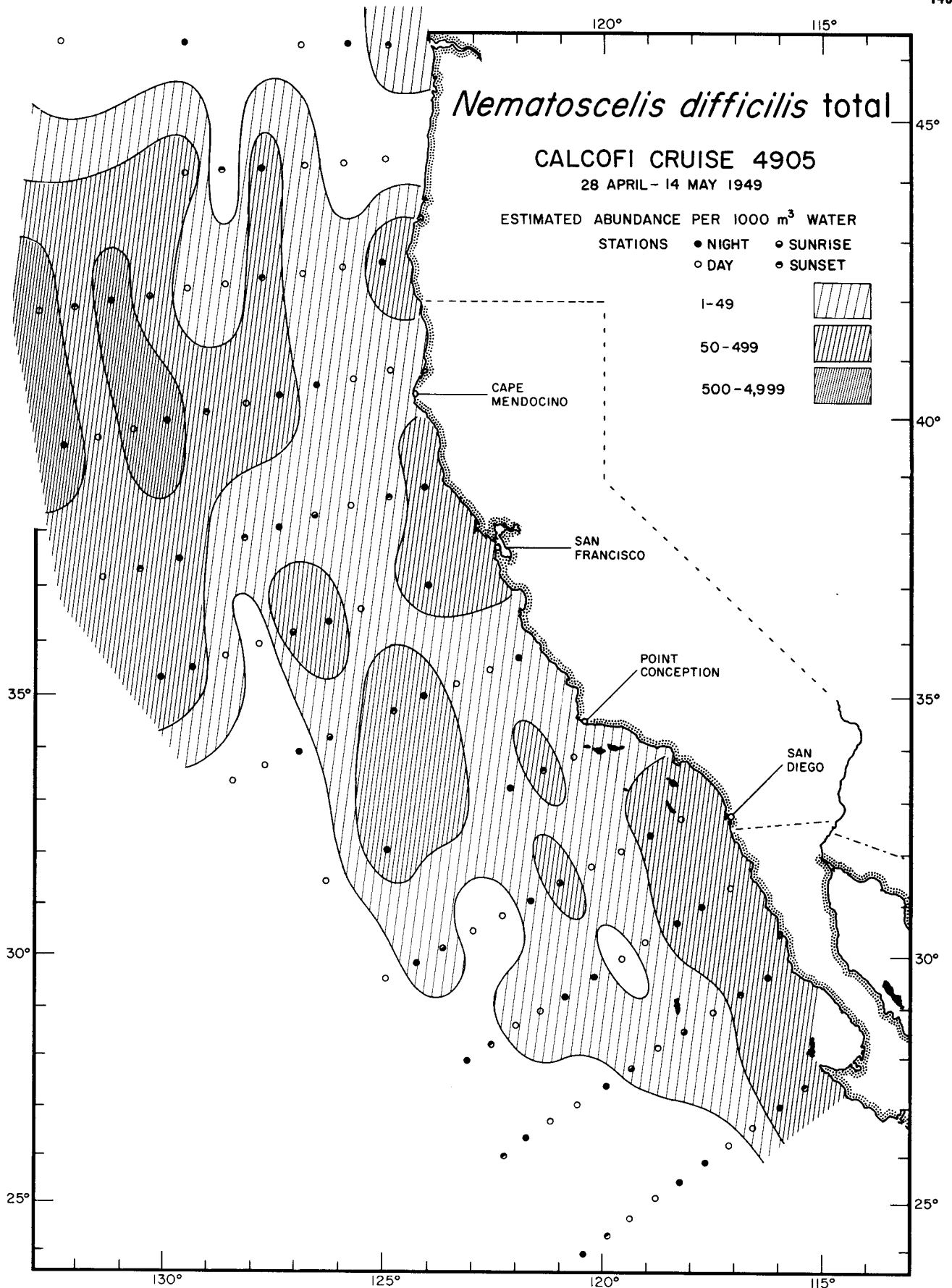
Euphausiacea
Nematoscelis difficilis larvae
4904



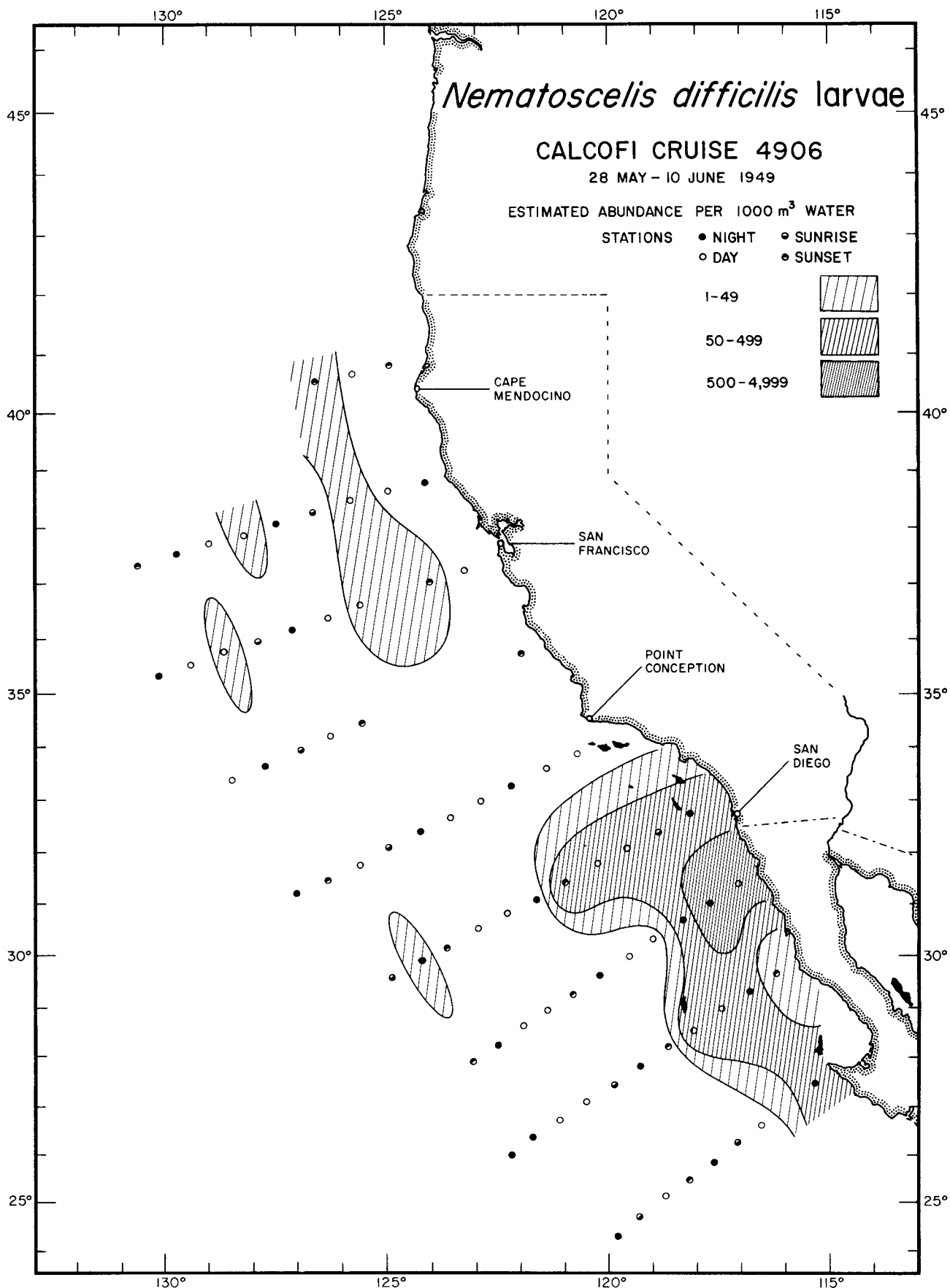
Euphausiacea
Nematoscelis difficilis total
4904



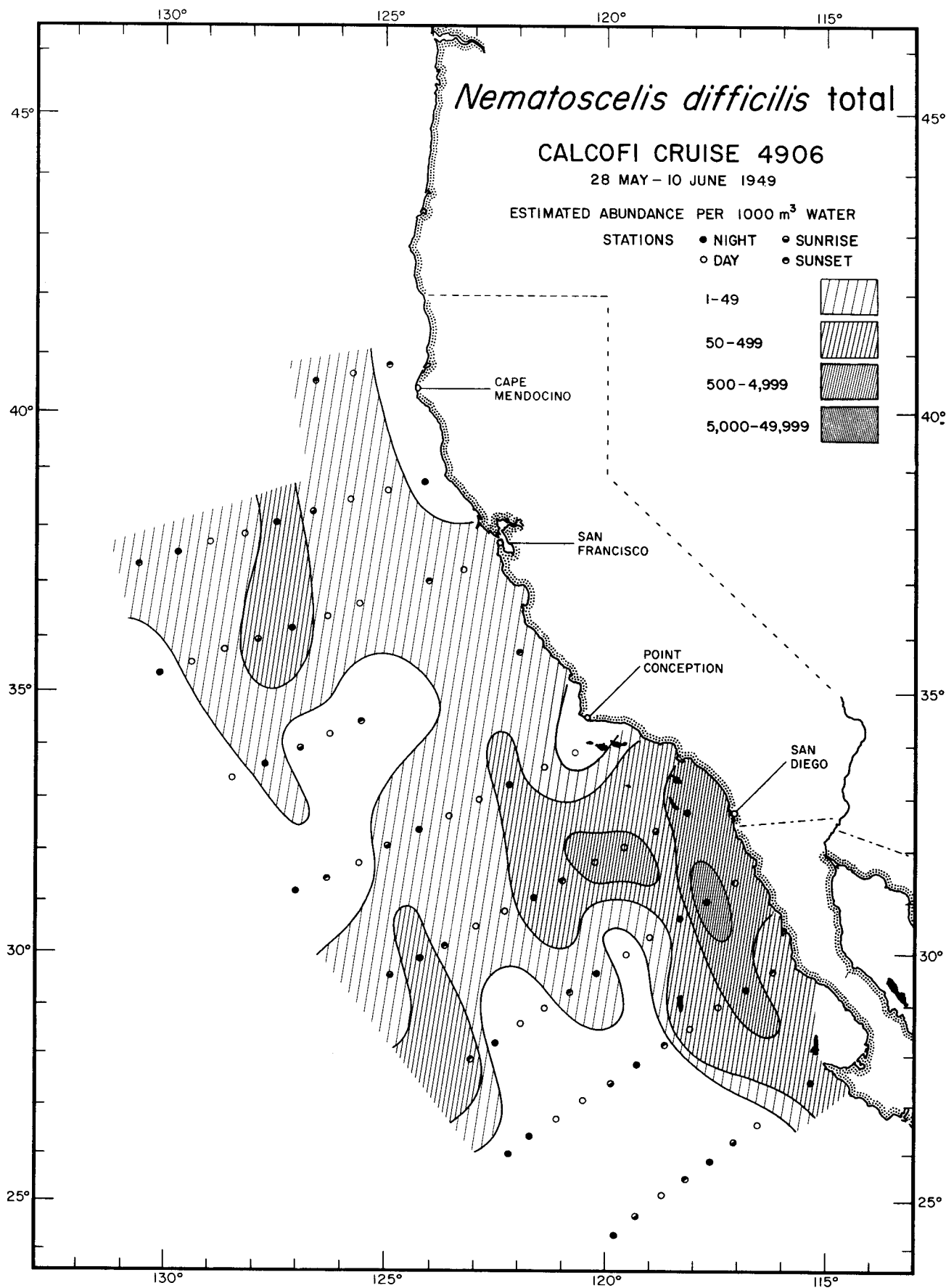
Euphausiacea
Nematoscelis difficilis larvae
4905



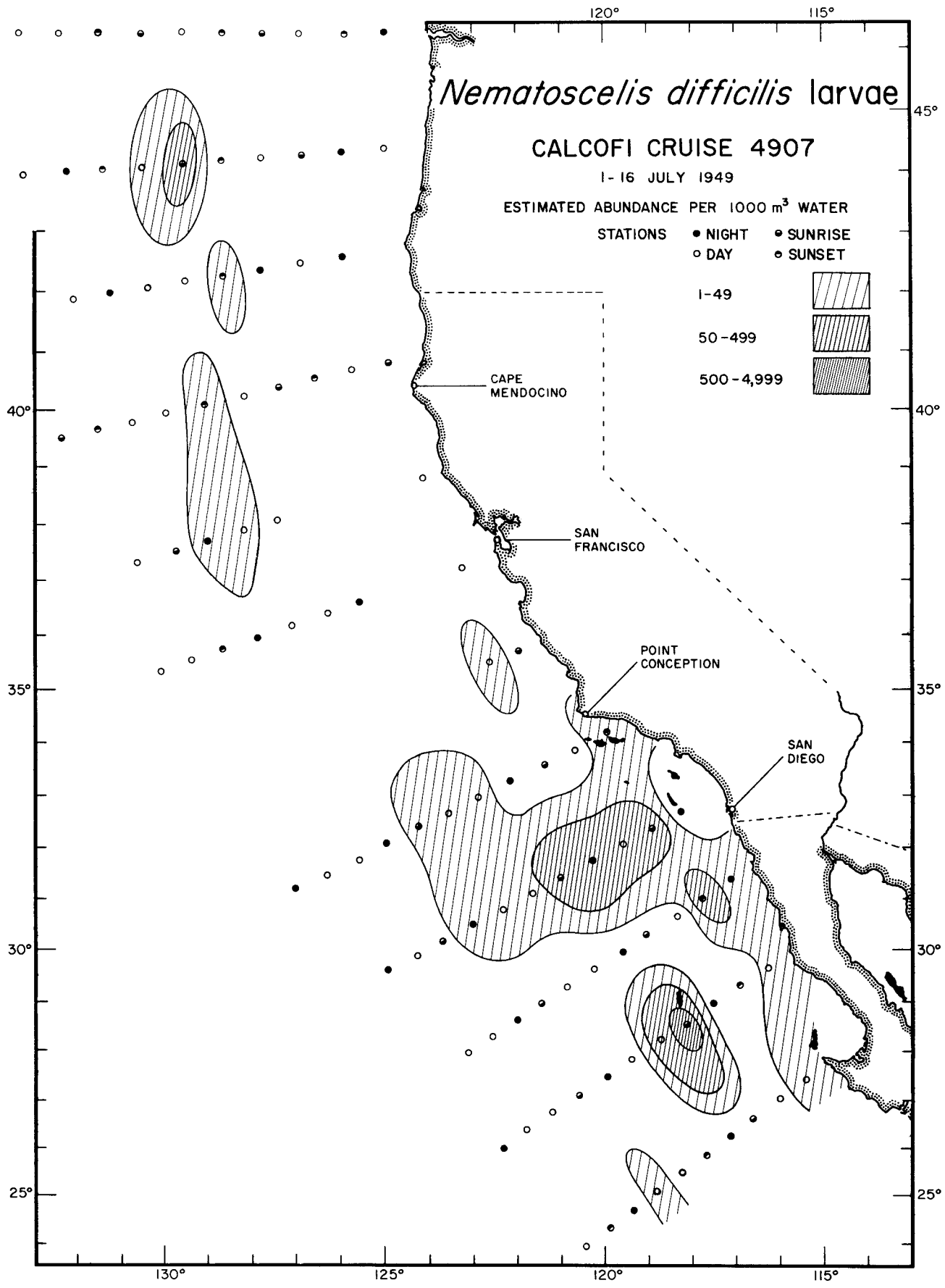
Euphausiacea
Nematoscelis difficilis total
4905



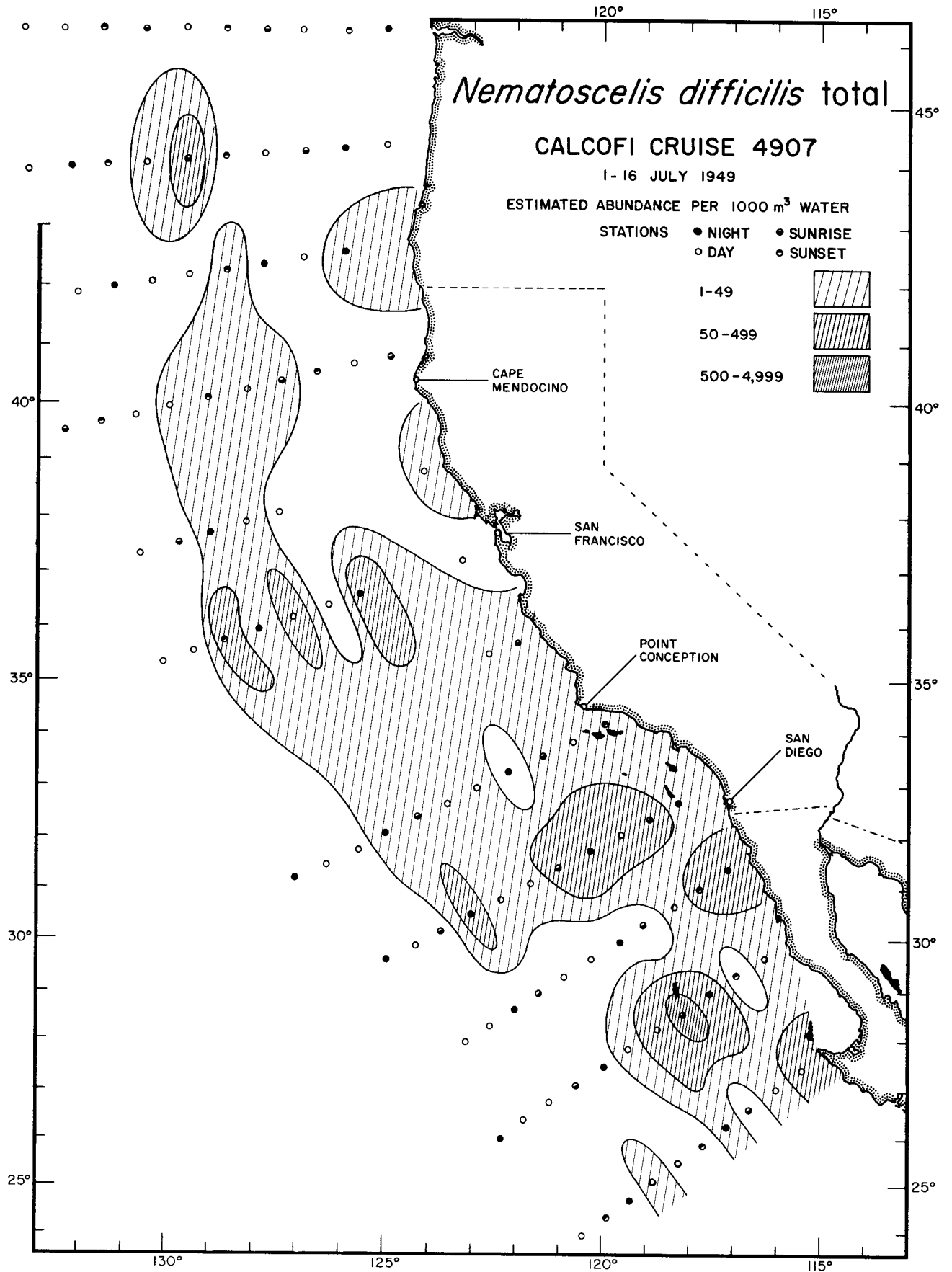
Euphausiacea
Nematoscelis difficilis larvae
4906



Euphausiacea
Nematoscelis difficilis total
4906



Euphausiacea
Nematoscelis difficilis larvae
4907



Nematoscelis difficilis total

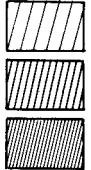
CALCOFI CRUISE 4907

1-16 JULY 1949

ESTIMATED ABUNDANCE PER 1000 m³ WATER

STATIONS ● NIGHT ○ DAY ● SUNRISE ○ SUNSET

1-49
50-499
500-4,999



CAPE MENDOCINO

SAN FRANCISCO

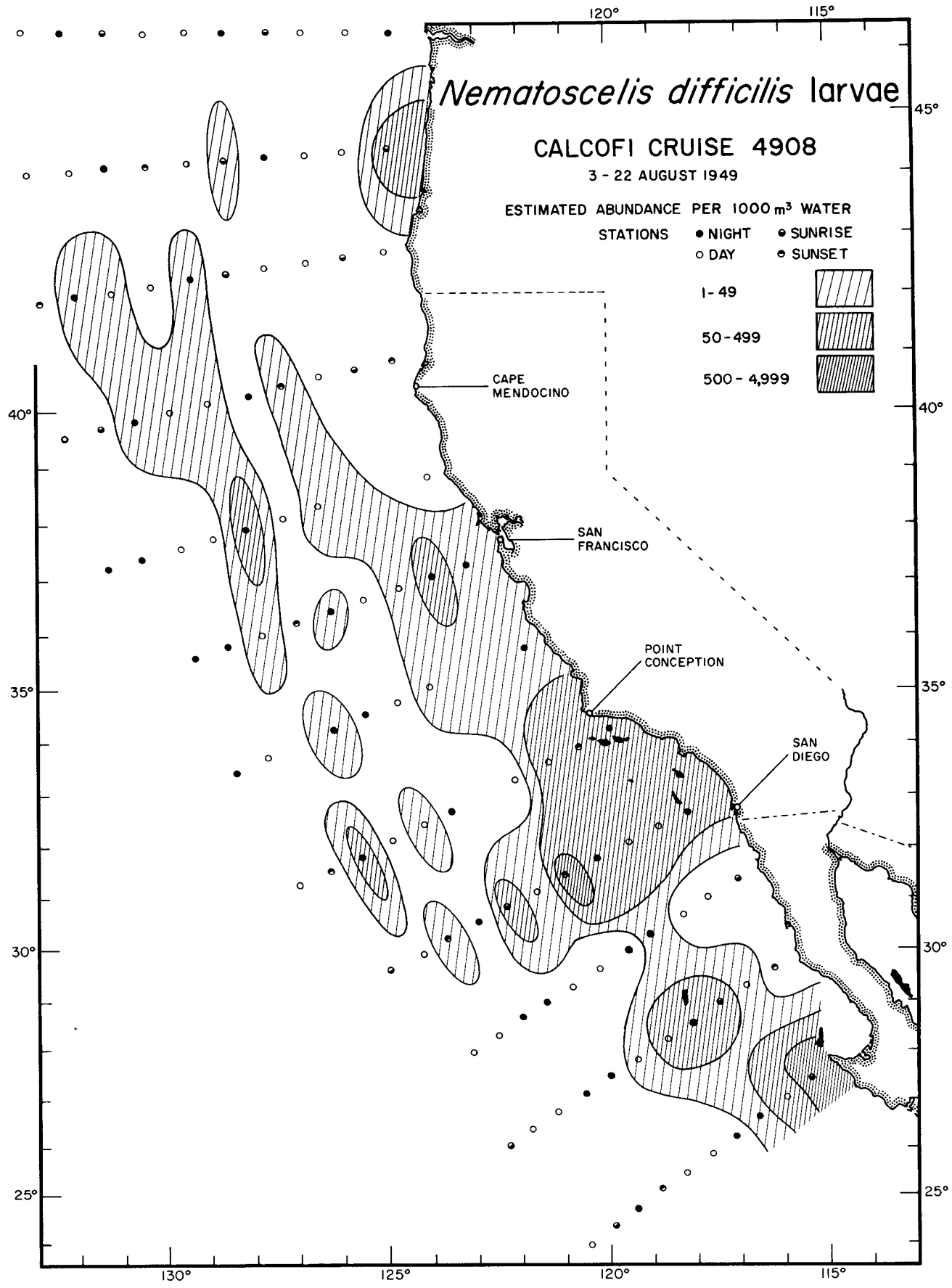
POINT CONCEPTION

SAN DIEGO

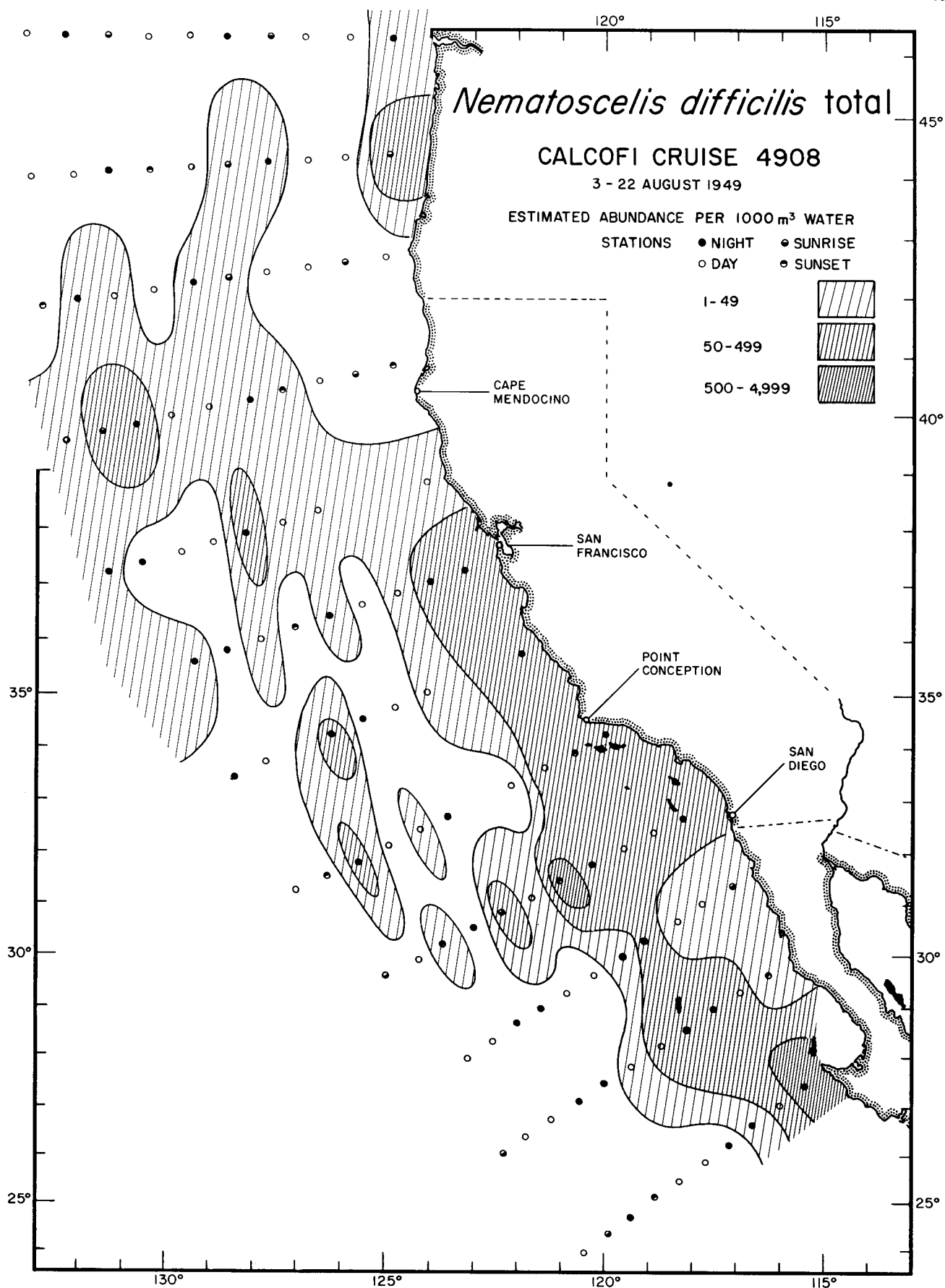
Euphausiacea

Nematoscelis difficilis total

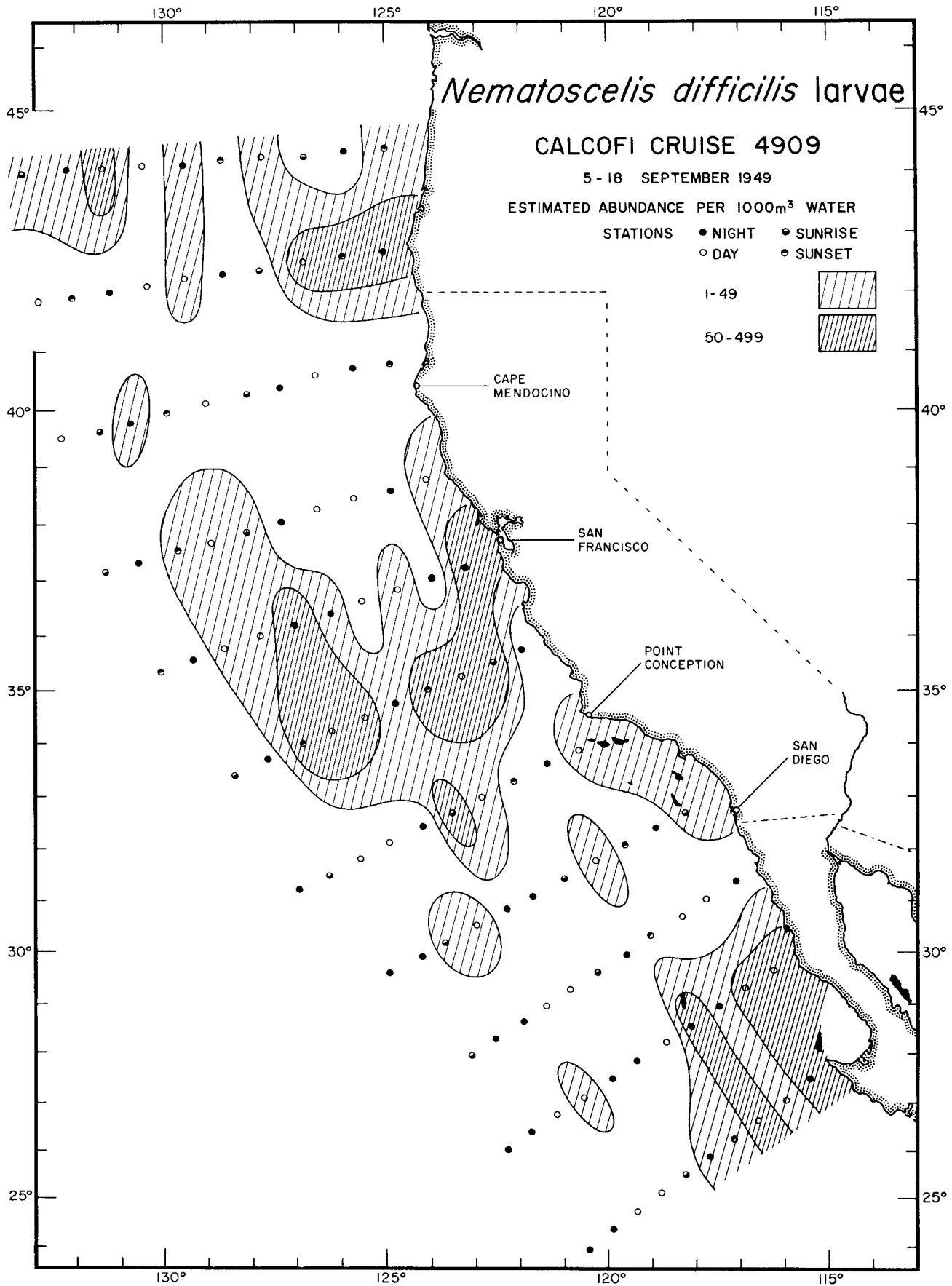
4907



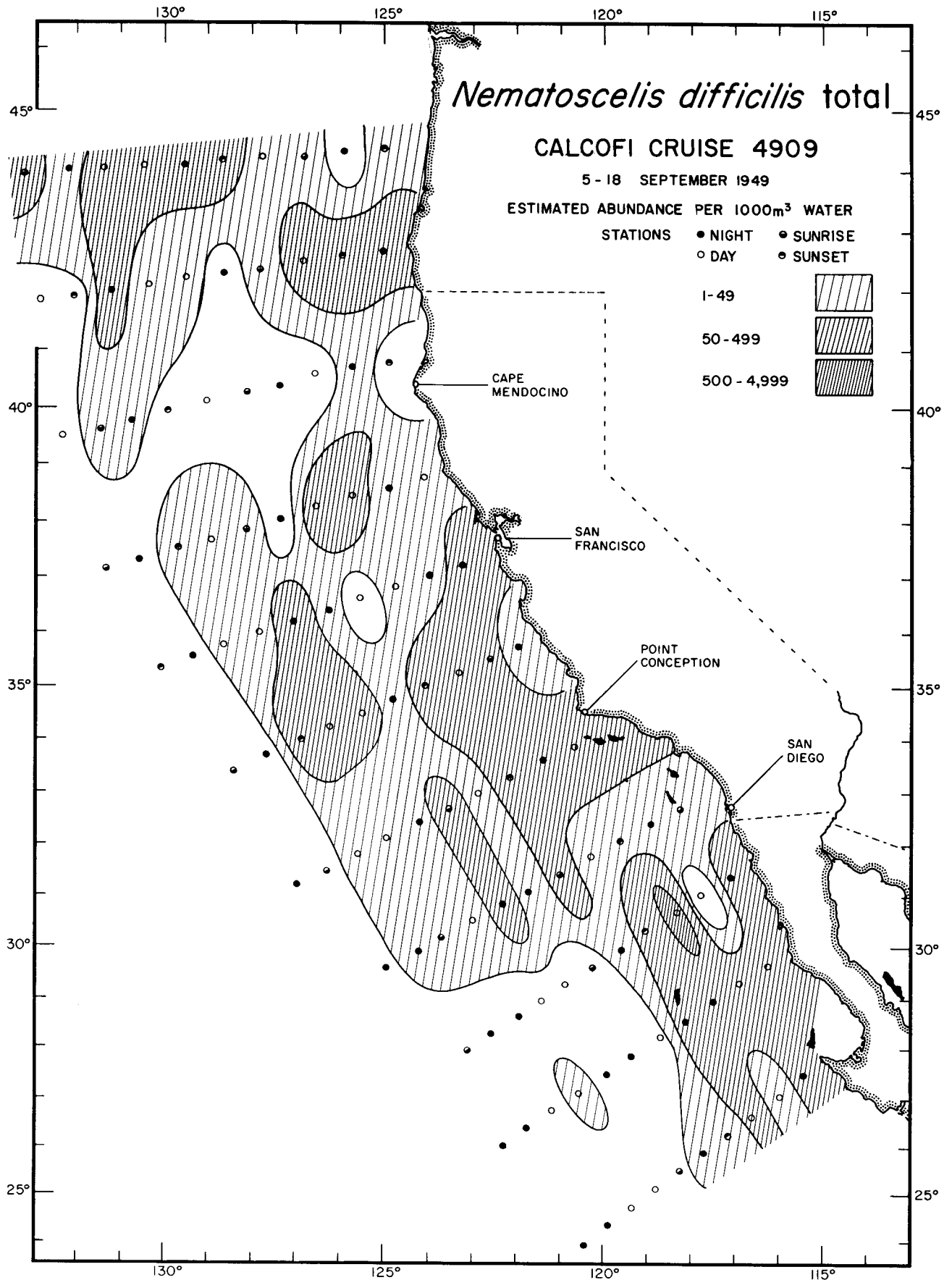
Euphausiacea
Nematoscelis difficilis larvae
4908



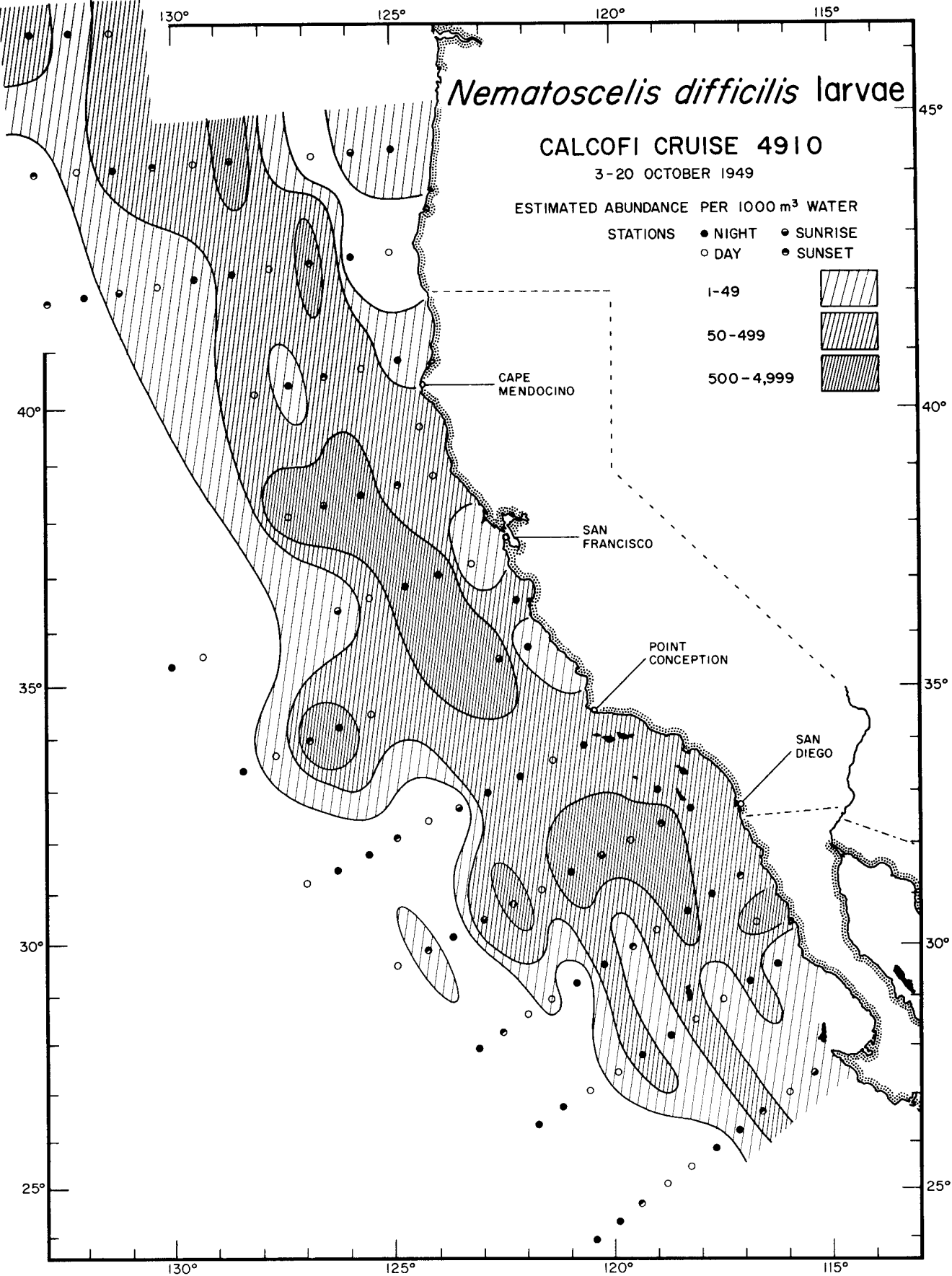
Euphausiacea
Nematoscelis difficilis total
4908



Euphausiacea
Nematoscelis difficilis larvae
4909

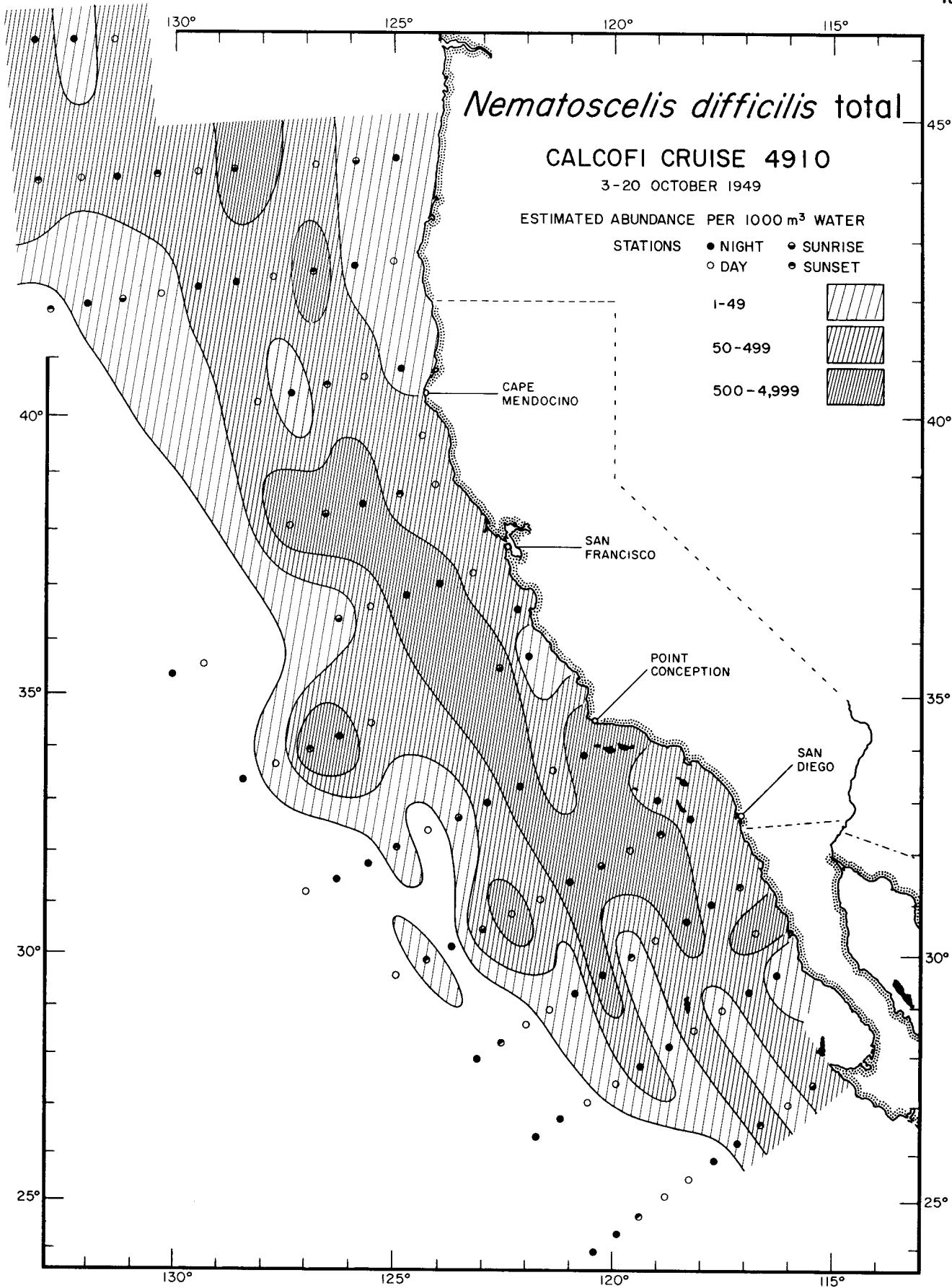


Euphausiacea
Nematoscelis difficilis total
4909

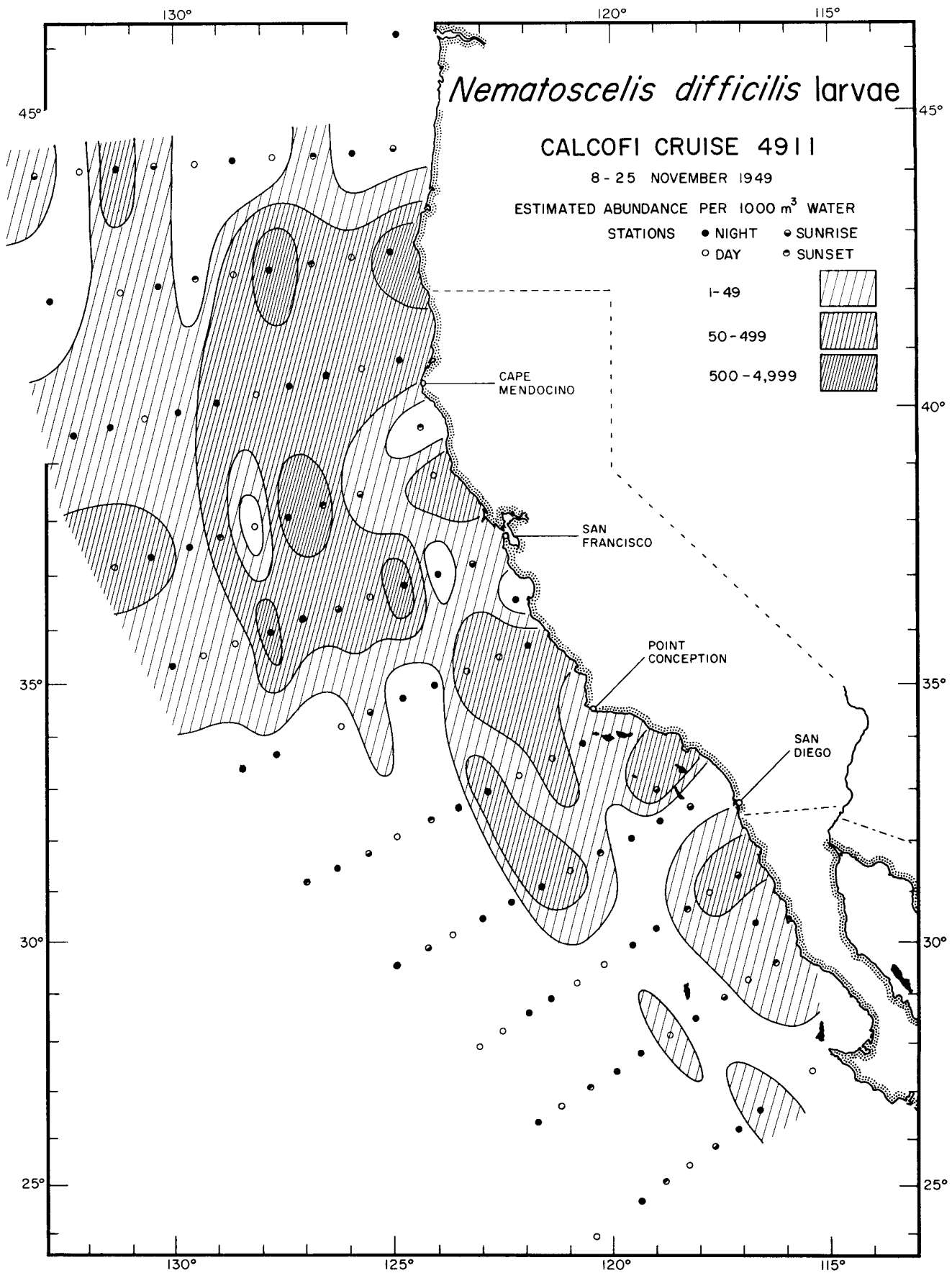


Euphausiacea
Nematoscelis difficilis larvae

4910



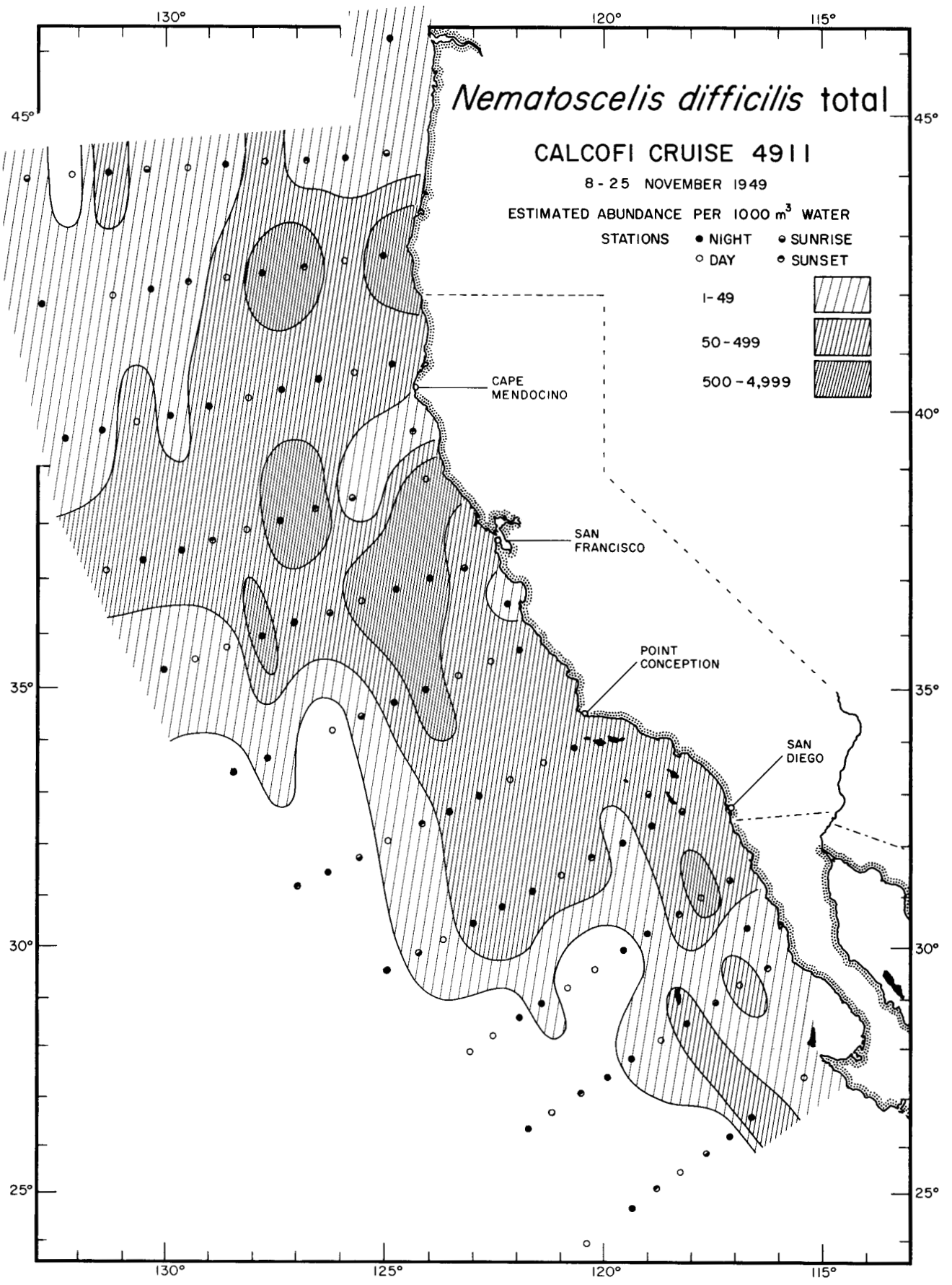
Euphausiacea
Nematoscelis difficilis total
4910



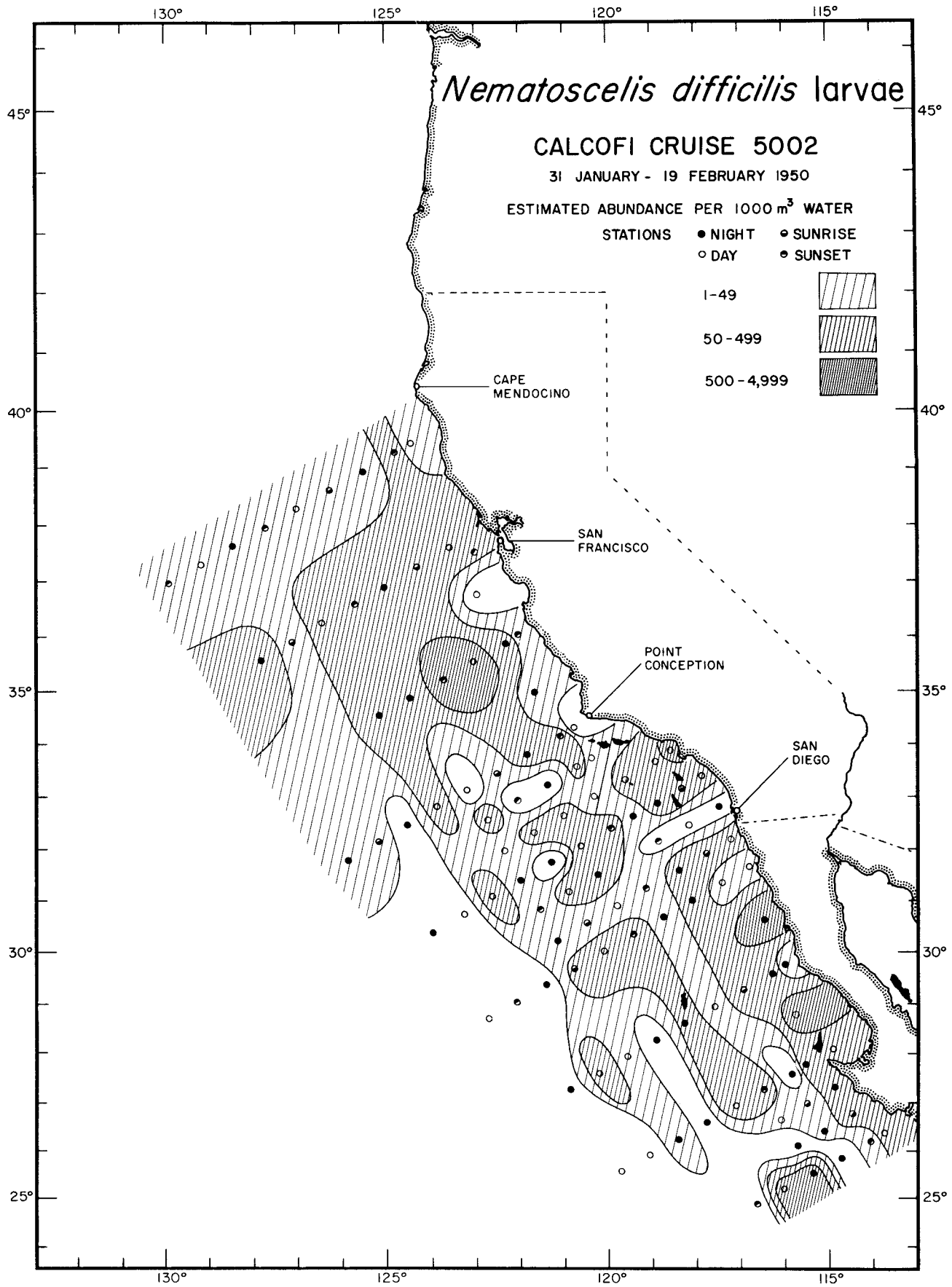
Euphausiacea

Nematoscelis difficilis larvae

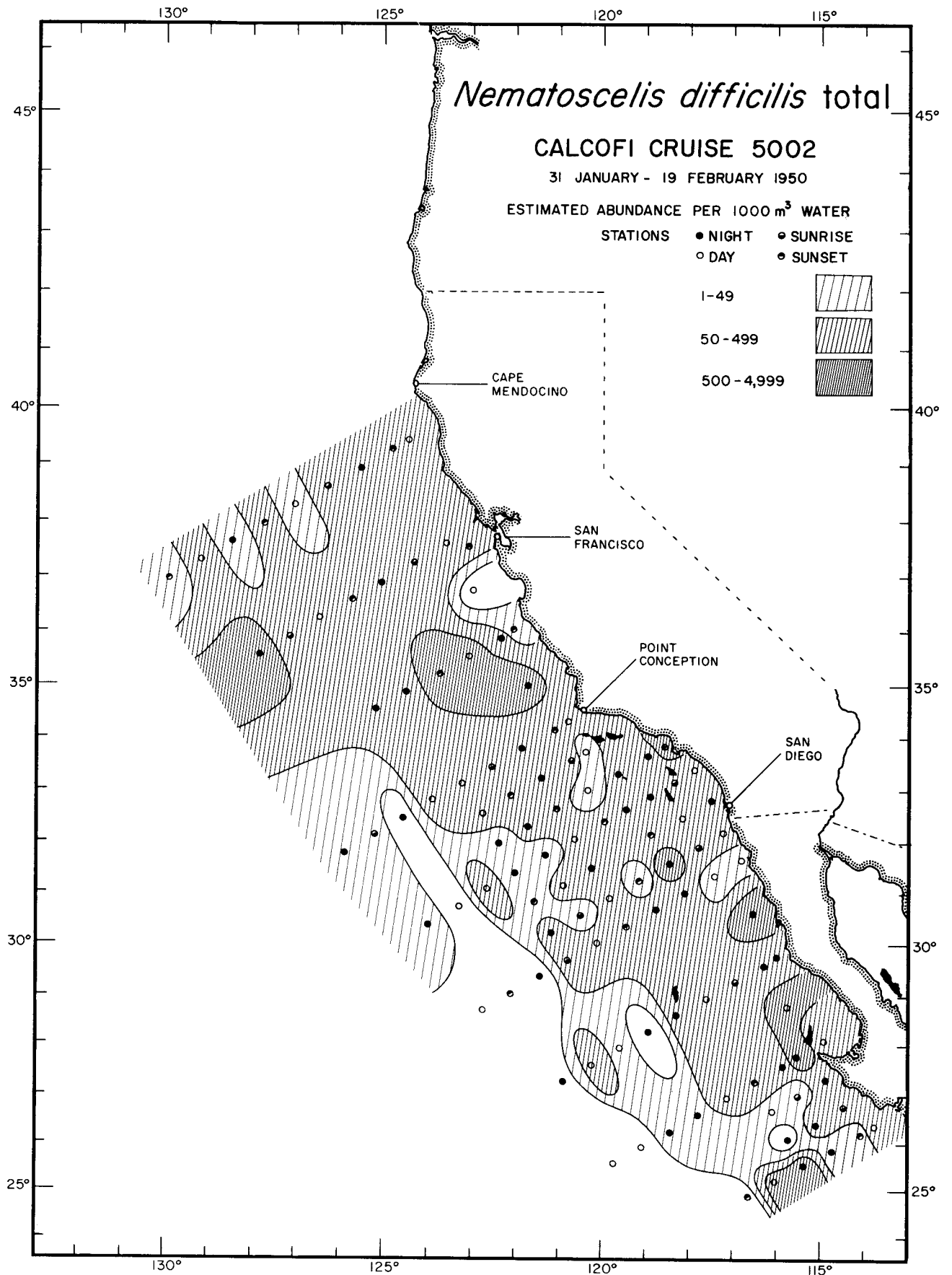
4911



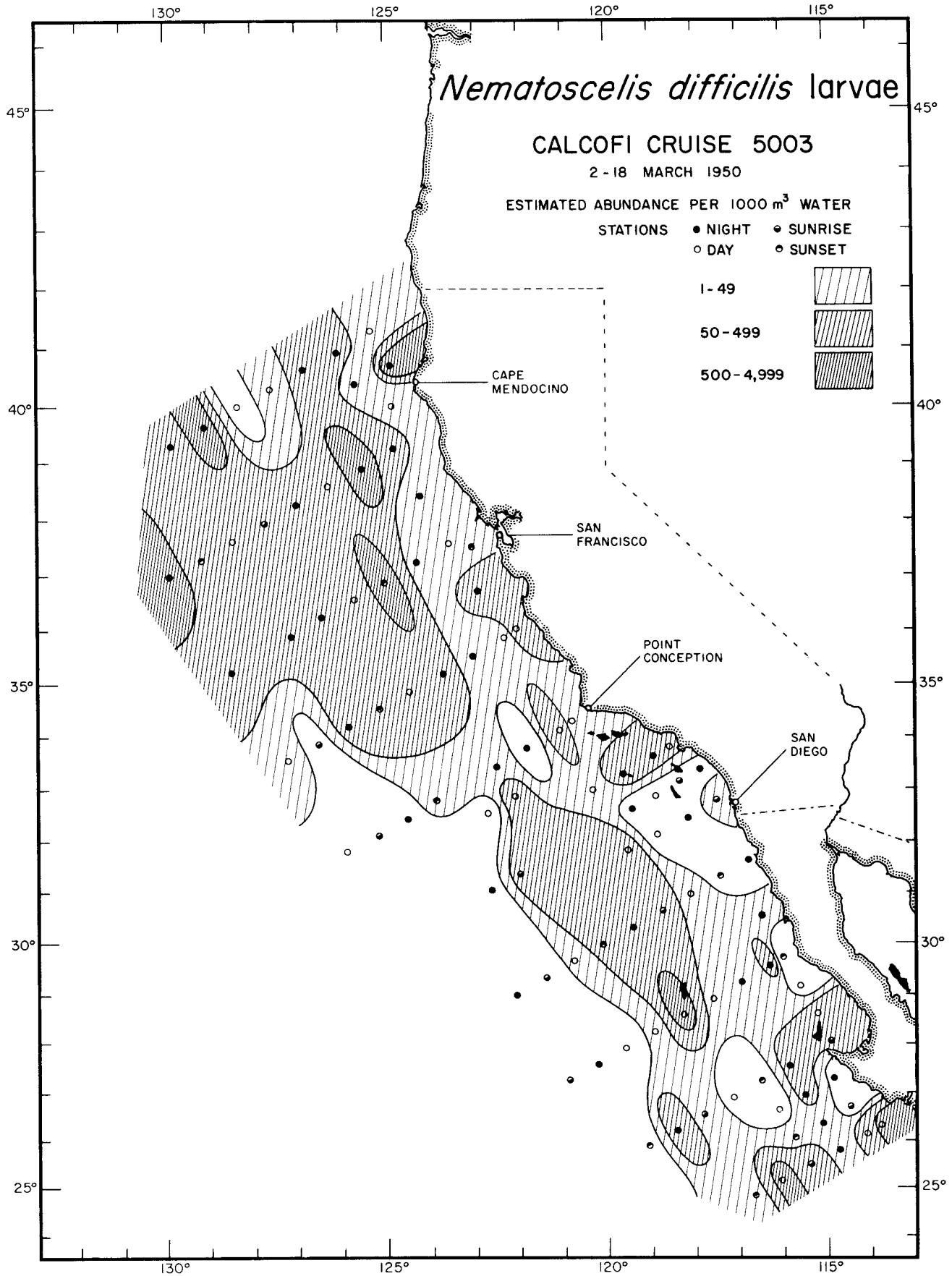
Euphausiacea
Nematoscelis difficilis total
4911



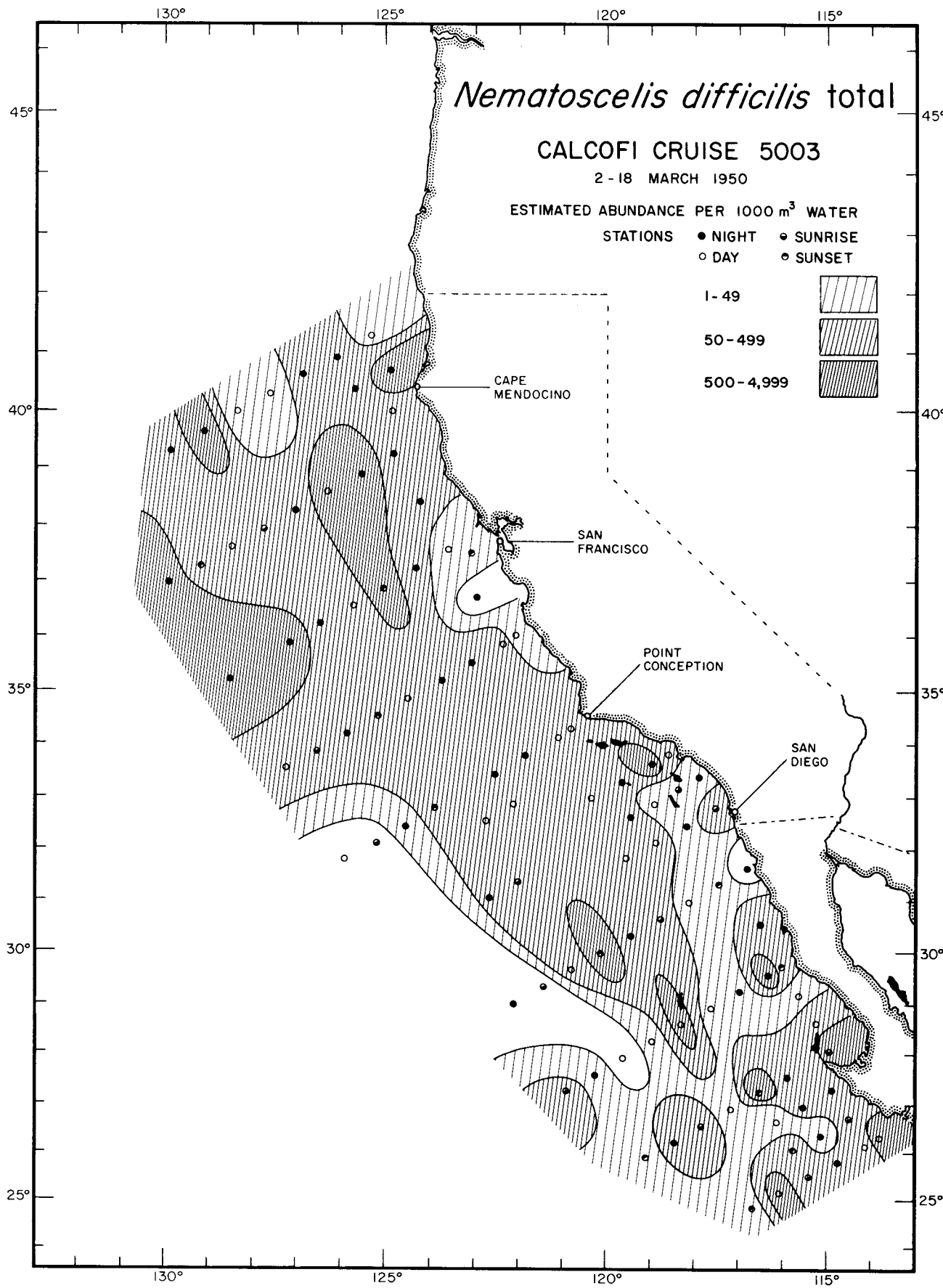
Euphausiacea
Nematoscelis difficilis larvae
5002



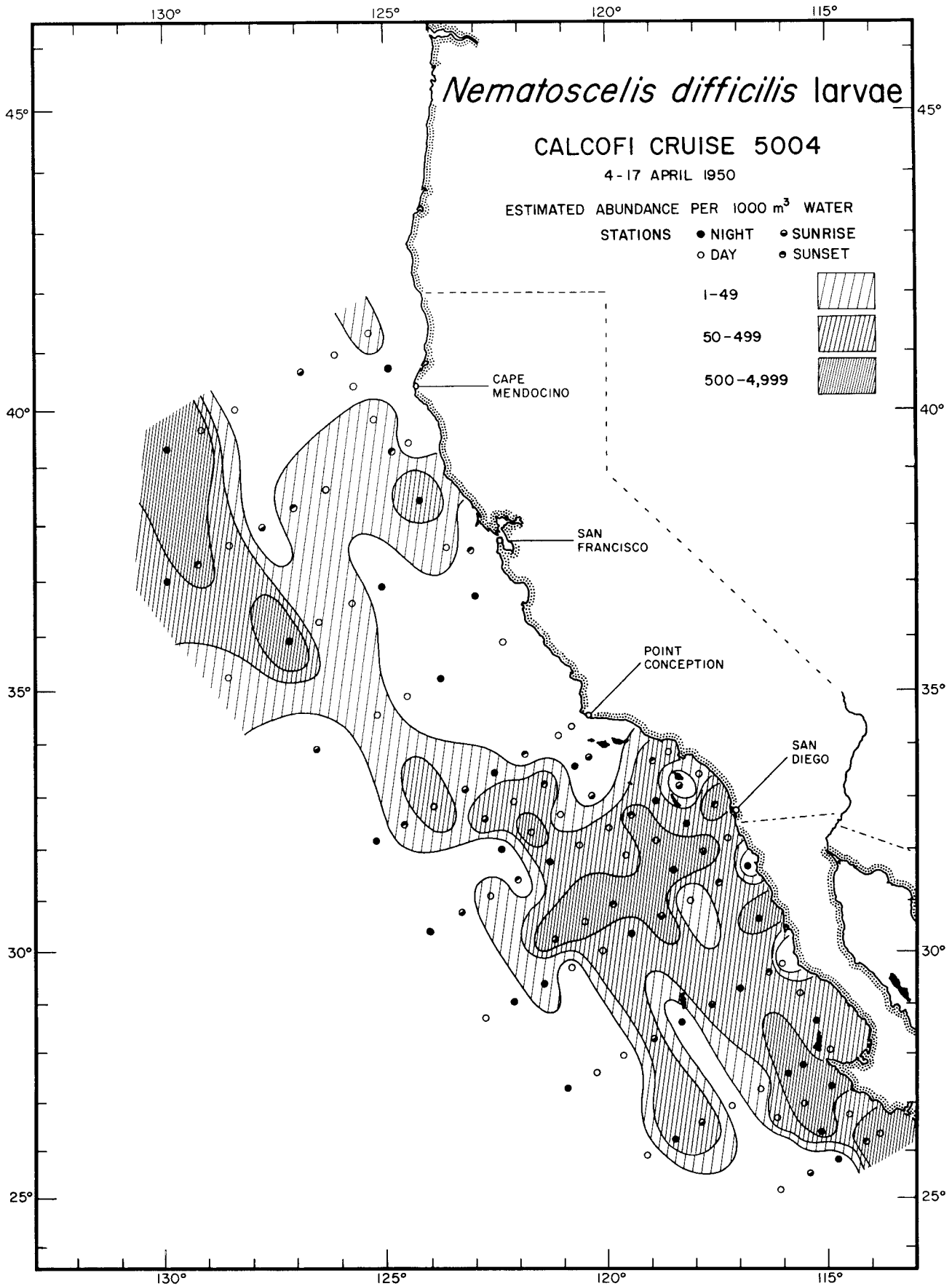
Euphausiacea
Nematoscelis difficilis total
5002



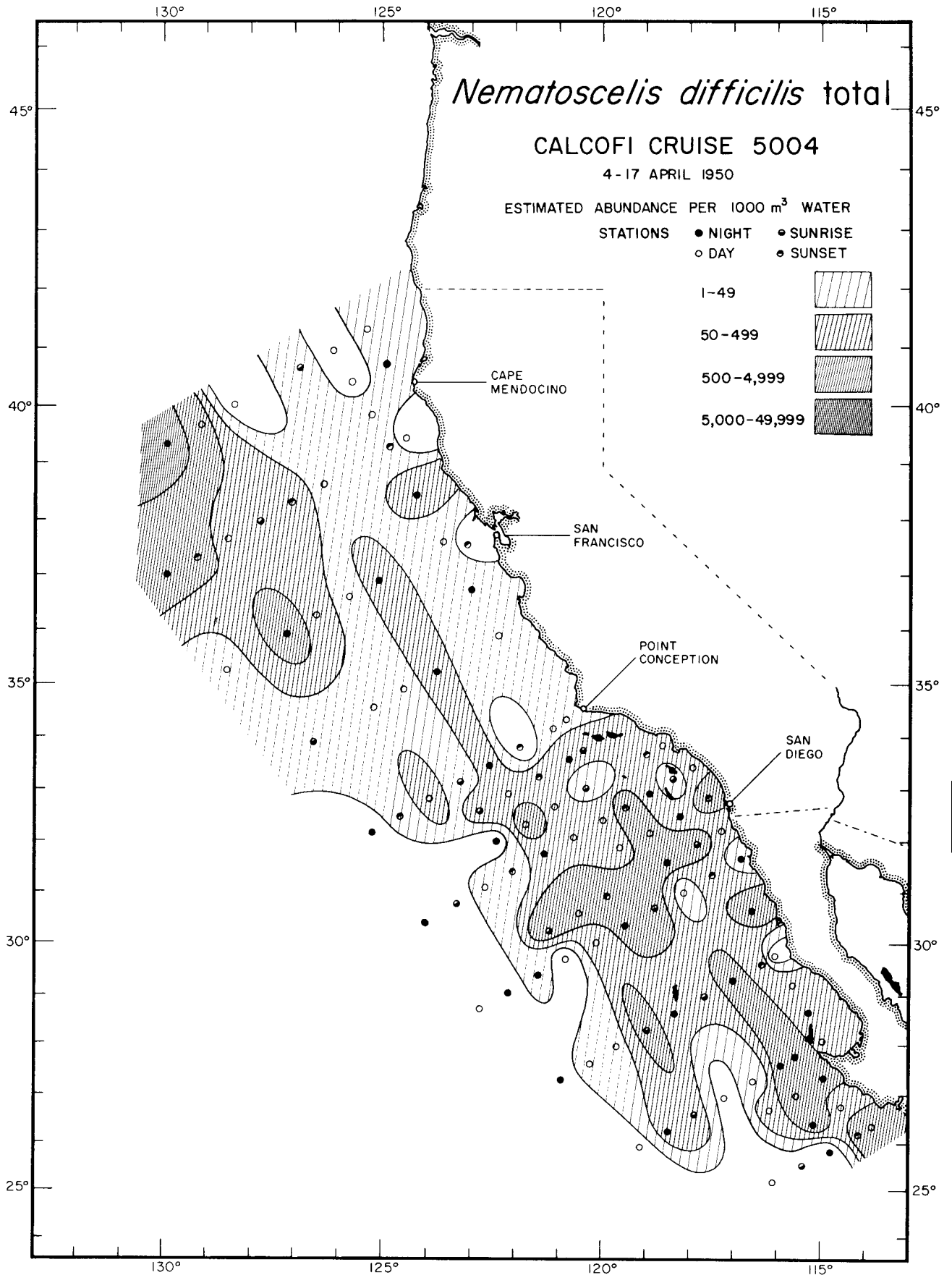
Euphausiacea
Nematoscelis difficilis larvae
5003



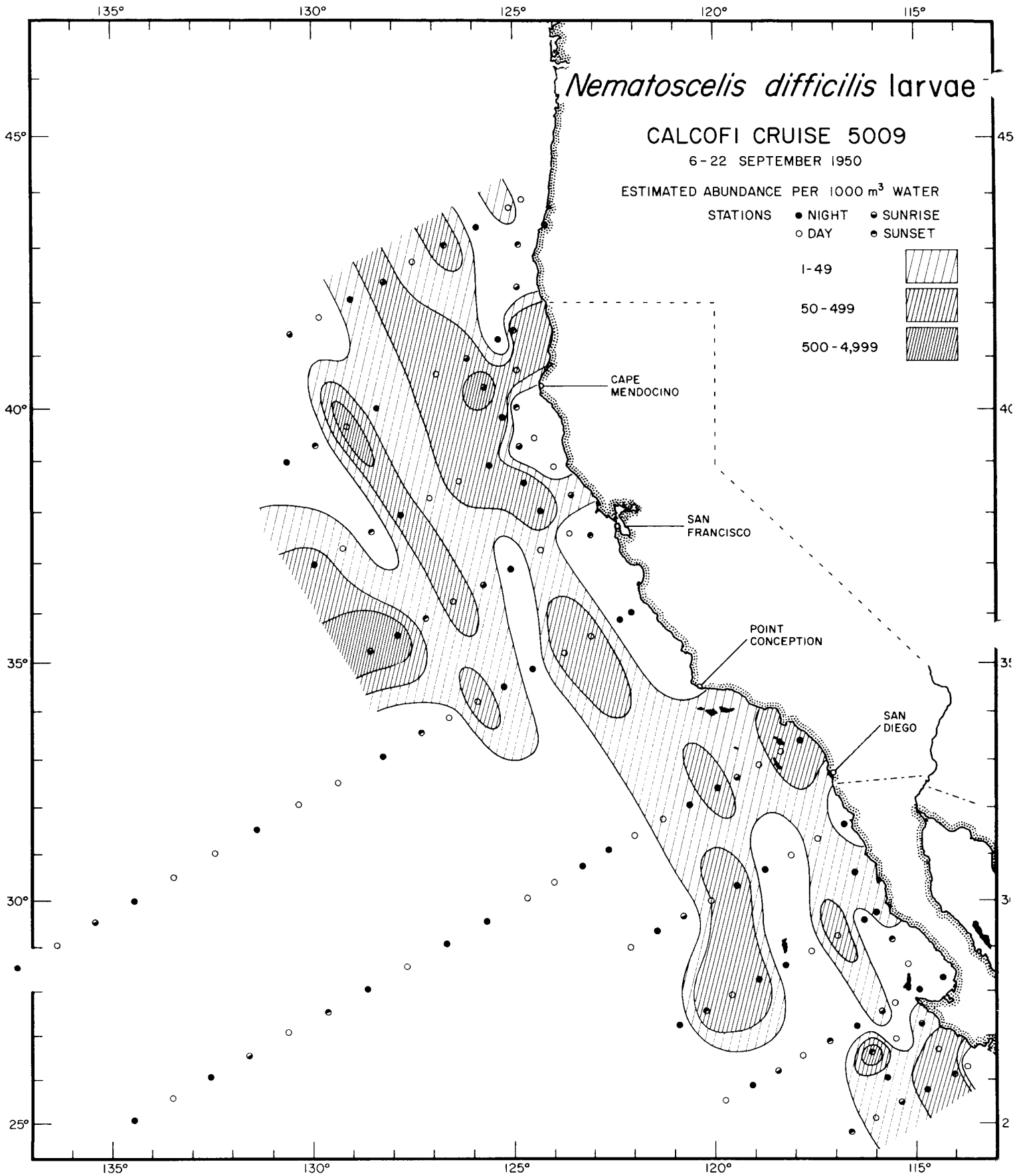
Euphausiacea
Nematoscelis difficilis total
5003



Euphausiacea
Nematoscelis difficilis larvae
5004



Euphausiacea
Nematoscelis difficilis total
5004



135° 130° 125° 120° 115°

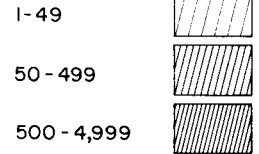
Nematoscelis difficilis total

CALCOFI CRUISE 5009

6-22 SEPTEMBER 1950

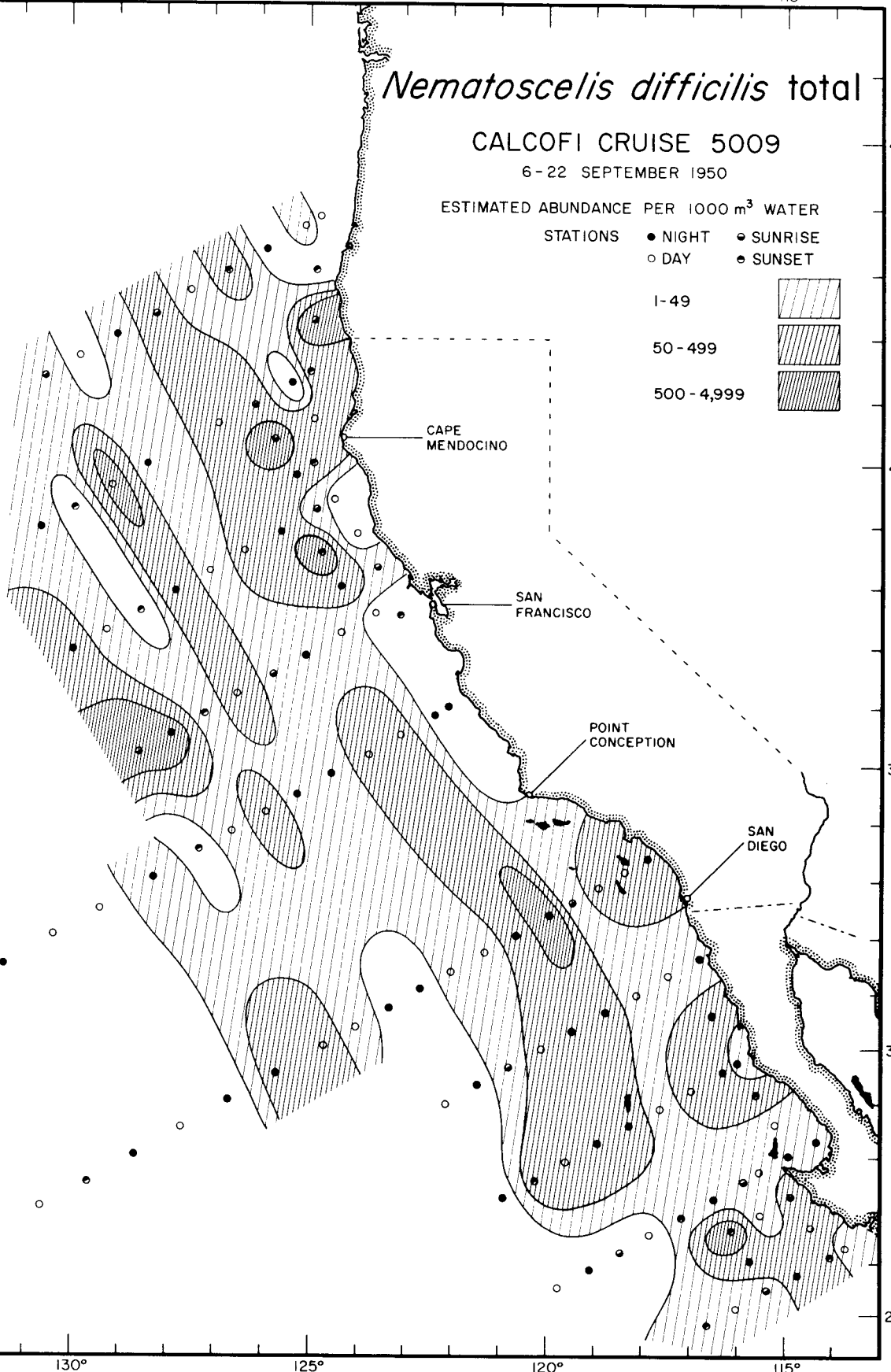
ESTIMATED ABUNDANCE PER 1000 m³ WATER

STATIONS ● NIGHT ○ DAY
● SUNRISE ● SUNSET

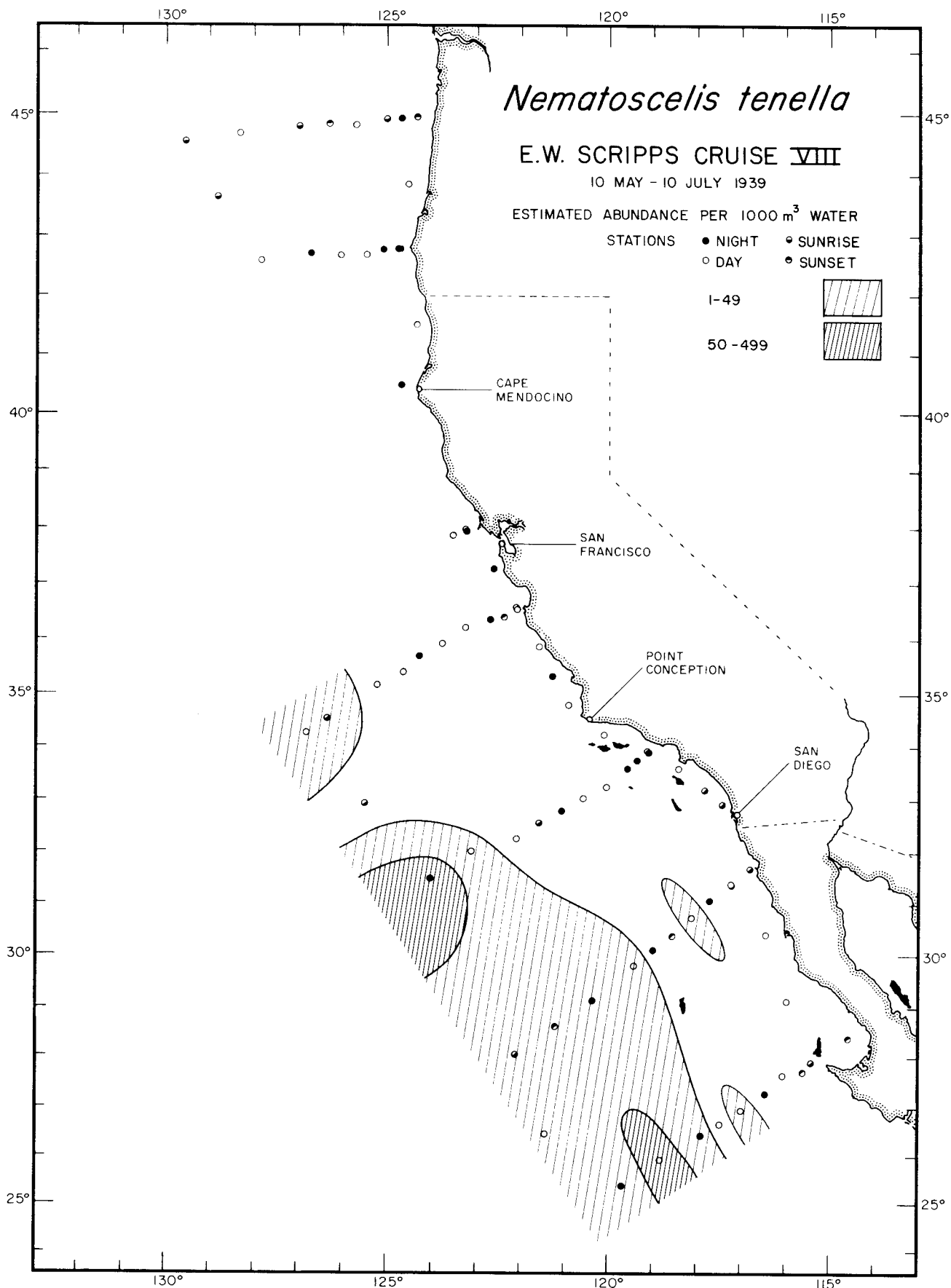


45°
10°
5°

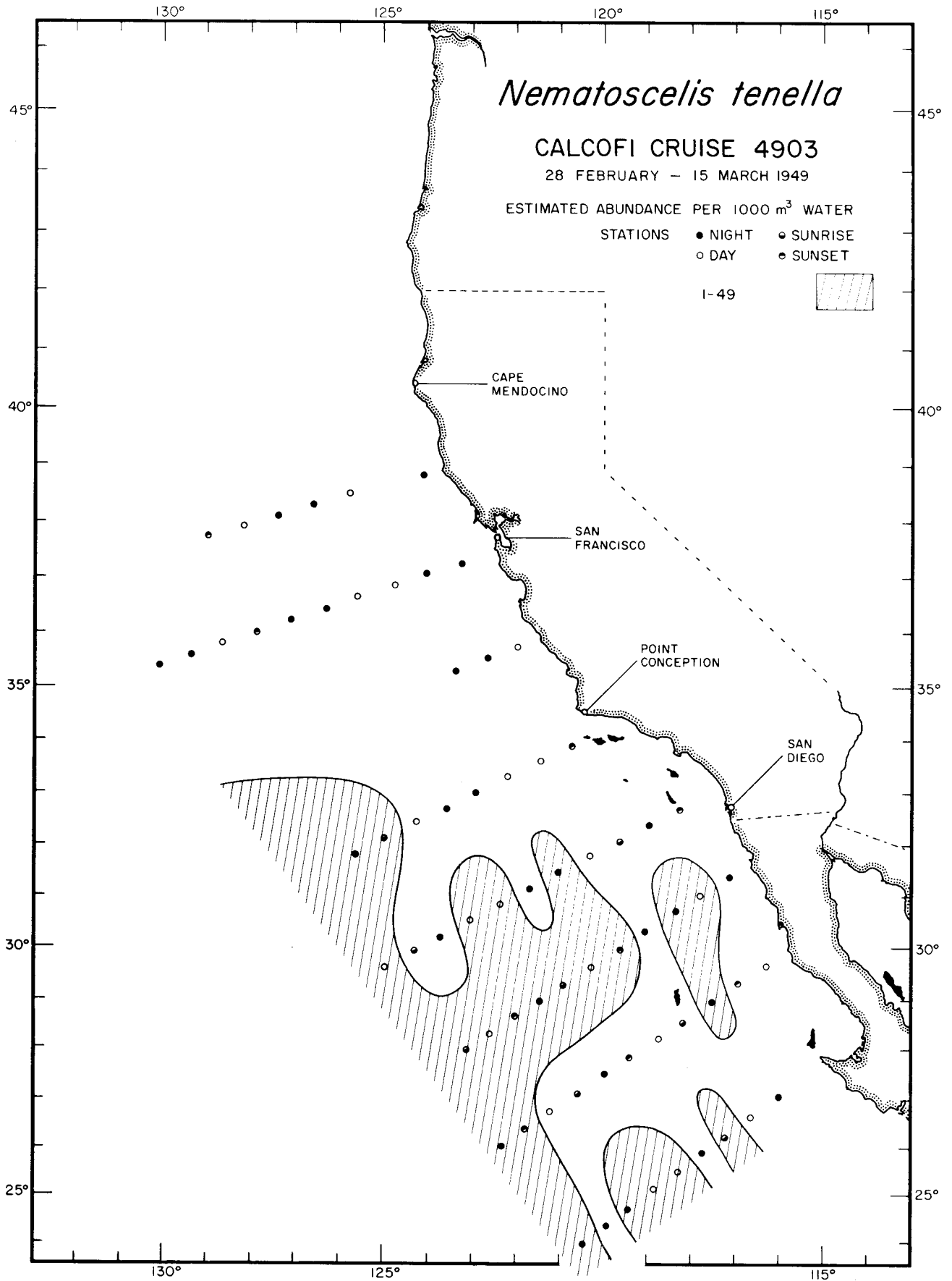
45°
40°
35°
30°
25°



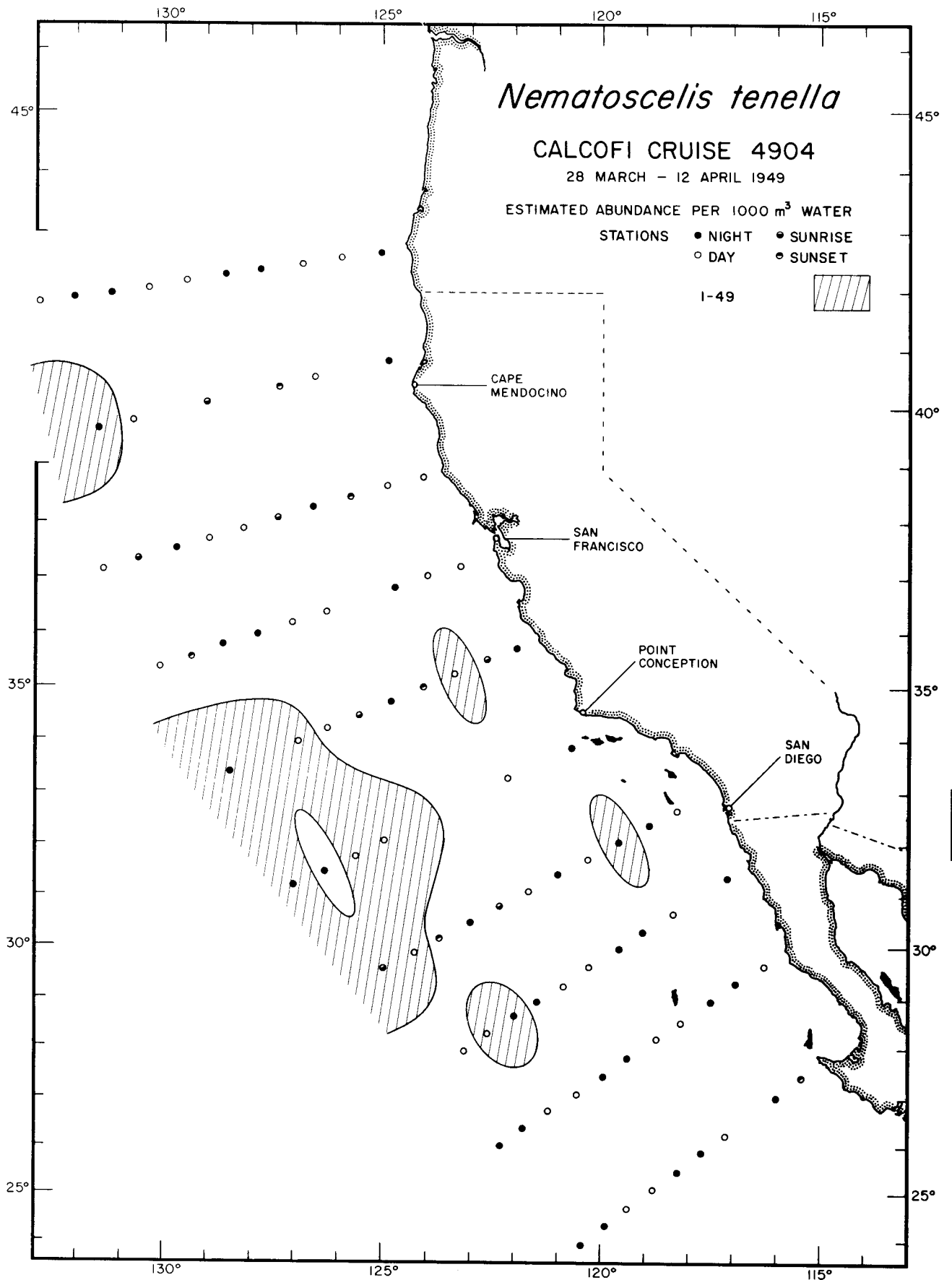
135° 130° 125° 120° 115°



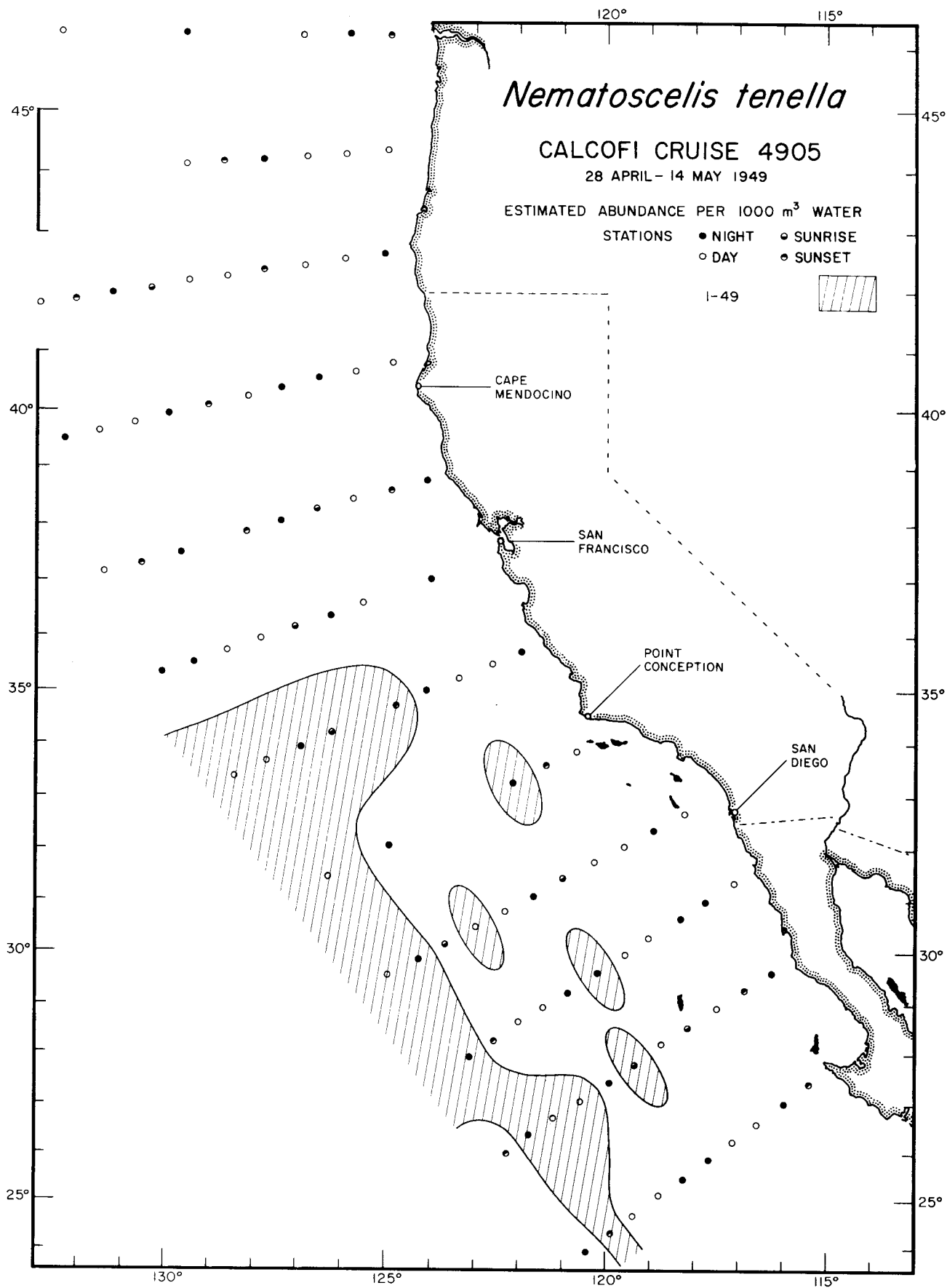
Euphausiacea
Nematoscelis tenella
E. W. SCRIPPS CRUISE VIII



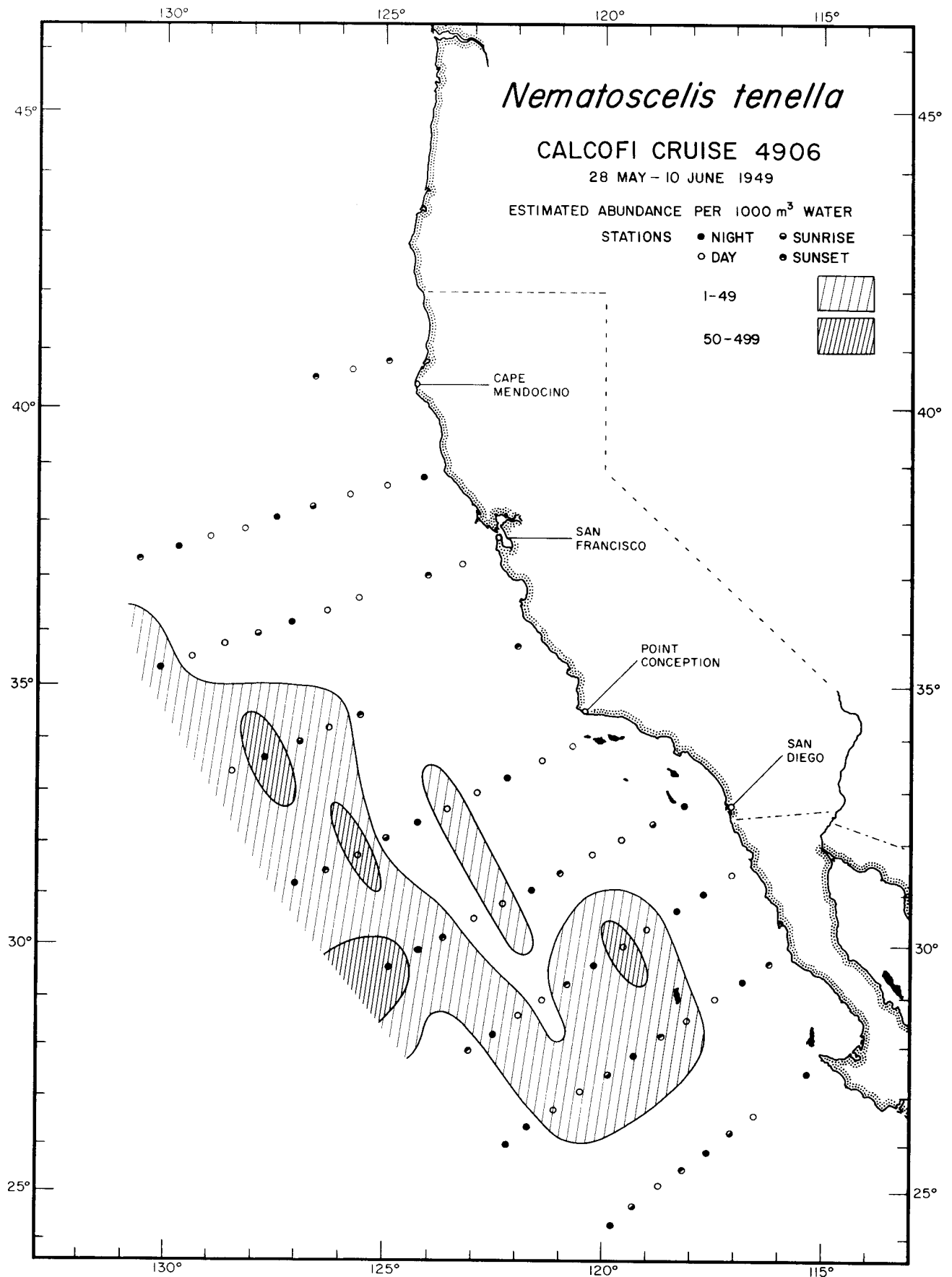
Euphausiacea
Nematoscelis tenella
4903



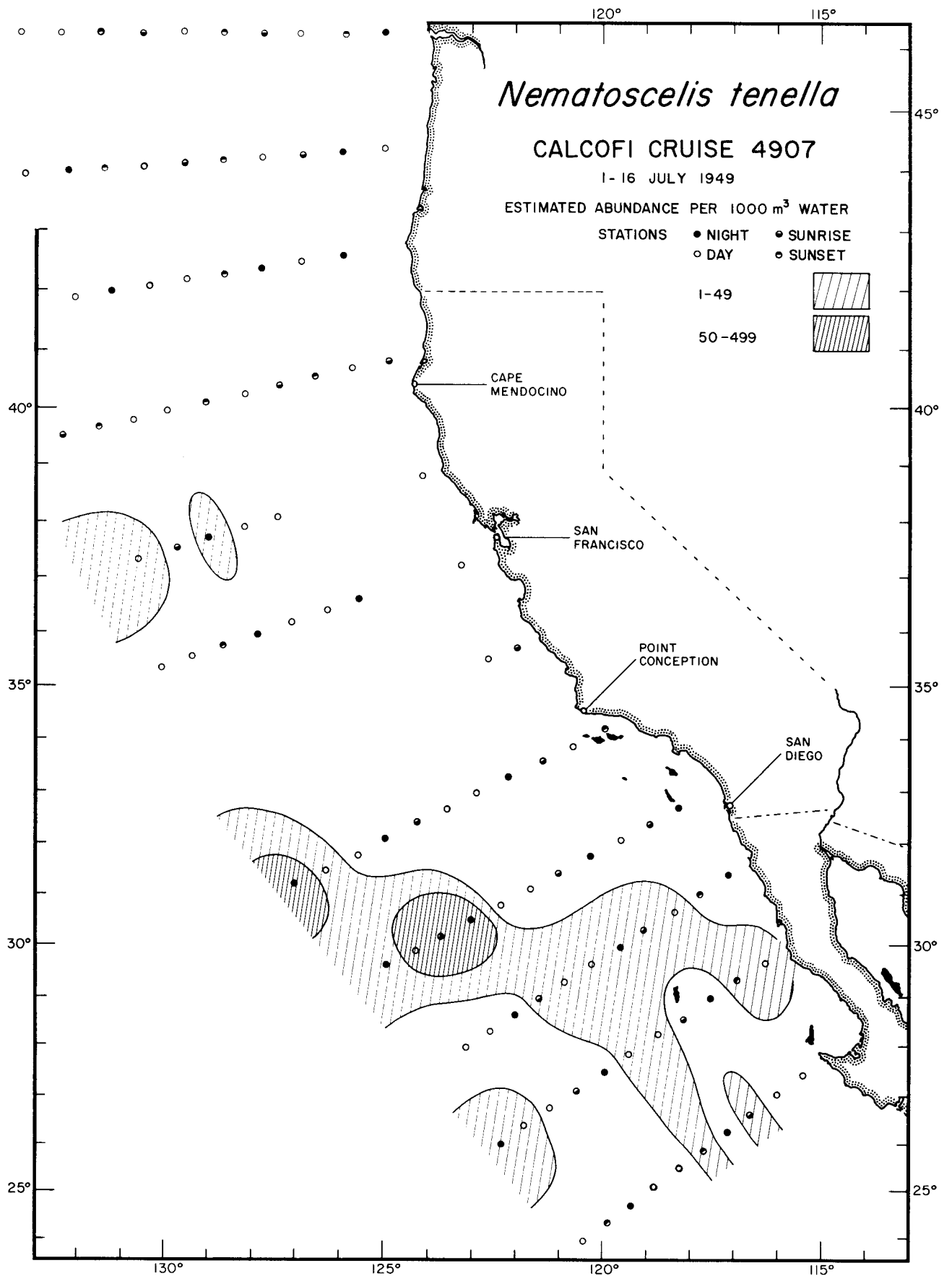
Euphausiacea
Nematoscelis tenella
4904



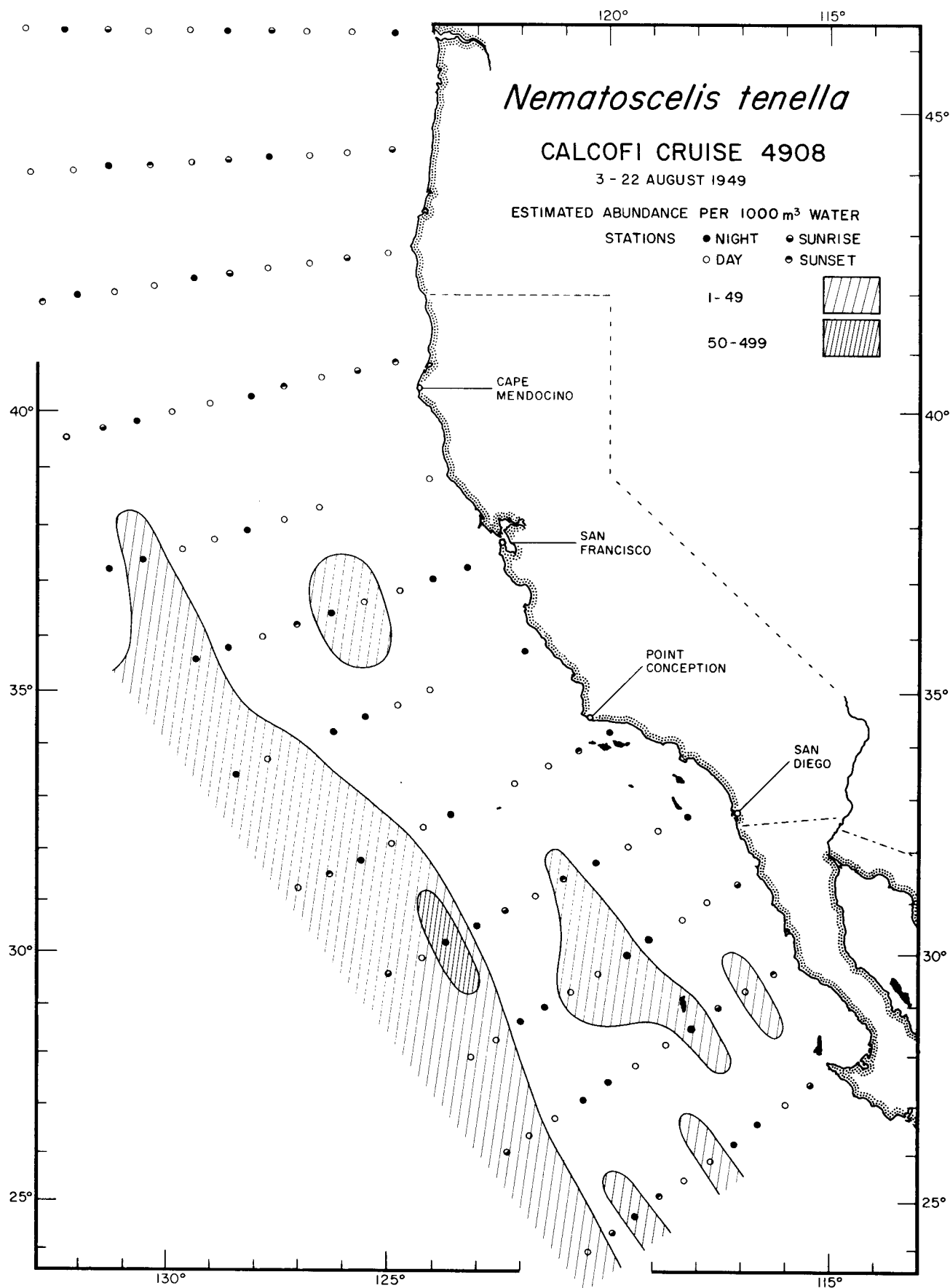
Euphausiacea
Nematoscelis tenella
4905



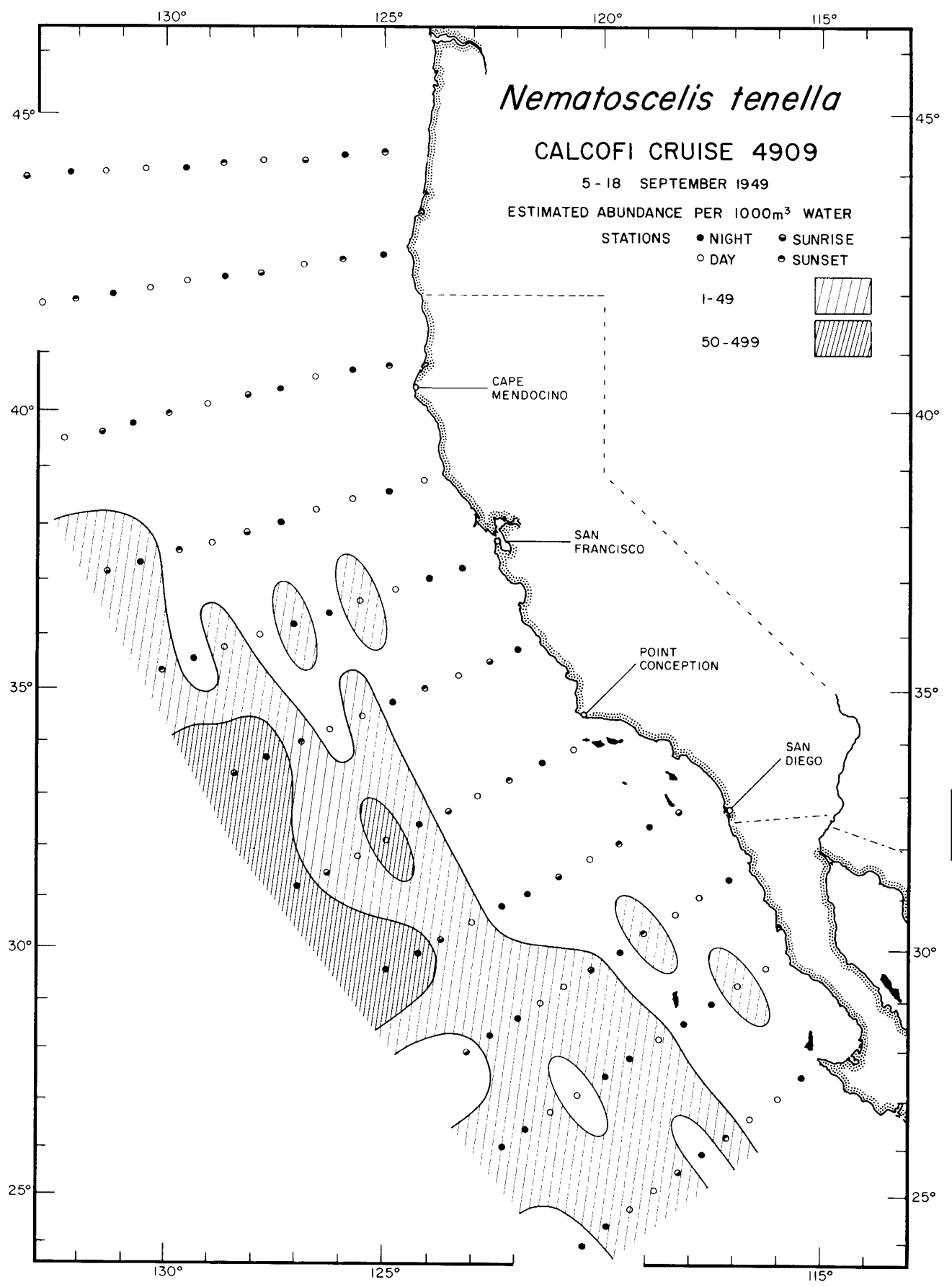
Euphausiacea
Nematoscelis tenella
4906



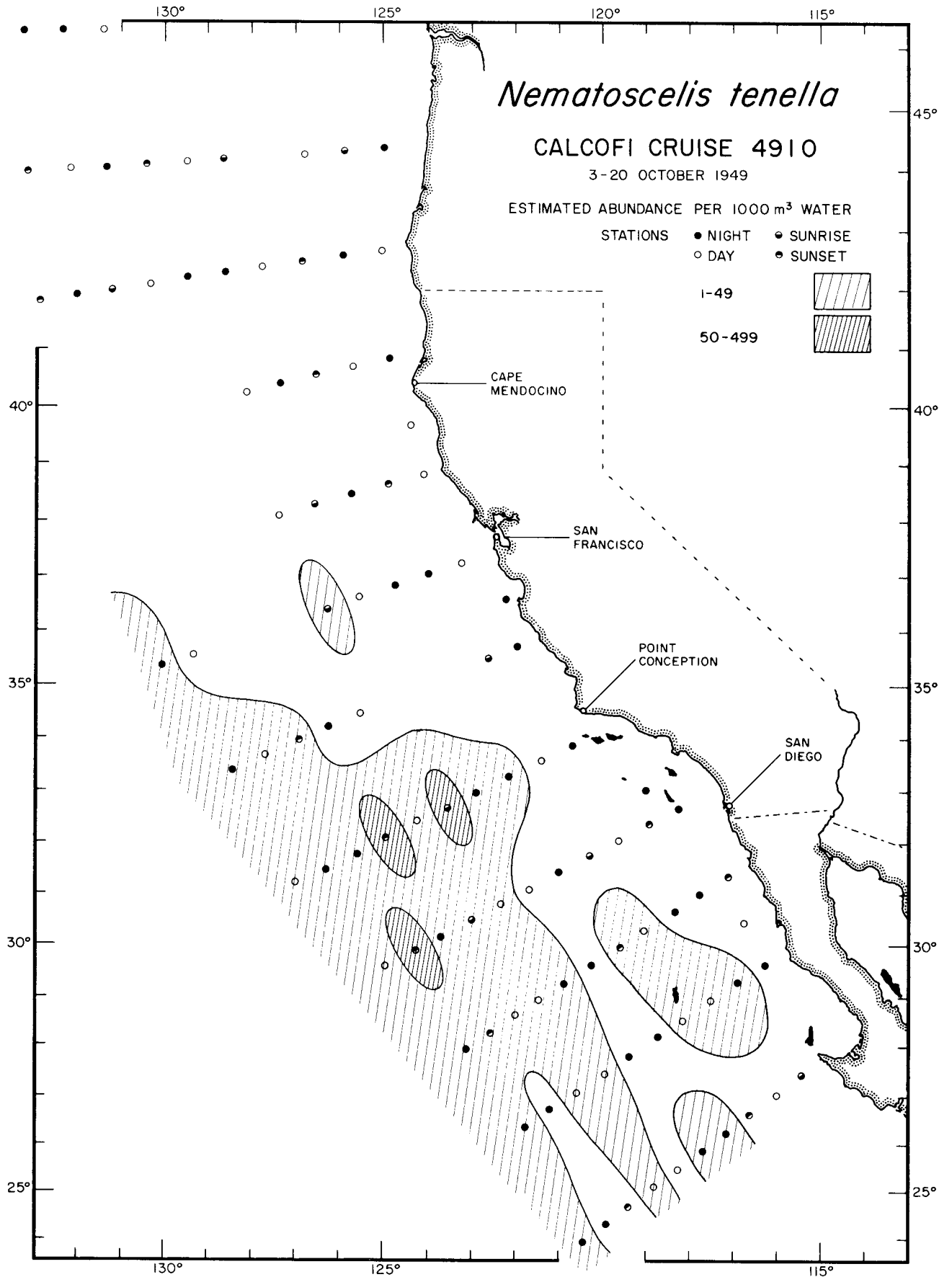
Euphausiacea
Nematoscelis tenella
4907



Euphausiacea
Nematoscelis tenella
4908



Euphausiacea
Nematoscelis tenella
4909



Nematoscelis tenella

CALCOFI CRUISE 4910

3-20 OCTOBER 1949

ESTIMATED ABUNDANCE PER 1000 m³ WATER

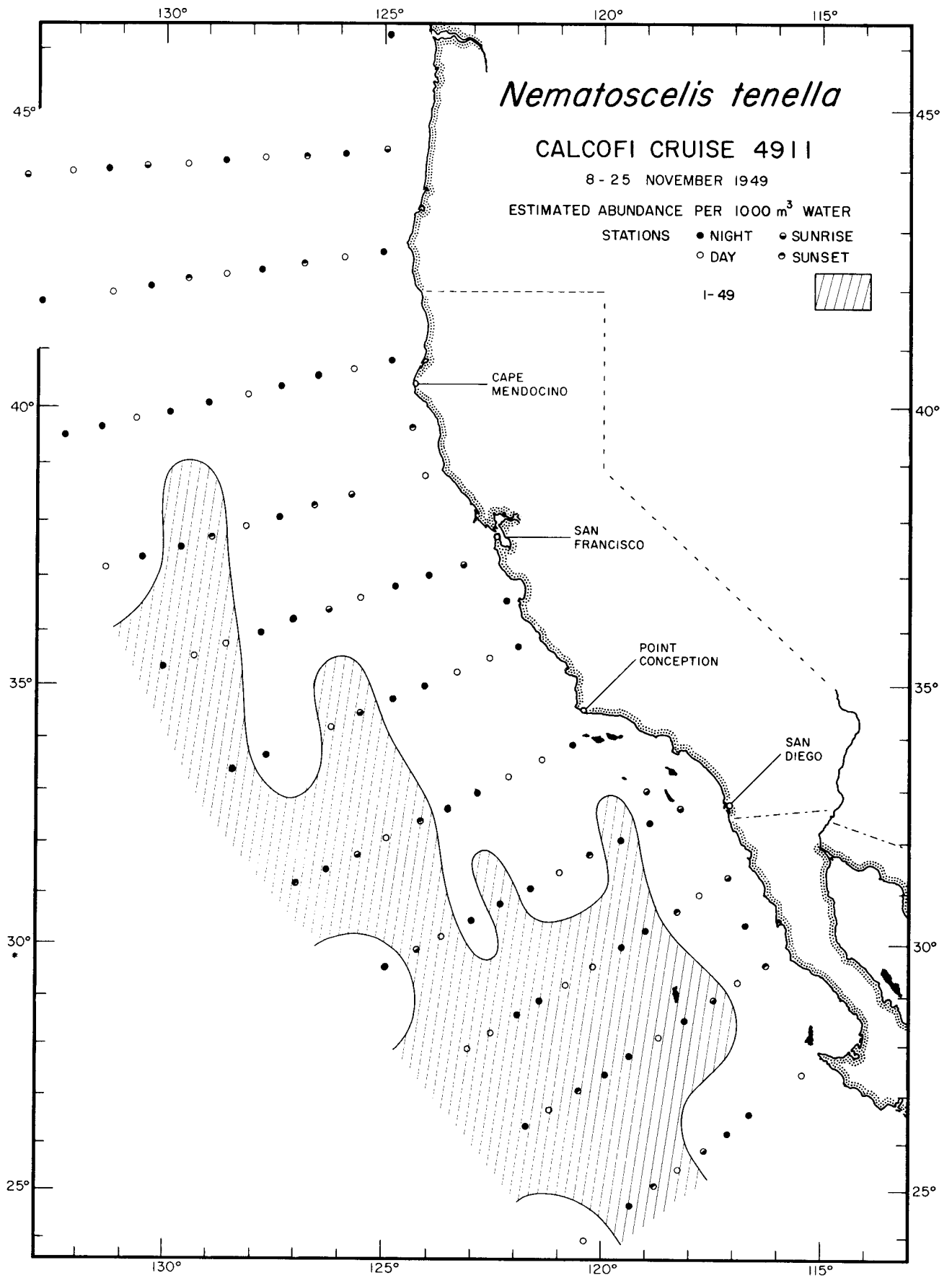
STATIONS ● NIGHT ○ DAY ● SUNRISE ● SUNSET

1-49

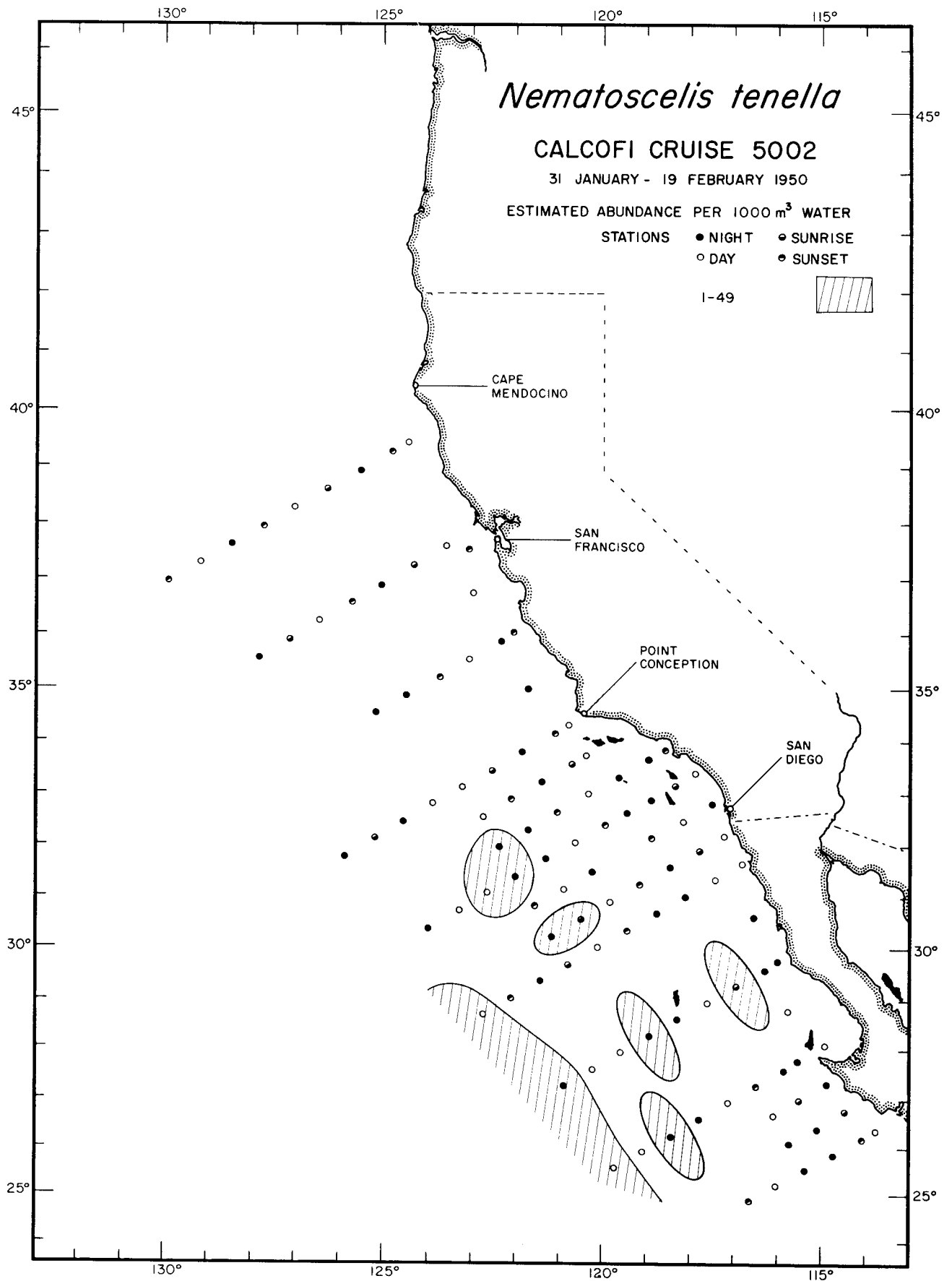
50-499



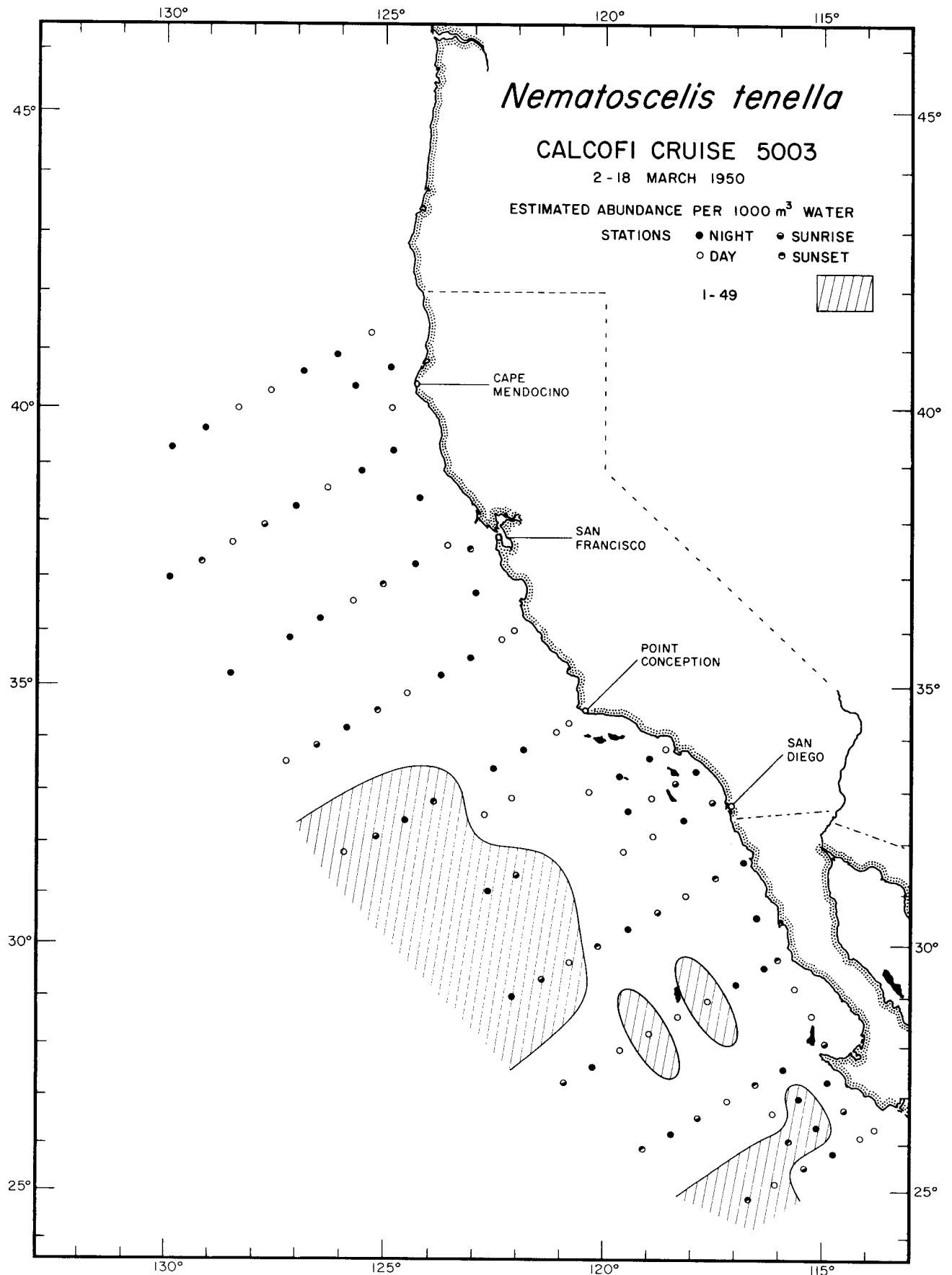
Euphausiacea
Nematoscelis tenella
4910



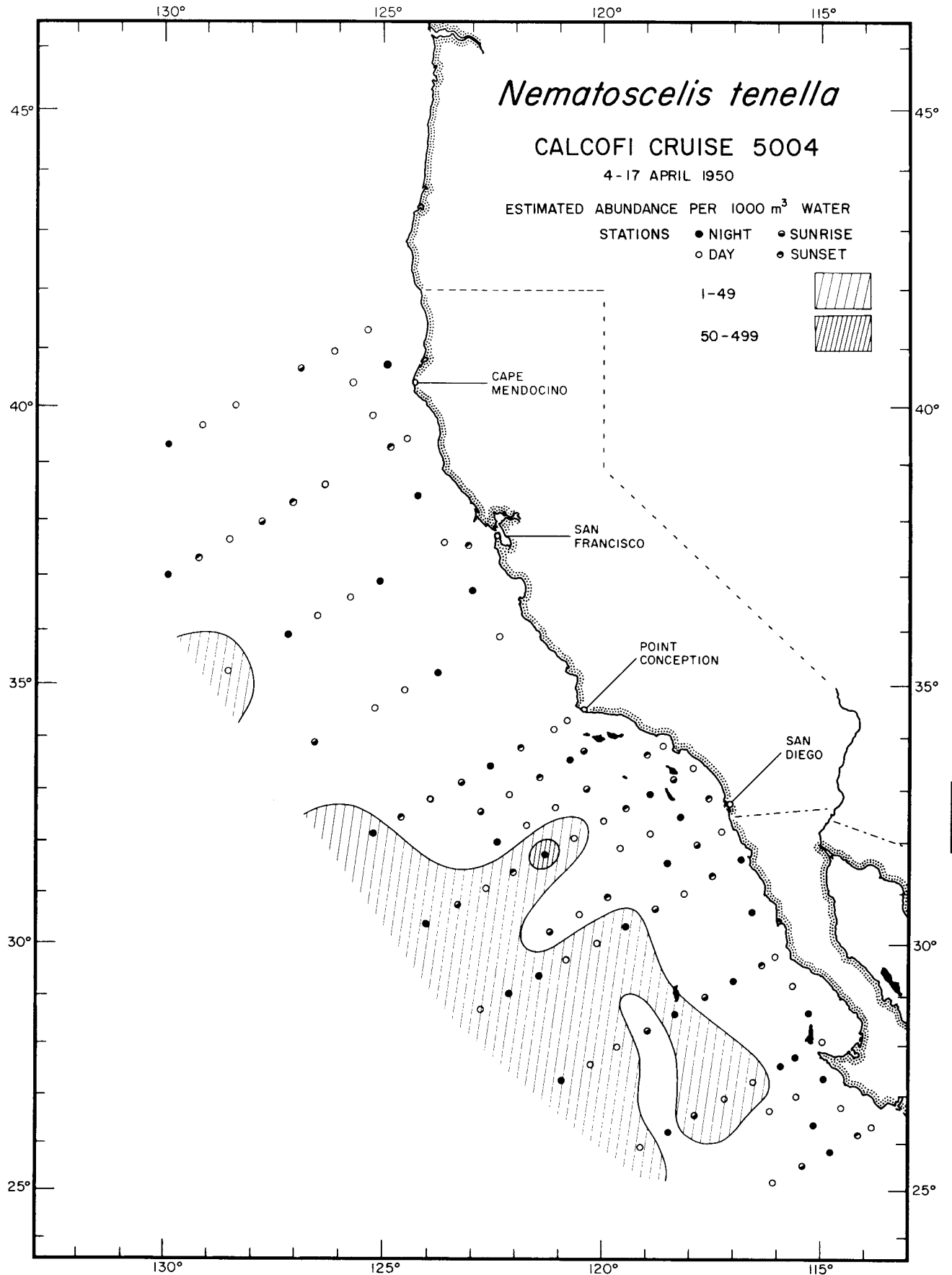
Euphausiacea
Nematoscelis tenella
4911



Euphausiacea
Nematoscelis tenella
5002



Euphausiacea
Nematoscelis tenella
5003



Euphausiacea
Nematoscelis tenella
5004

135° 130° 125° 120° 115°

Nematoscelis tenella

CALCOFI CRUISE 5009

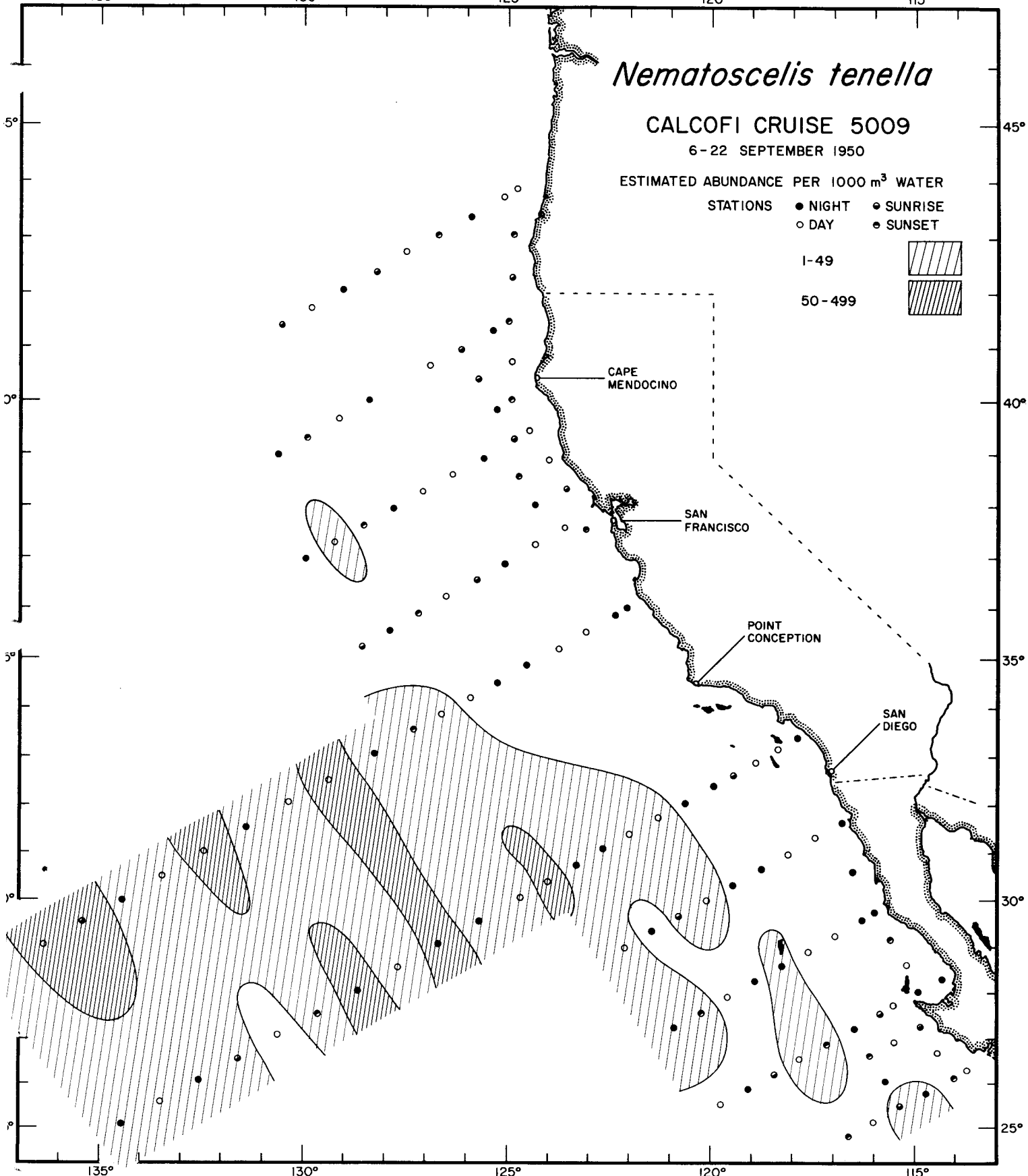
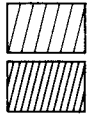
6-22 SEPTEMBER 1950

ESTIMATED ABUNDANCE PER 1000 m³ WATER

STATIONS ● NIGHT ○ DAY ● SUNRISE ● SUNSET

1-49

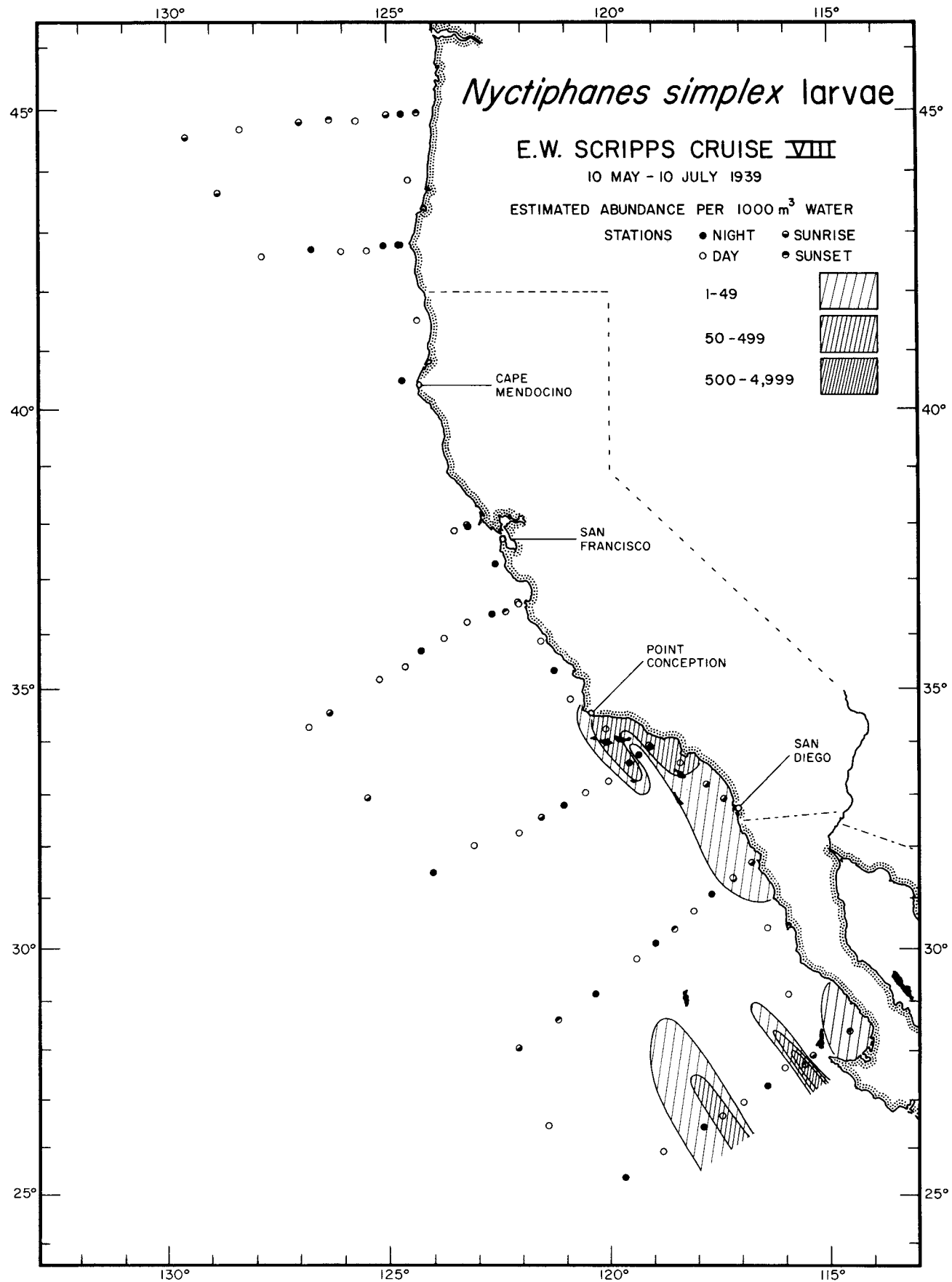
50-499



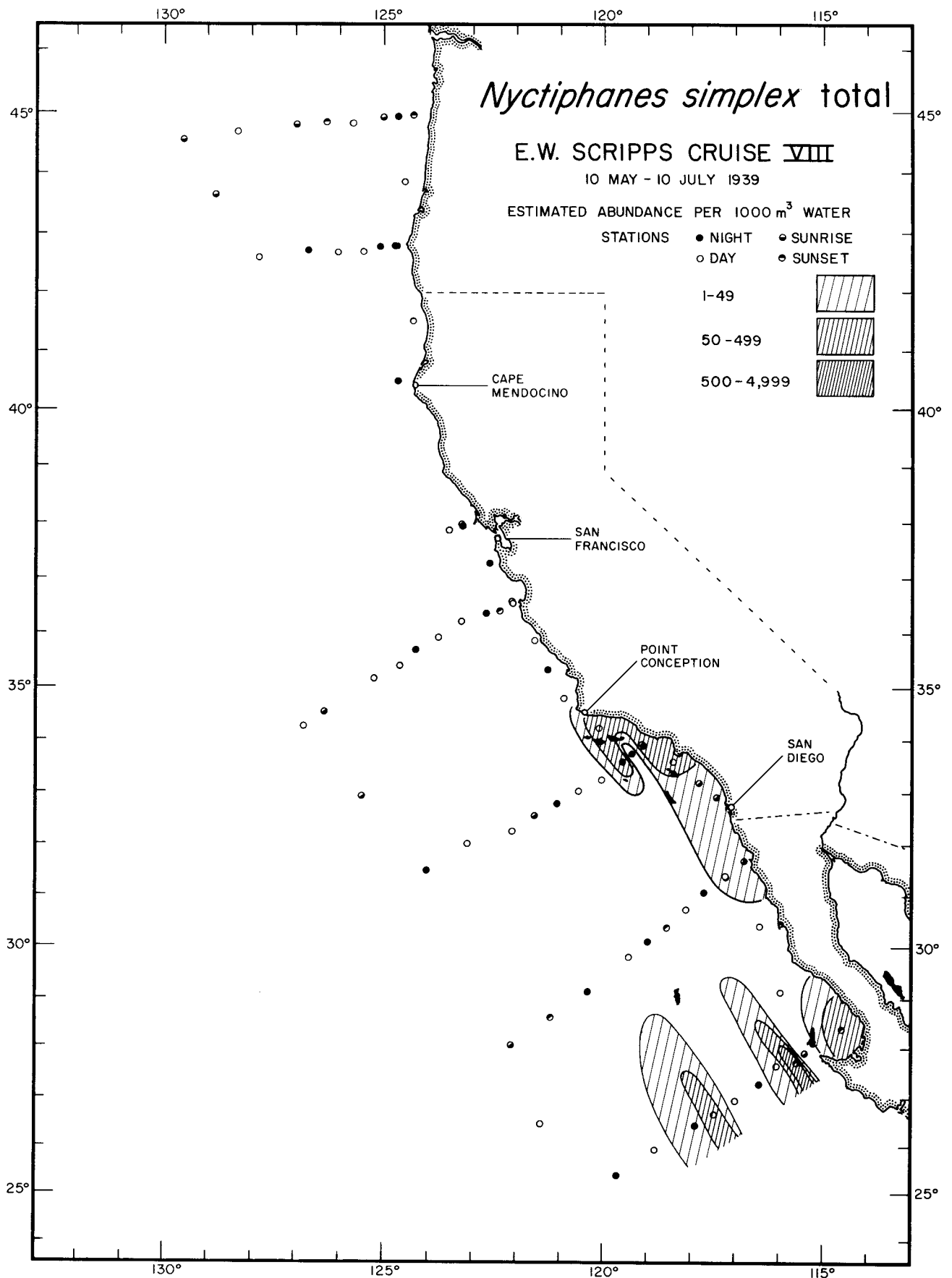
Euphausiacea

Nematoscelis tenella

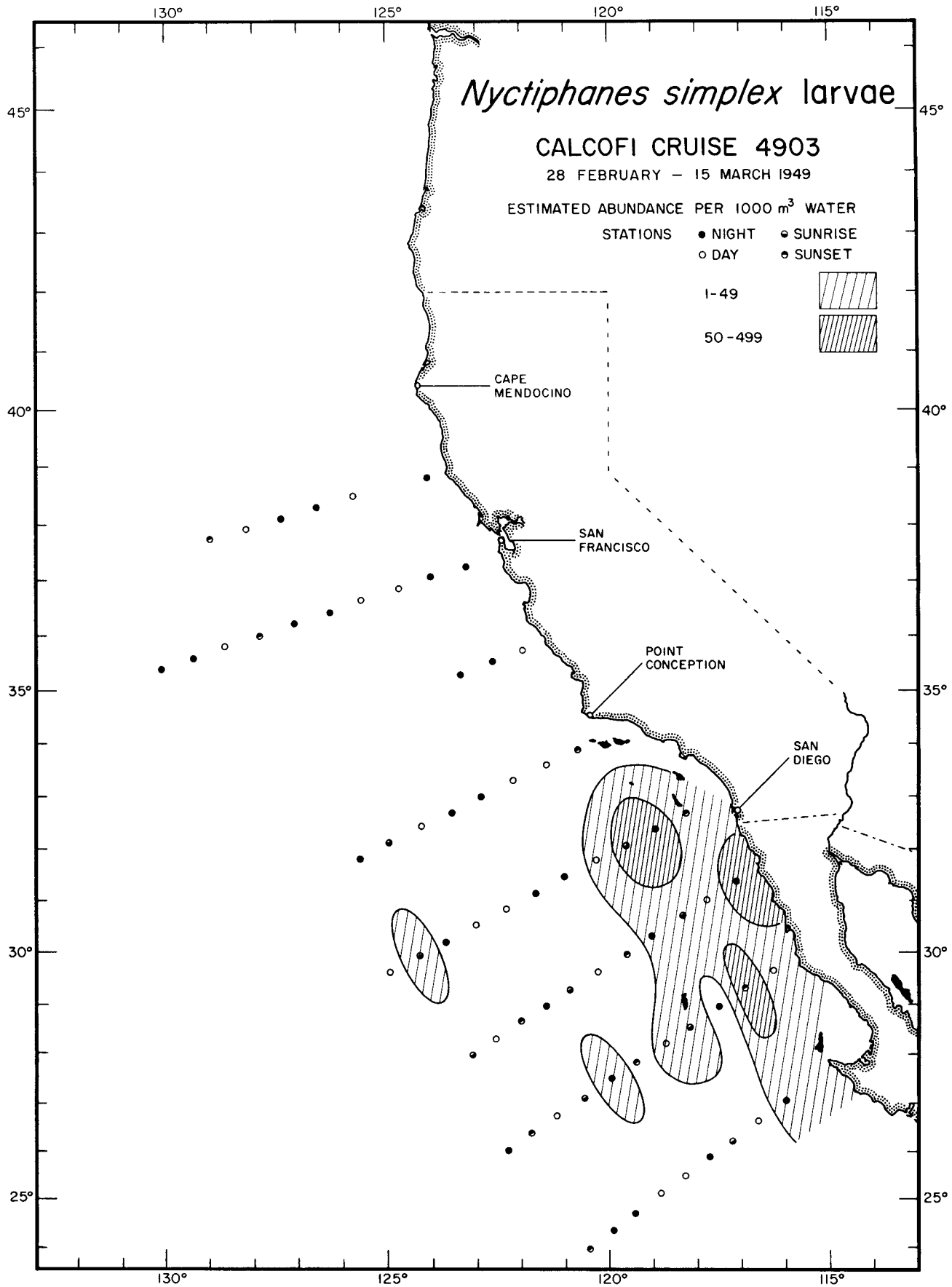
5009



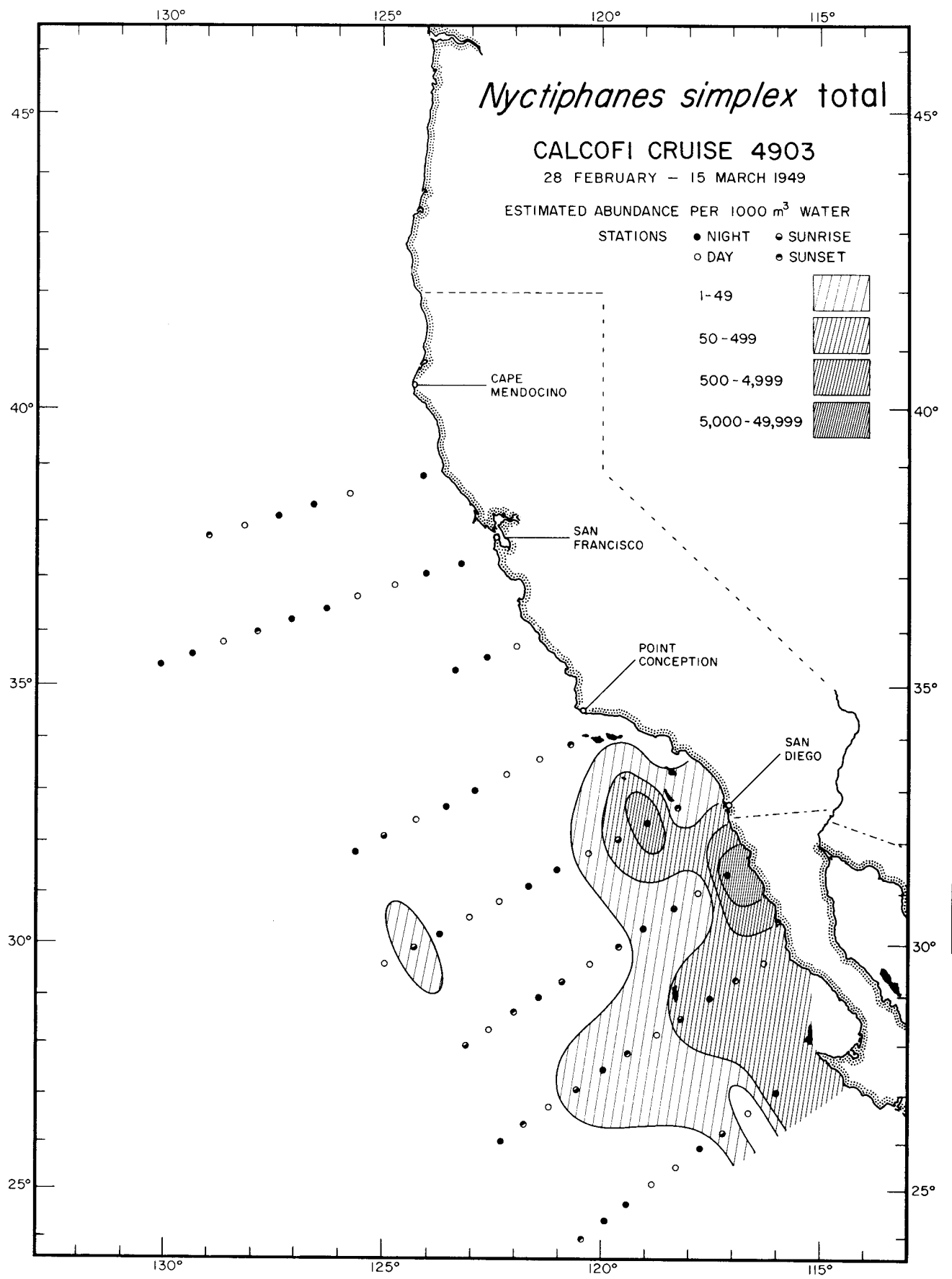
Euphausiacea
Nyctiphanes simplex larvae
E.W. SCRIPPS CRUISE VIII



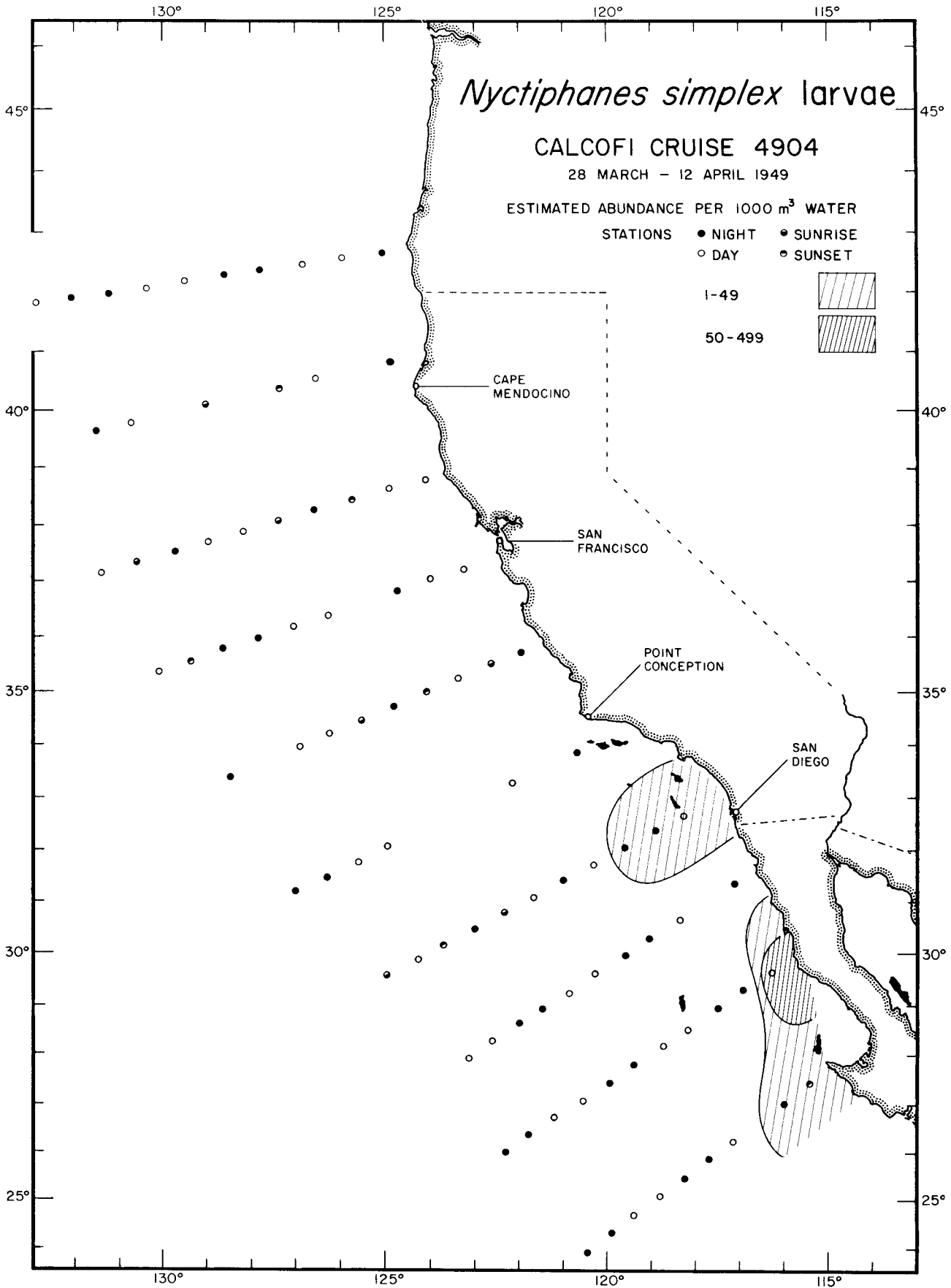
Euphausiacea
Nyctiphanes simplex total
E. W. SCRIPPS CRUISE VIII



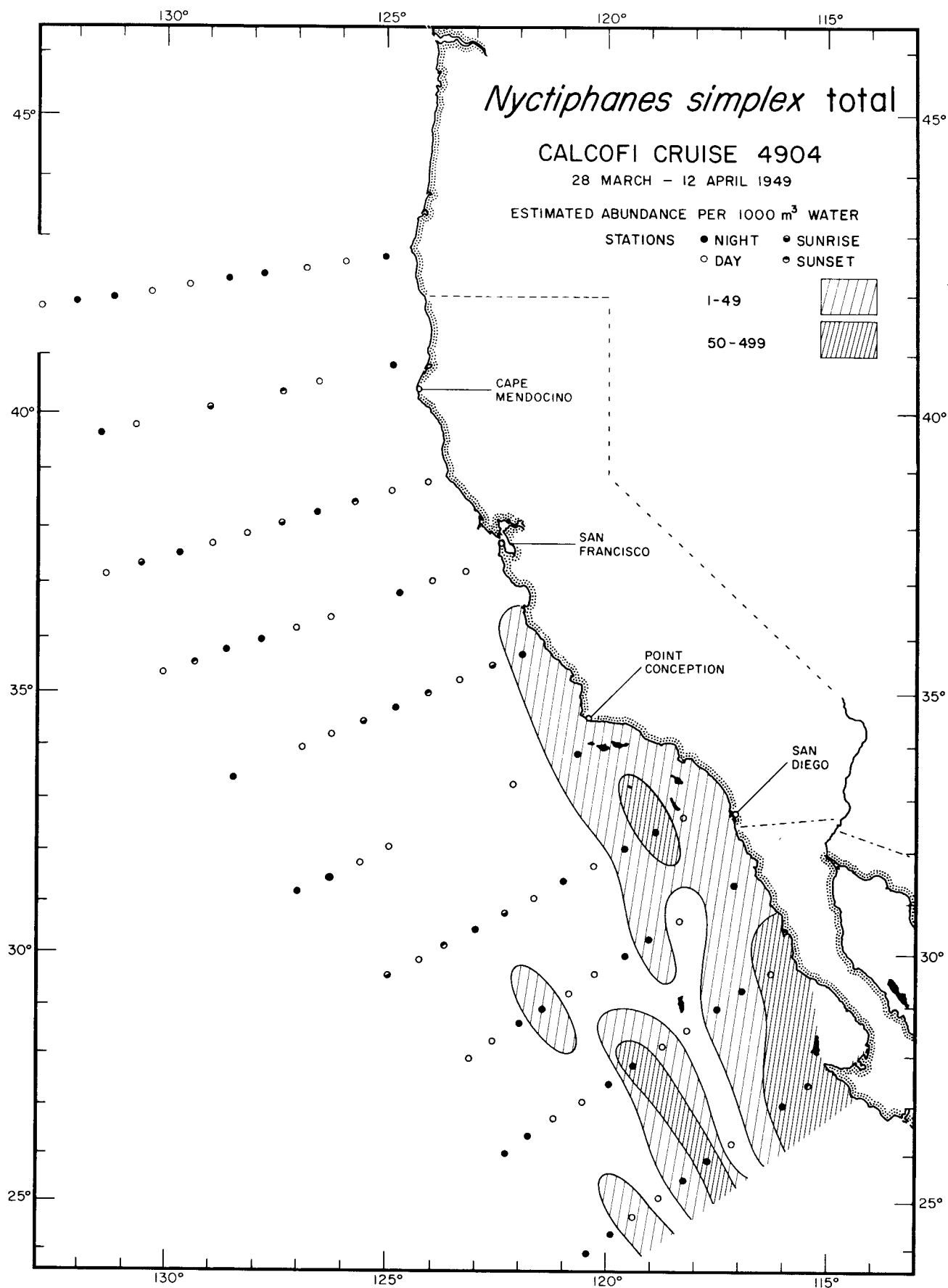
Euphausiacea
Nyctiphanes simplex larvae
4903



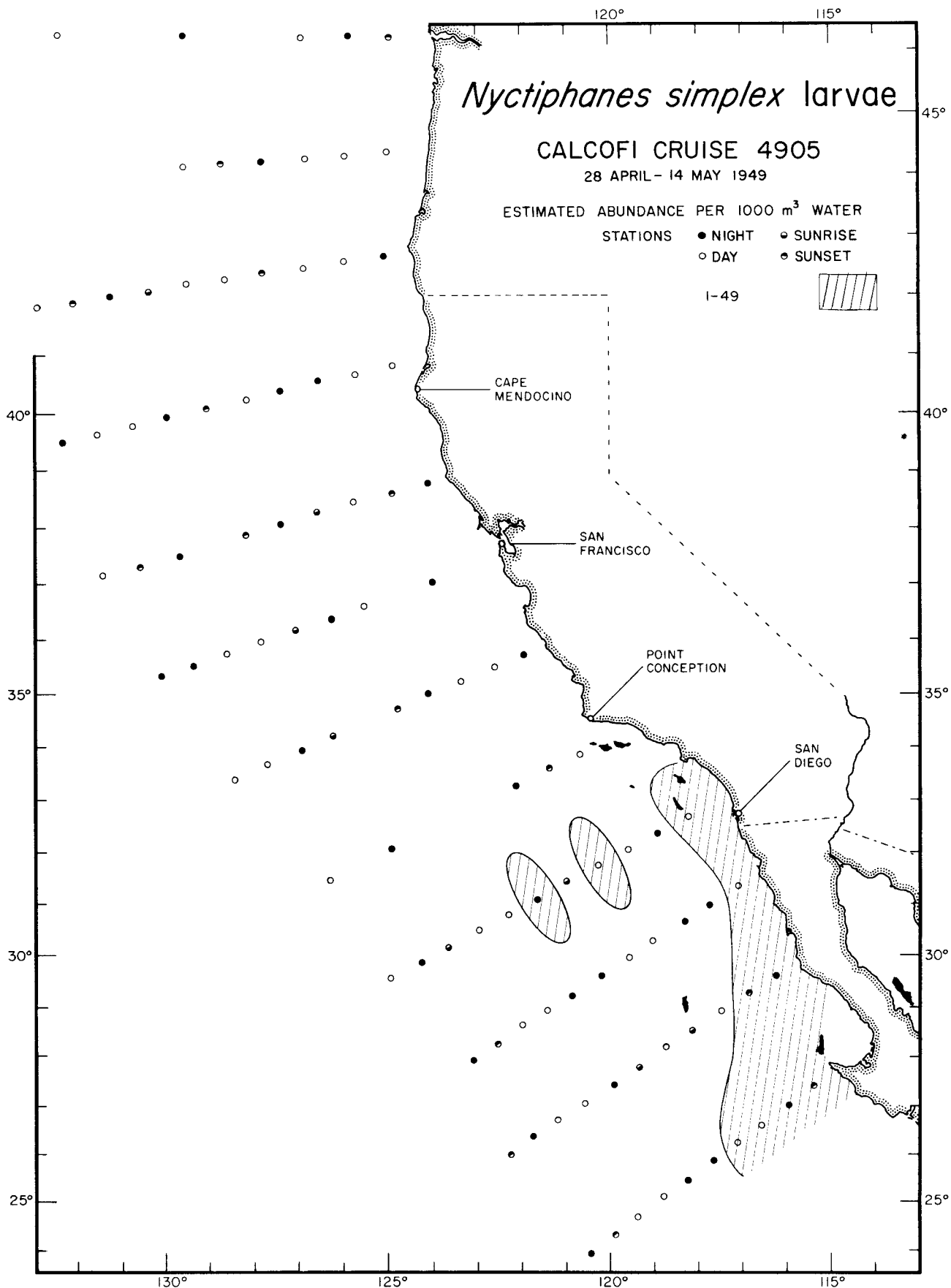
Euphausiacea
Nyctiphanes simplex total
4903



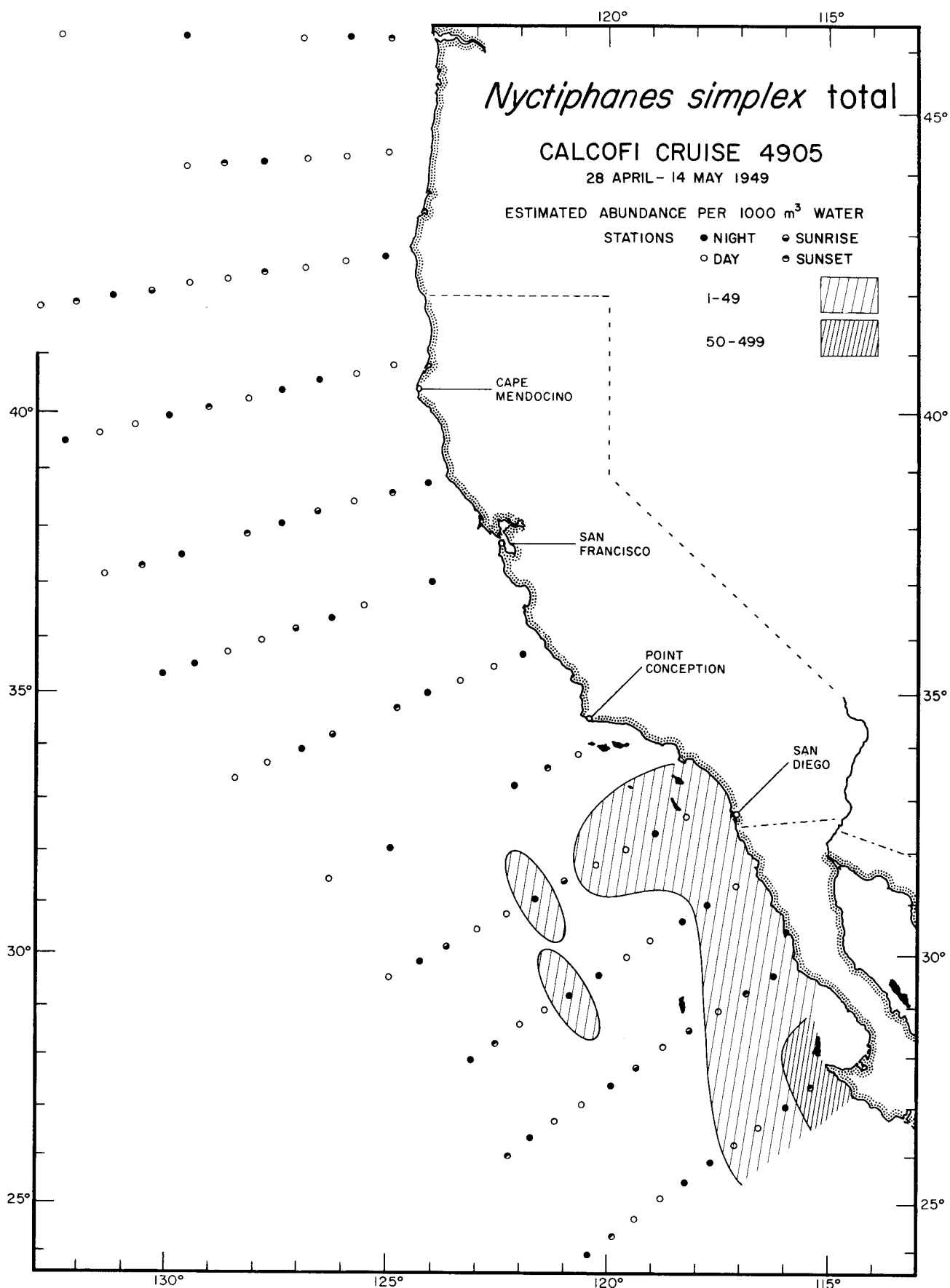
Euphausiacea
Nyctiphanes simplex larvae
4904



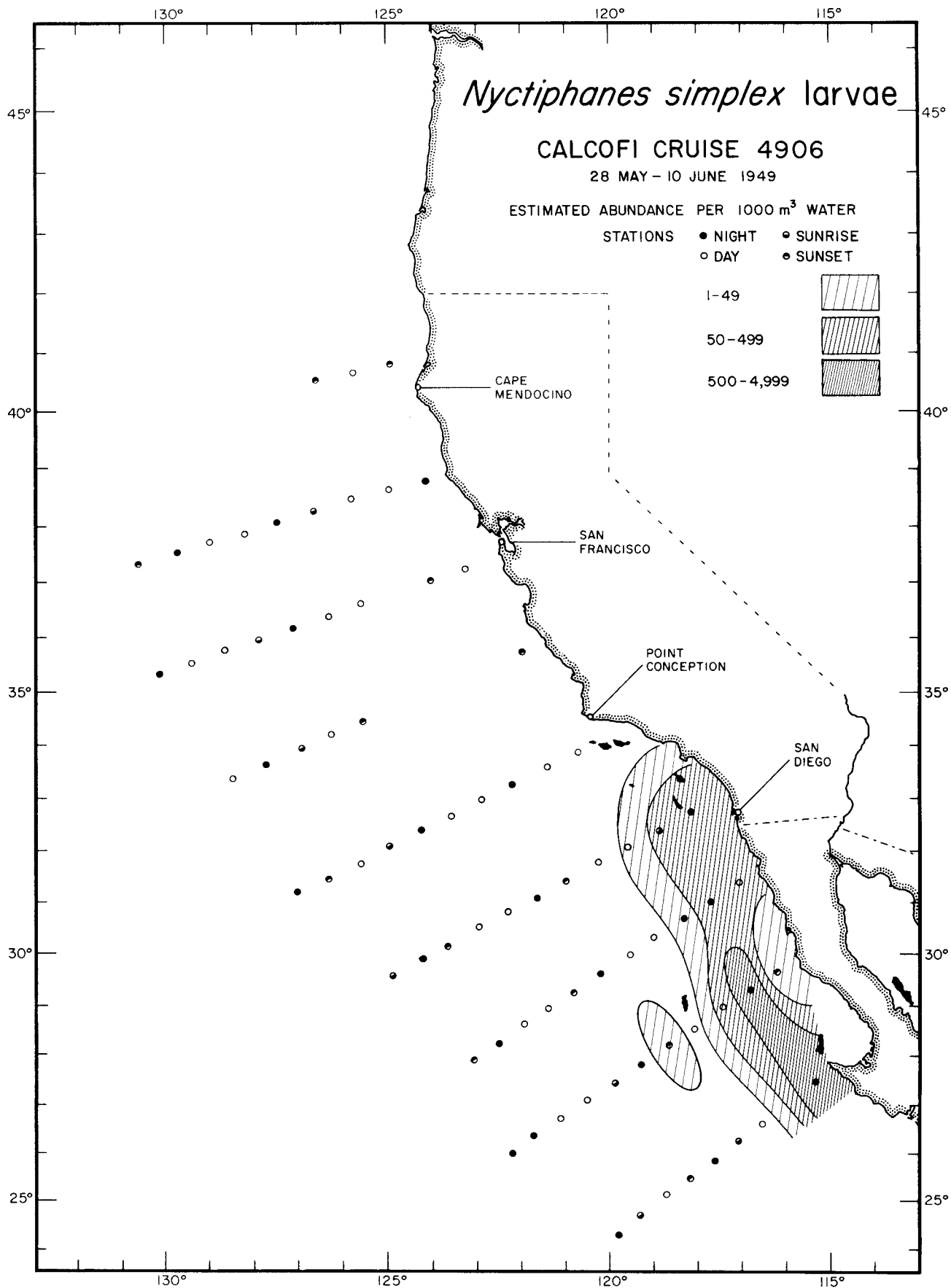
Euphausiacea
Nyctiphanes simplex total
4904



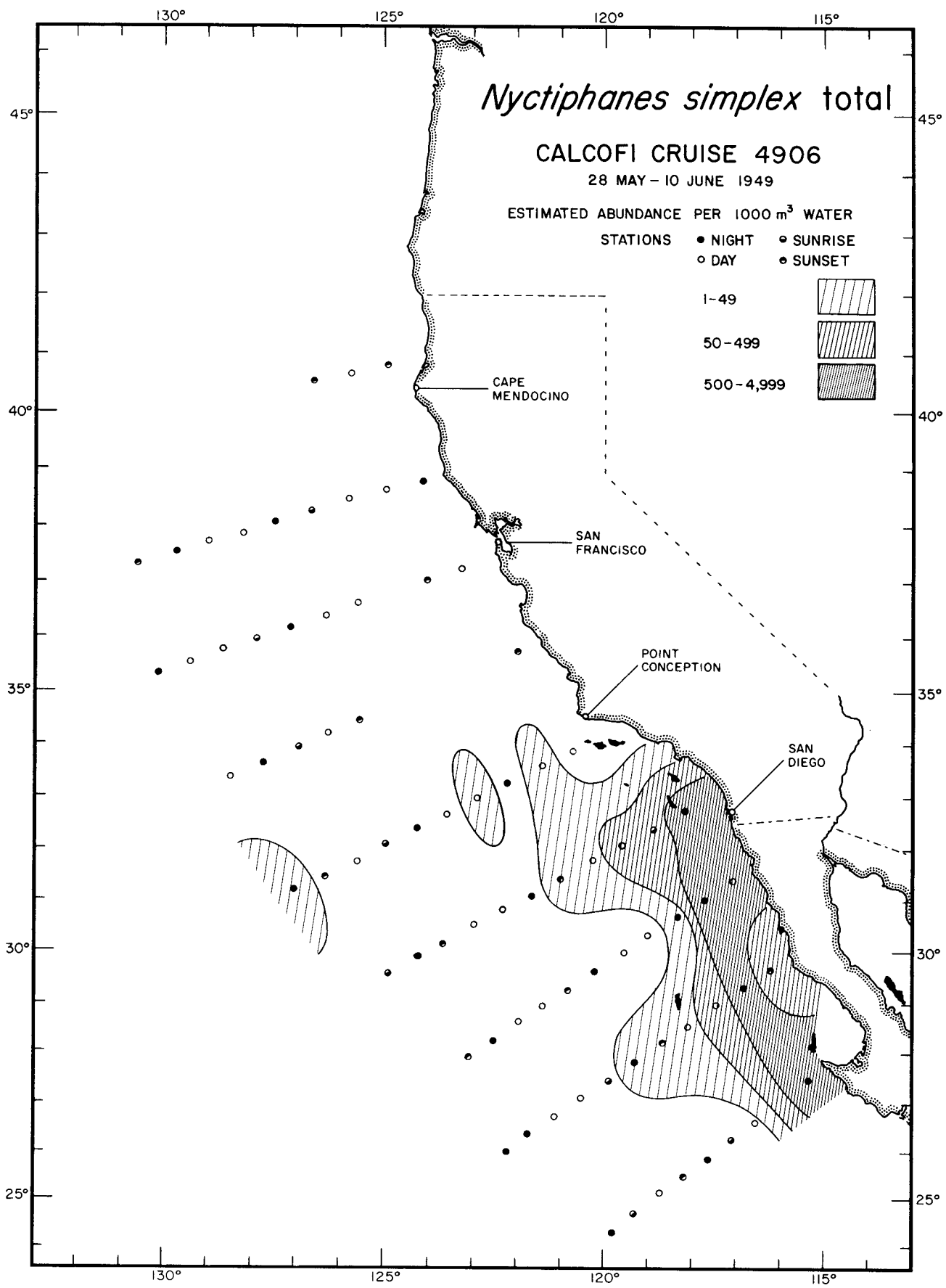
Euphausiacea
Nyctiphanes simplex larvae
4905



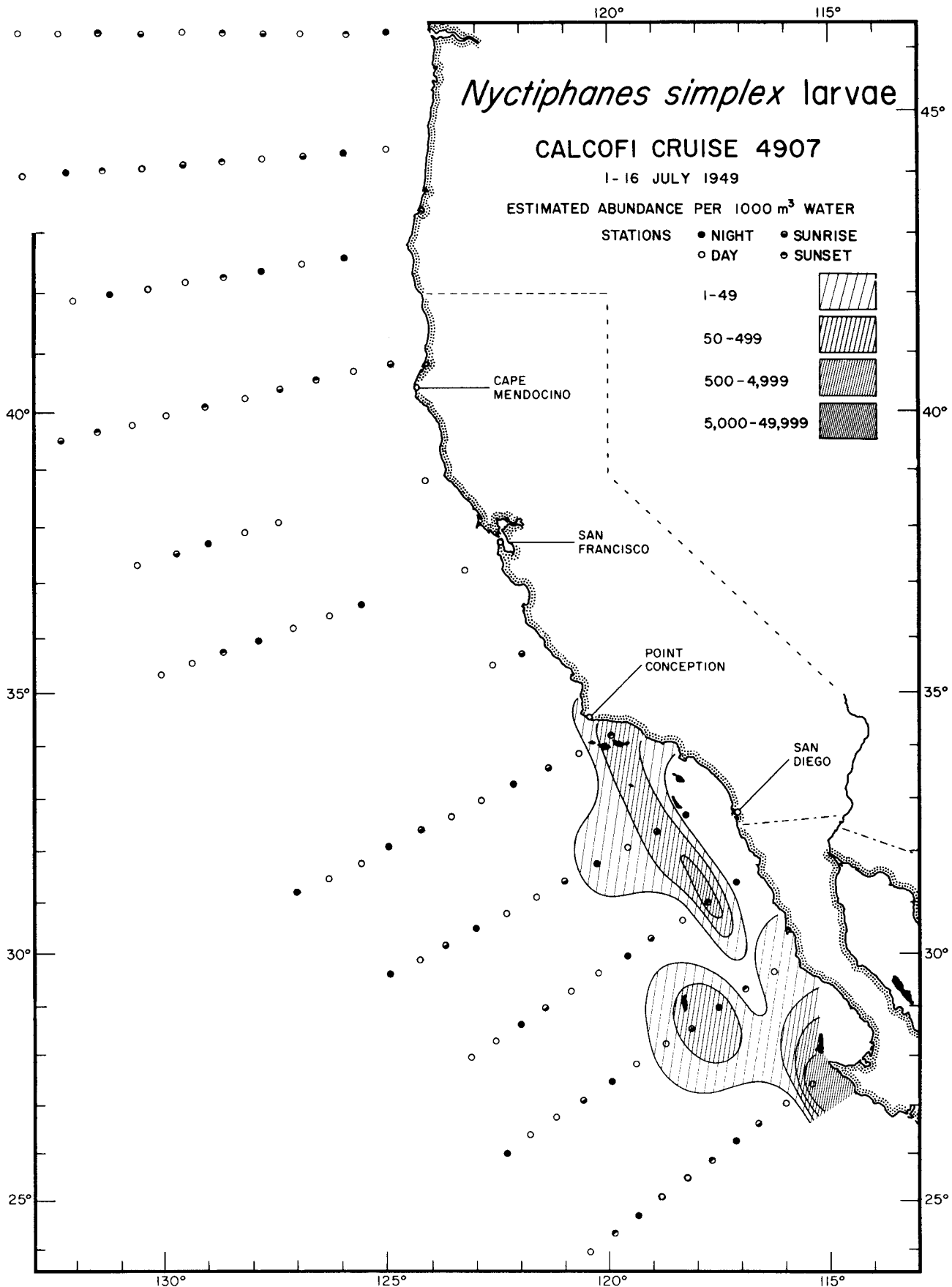
Euphausiacea
Nyctiphanes simplex total
4905



Euphausiacea
Nyctiphanes simplex larvae
4906

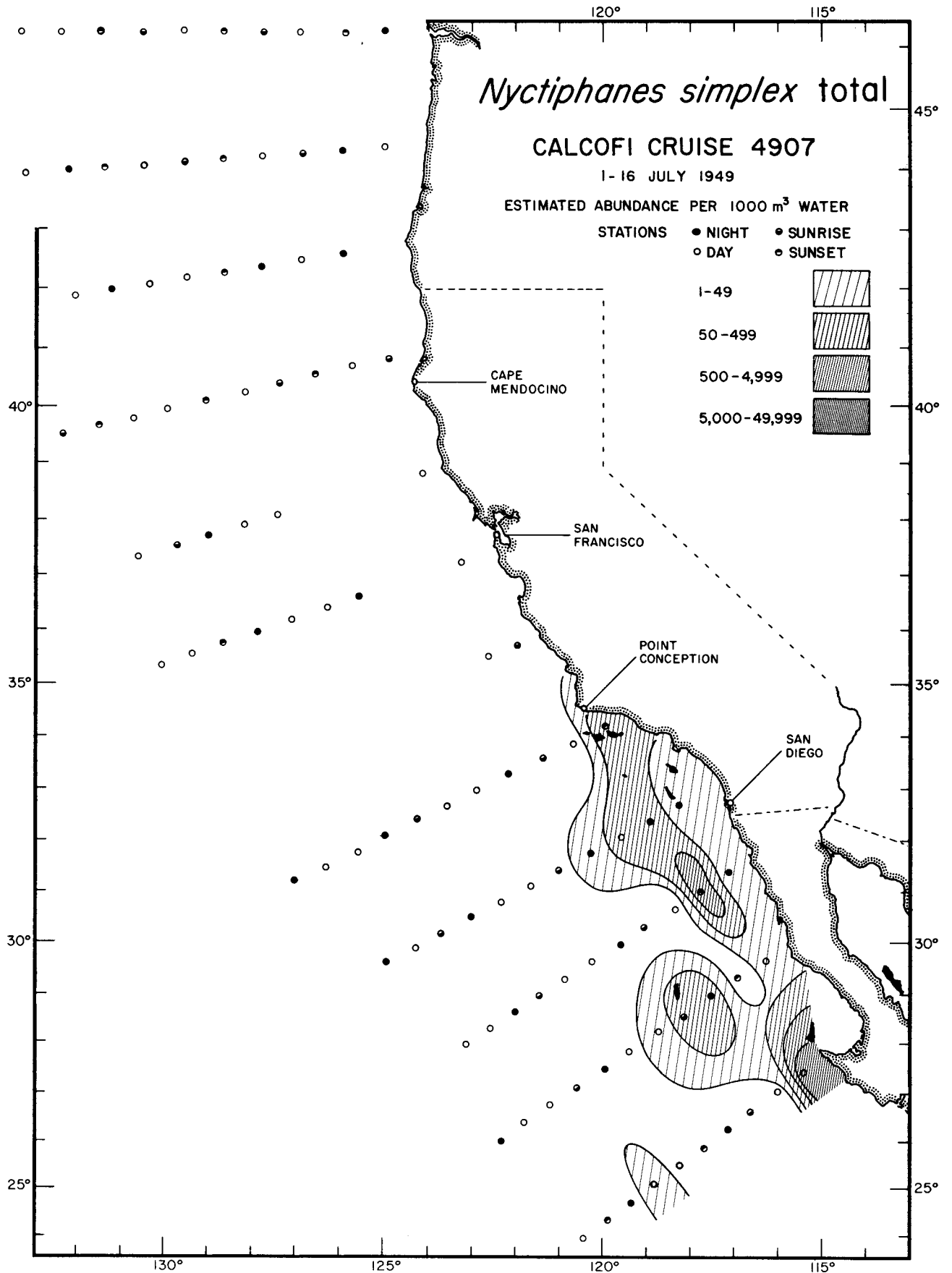


Euphausiacea
Nyctiphanes simplex total
4906

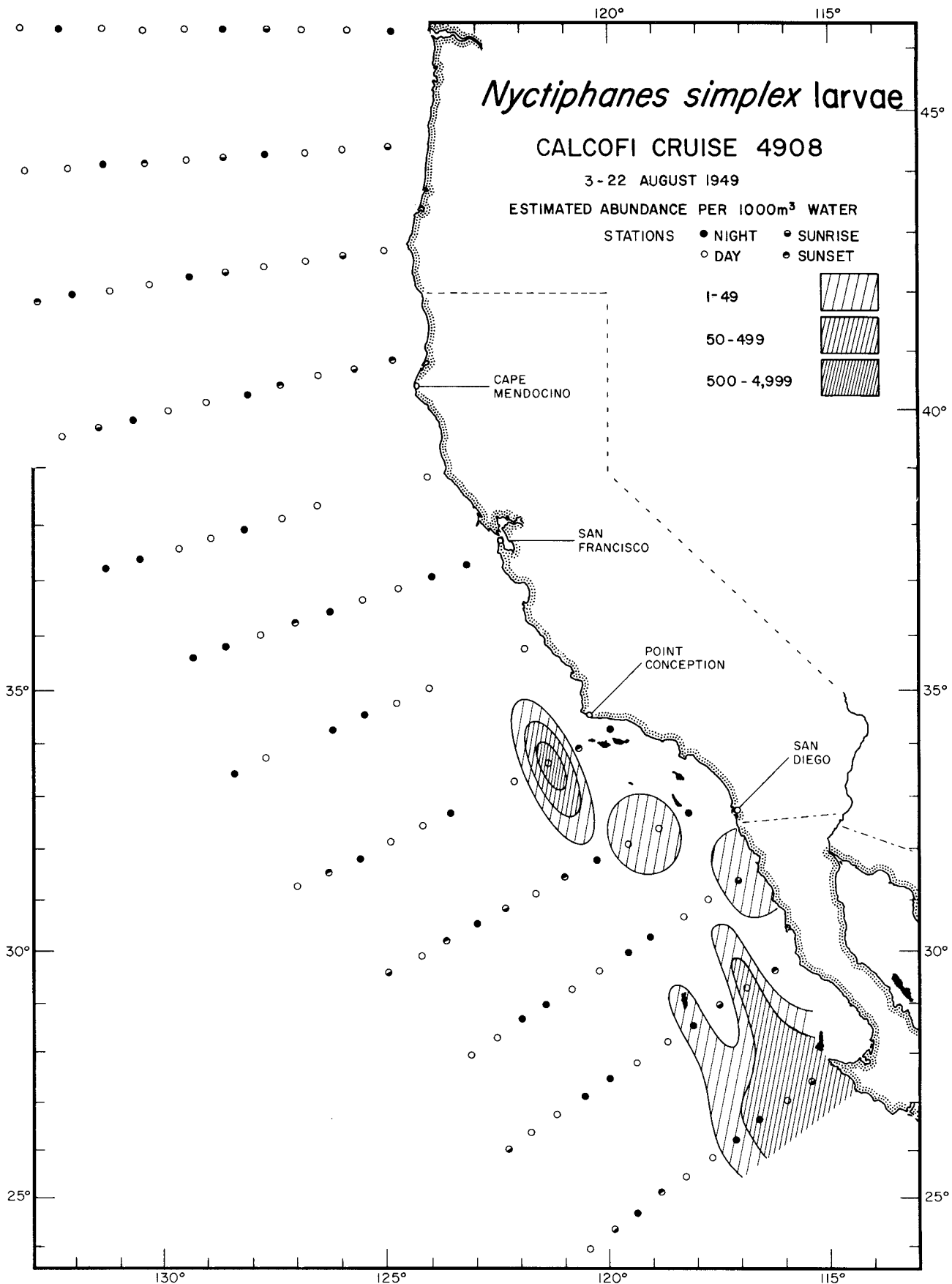


Euphausiacea
Nyctiphanes simplex larvae

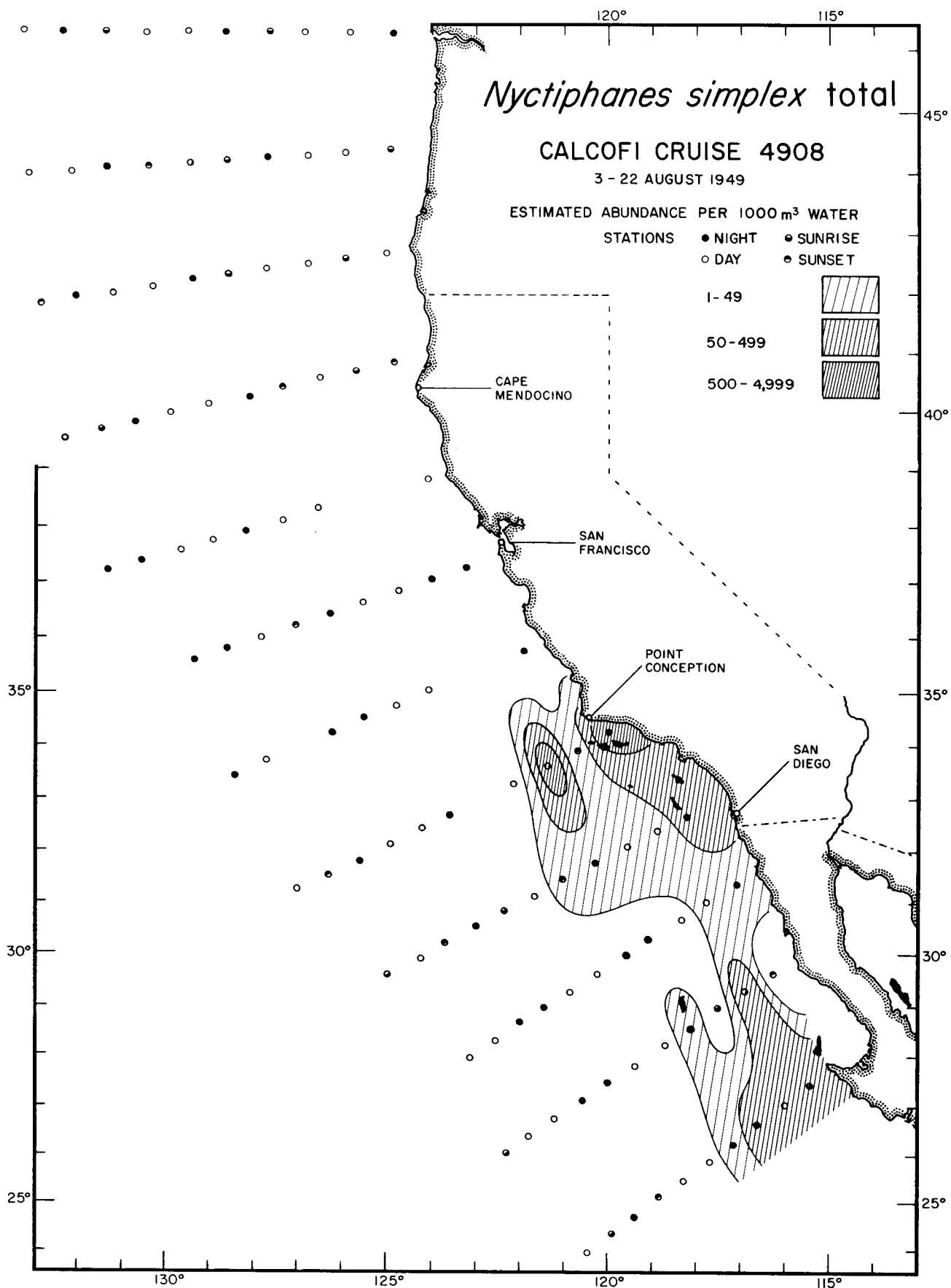
4907



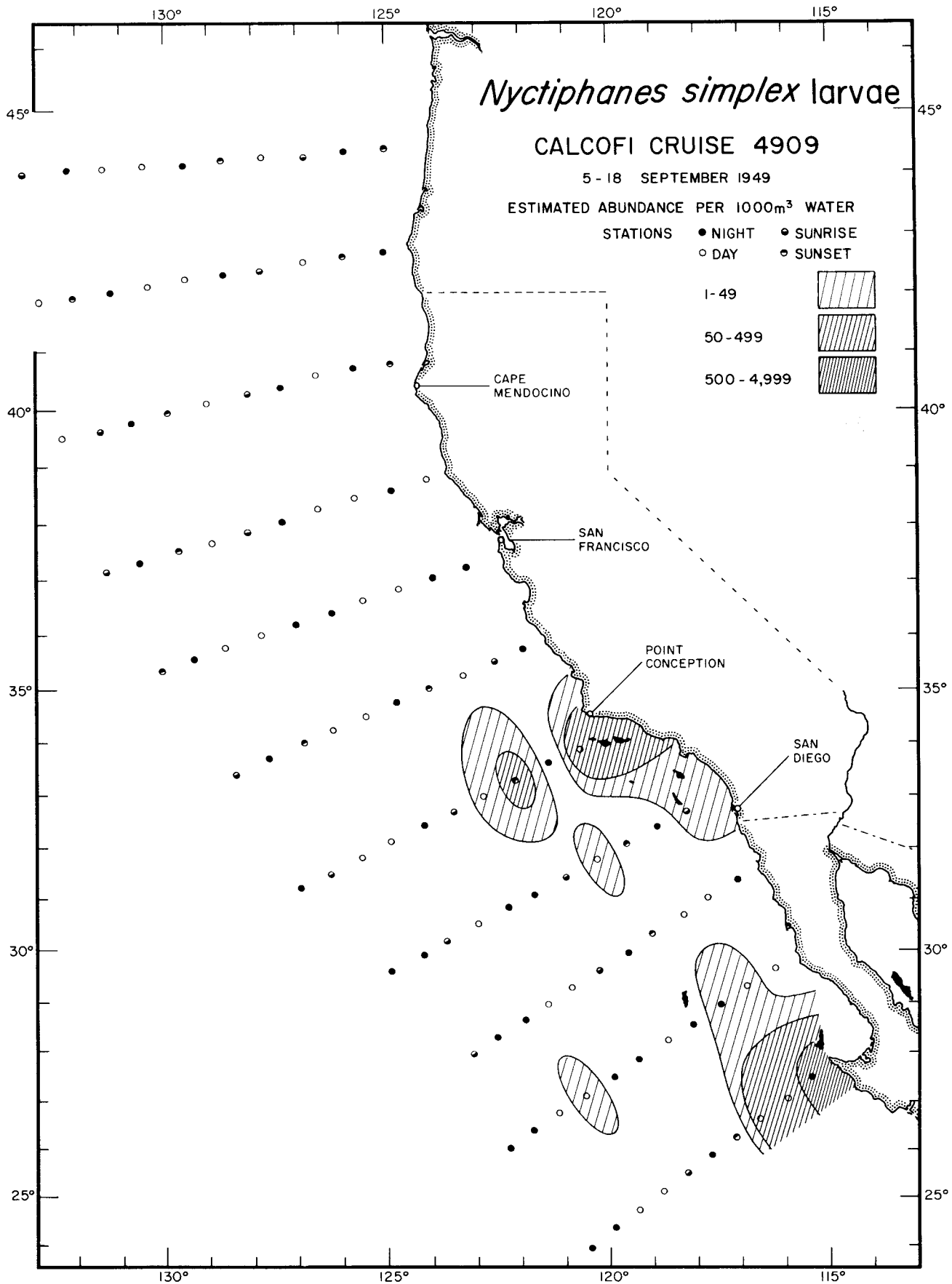
Euphausiacea
Nyctiphanes simplex total
4907



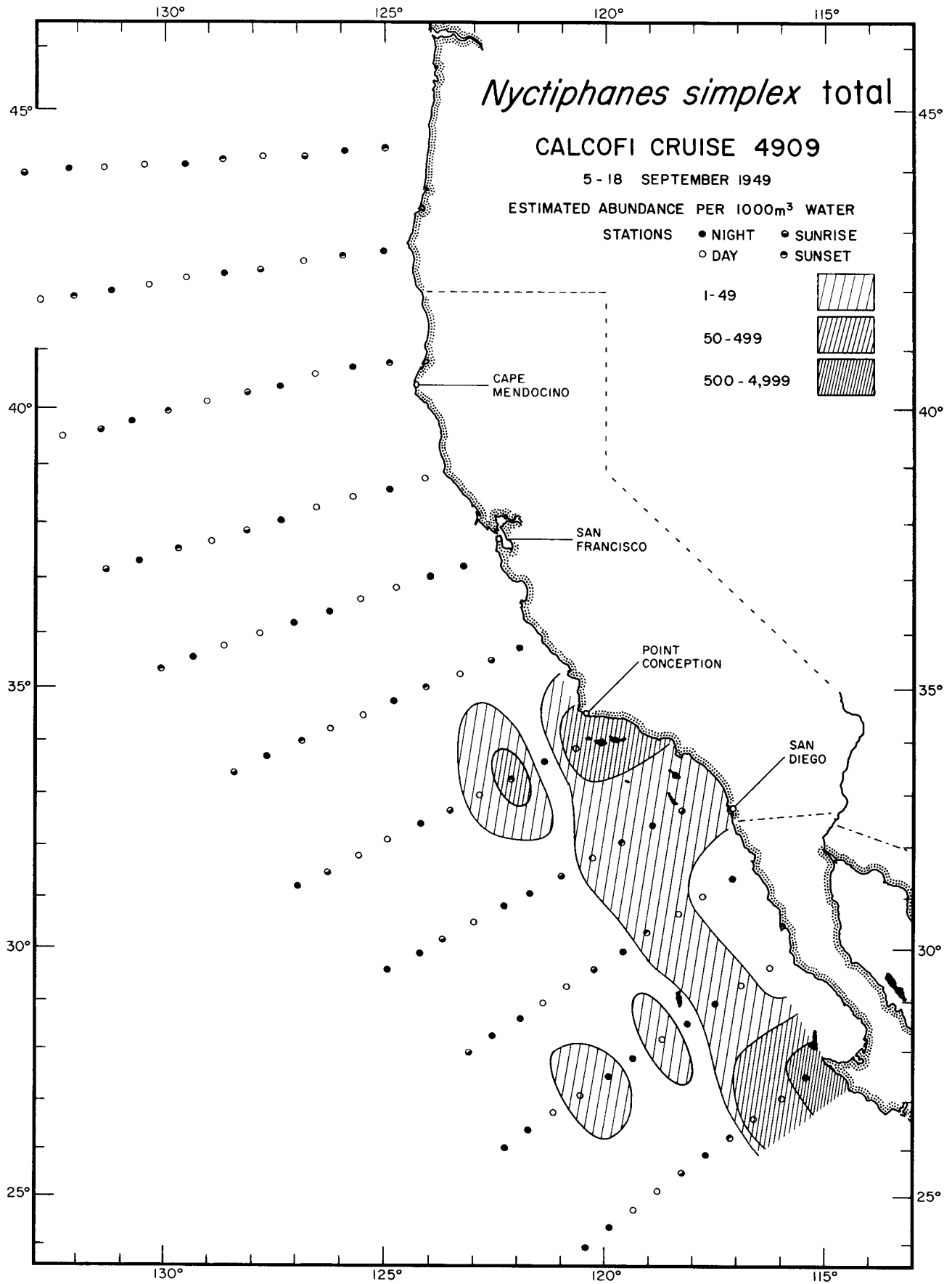
Euphausiacea
Nyctiphanes simplex larvae
4908



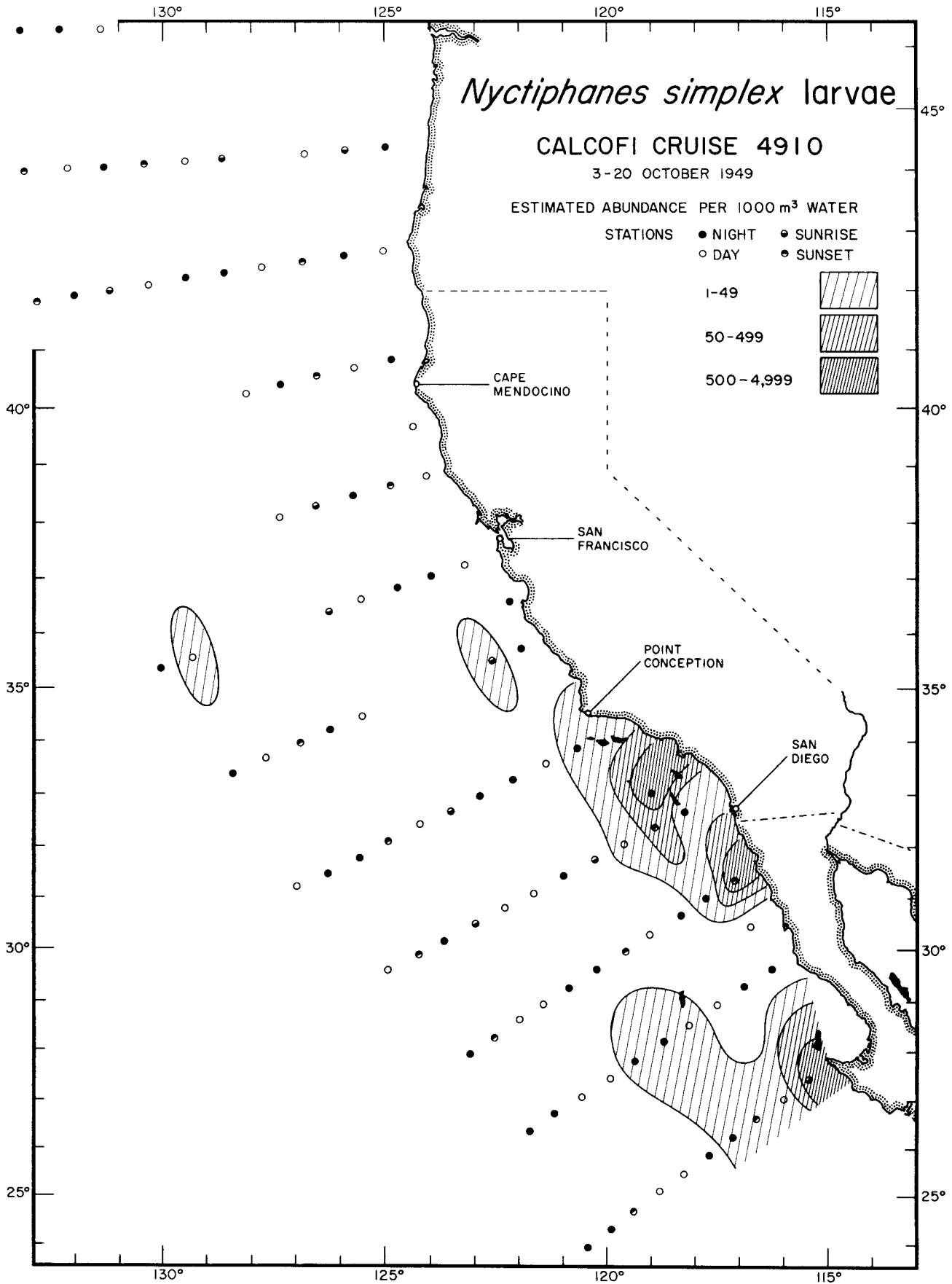
Euphausiacea
Nyctiphanes simplex total
4908



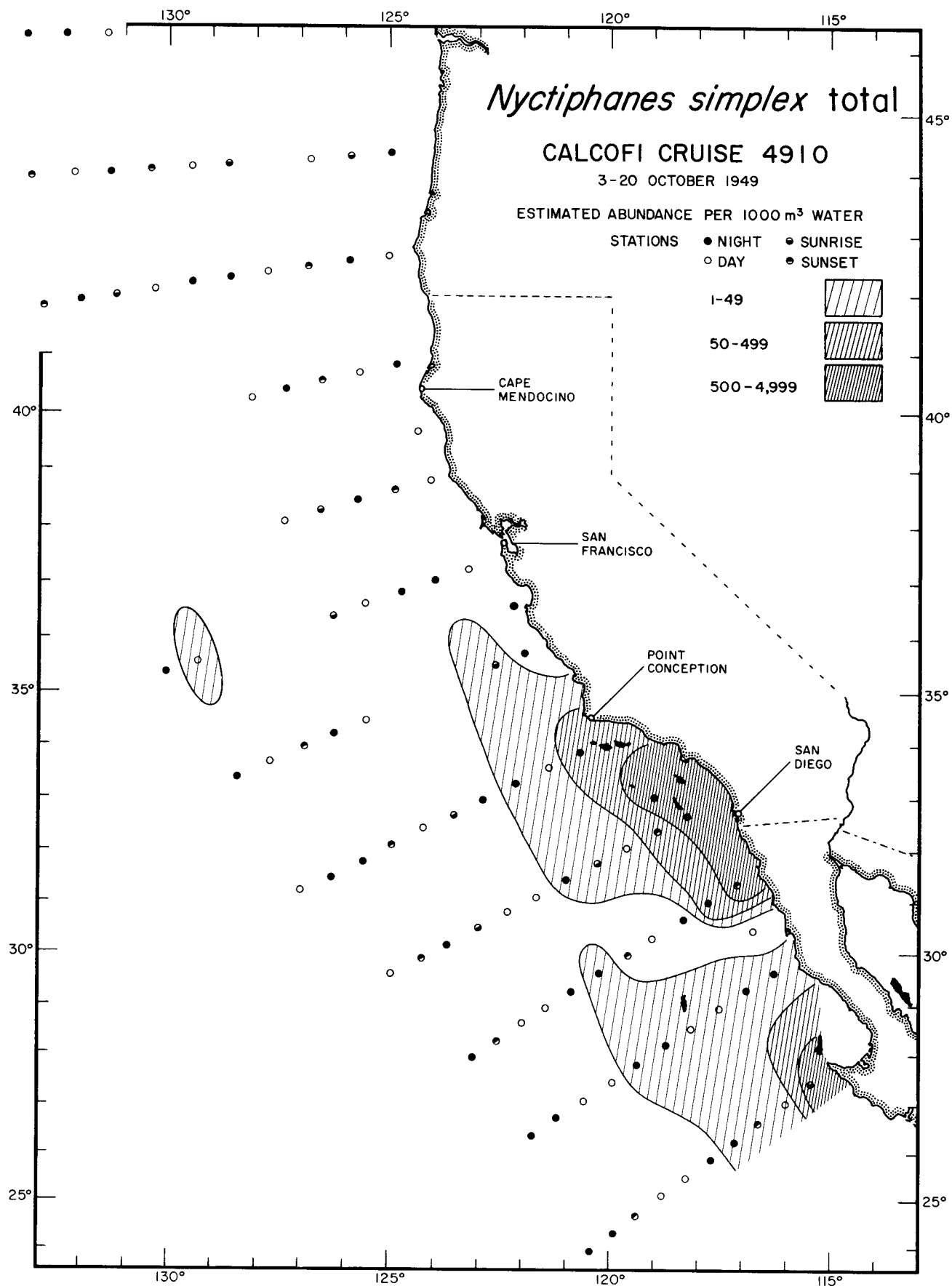
Euphausiacea
Nyctiphanes simplex larvae
4909



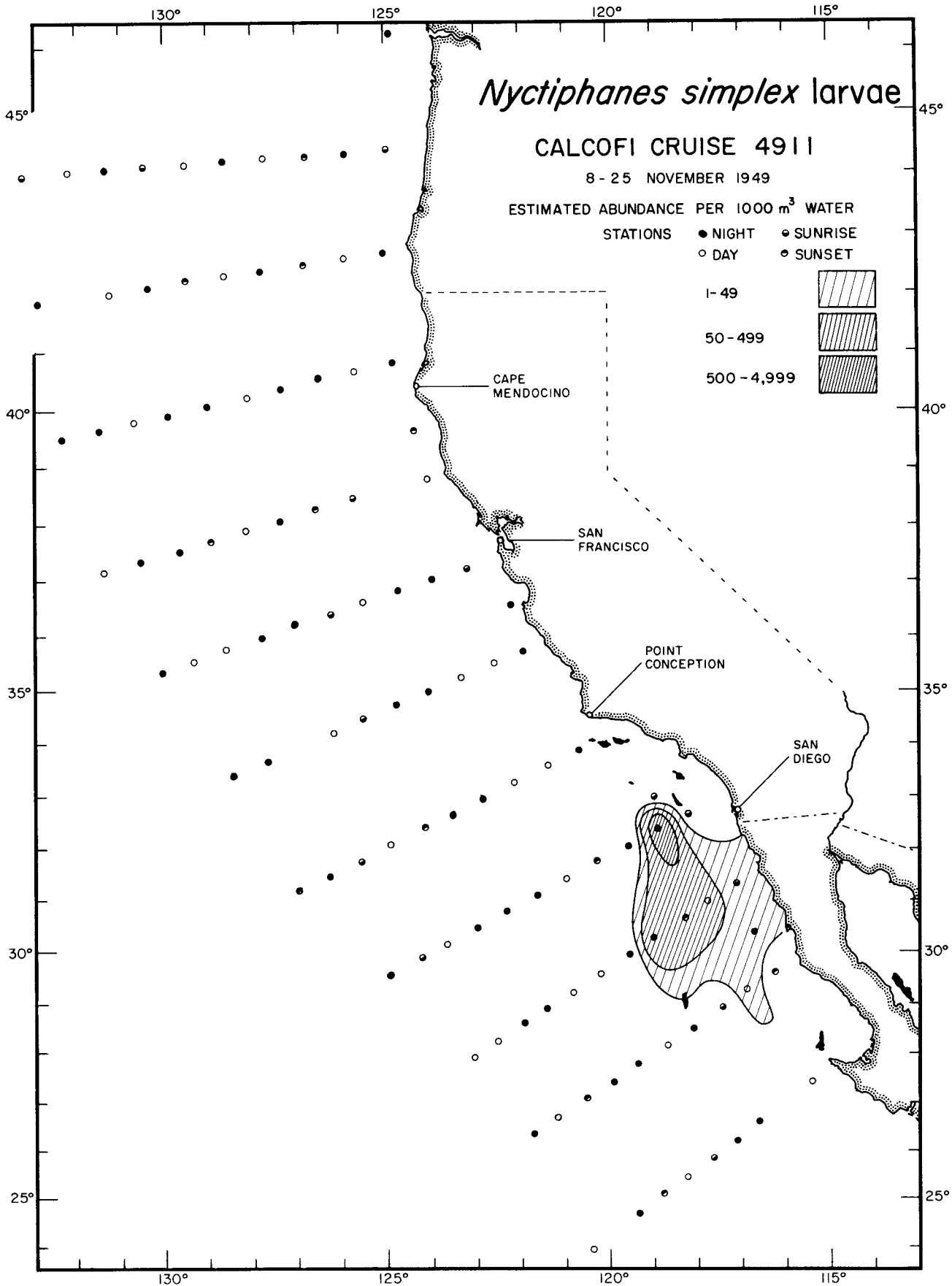
Euphausiacea
Nyctiphanes simplex total
4909



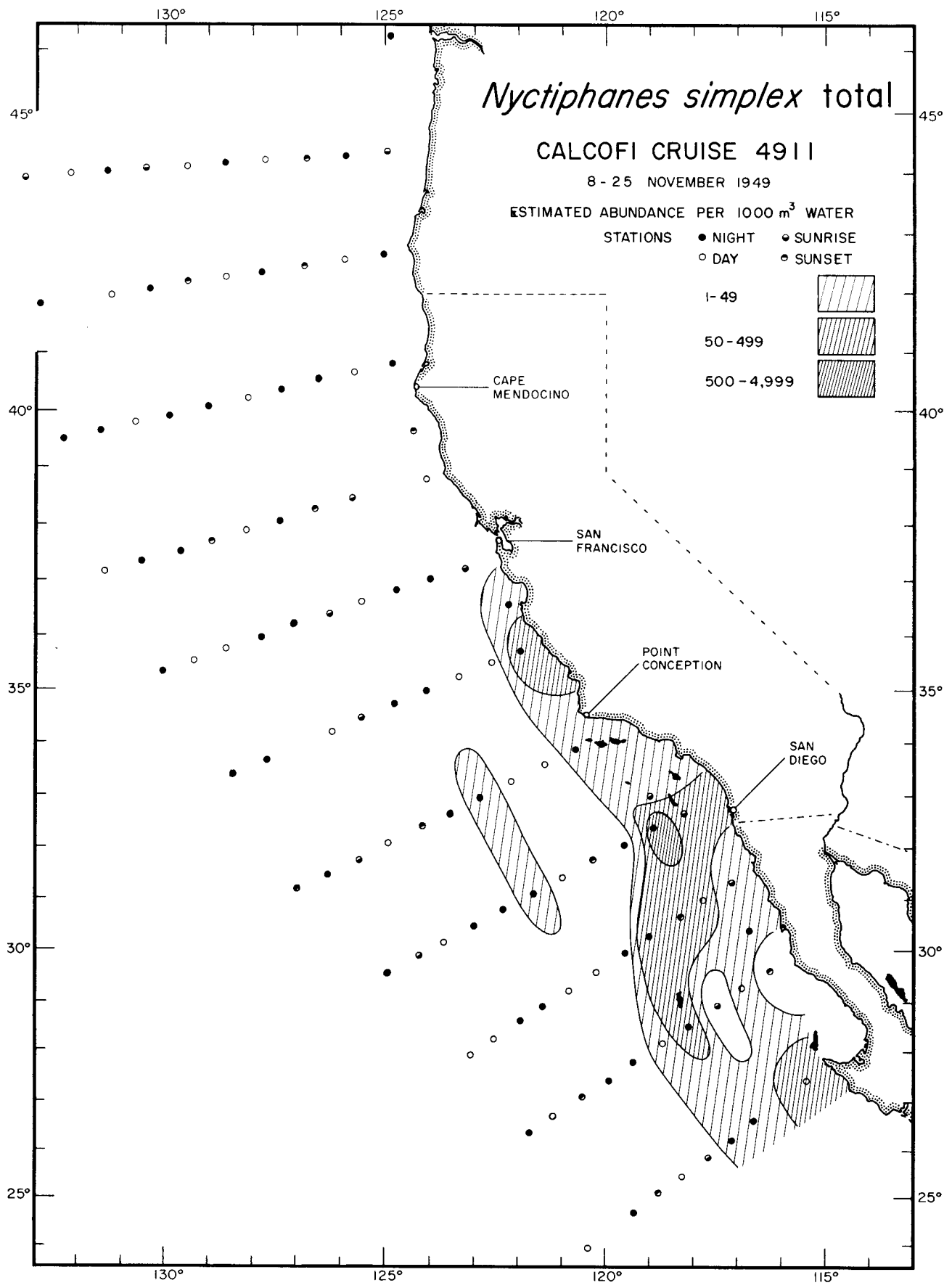
Euphausiacea
Nyctiphanes simplex larvae
4910



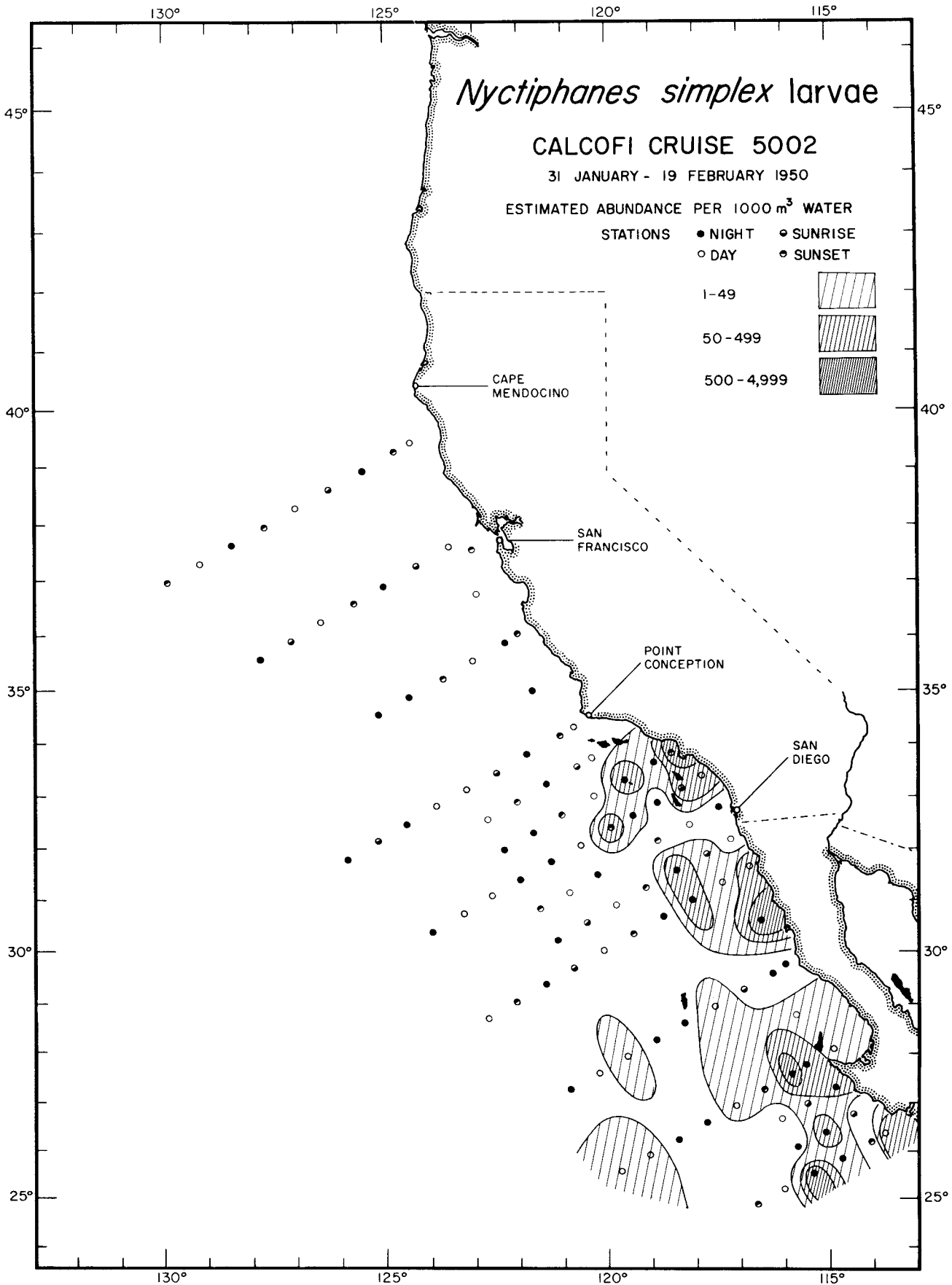
Euphausiacea
Nyctiphanes simplex total
4910



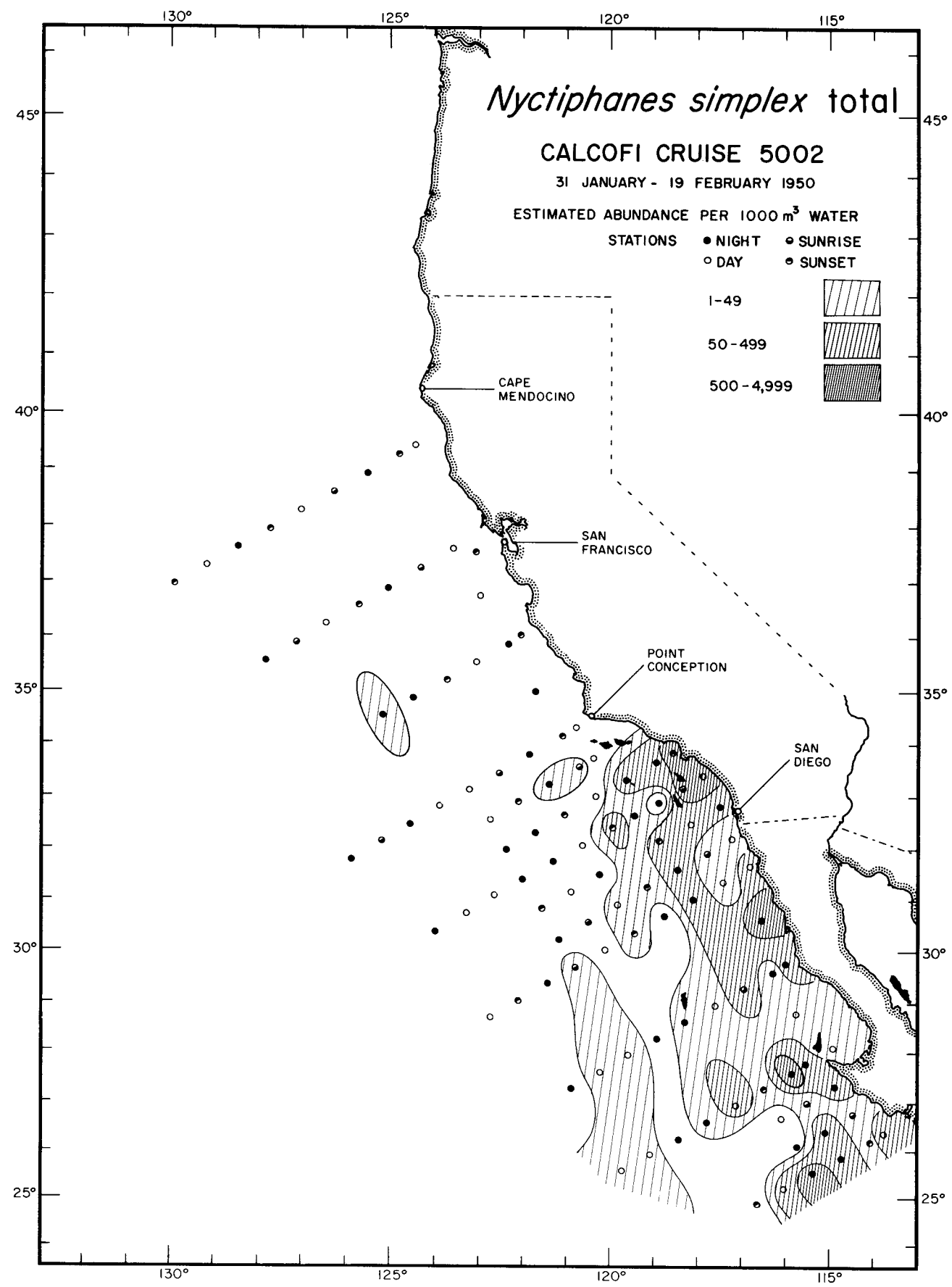
Euphausiacea
Nyctiphanes simplex larvae
4911



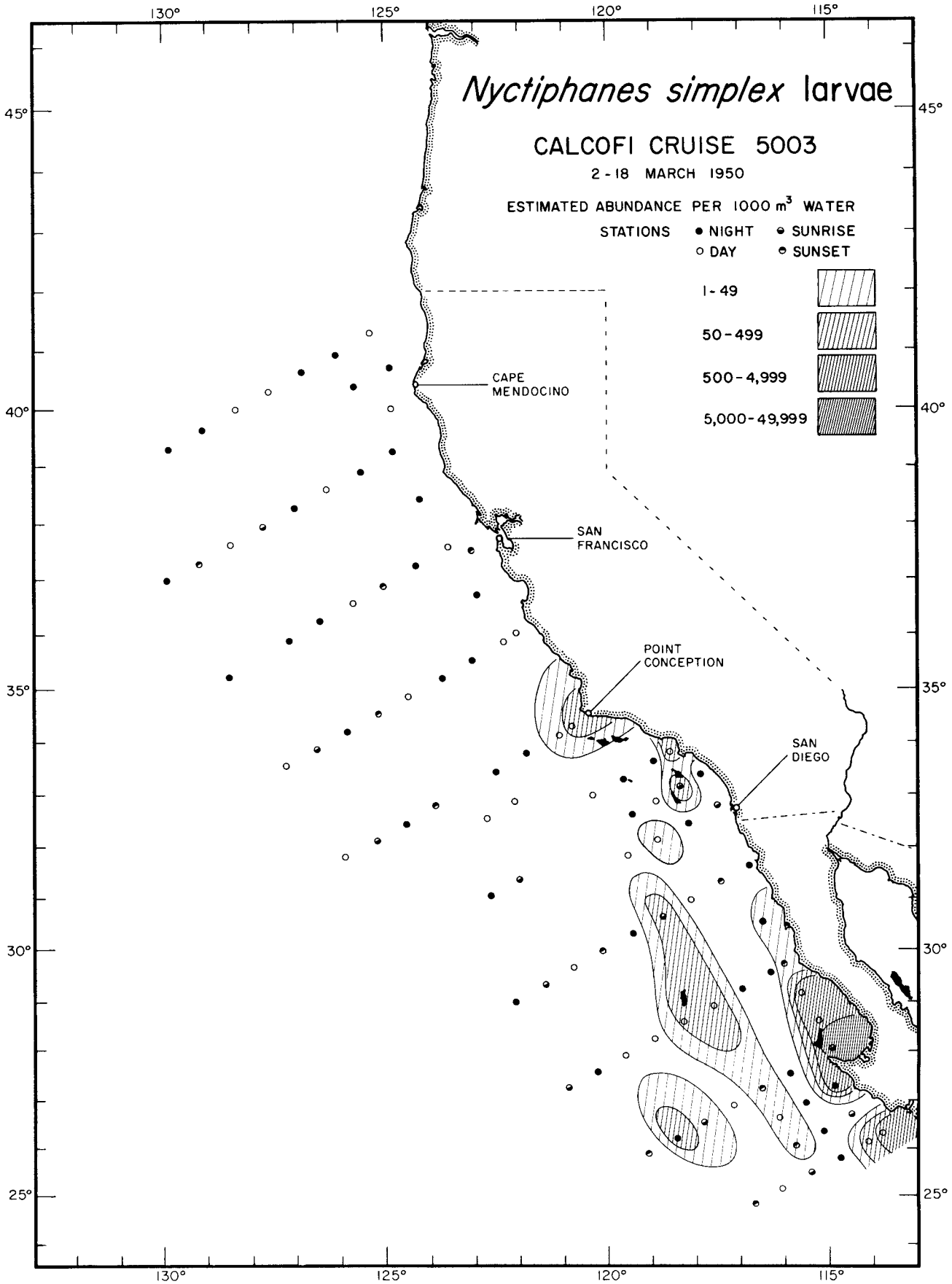
Euphausiacea
Nyctiphanes simplex total
4911



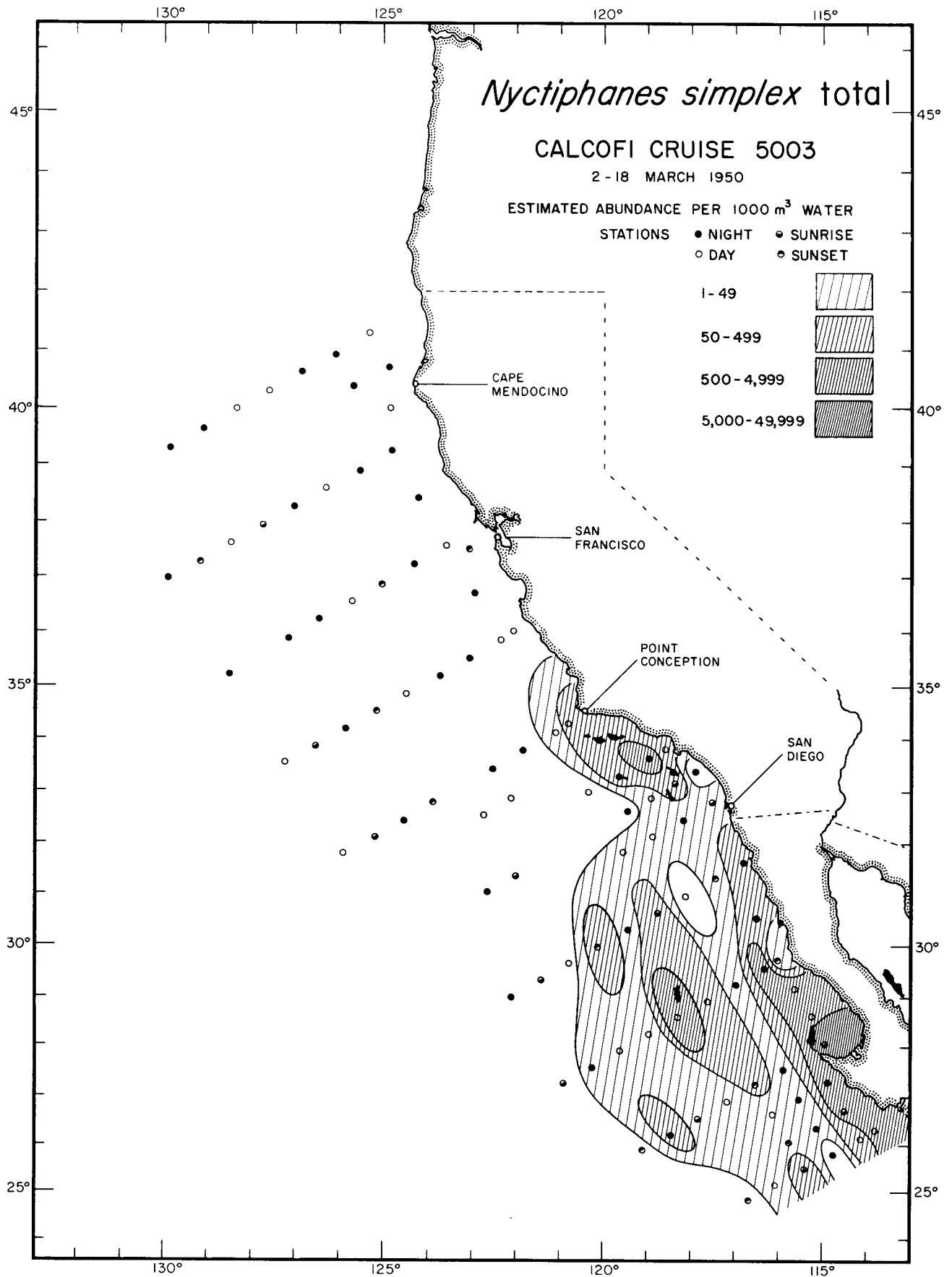
Euphausiacea
Nyctiphanes simplex larvae
5002



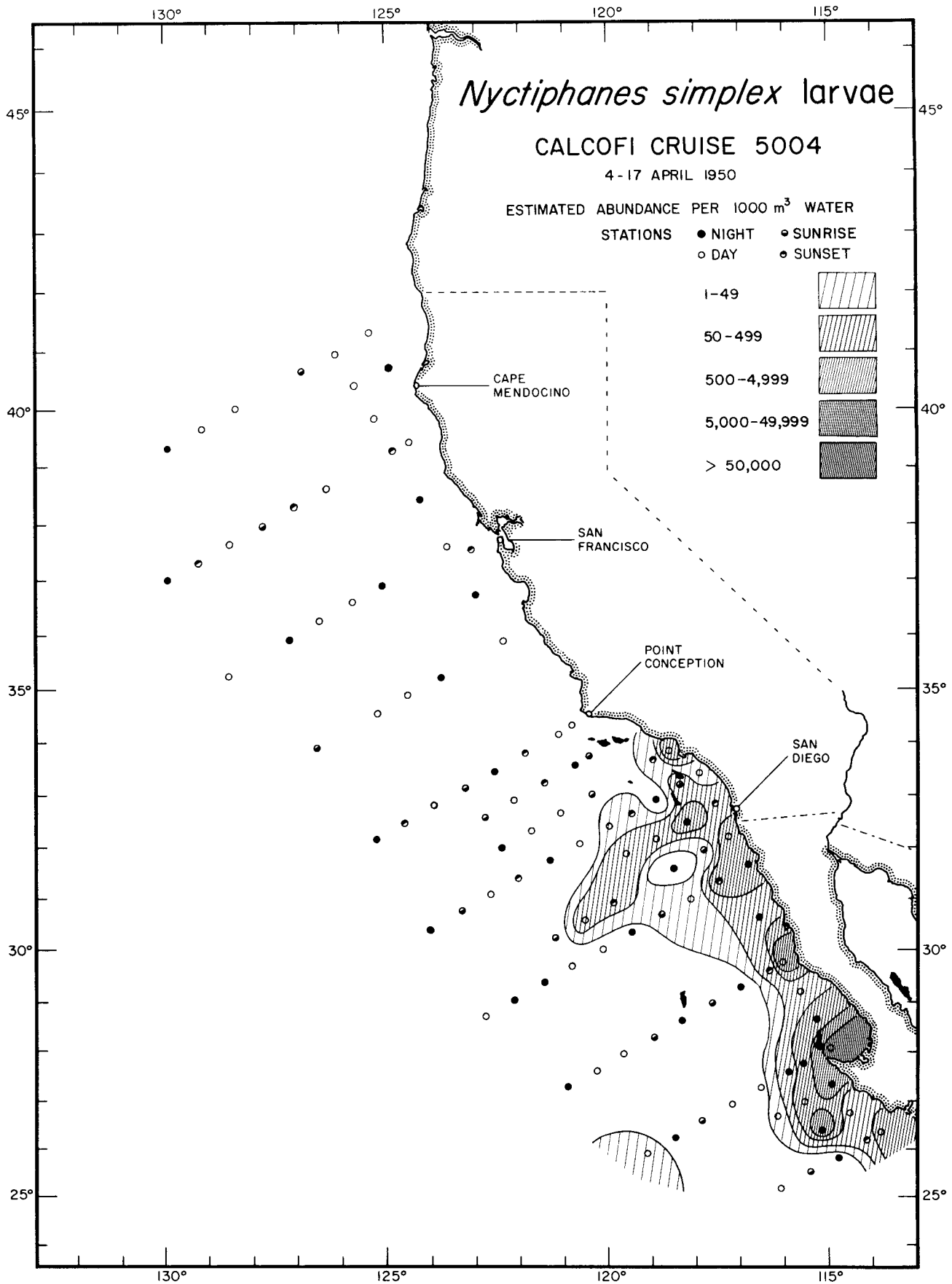
Euphausiacea
Nyctiphanes simplex total
5002



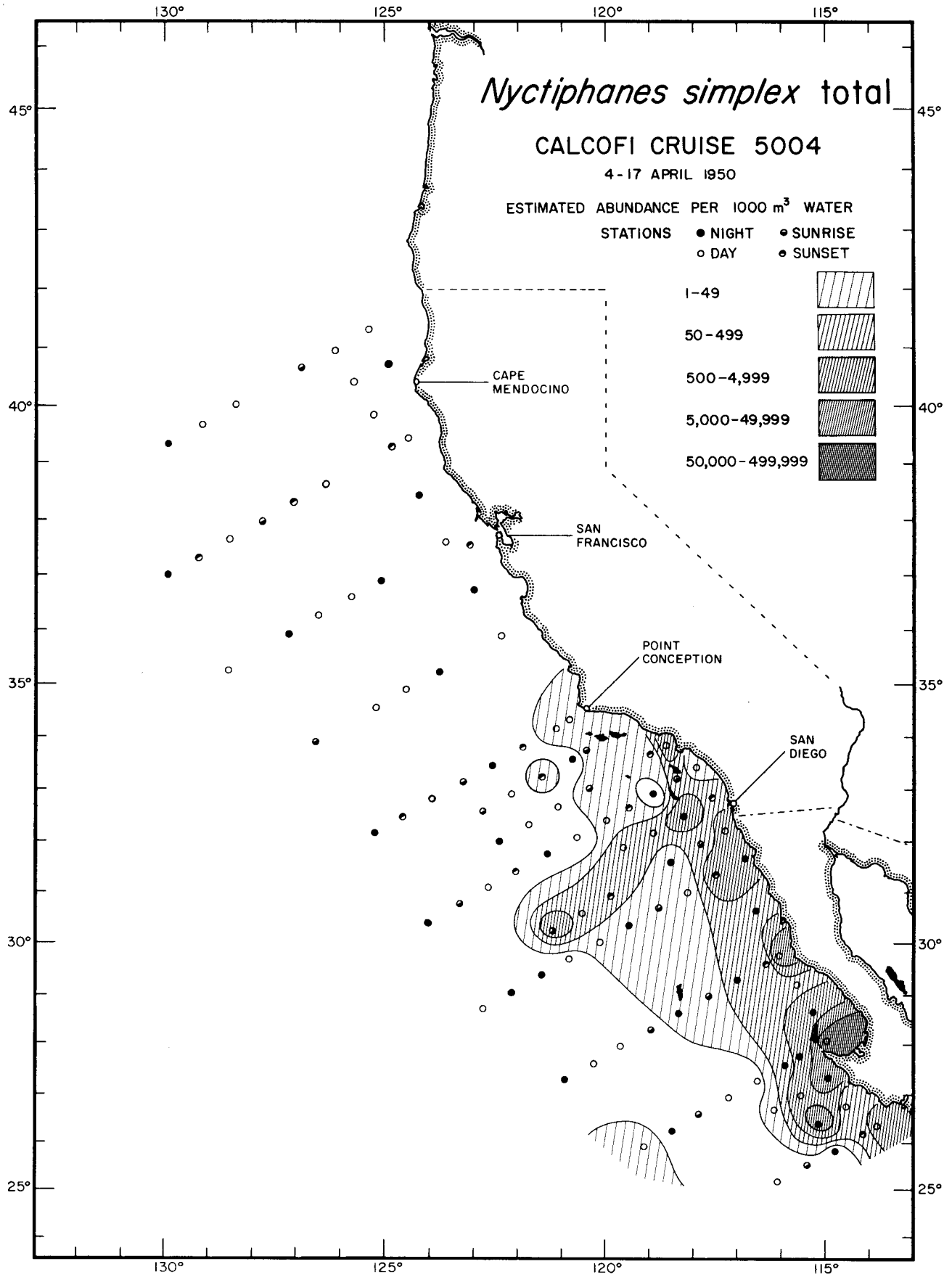
Euphausiacea
Nyctiphanes simplex larvae
5003



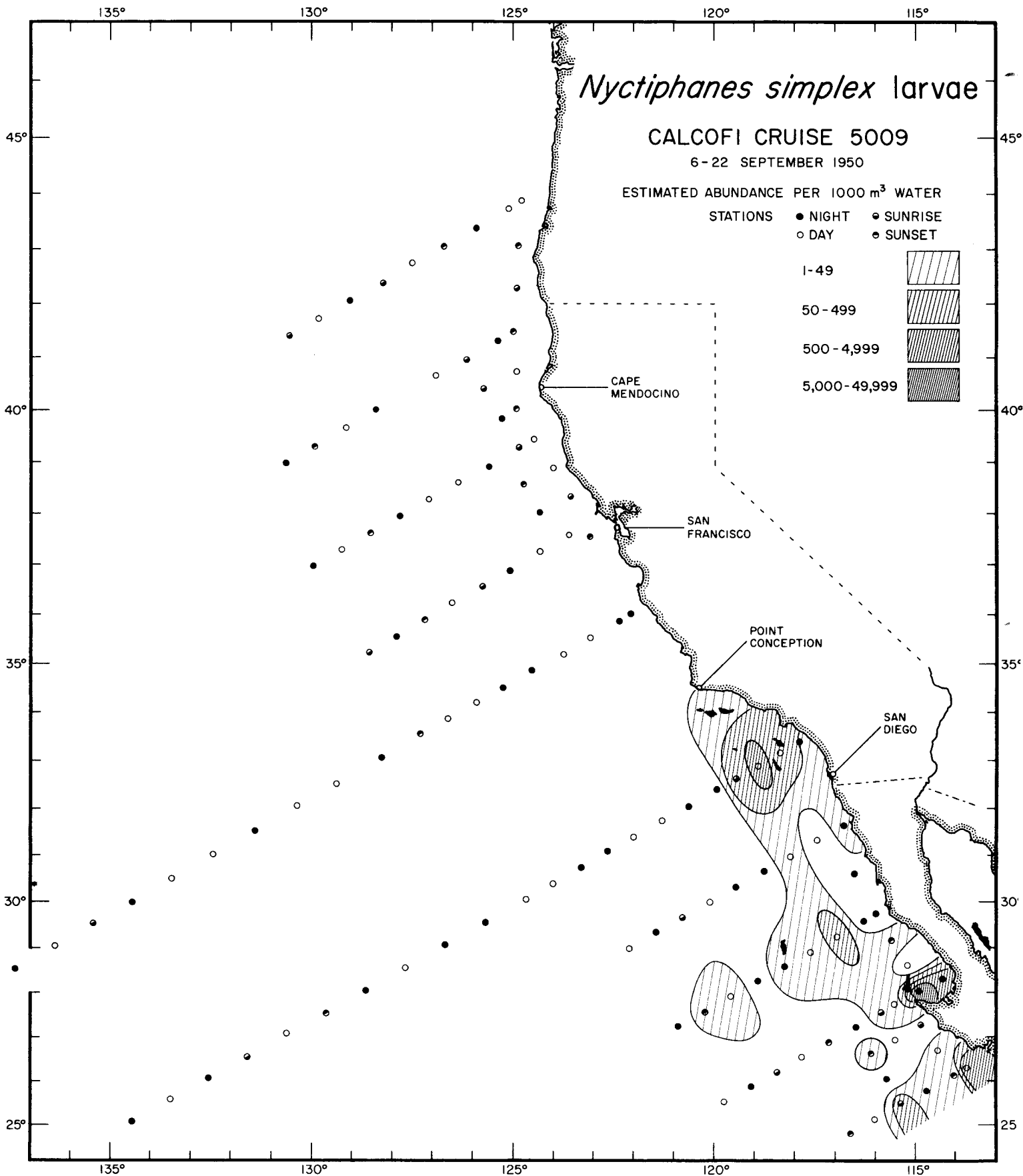
Euphausiacea
Nyctiphanes simplex total
5003



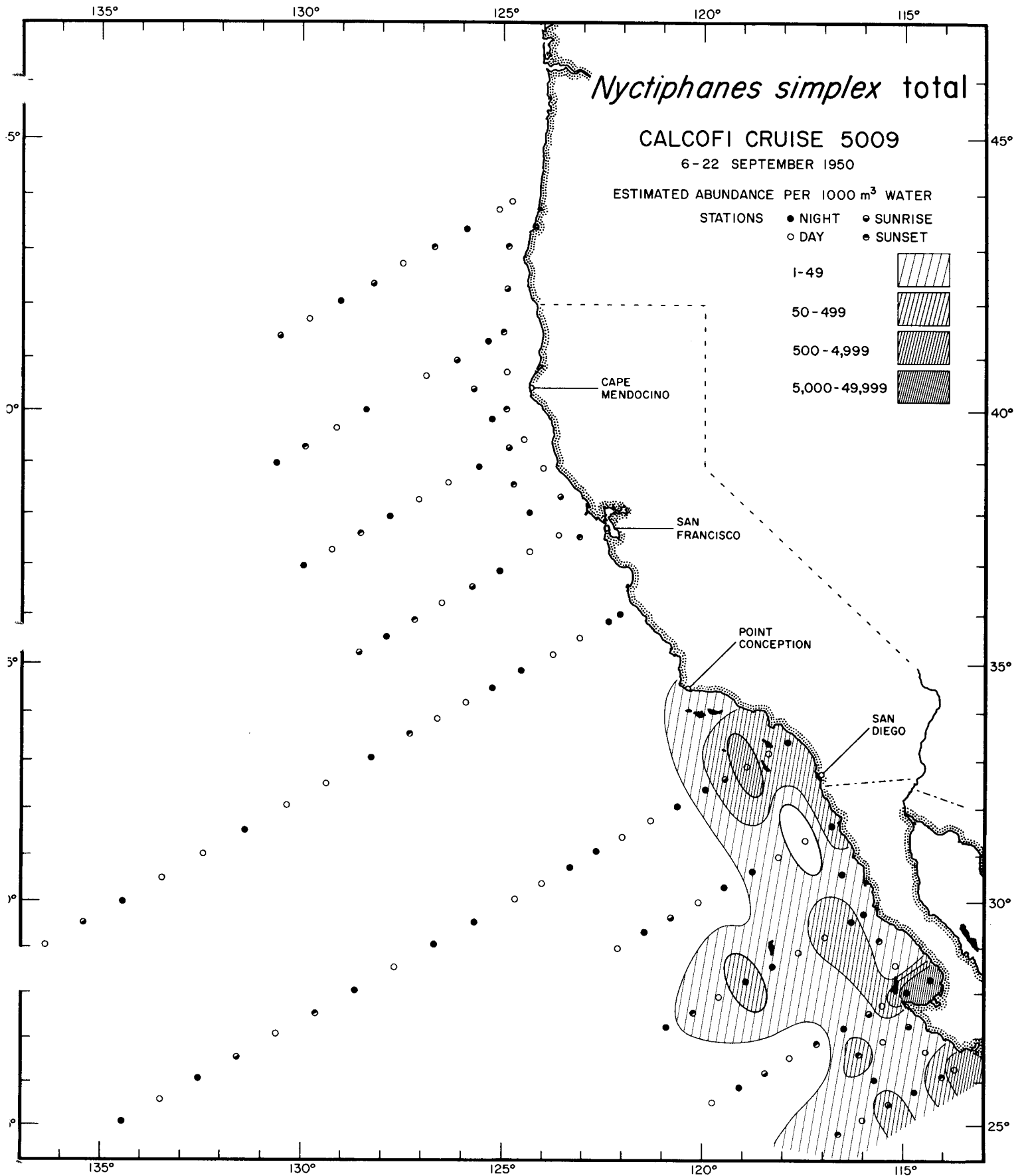
Euphausiacea
Nyctiphanes simplex larvae
5004



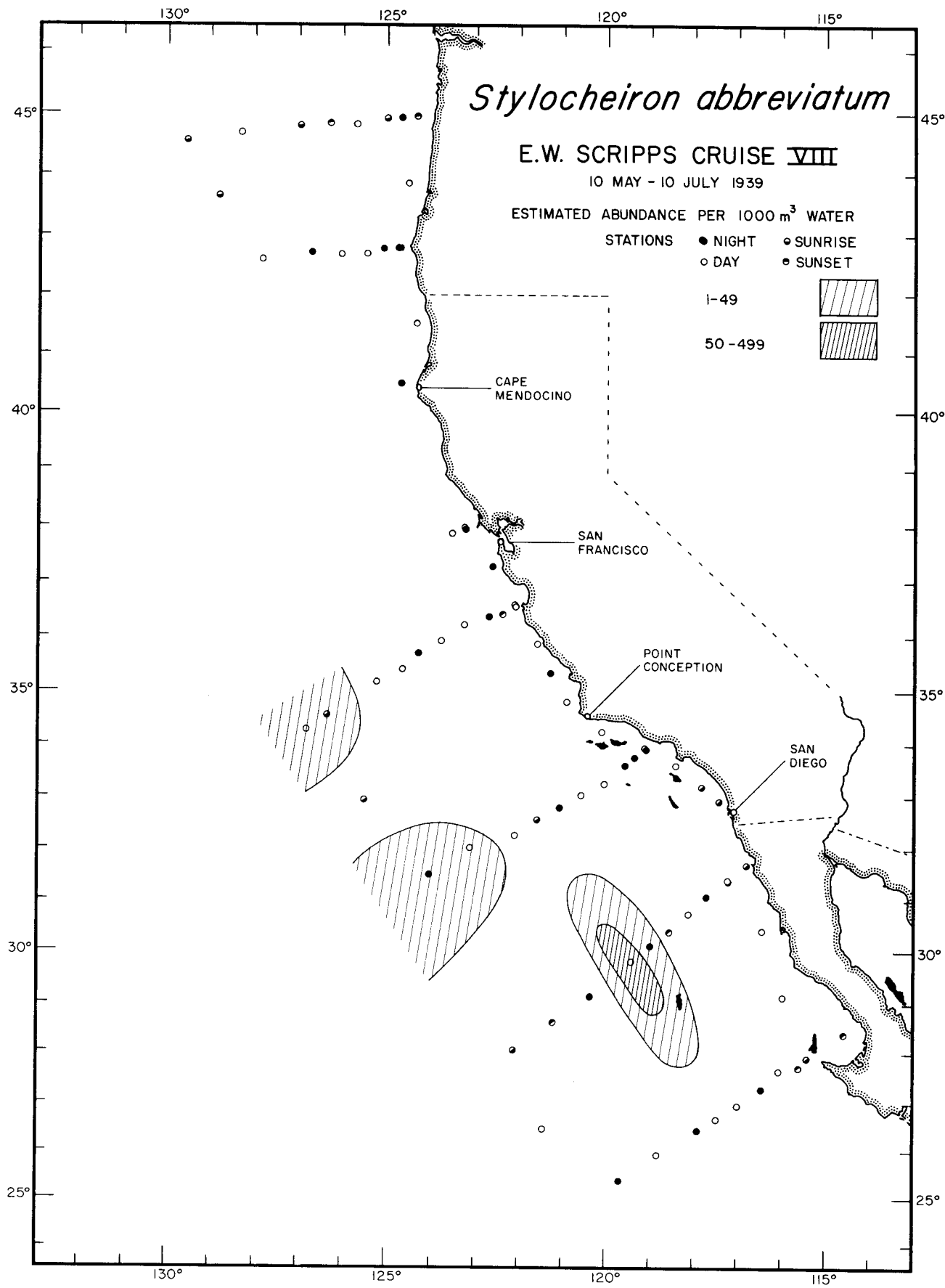
Euphausiacea
Nyctiphanes simplex total
5004



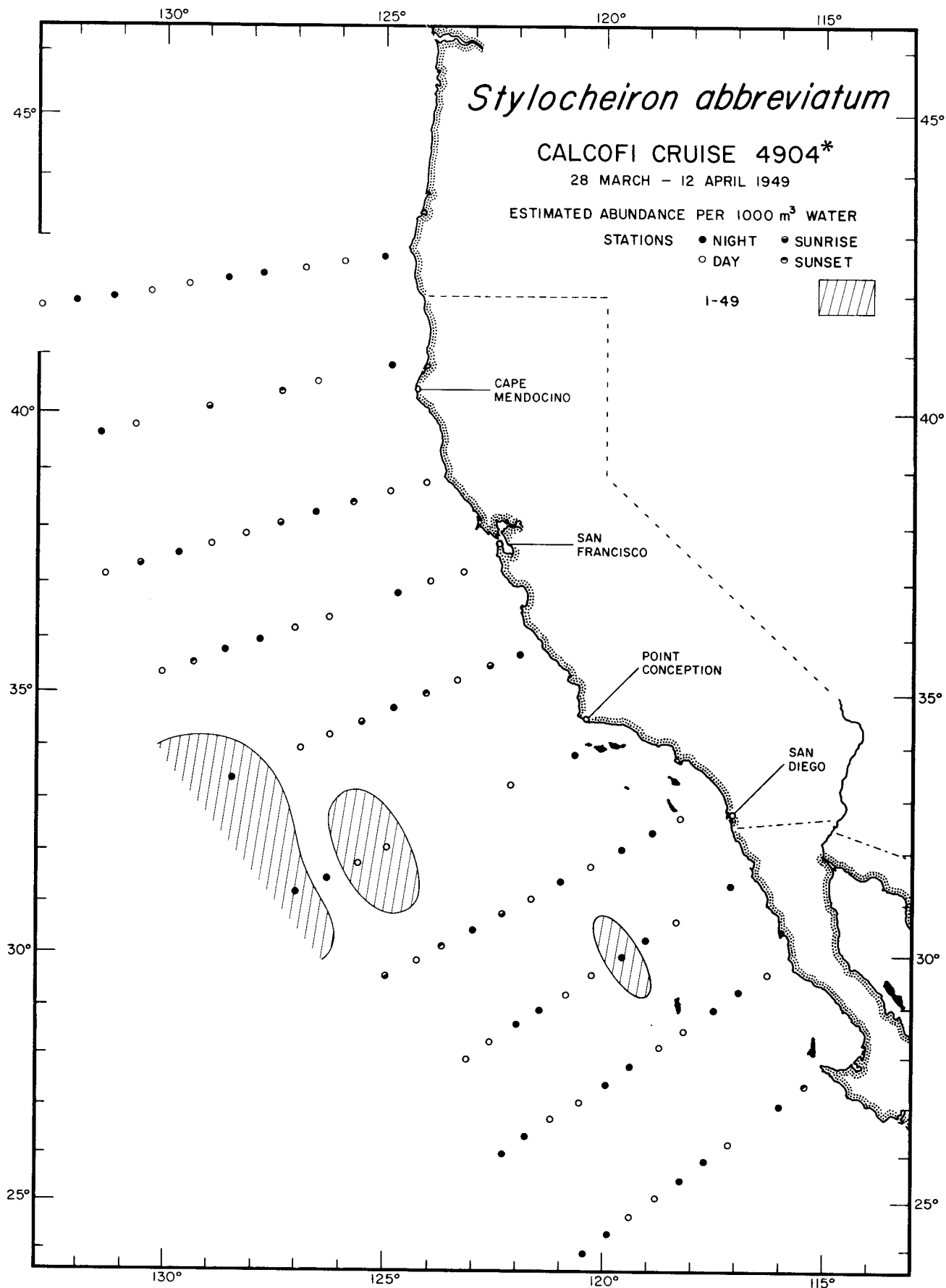
Euphausiacea
Nyctiphanes simplex larvae
5009



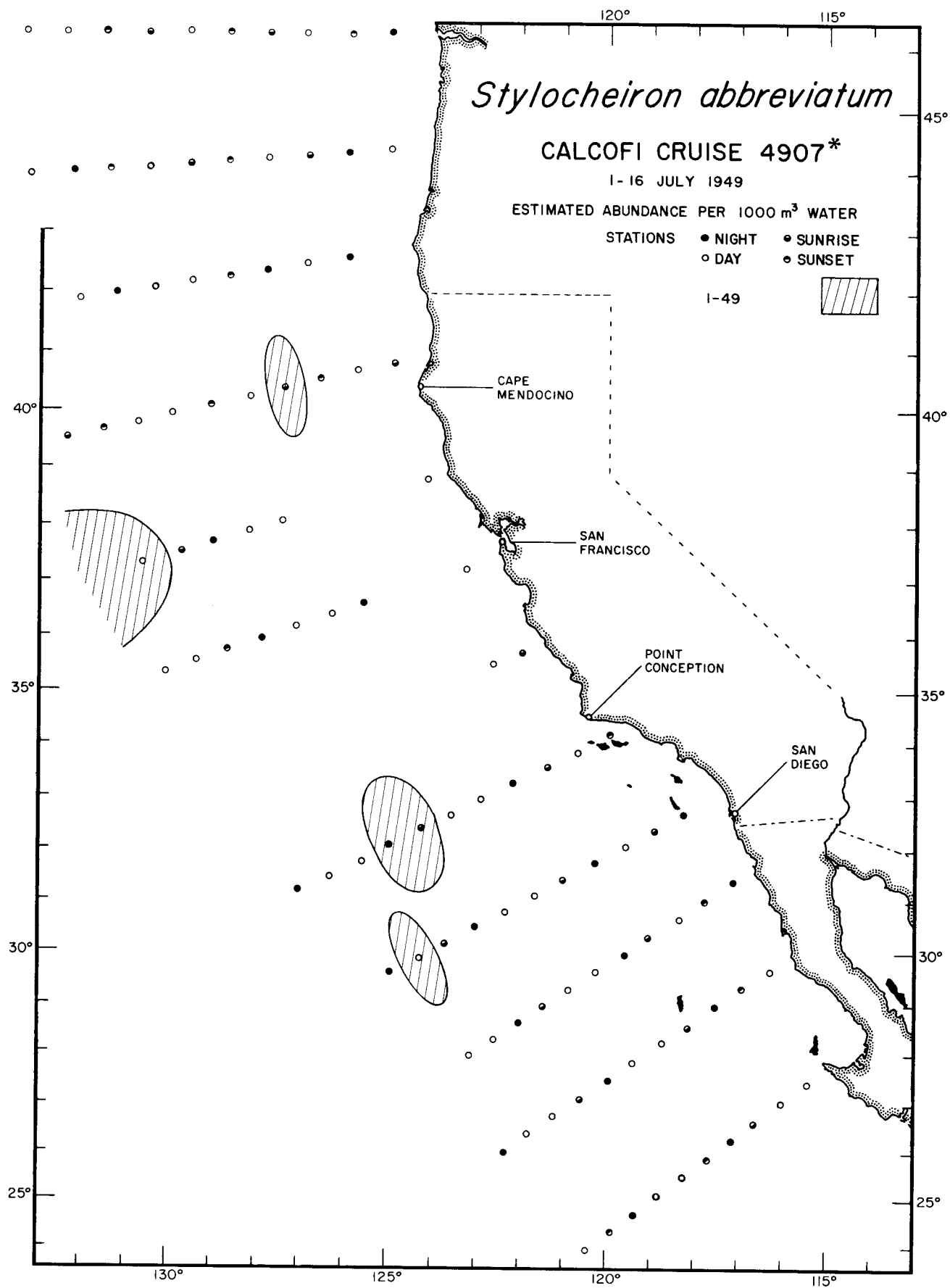
Euphausiacea
Nyctiphanes simplex total
5009



Euphausiacea
Stylocheiron abbreviatum
E. W. SCRIPPS CRUISE VIII

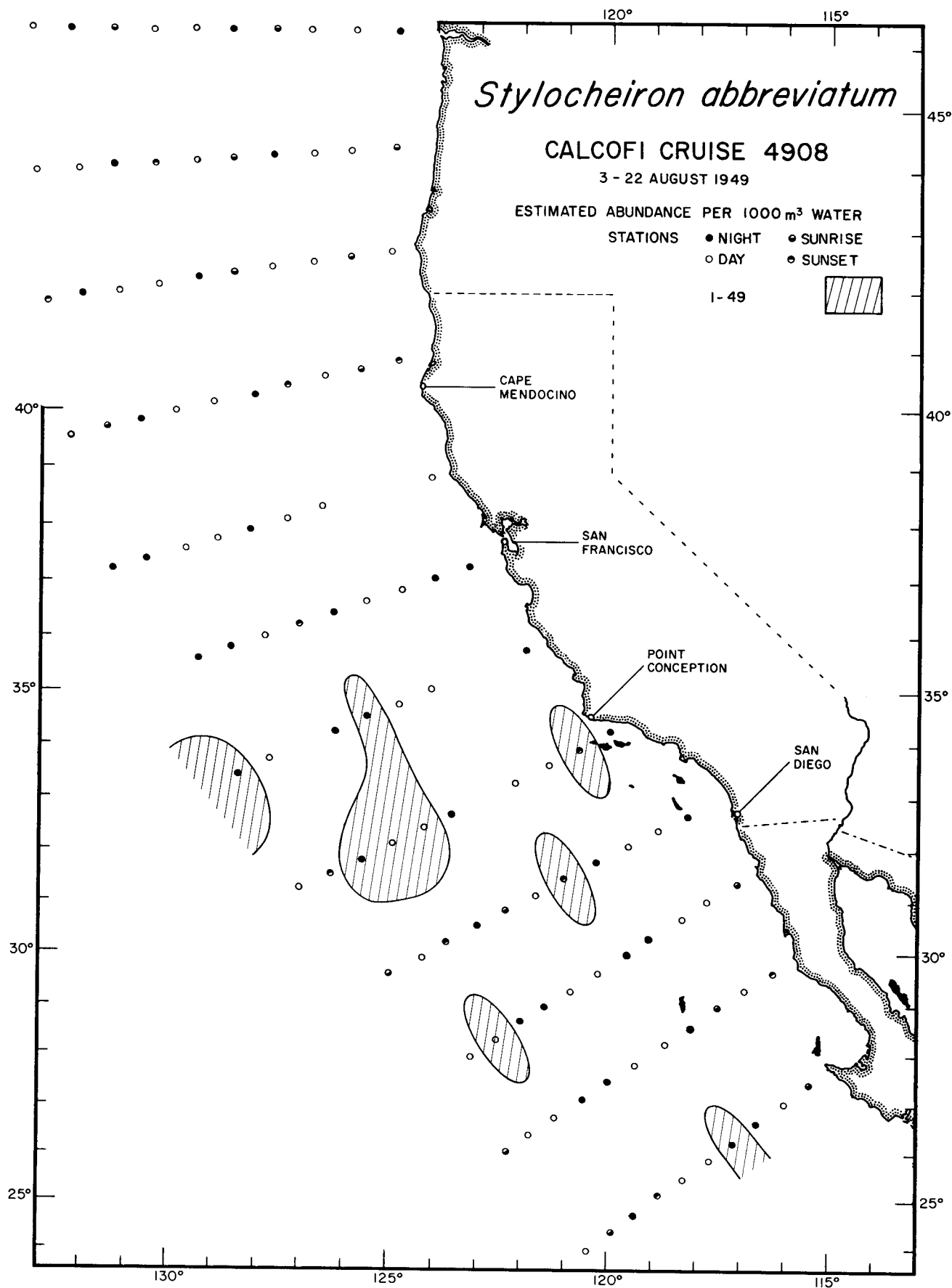


* See Table 1 for Cruise 4903

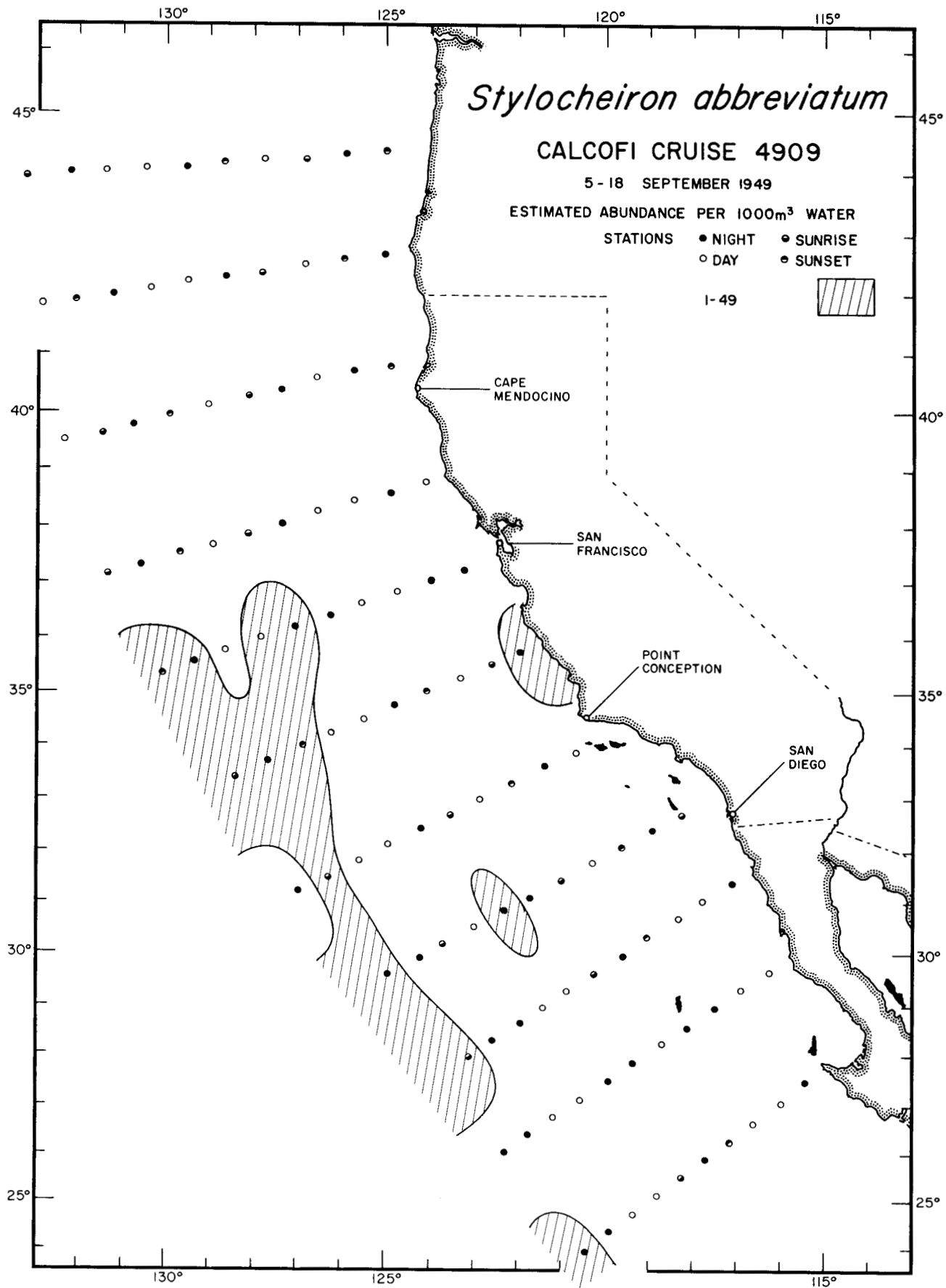


* See Table 1 for Cruises 4905, 6

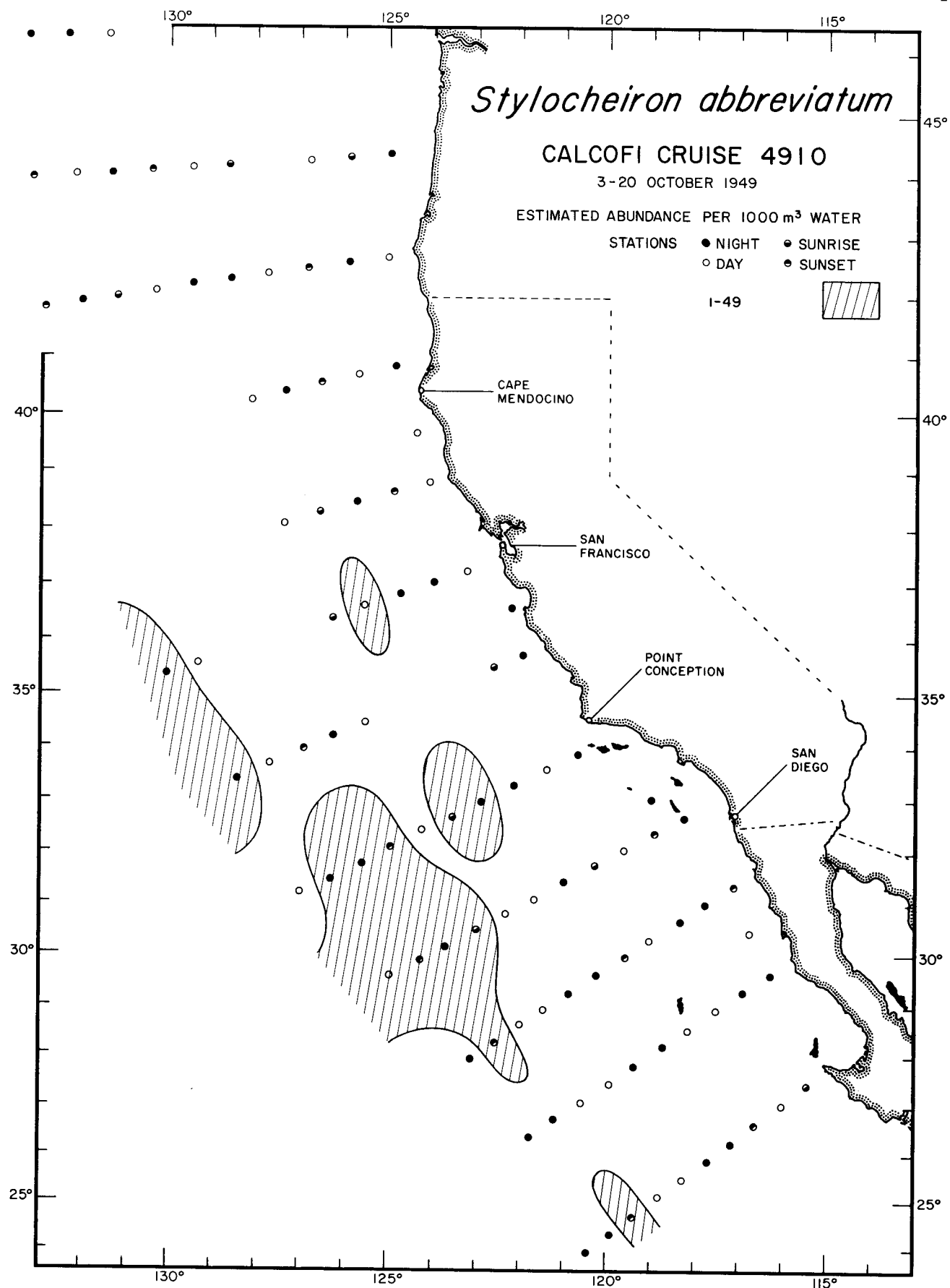
Euphausiacea
Stylocheiron abbreviatum
4907



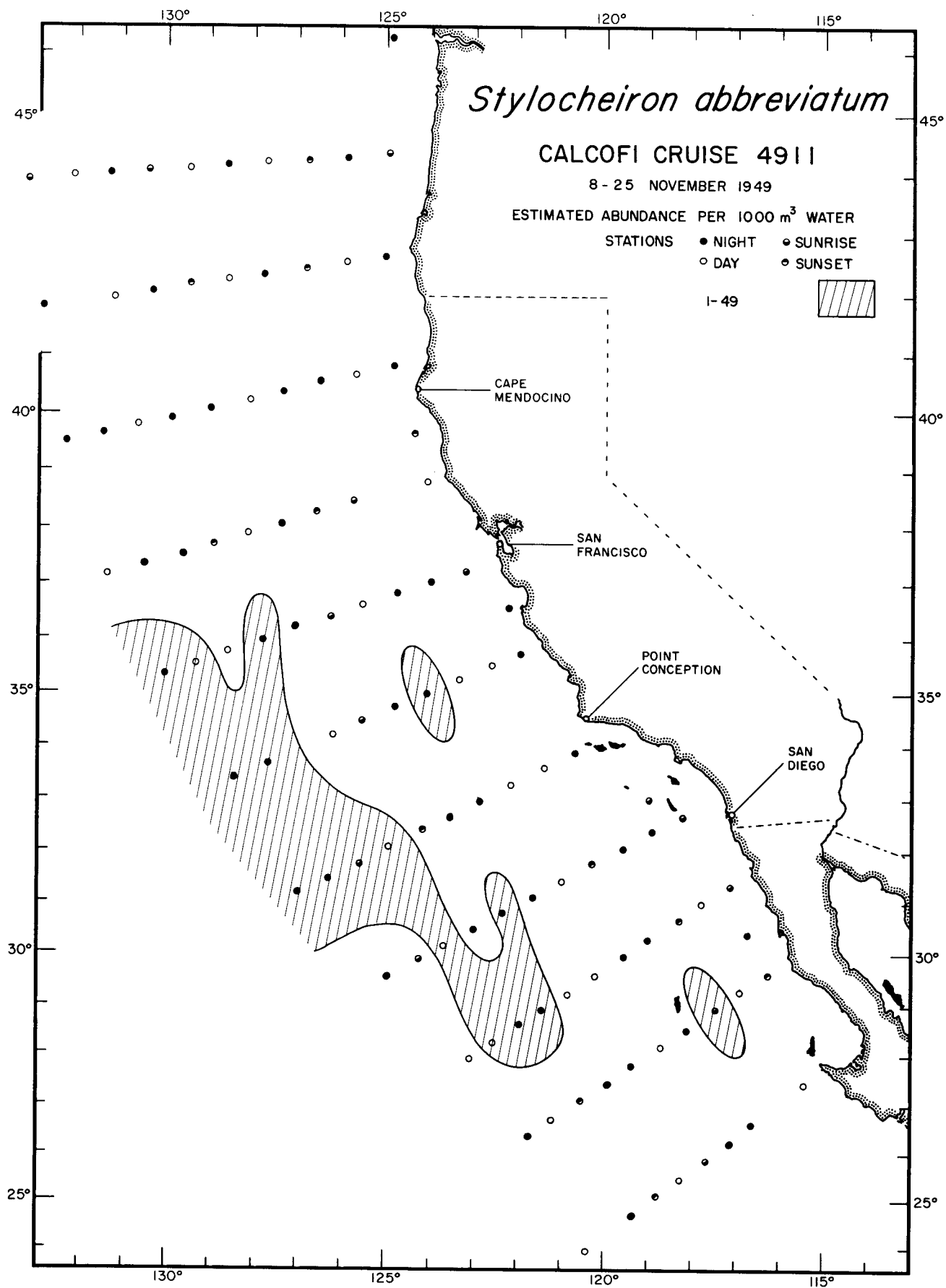
Euphausiacea
Stylocheiron abbreviatum
4908



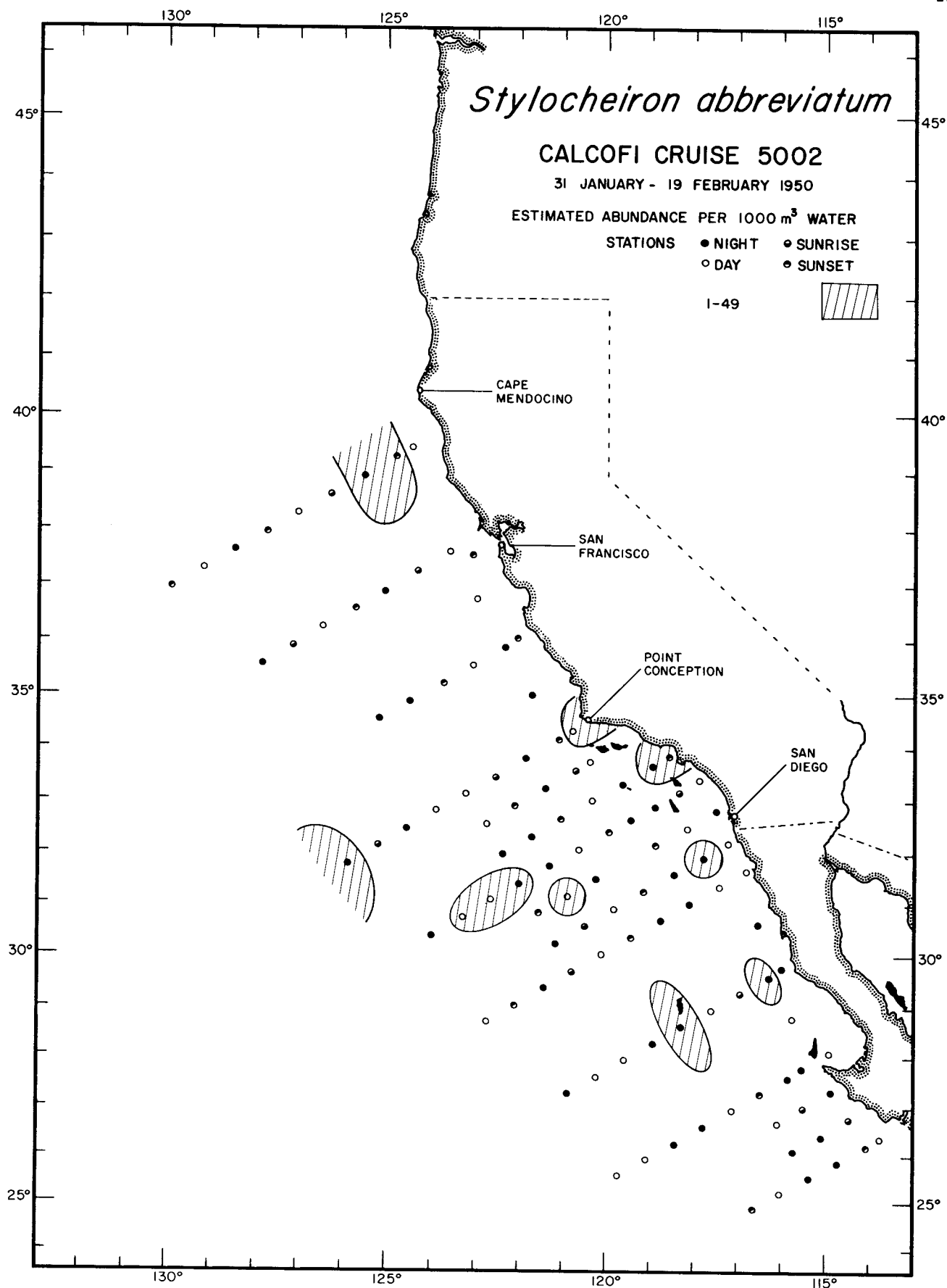
Euphausiacea
Stylocheiron abbreviatum
4909



Euphausiacea
Stylocheiron abbreviatum
4910

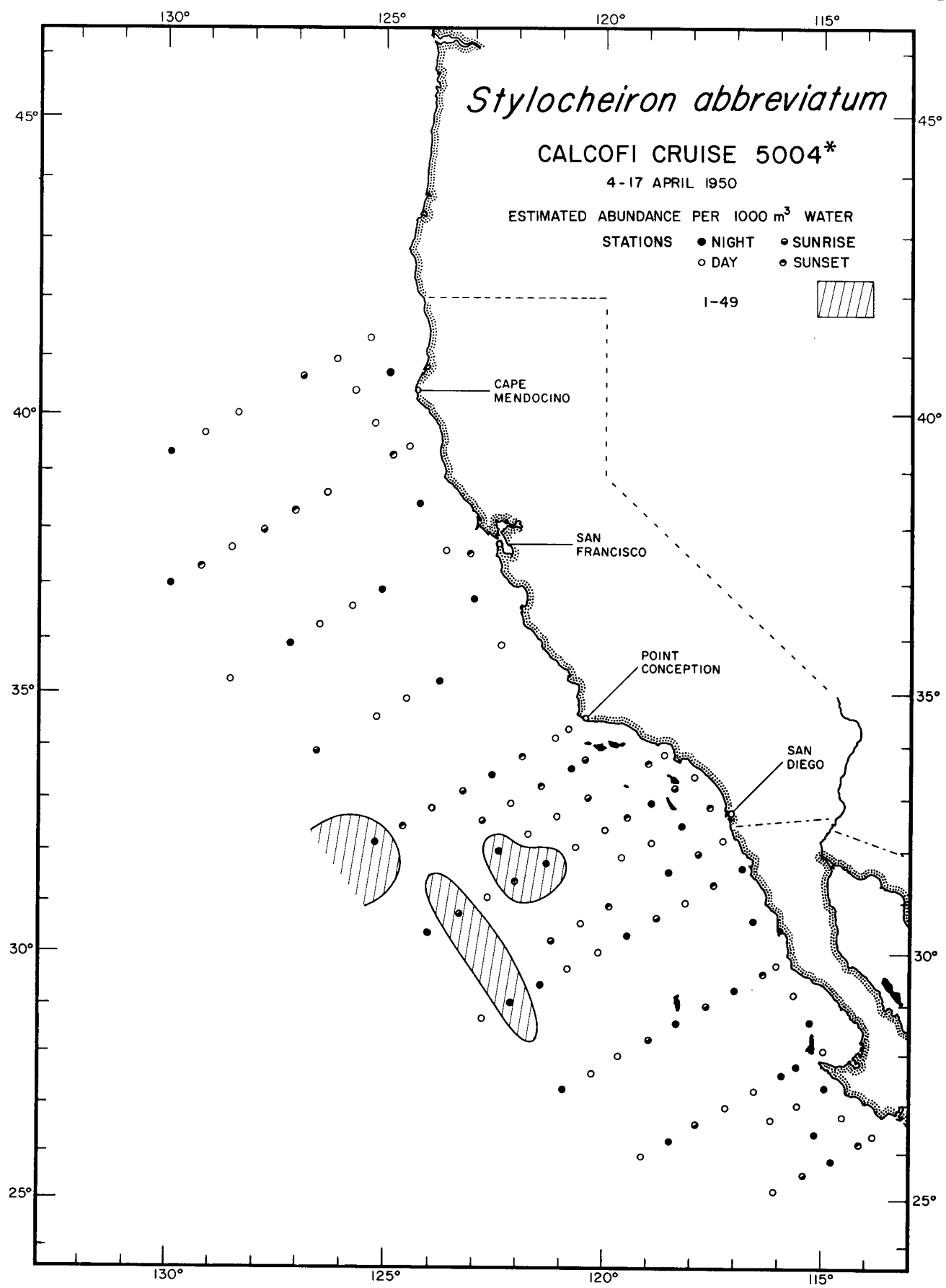


Euphausiacea
Stylocheiron abbreviatum
4911



Euphausiacea
Stylocheiron abbreviatum

5002



* See Table 1 for Cruise 5003

135° 130° 125° 120° 115°

Stylocheiron abbreviatum

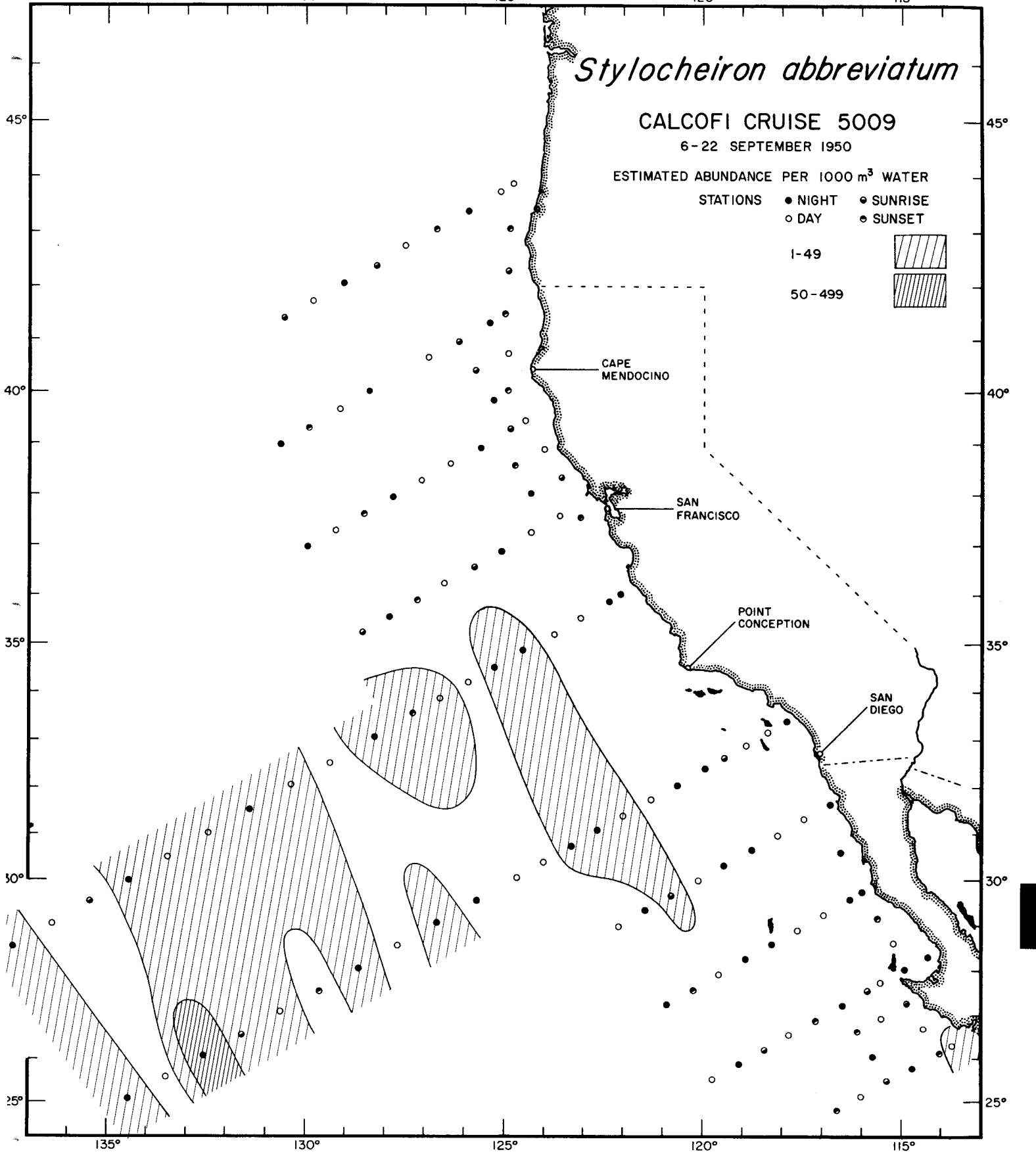
CALCOFI CRUISE 5009

6-22 SEPTEMBER 1950

ESTIMATED ABUNDANCE PER 1000 m³ WATER

STATIONS ● NIGHT ○ DAY
● SUNRISE ○ SUNSET

1-49 [diagonal lines]
50-499 [cross-hatch]



CAPE MENDOCINO

SAN FRANCISCO

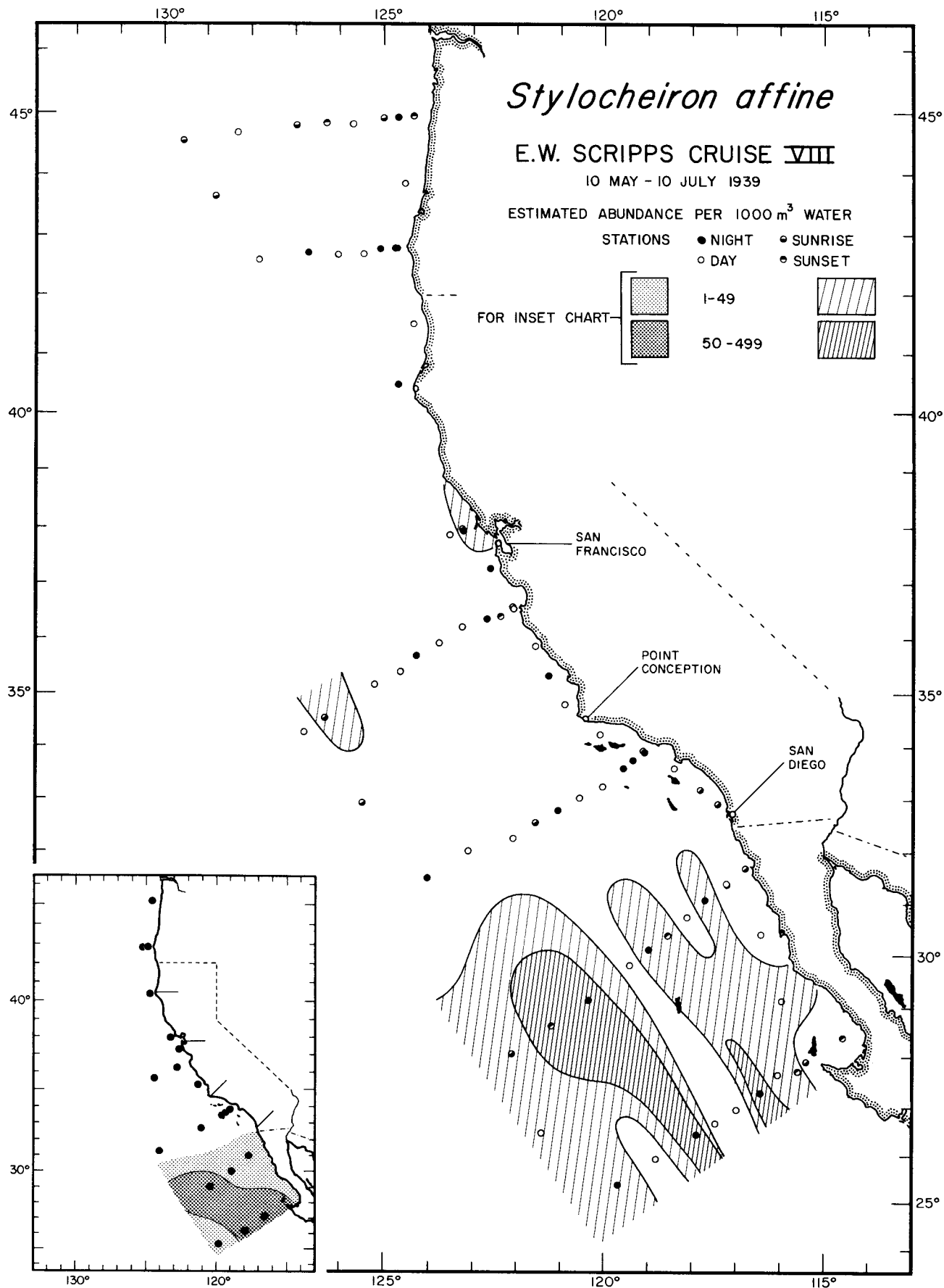
POINT CONCEPTION

SAN DIEGO

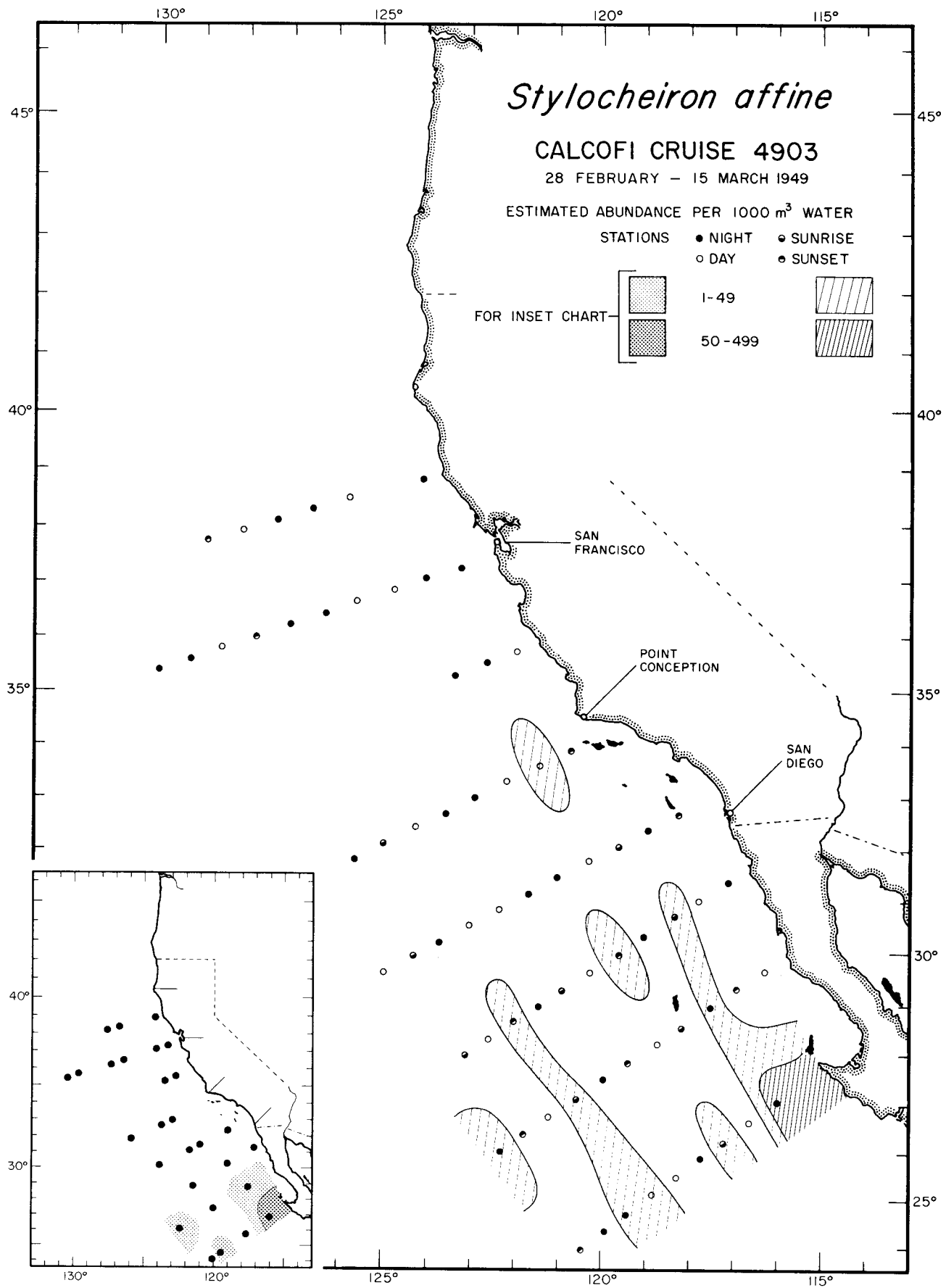
Euphausiacea

Stylocheiron abbreviatum

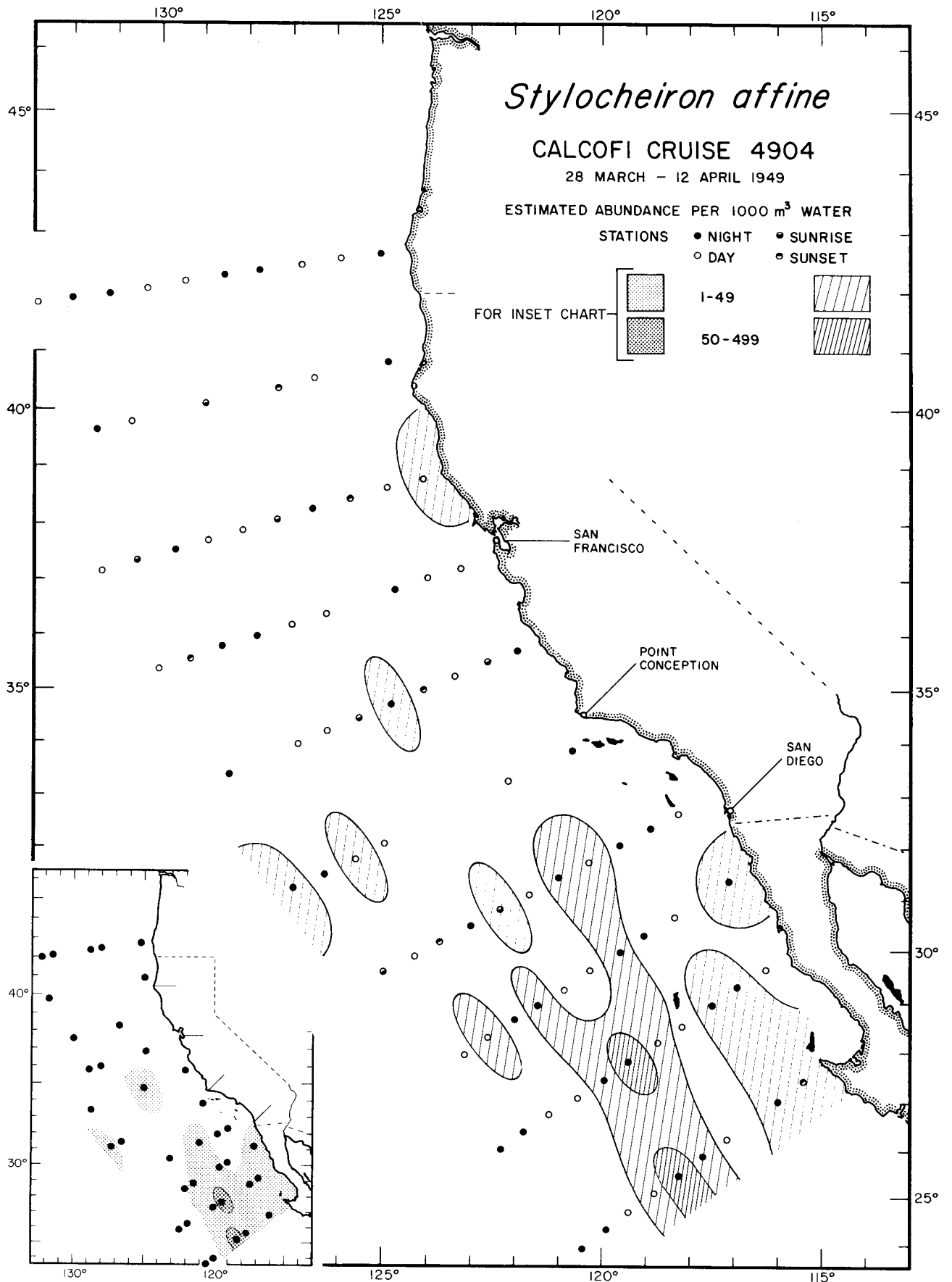
5009



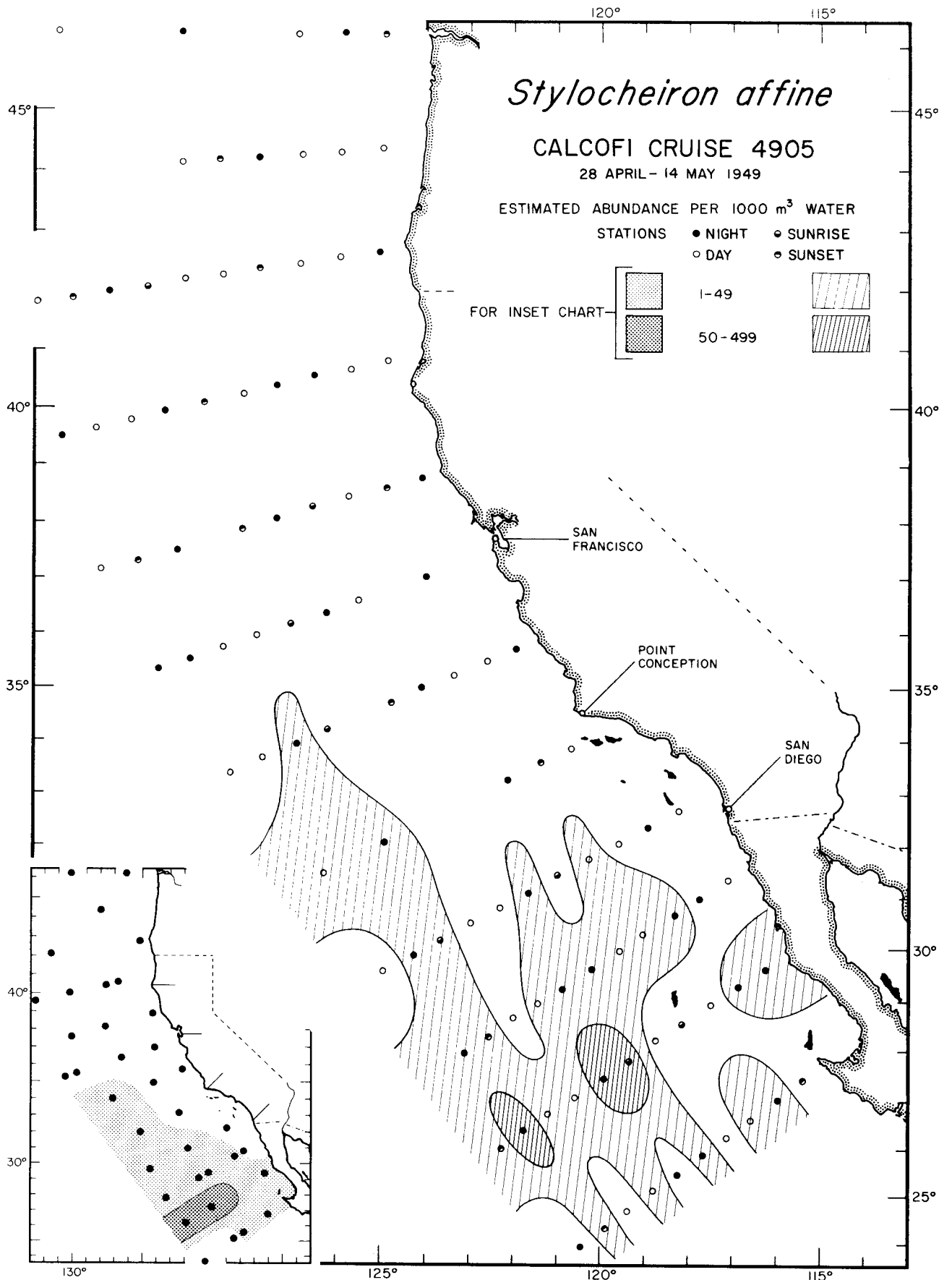
Euphausiacea
Stylocheiron affine
E. W. SCRIPPS CRUISE VIII



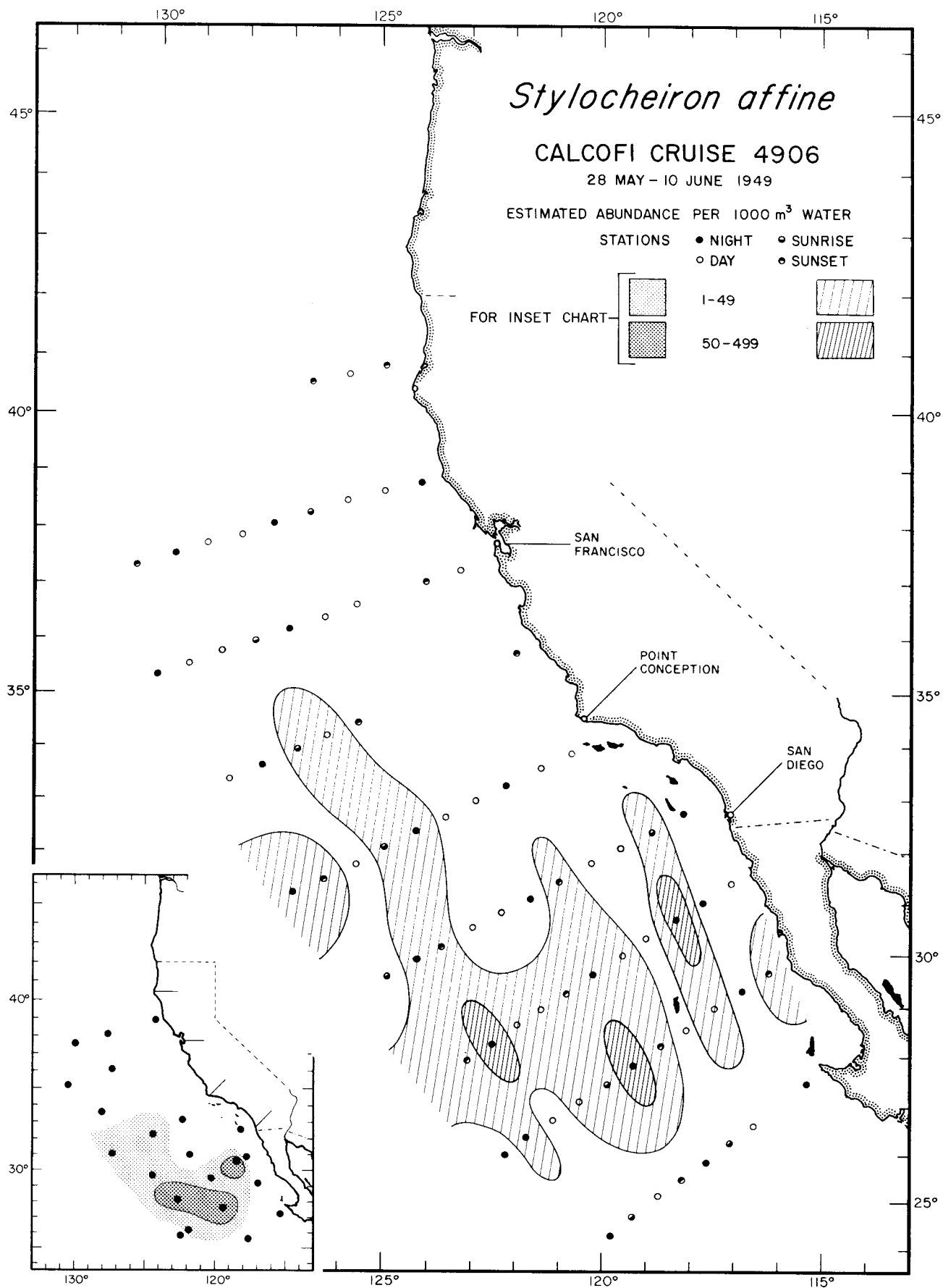
Euphausiacea
Stylocheiron affine
4903



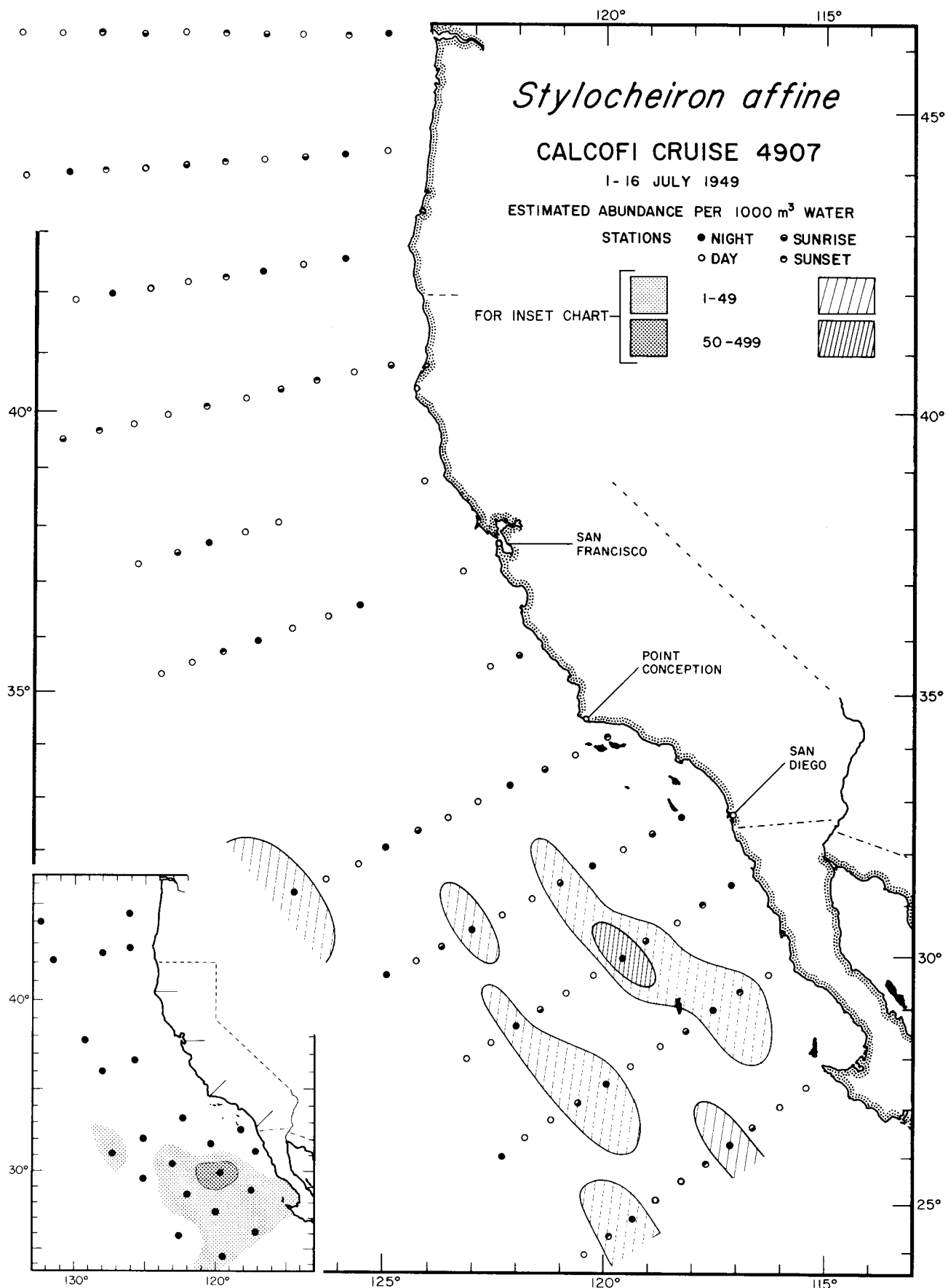
Euphausiacea
Stylocheiron affine
4904



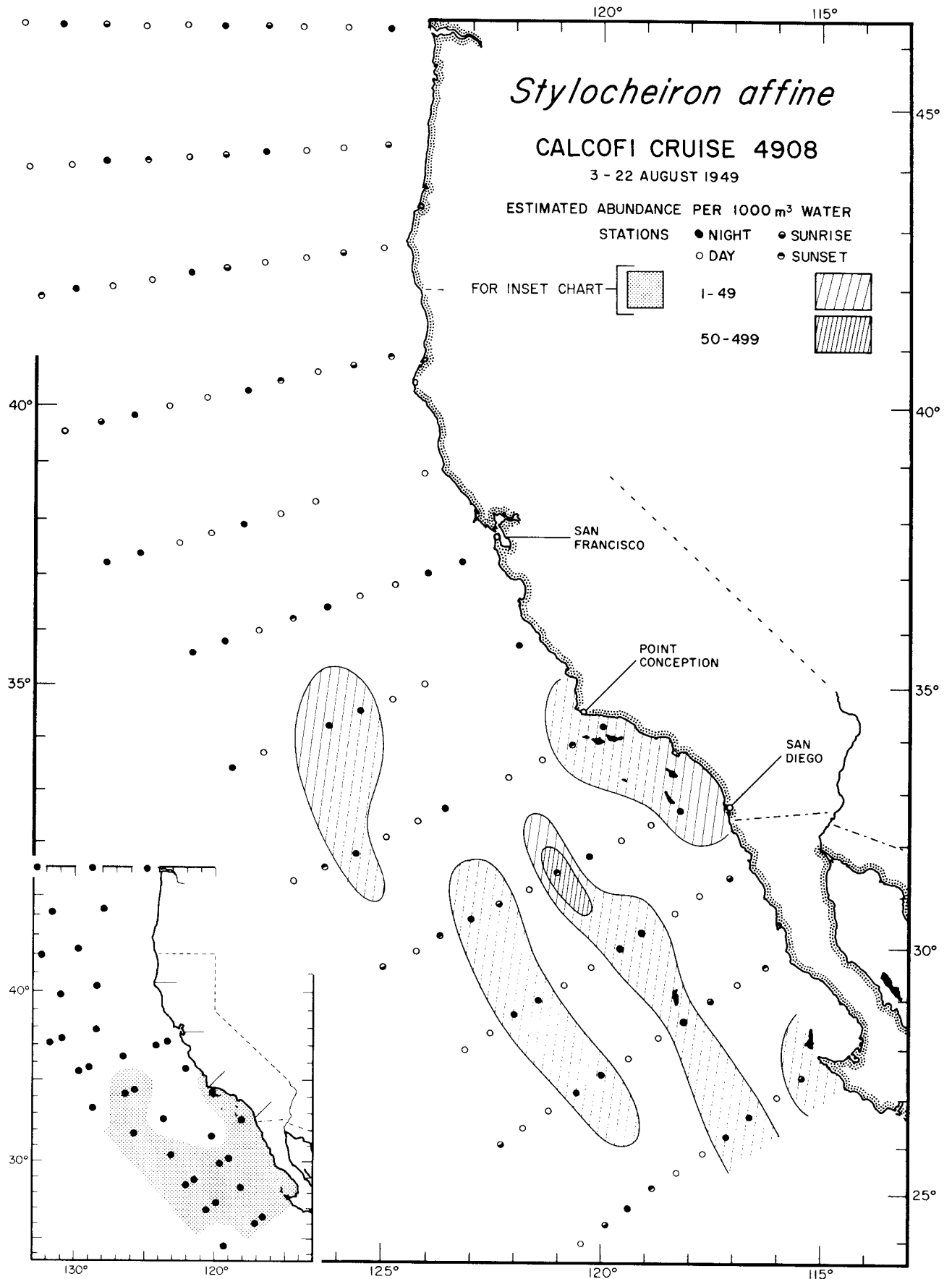
Euphausiacea
Stylocheiron affine
4905



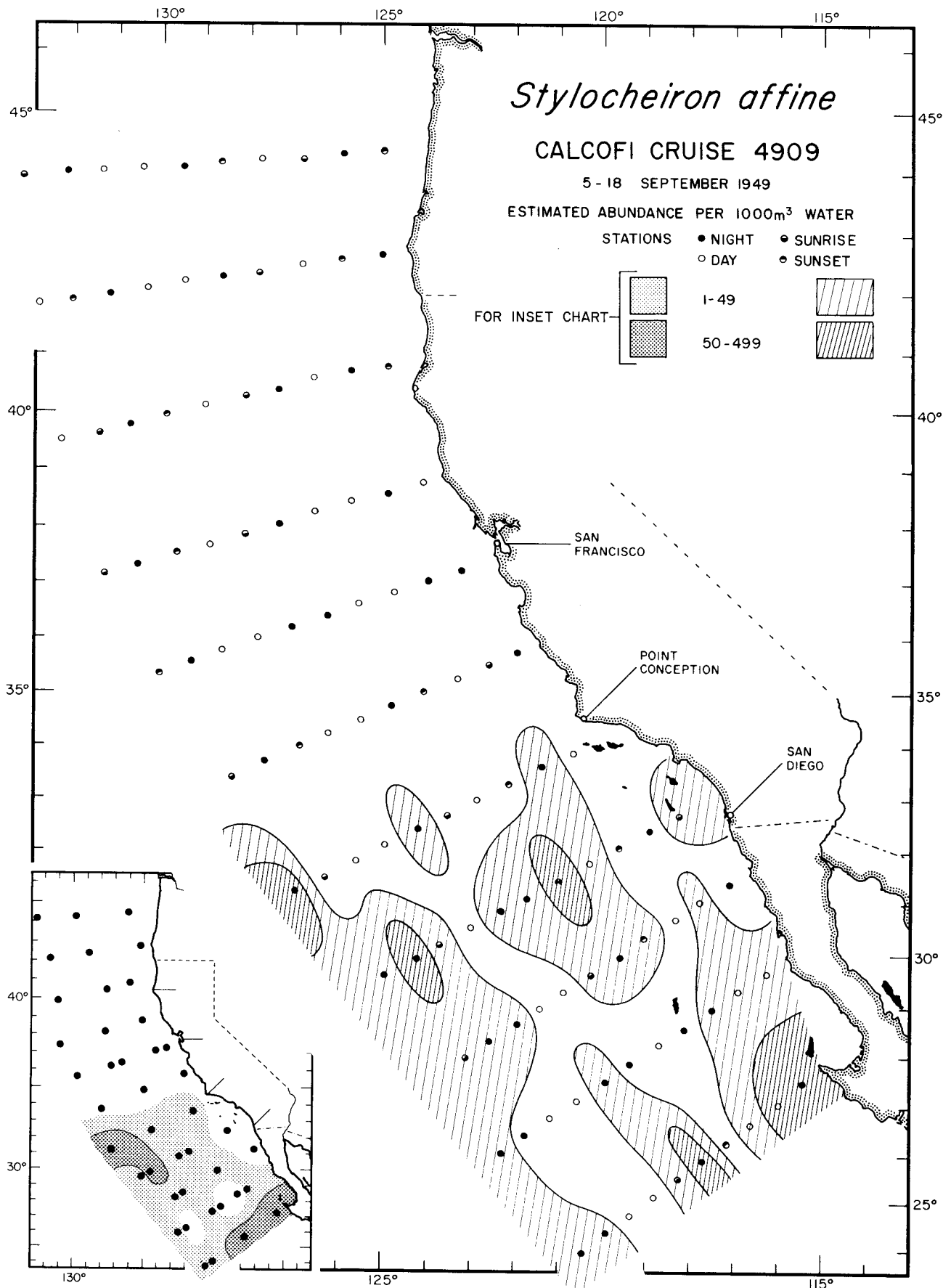
Euphausiacea
Stylocheiron affine
4906



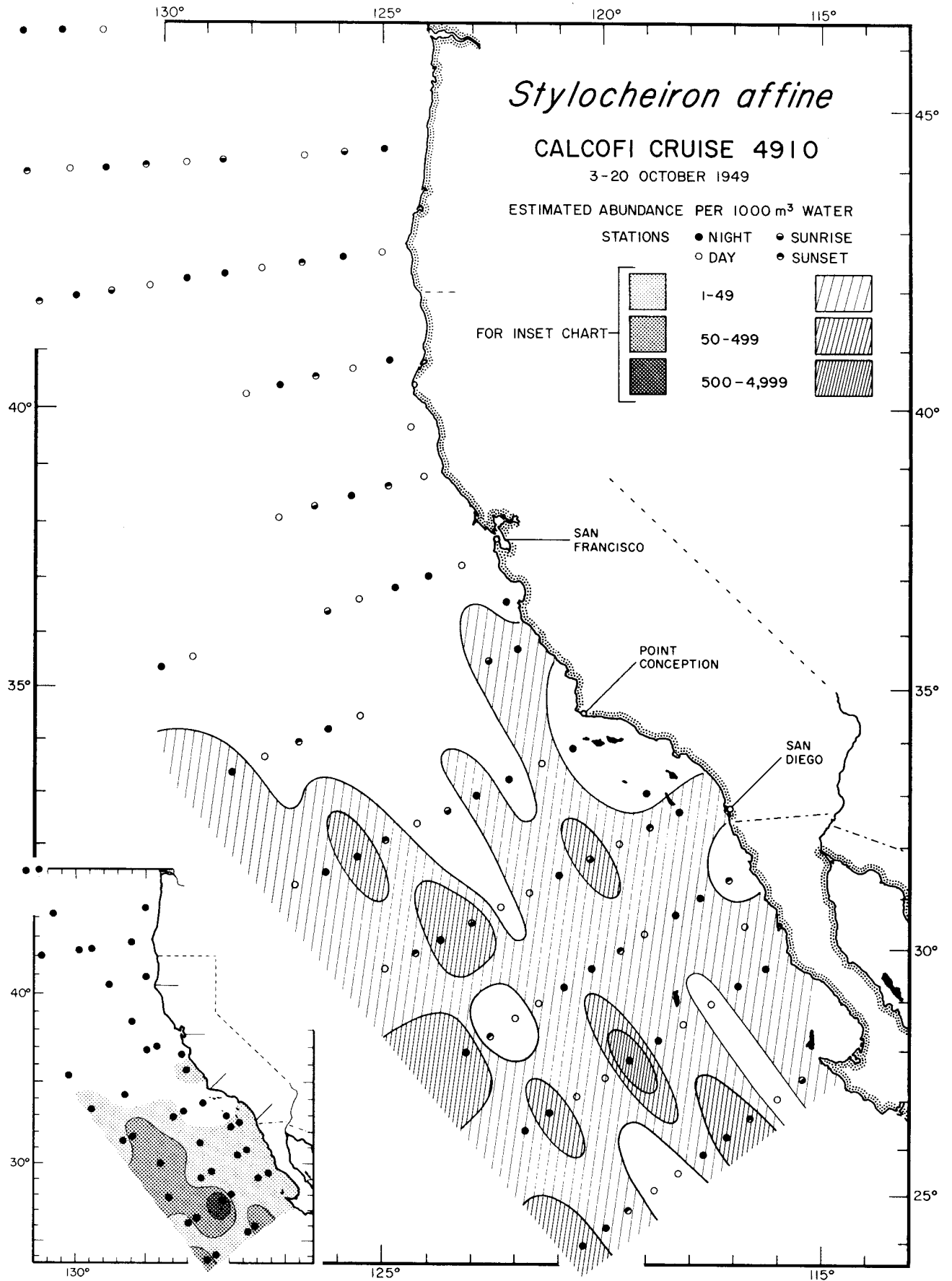
Euphausiacea
Stylocheiron affine
4907



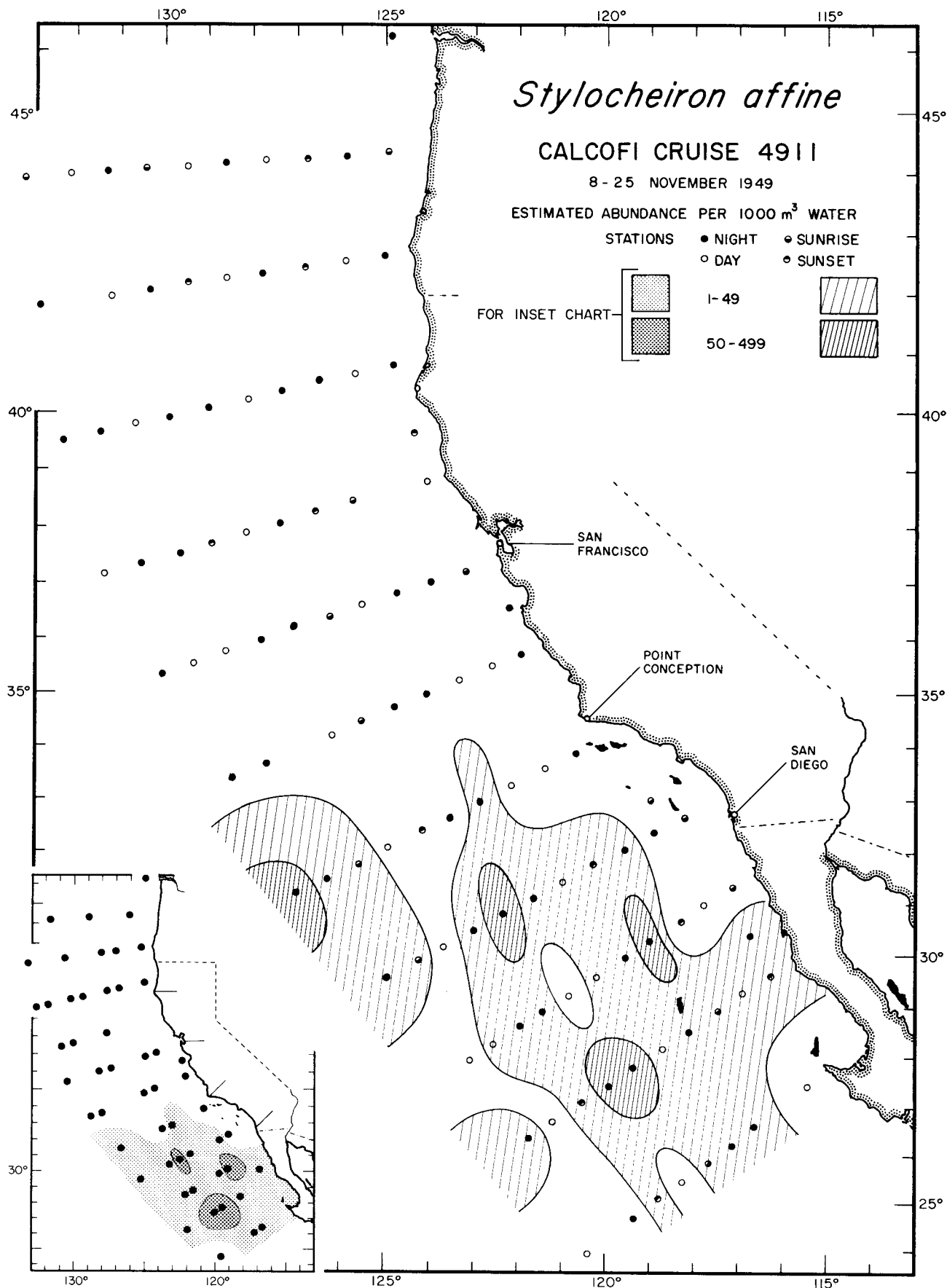
Euphausiacea
Stylocheiron affine
4908



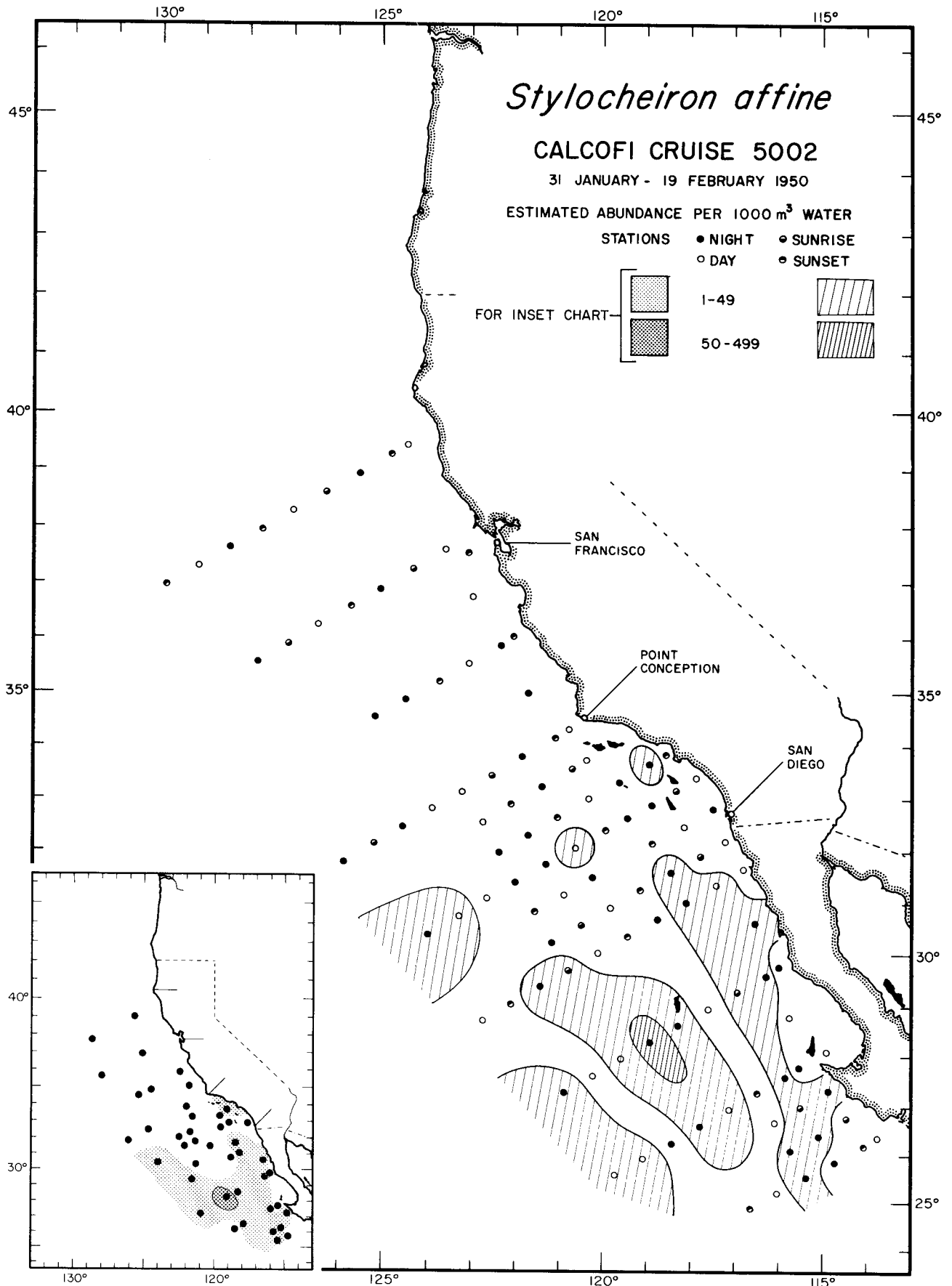
Euphausiacea
Stylocheiron affine
4909



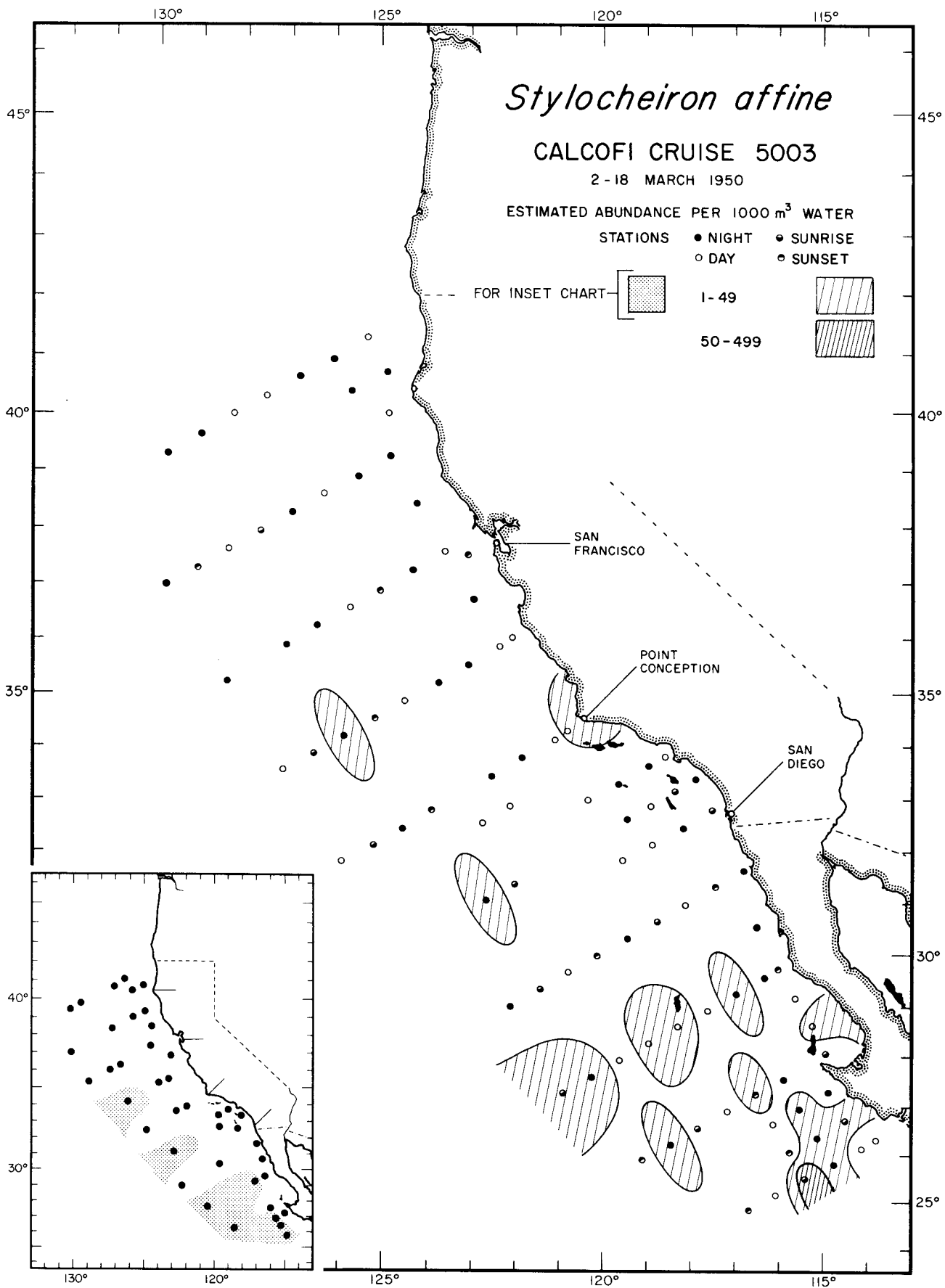
Euphausiacea
Stylocheiron affine
4910



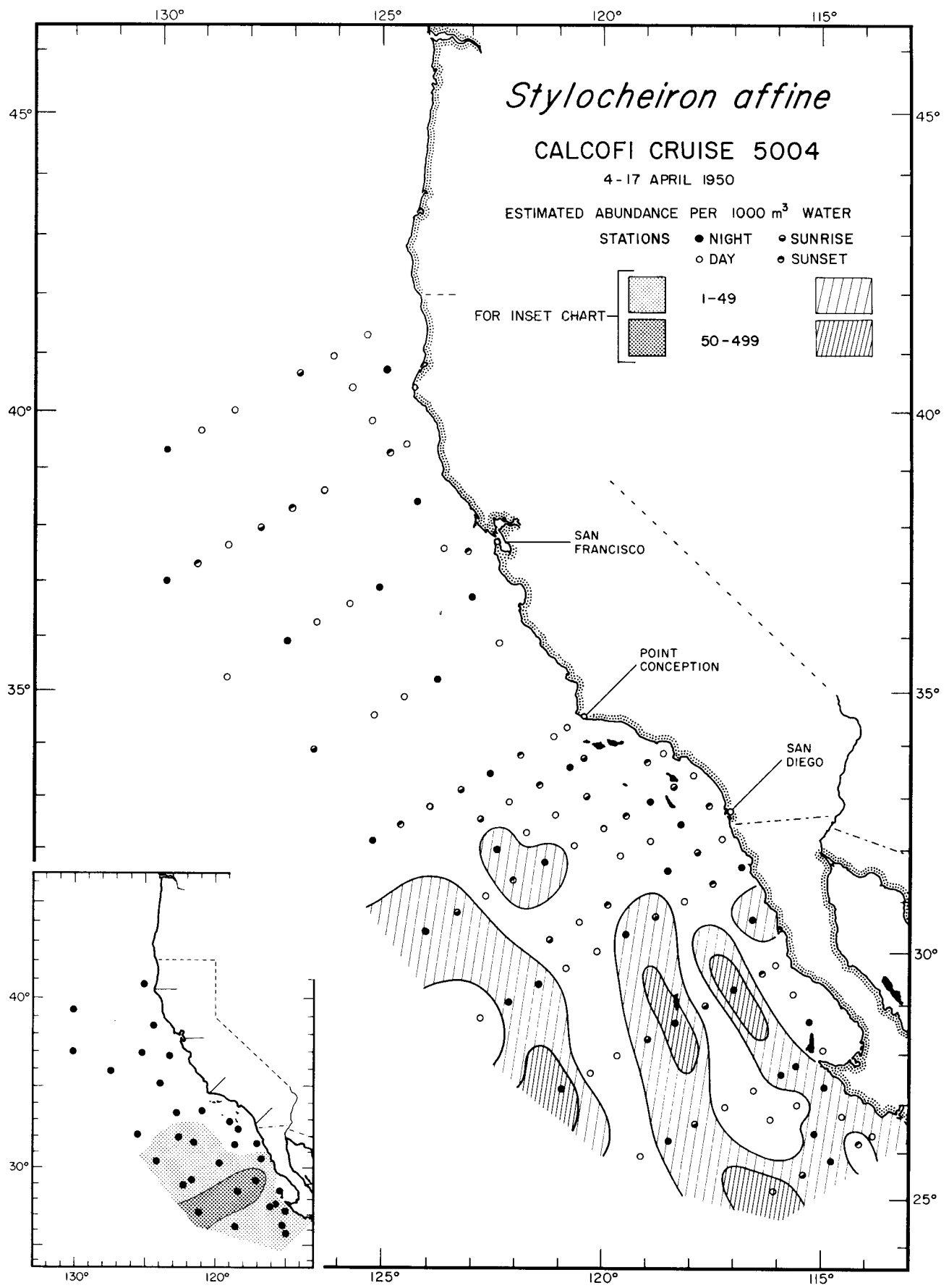
Euphausiacea
Stylocheiron affine
4911



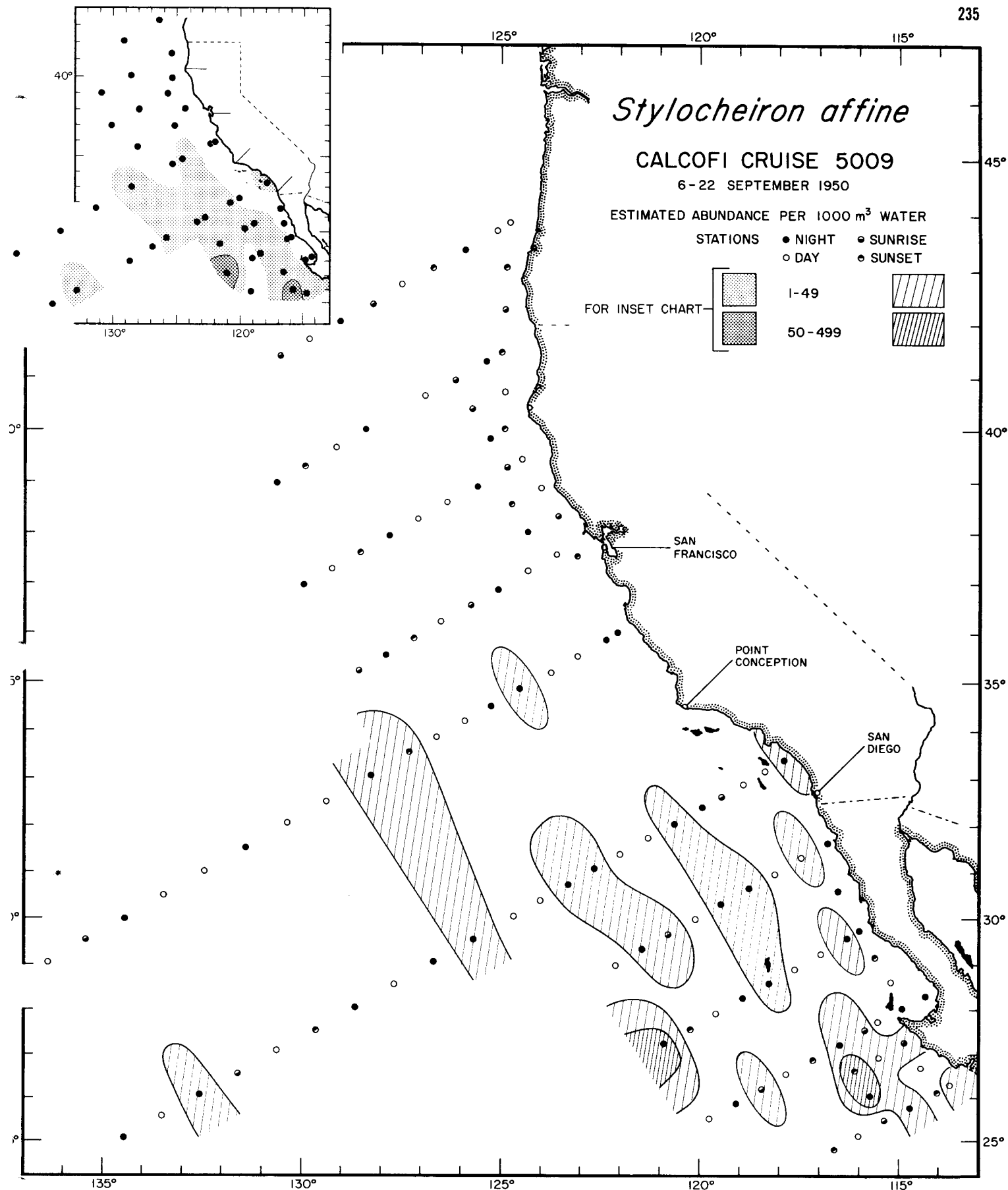
Euphausiacea
Stylocheiron affine
5002



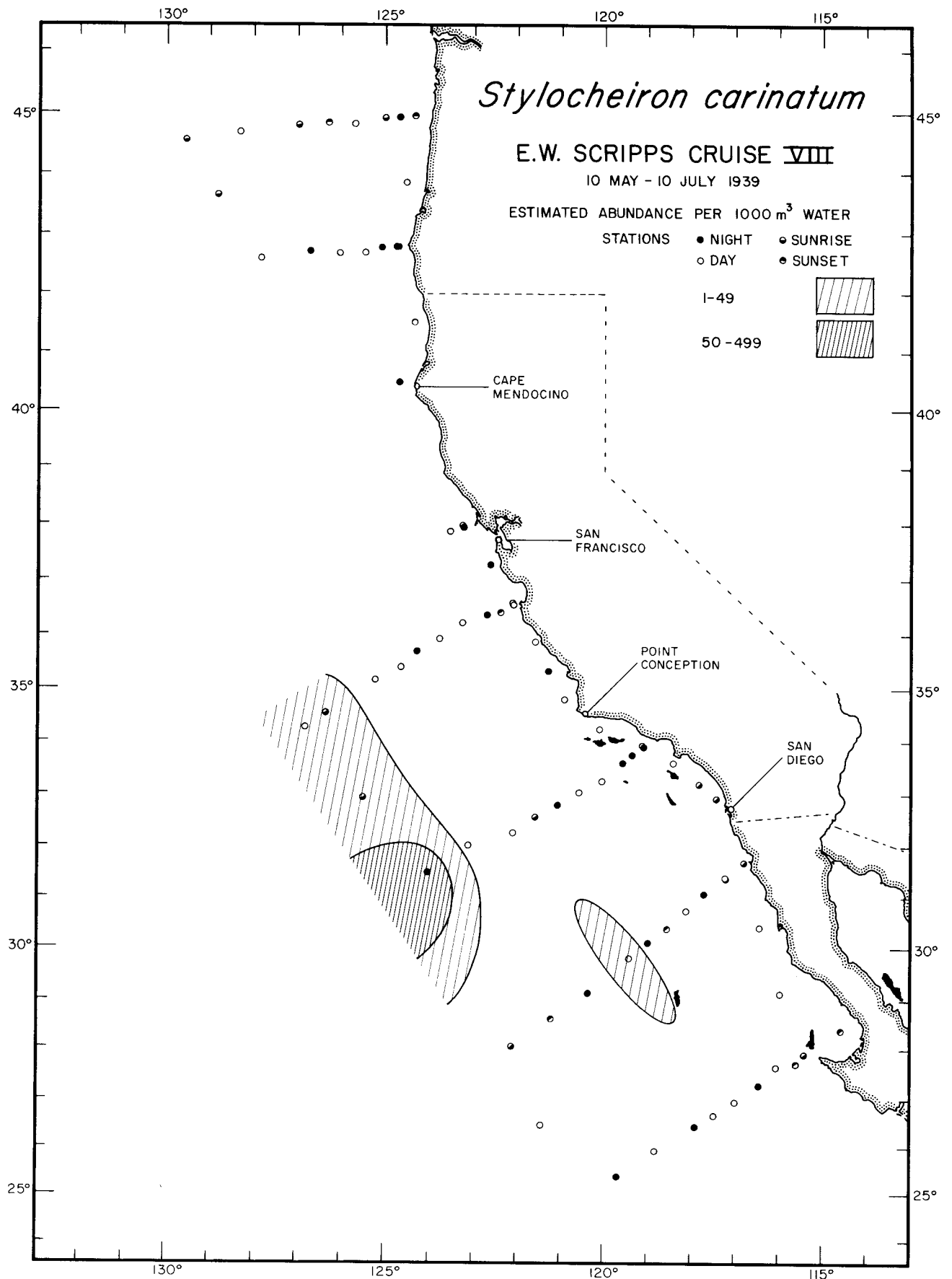
Euphausiacea
Stylocheiron affine
5003



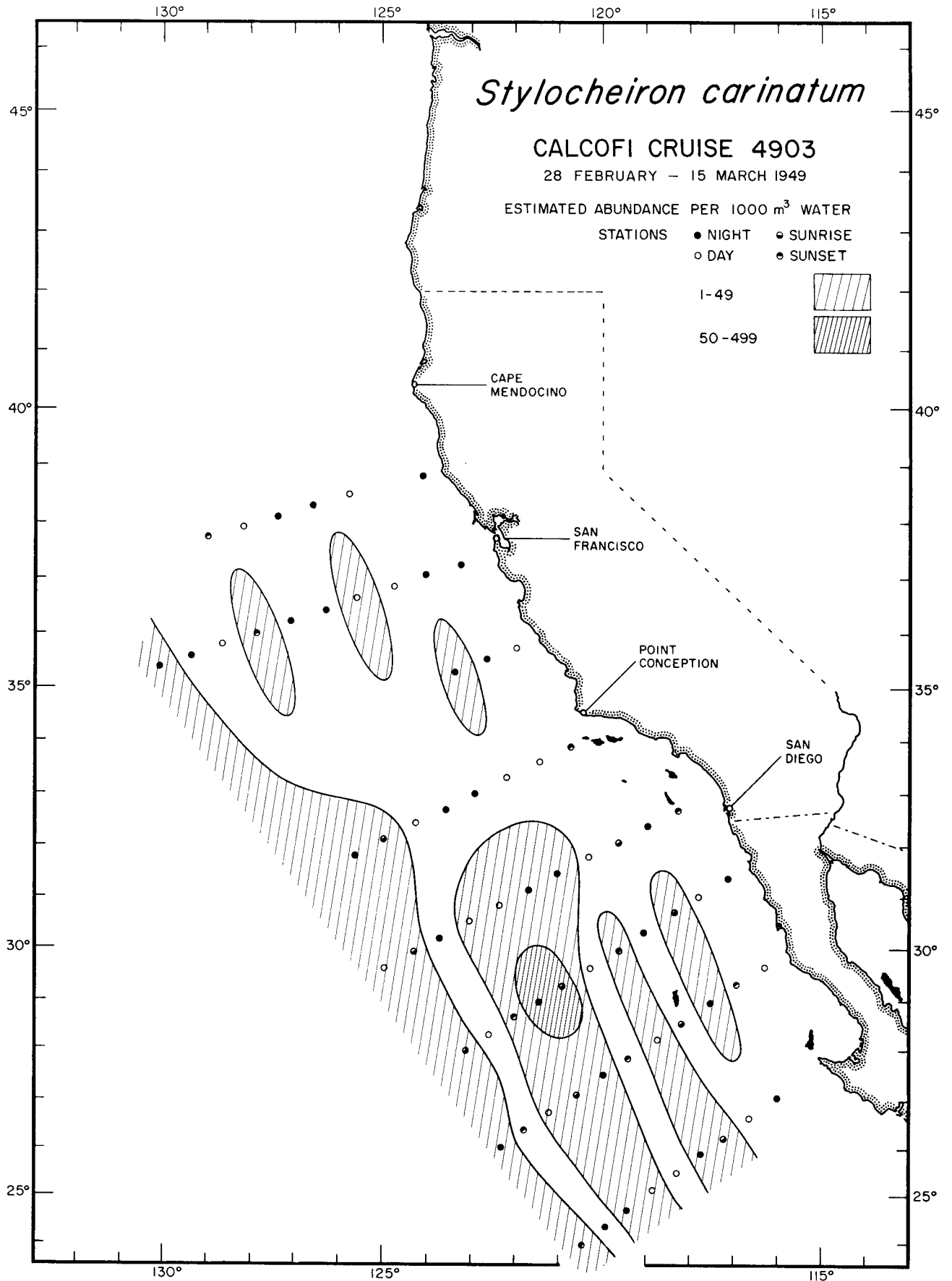
Euphausiacea
Stylocheiron affine
5004



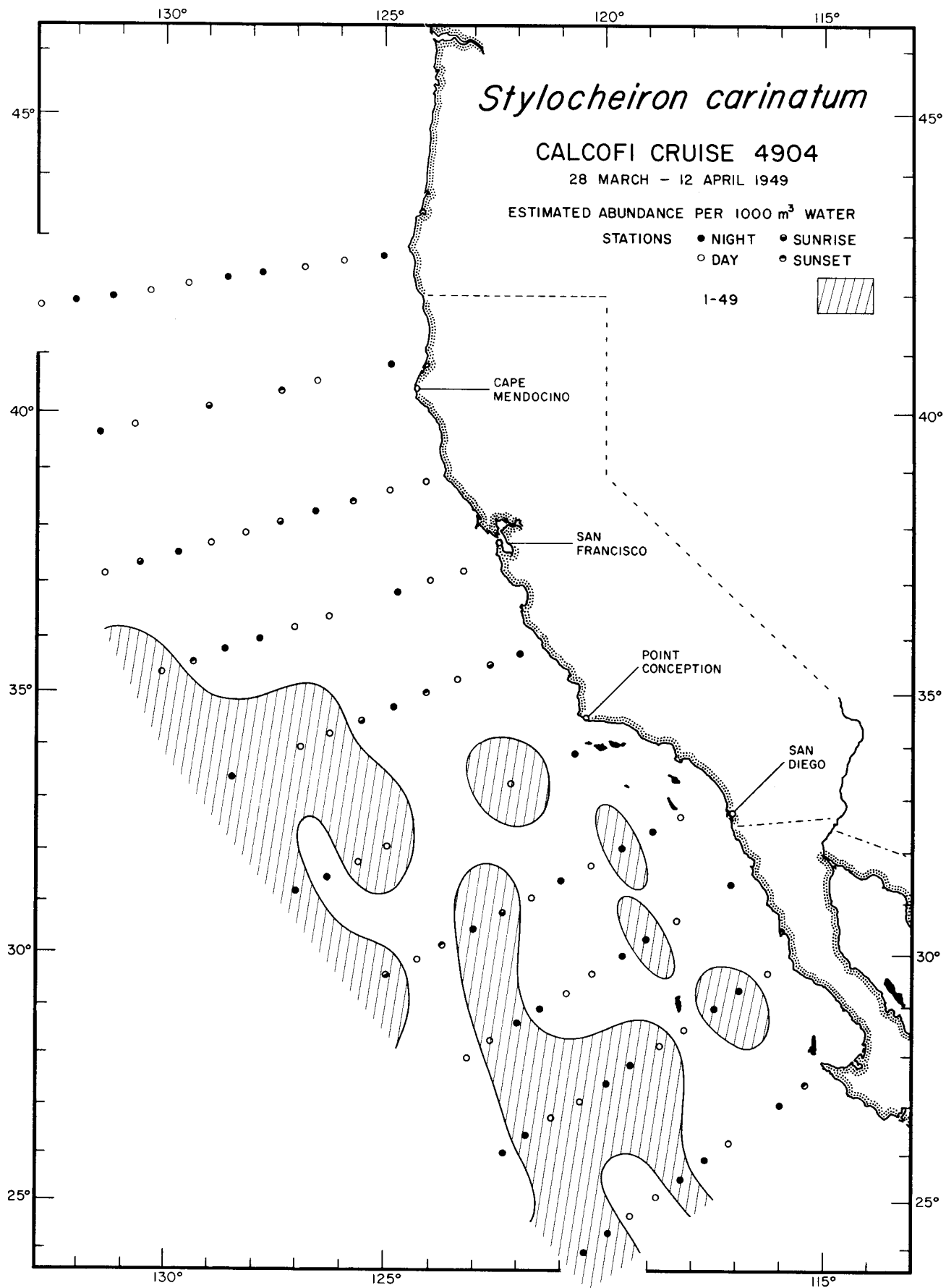
Euphausiacea
Stylocheiron affine
5009



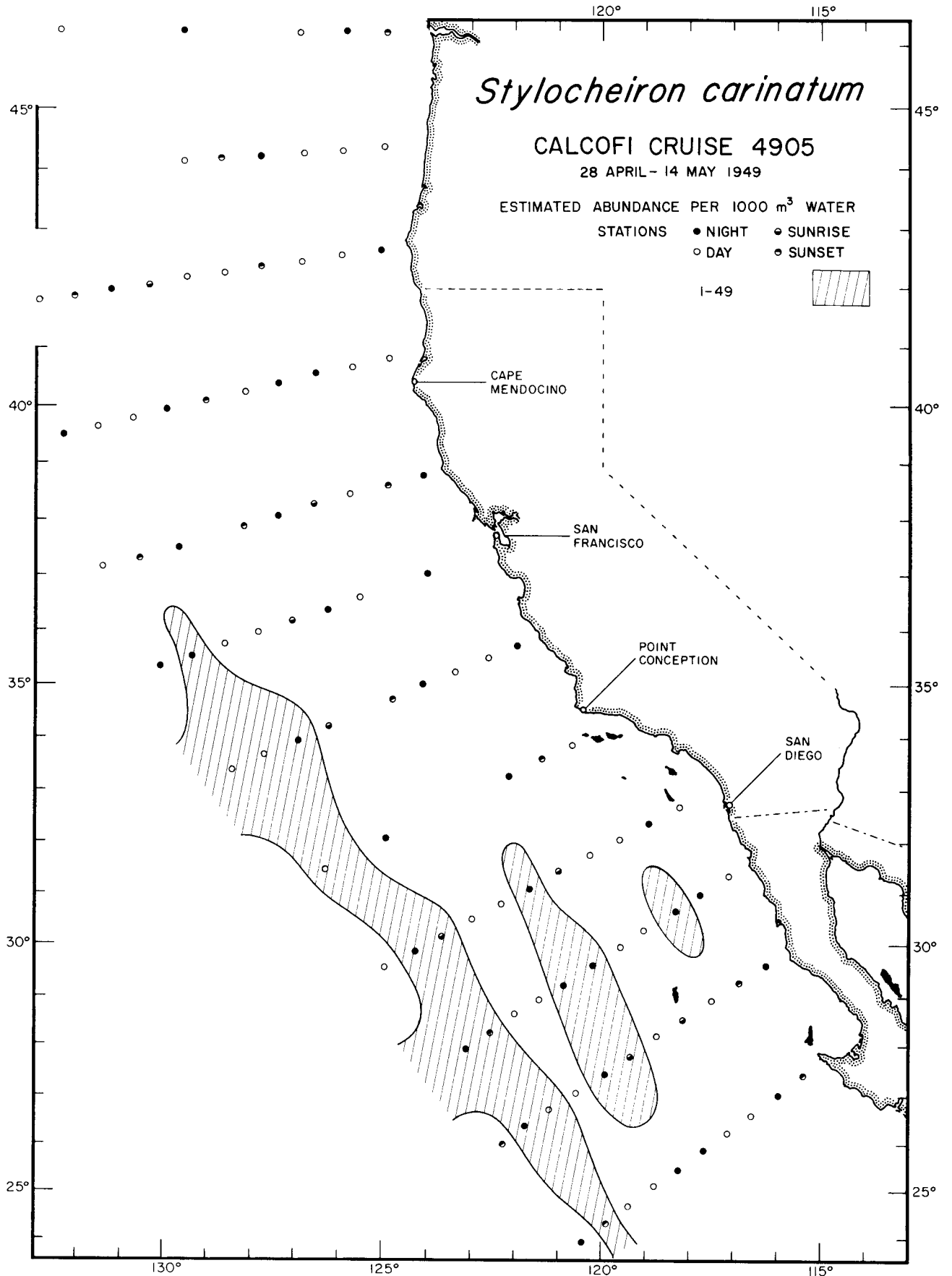
Euphausiacea
Stylocheiron carinatum
E. W. SCRIPPS CRUISE VIII



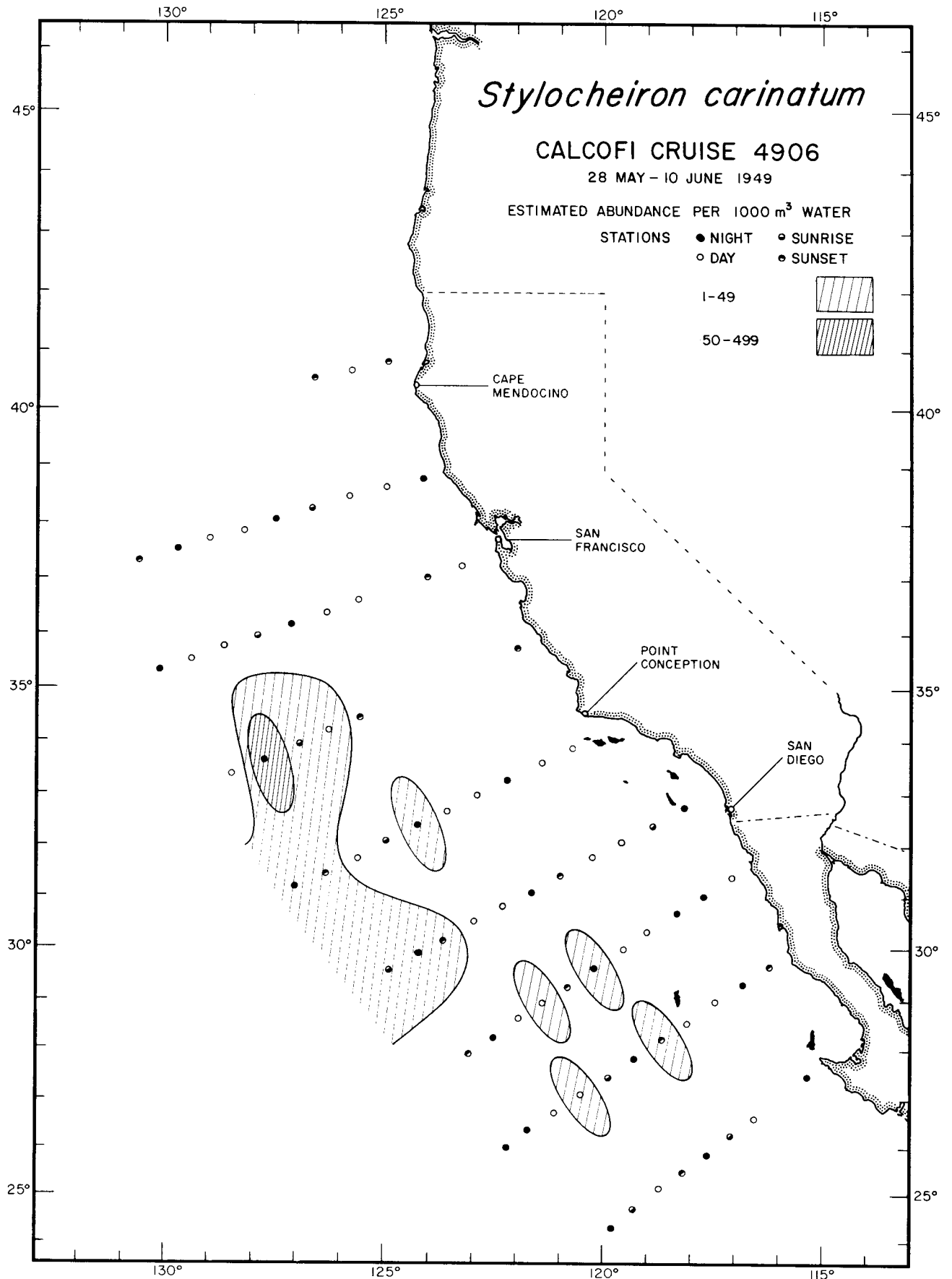
Euphausiacea
Stylocheiron carinatum
4903



Euphausiacea
Stylocheiron carinatum
4904



Euphausiacea
Stylocheiron carinatum
4905



Stylocheiron carinatum

CALCOFI CRUISE 4906
28 MAY - 10 JUNE 1949

ESTIMATED ABUNDANCE PER 1000 m³ WATER

STATIONS ● NIGHT ○ DAY
○ DAY ● SUNSET

1-49 [diagonal hatching]
50-499 [cross-hatching]

CAPE MENDOCINO

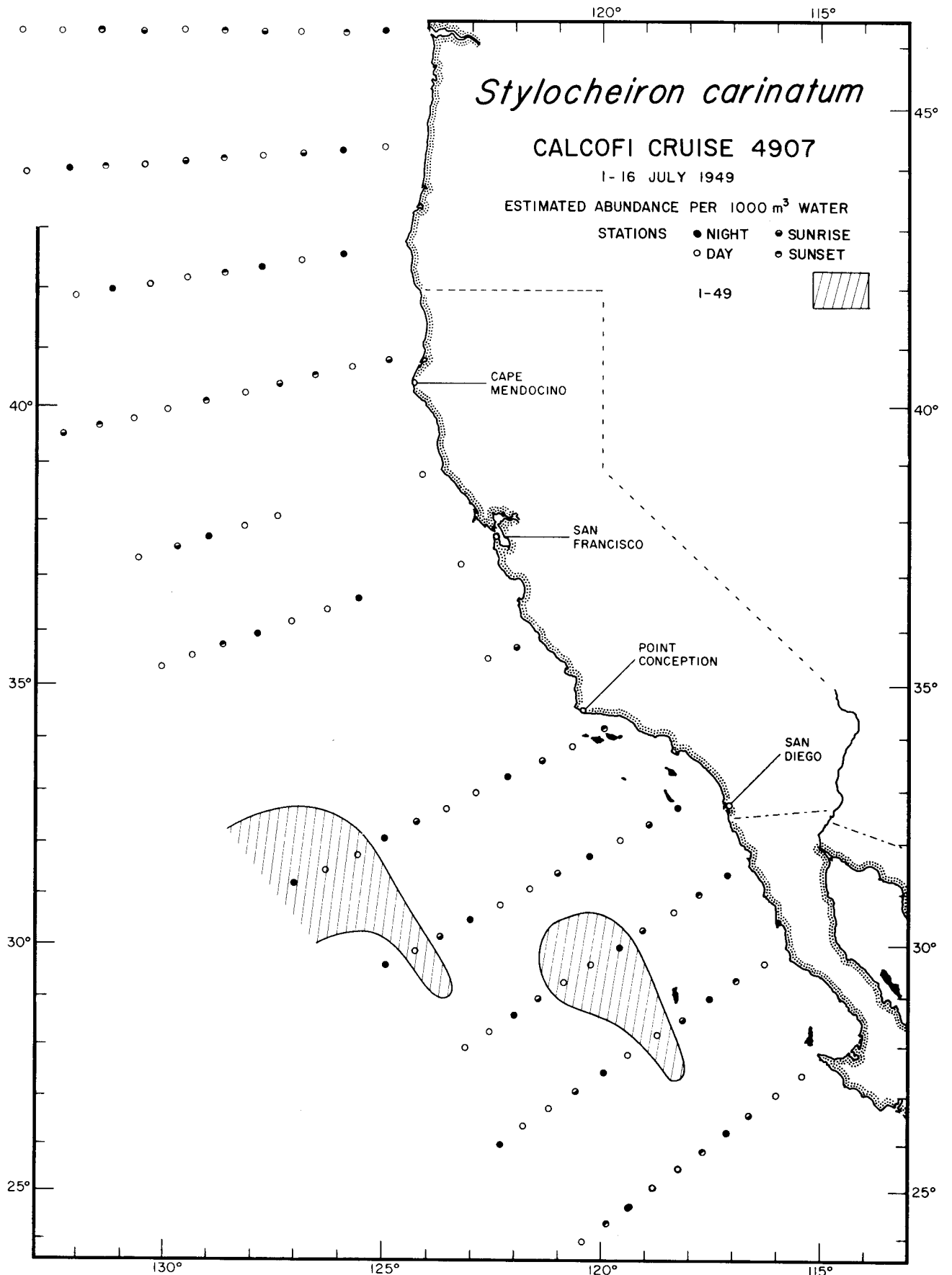
SAN FRANCISCO

POINT CONCEPTION

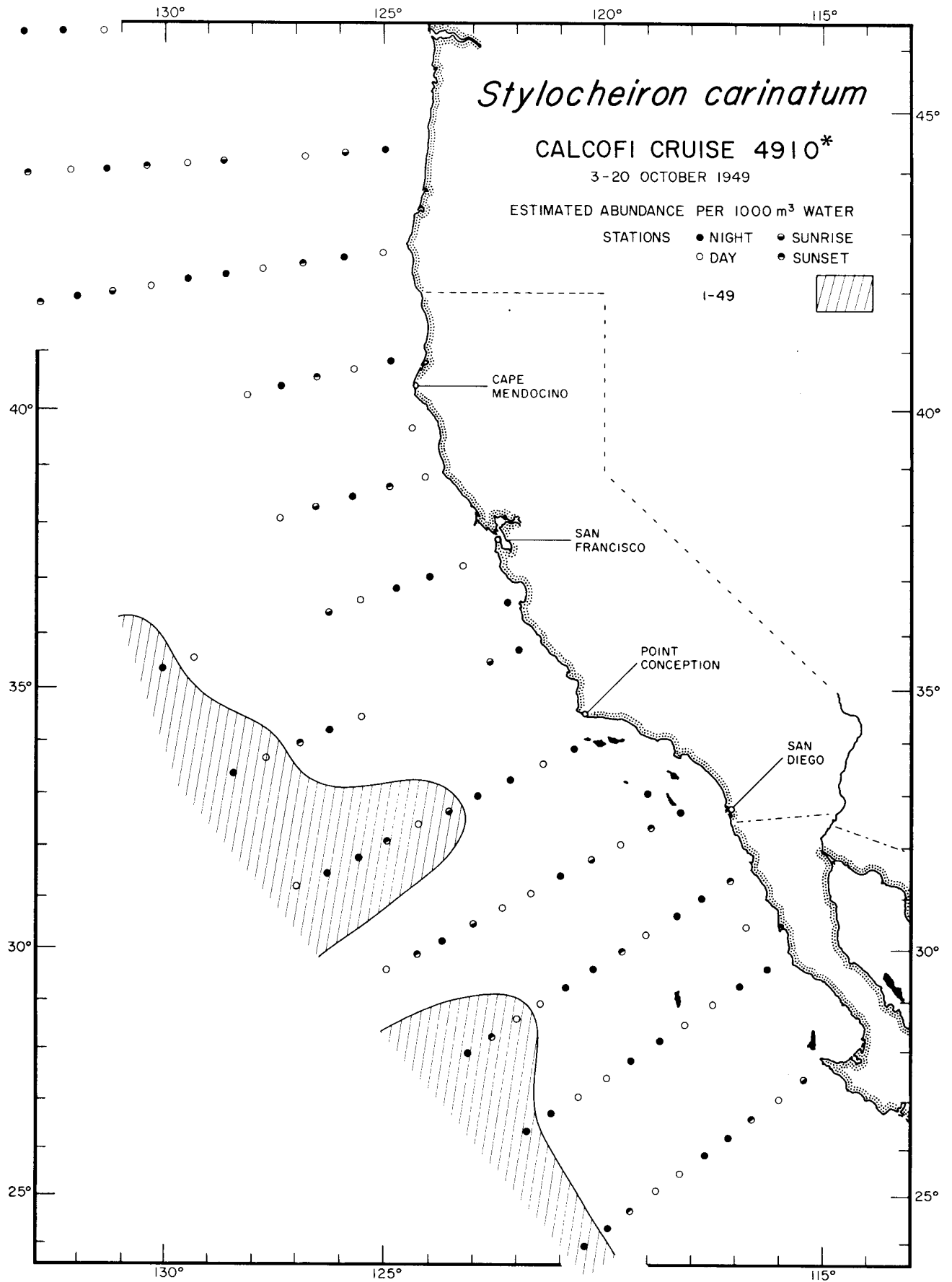
SAN DIEGO

Euphausiacea
Stylocheiron carinatum

4906

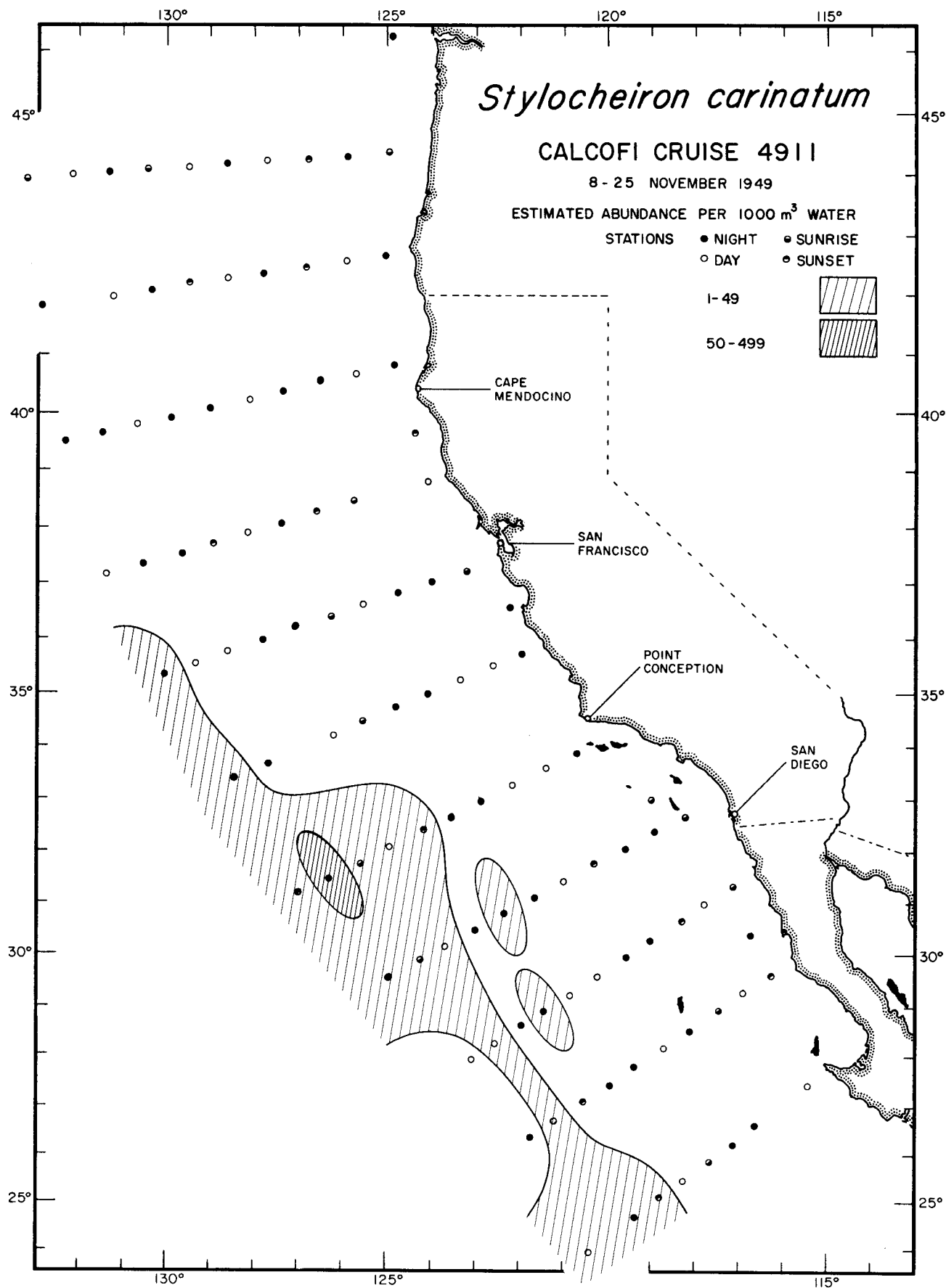


Euphausiacea
Stylocheiron carinatum
4907

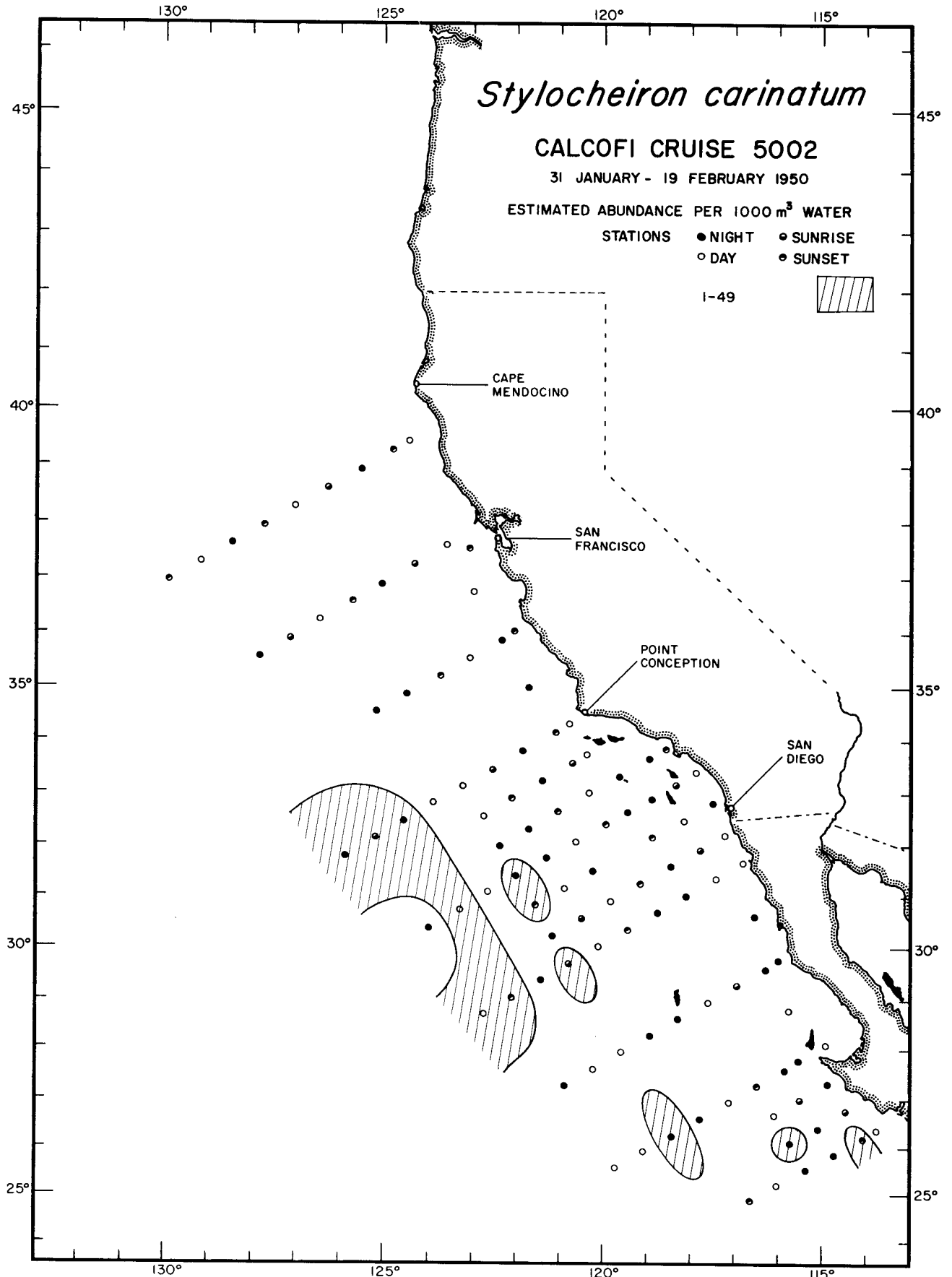


* See Table 1 for Cruises 4908, 9

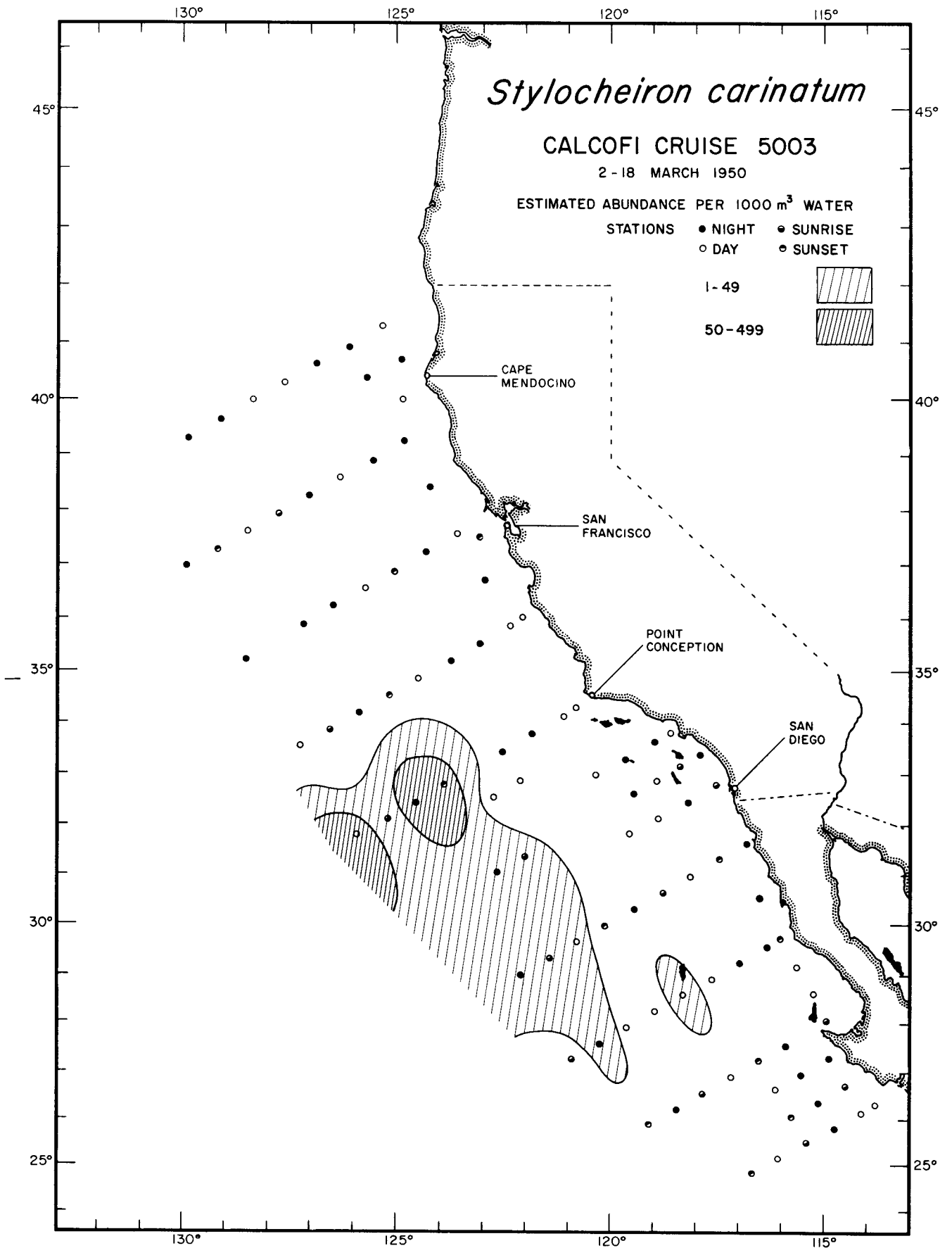
Euphausiacea
Stylocheiron carinatum
4910



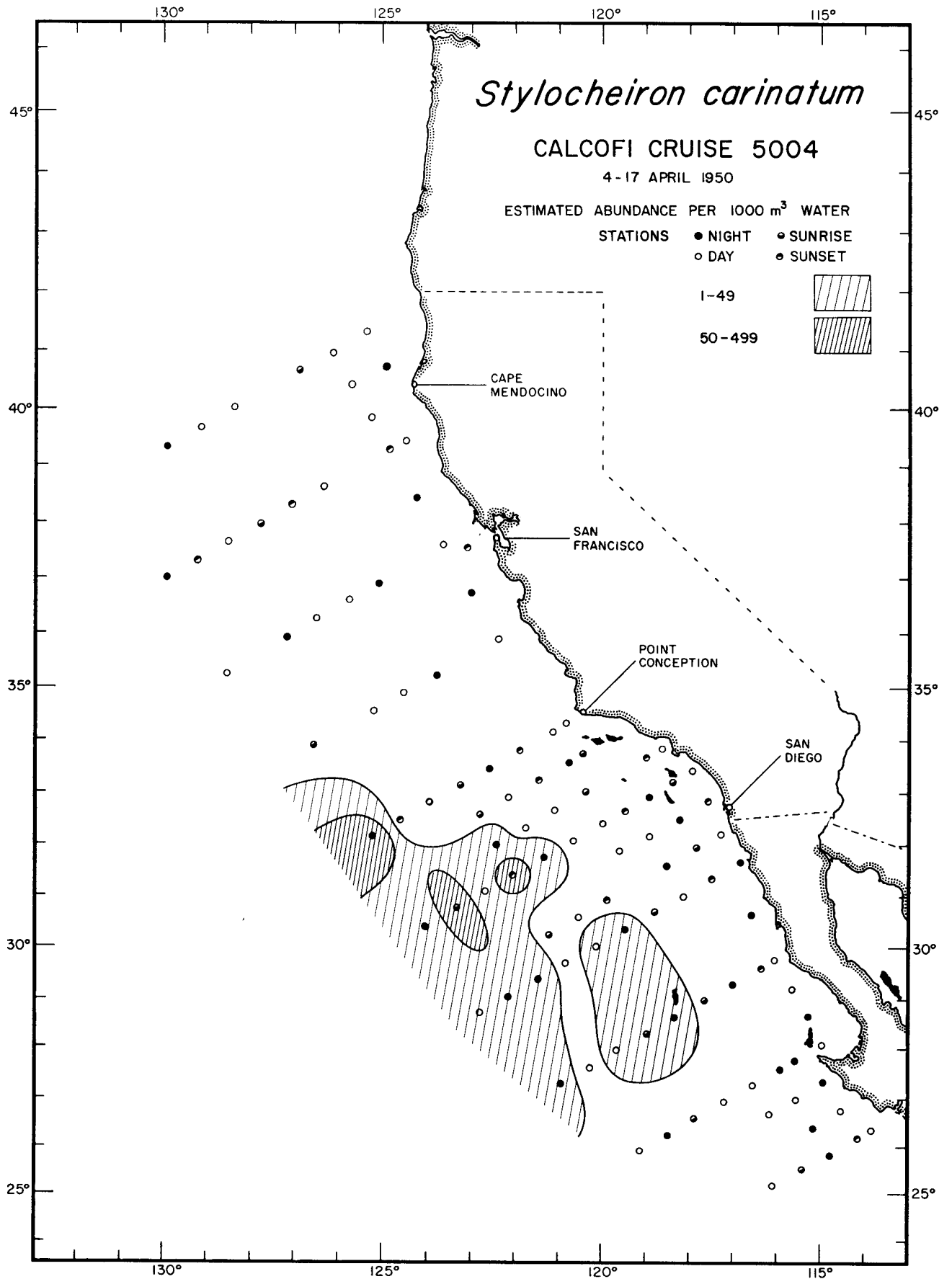
Euphausiacea
Stylocheiron carinatum
4911



Euphausiacea
Stylocheiron carinatum
5002



Euphausiacea
Stylocheiron carinatum
5003



Euphausiacea
Stylocheiron carinatum
5004

135° 130° 125° 120° 115°

Stylocheiron carinatum

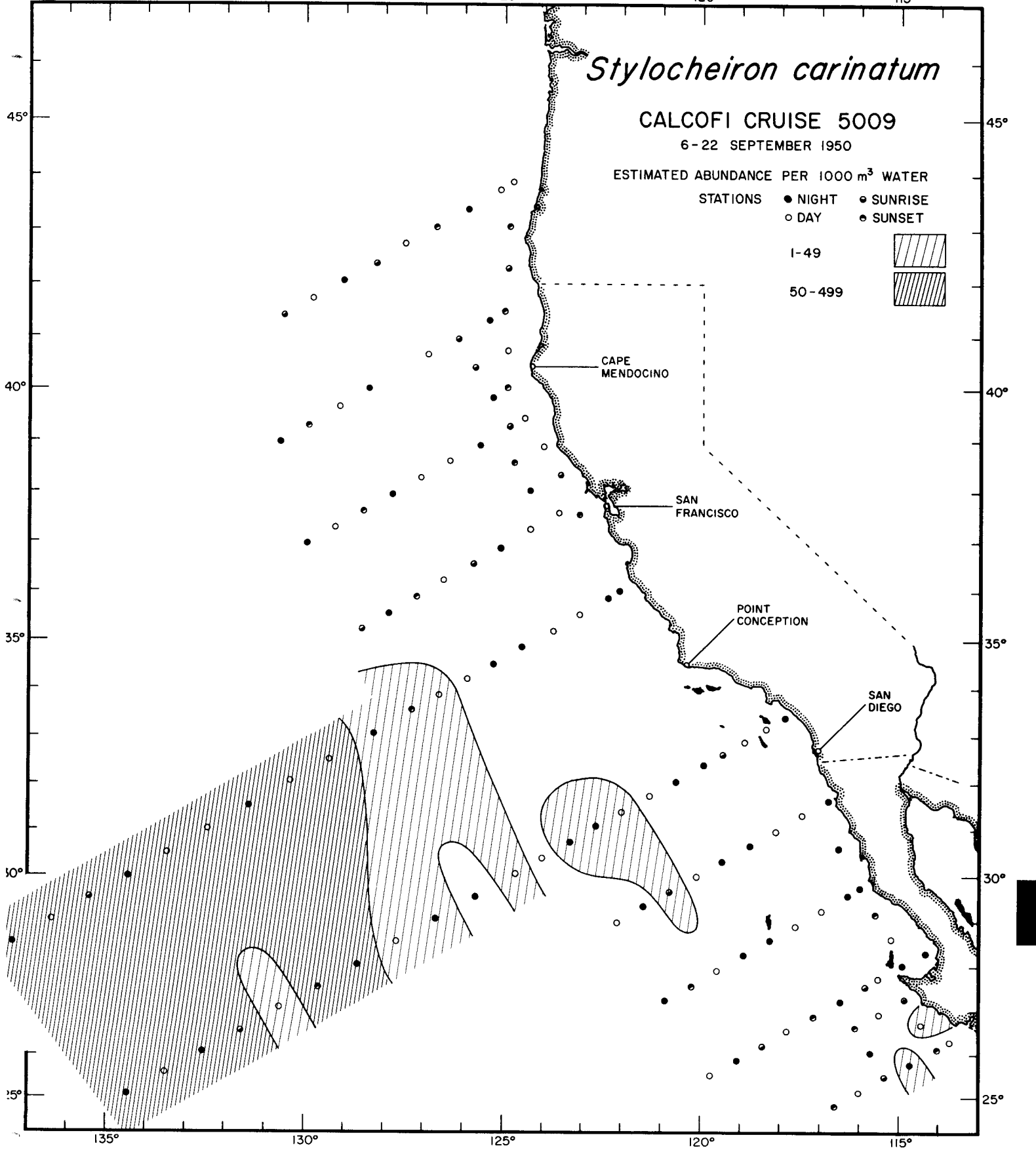
CALCOFI CRUISE 5009

6-22 SEPTEMBER 1950

ESTIMATED ABUNDANCE PER 1000 m³ WATER

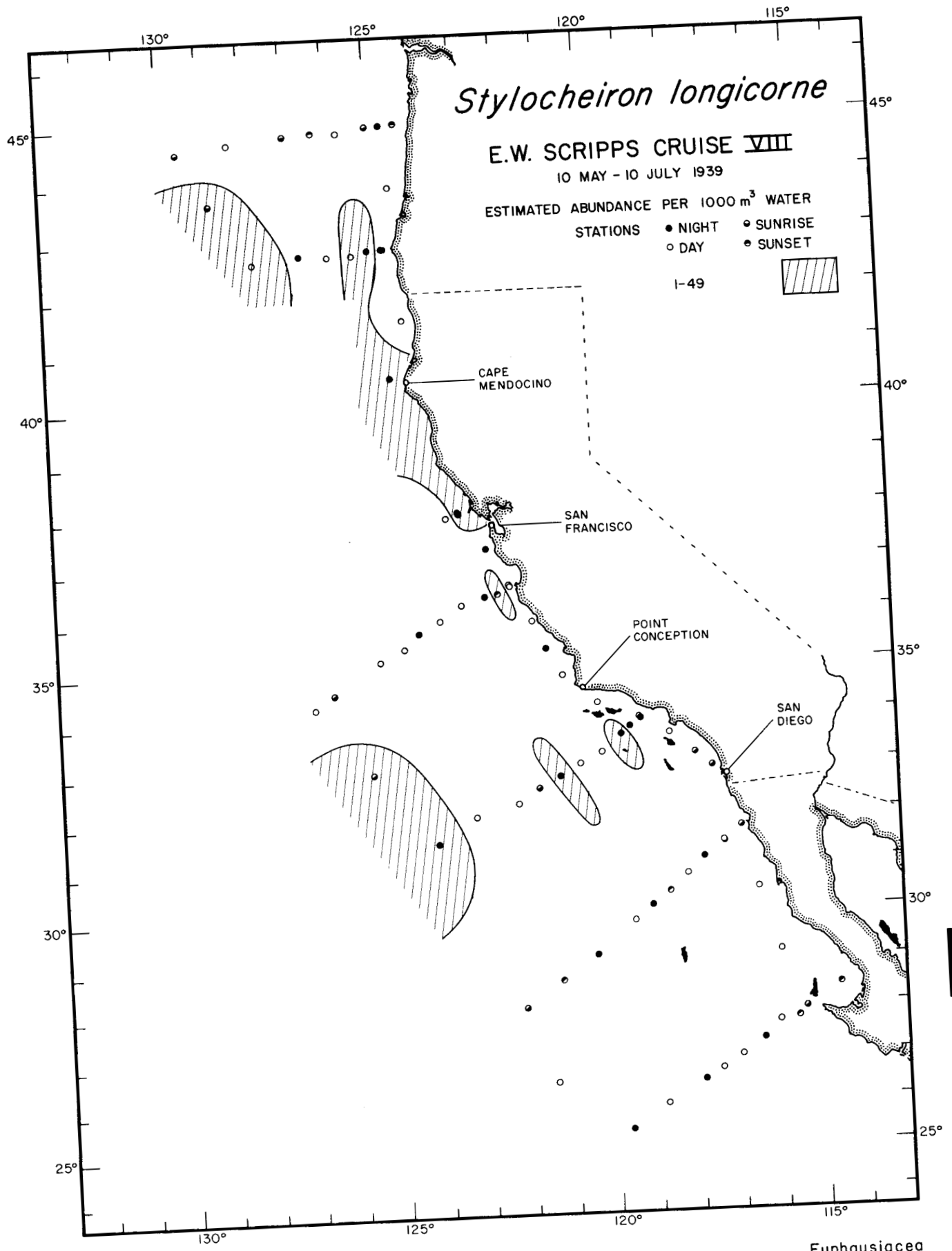
STATIONS ● NIGHT ○ DAY
○ SUNRISE ● SUNSET

1-49 [diagonal lines]
50-499 [cross-hatch]

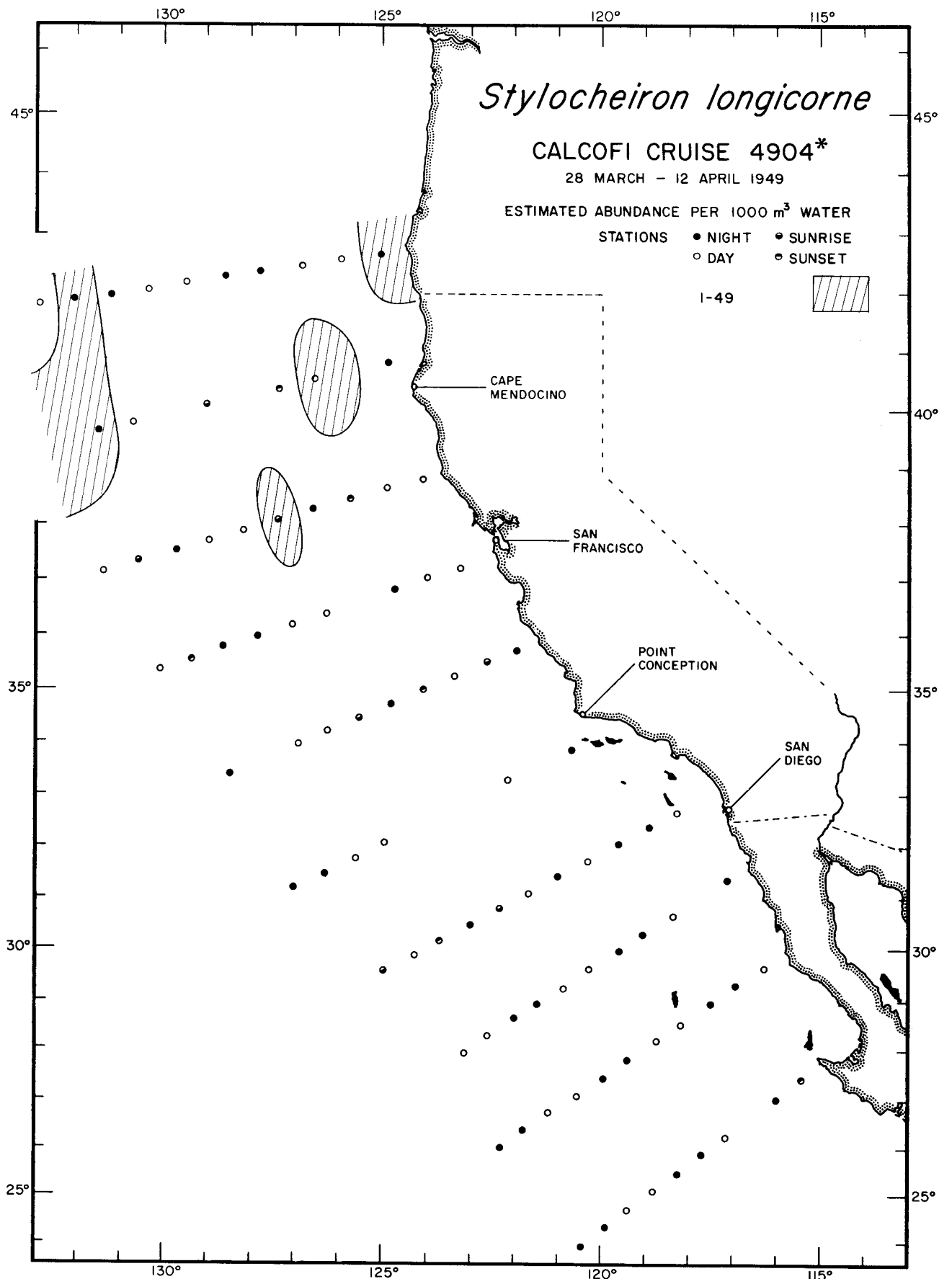


Euphausiacea
Stylocheiron carinatum

5009

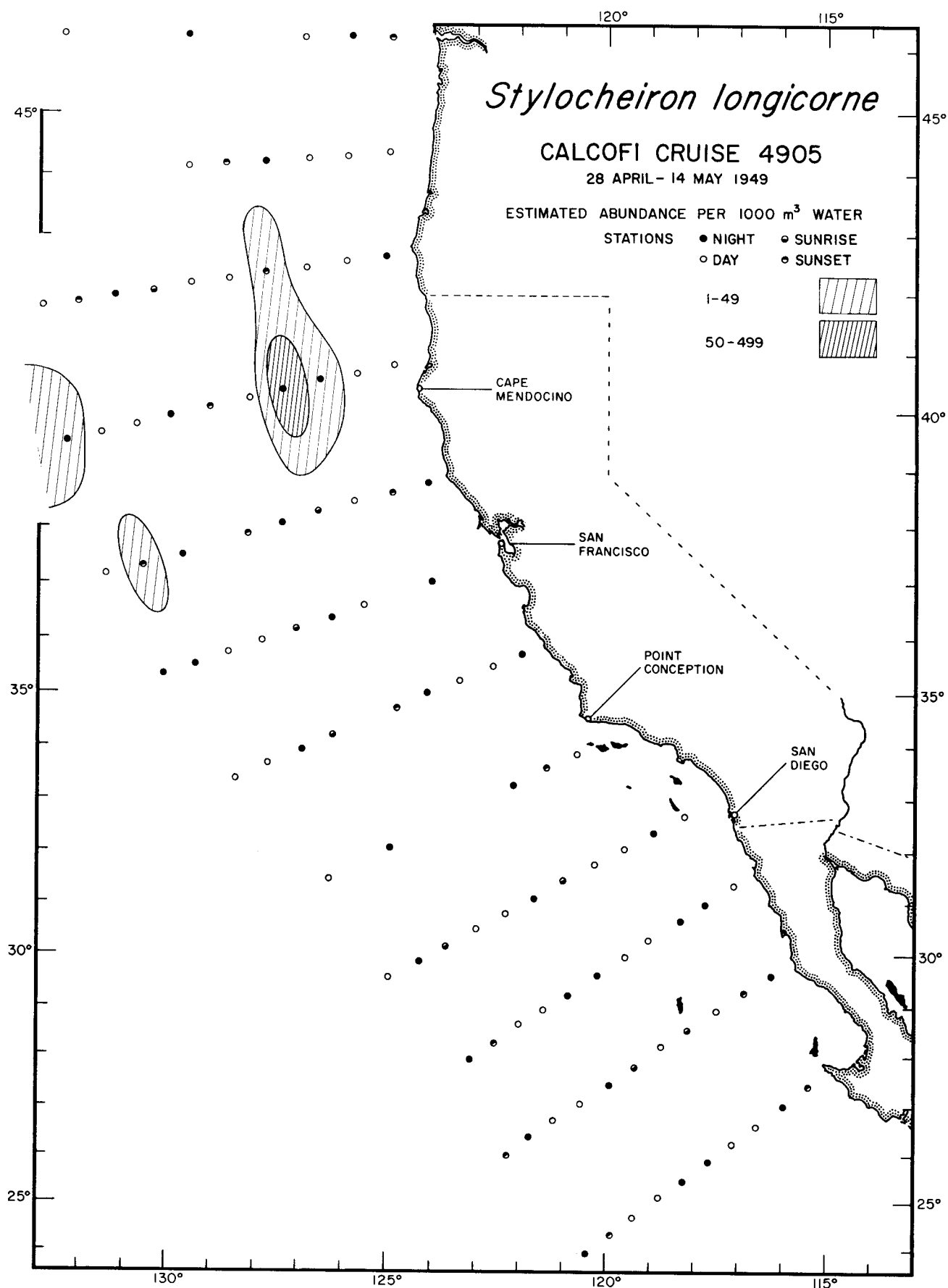


Euphausiacea
Stylocheiron longicorne
E. W. SCRIPPS CRUISE VIII

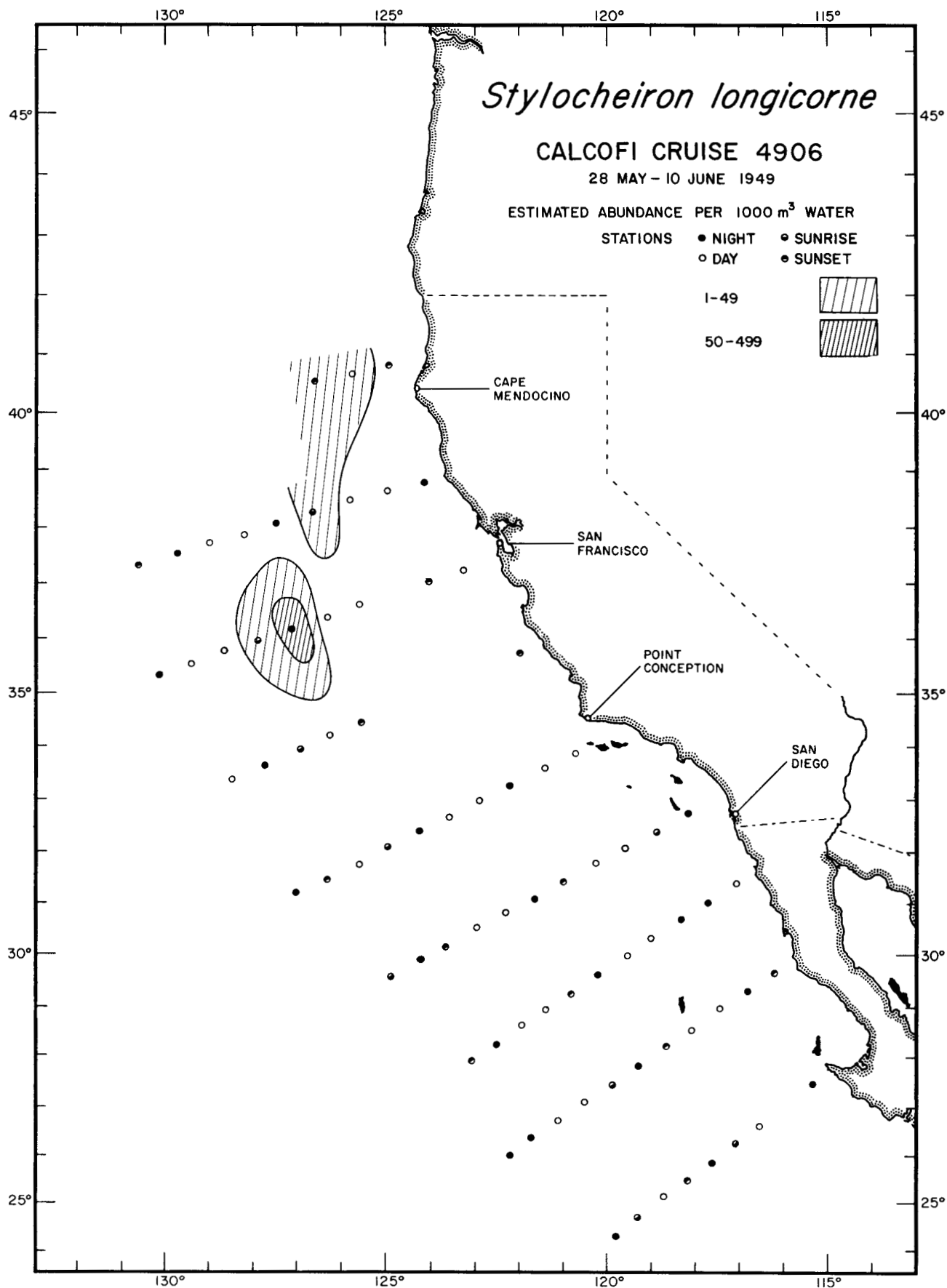


* See Table 1 for Cruise 4903

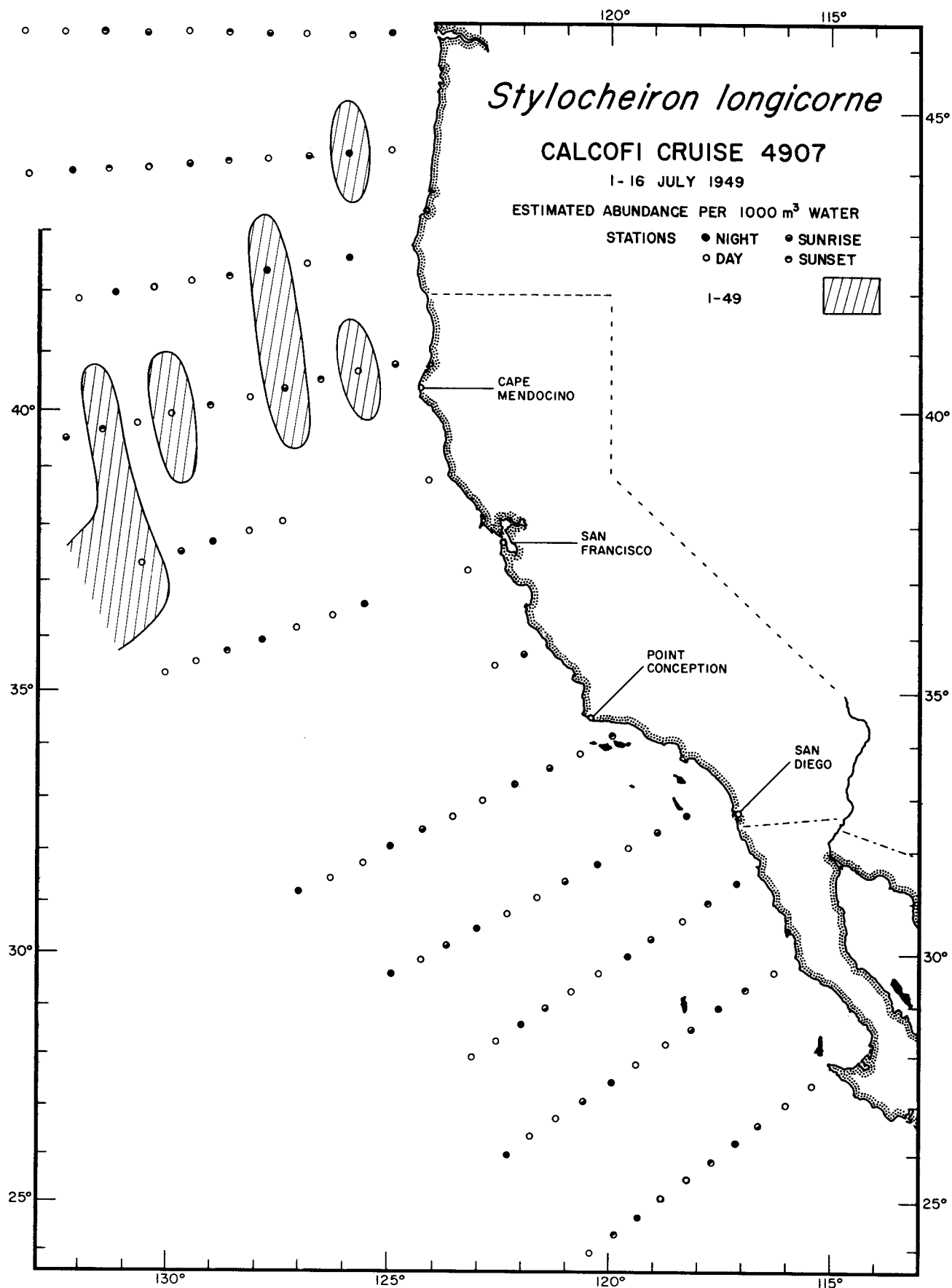
Euphausiacea
Stylocheiron longicorne
4904



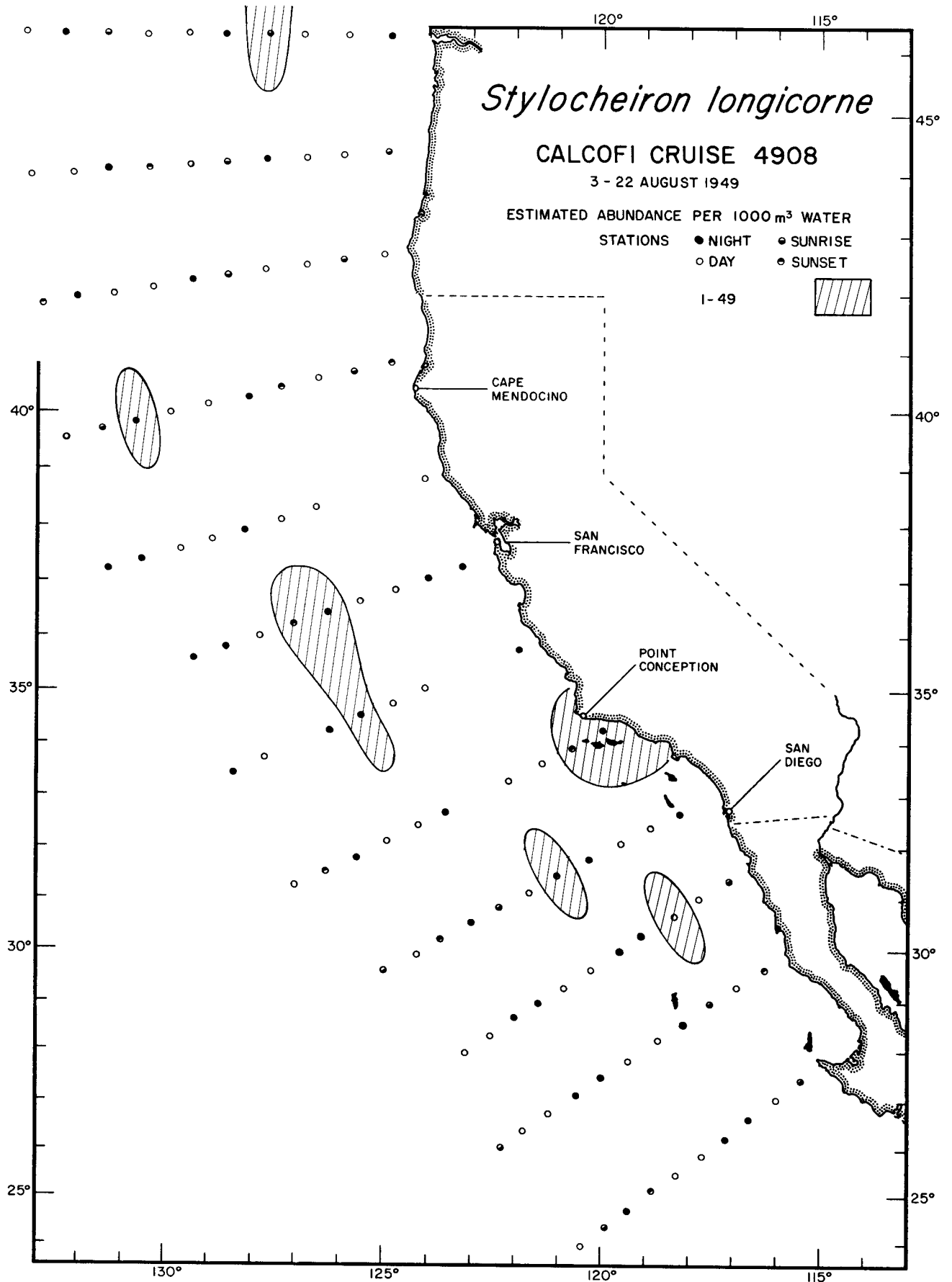
Euphausiacea
Stylocheiron longicorne
4905



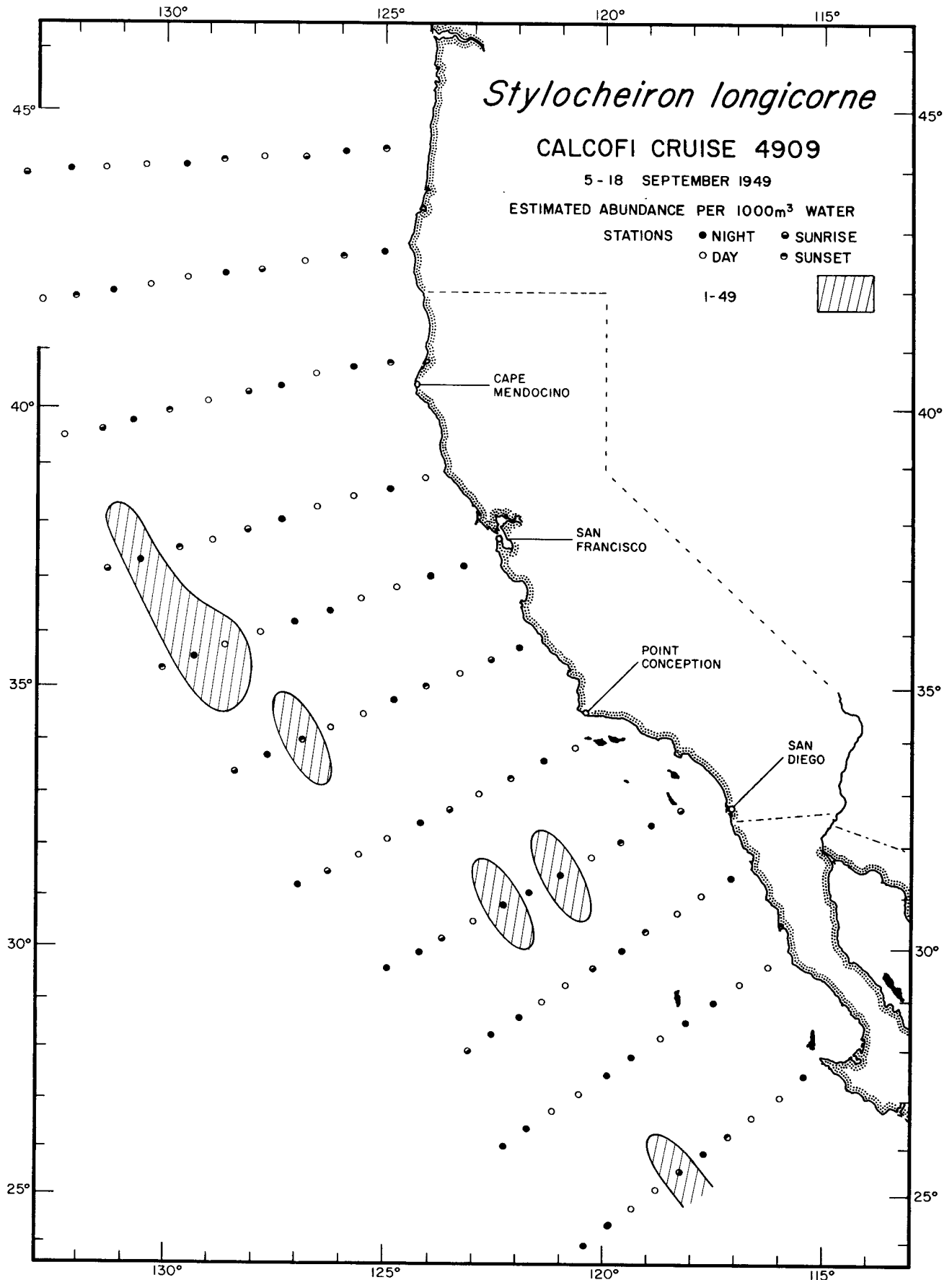
Euphausiacea
Stylocheiron longicorne
4906



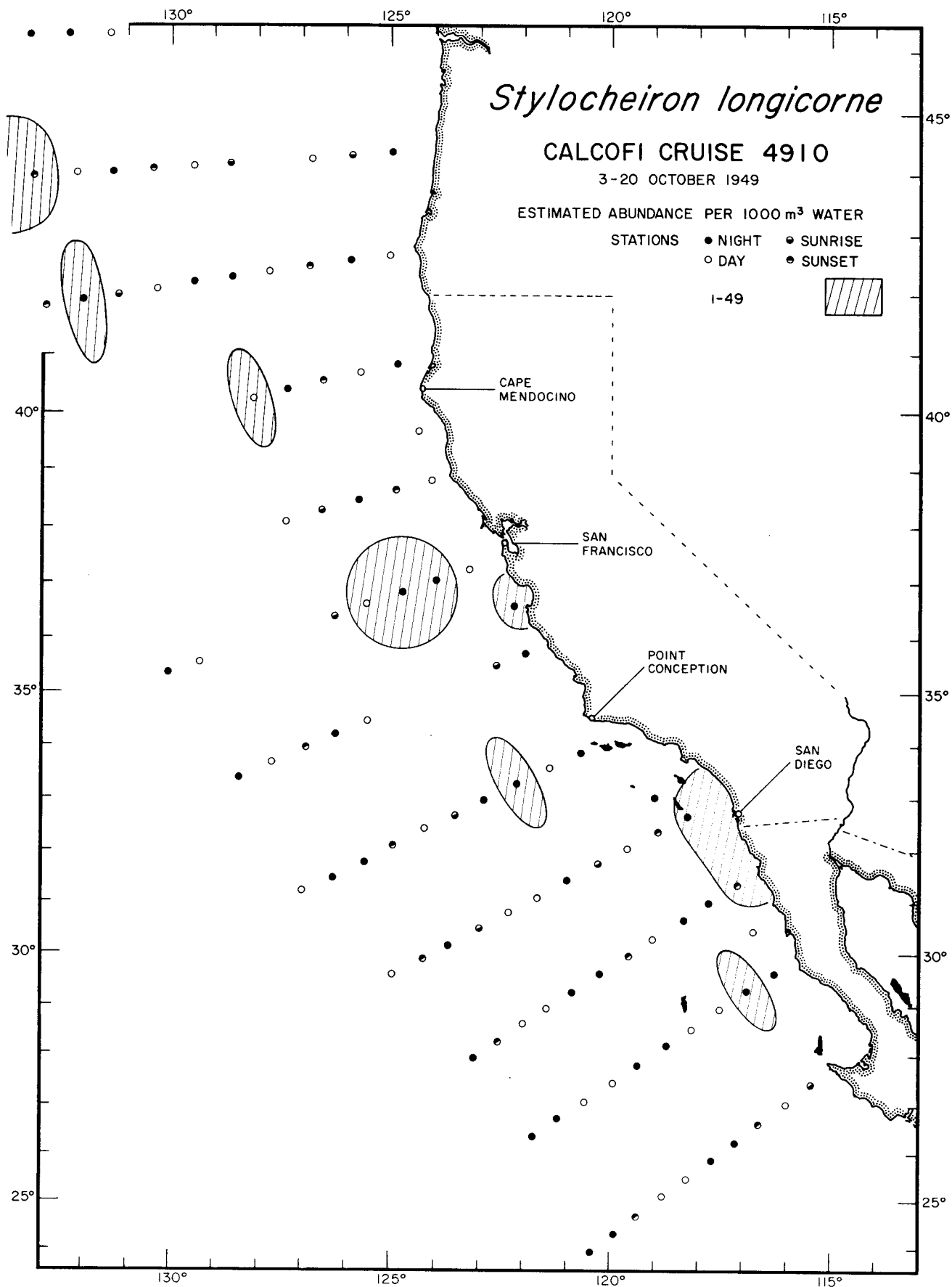
Euphausiacea
Stylocheiron longicorne
4907



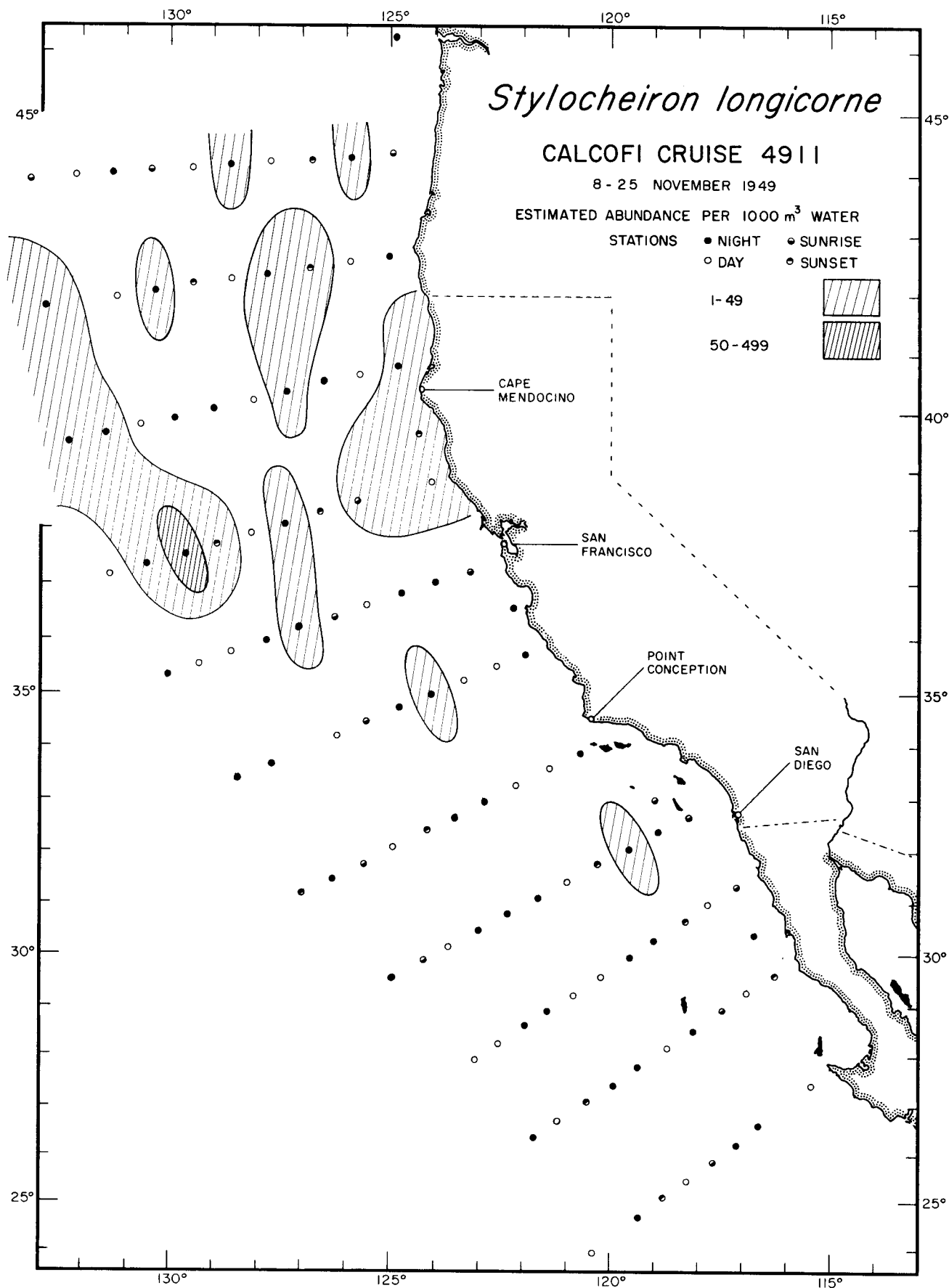
Euphausiacea
Stylocheiron longicorne
4908



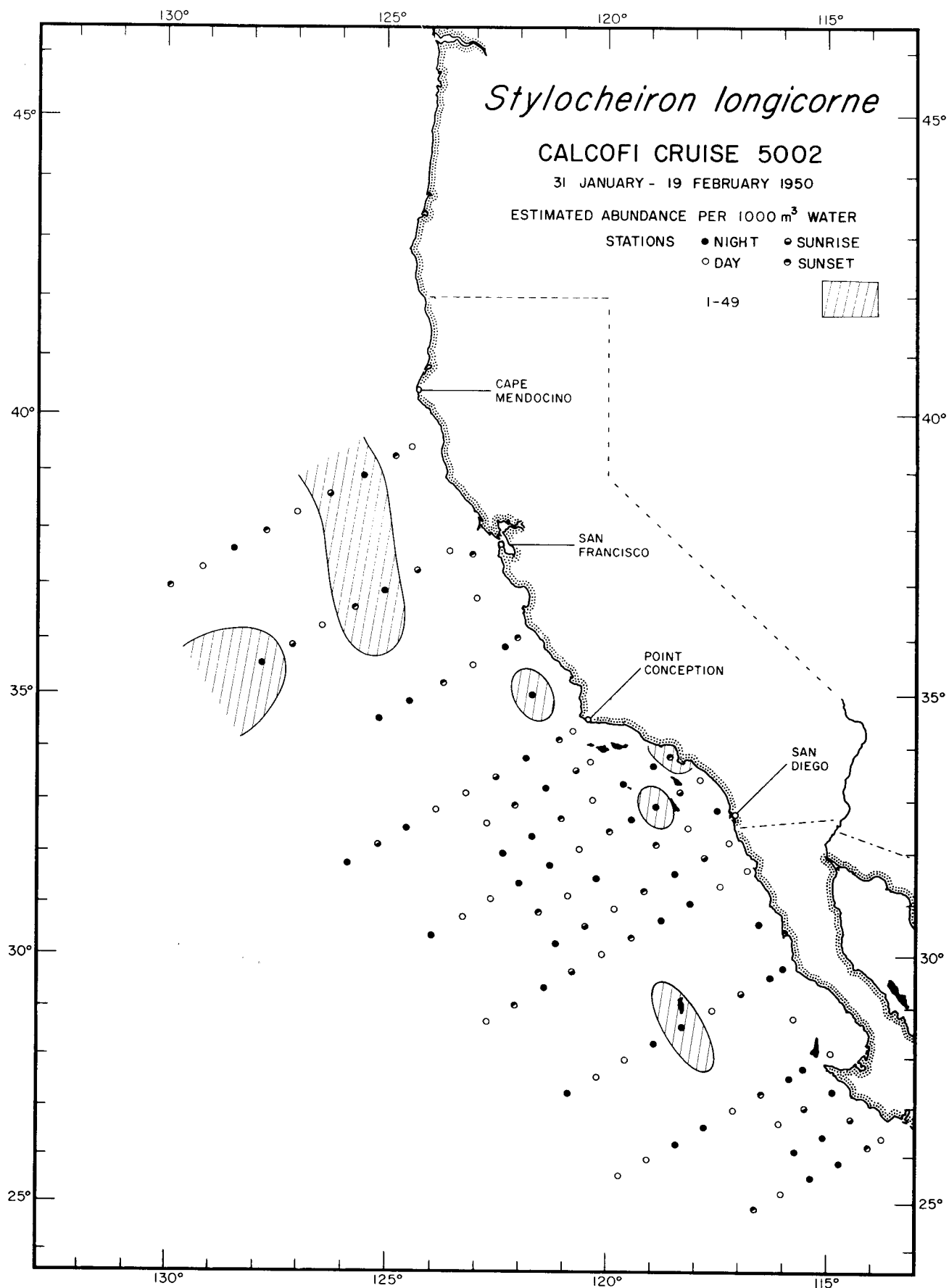
Euphausiacea
Stylocheiron longicorne
4909



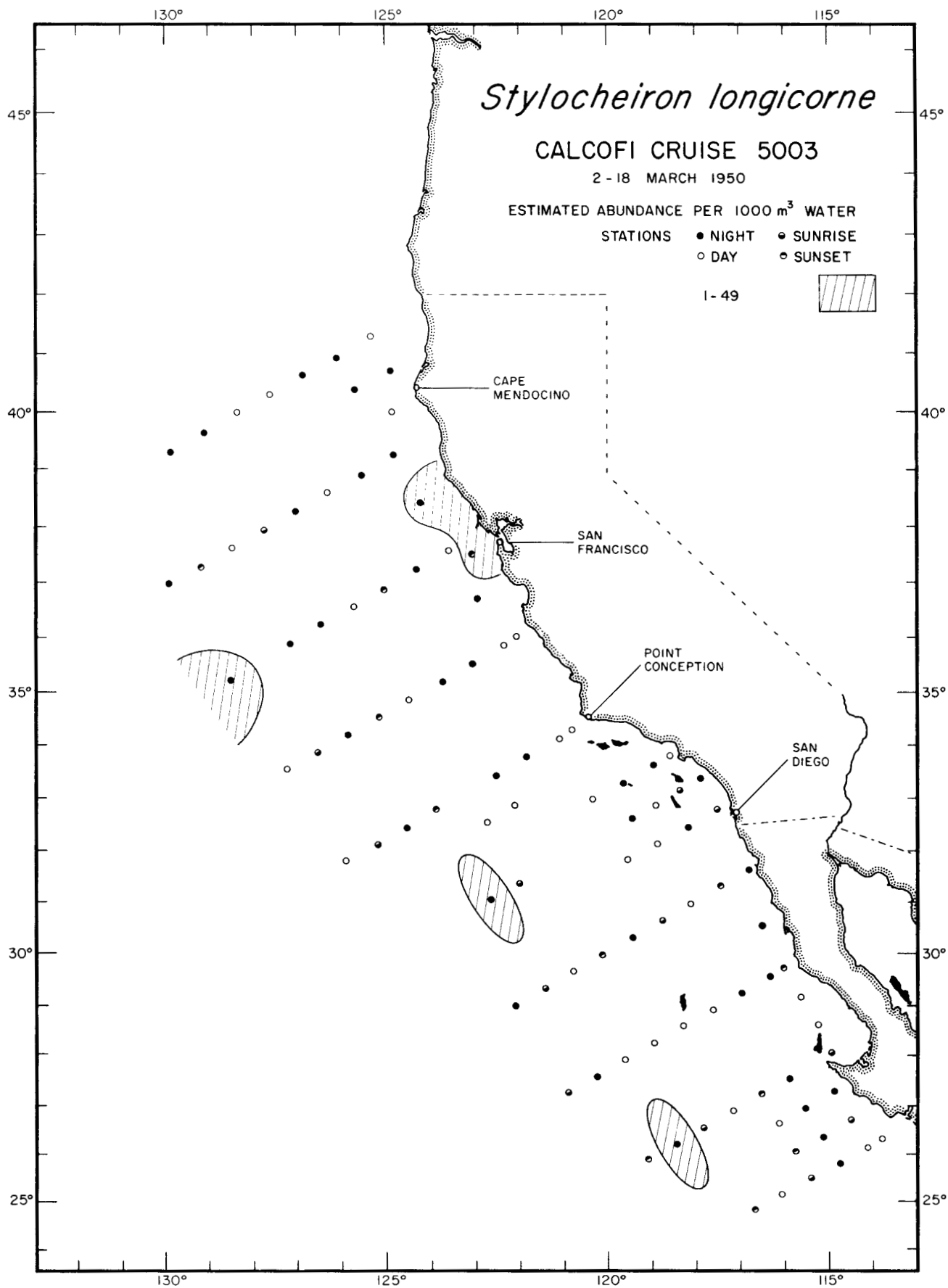
Euphausiacea
Stylocheiron longicorne
4910



Euphausiacea
Stylocheiron longicorne
4911



Euphausiacea
Stylocheiron longicorne
5002



Euphausiacea
Stylocheiron longicorne
5003

135° 130° 125° 120° 115°

Stylocheiron longicorne

CALCOFI CRUISE 5009*

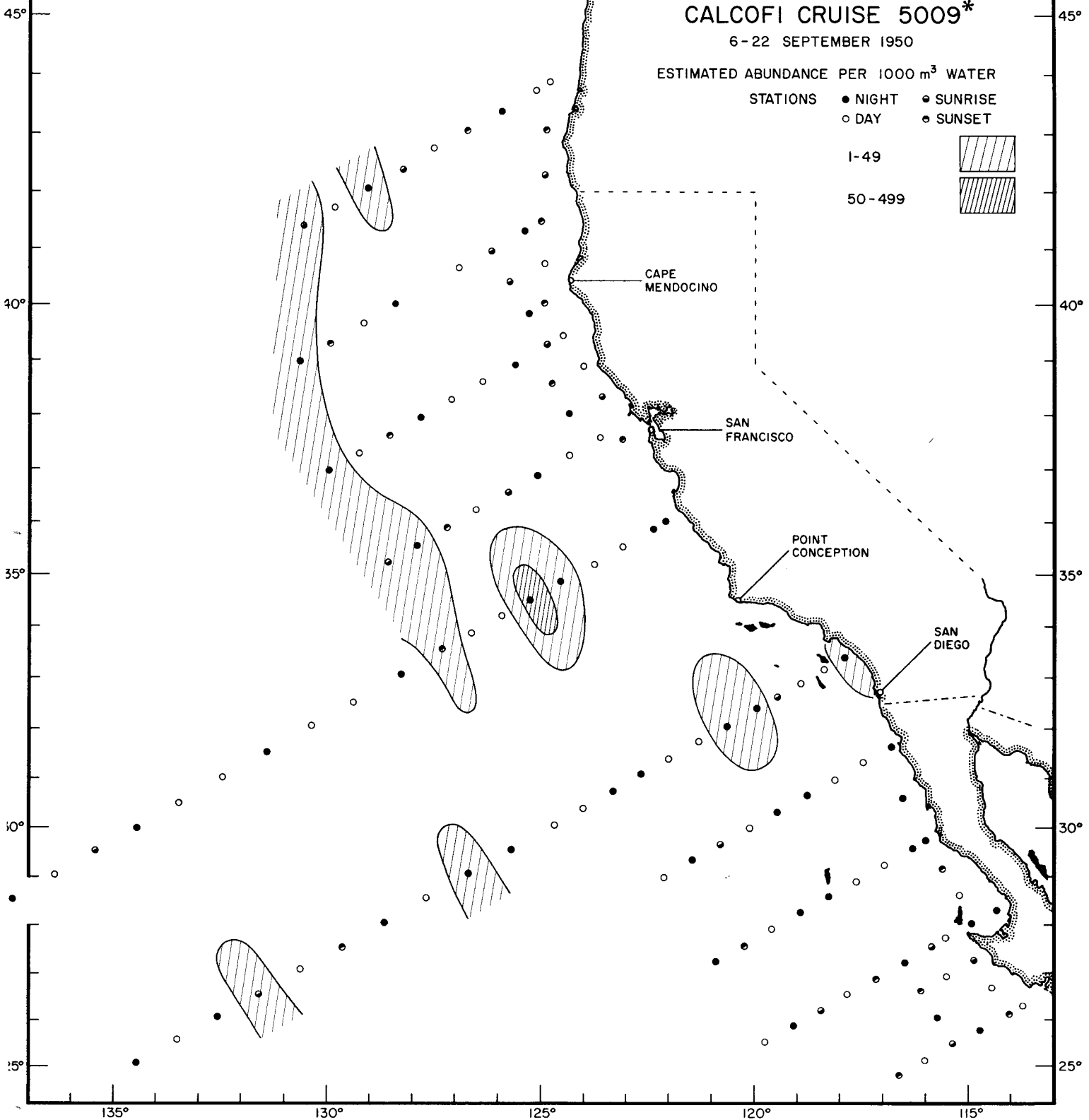
6-22 SEPTEMBER 1950

ESTIMATED ABUNDANCE PER 1000 m³ WATER

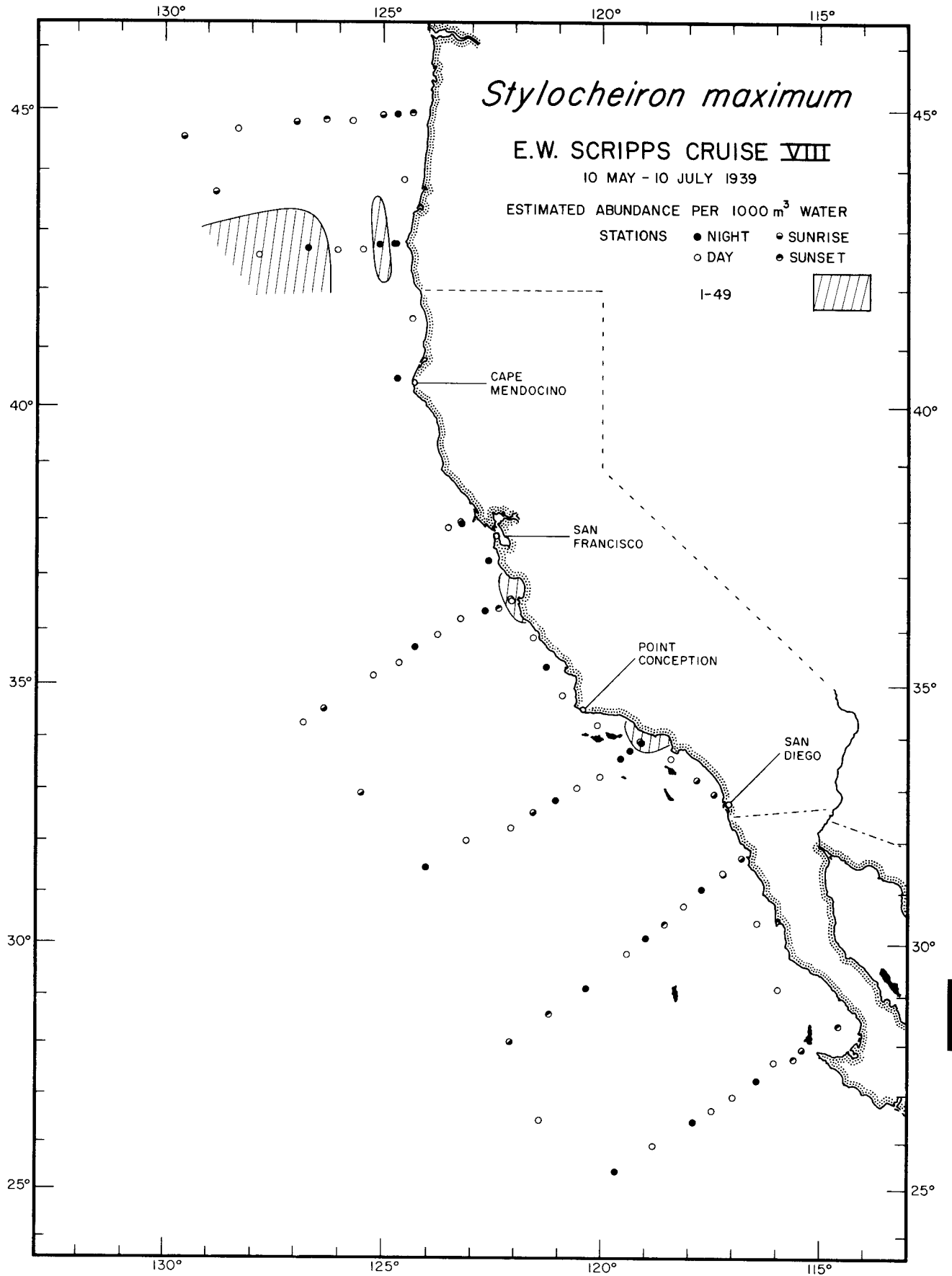
STATIONS ● NIGHT ● SUNRISE
○ DAY ○ SUNSET

1-49 

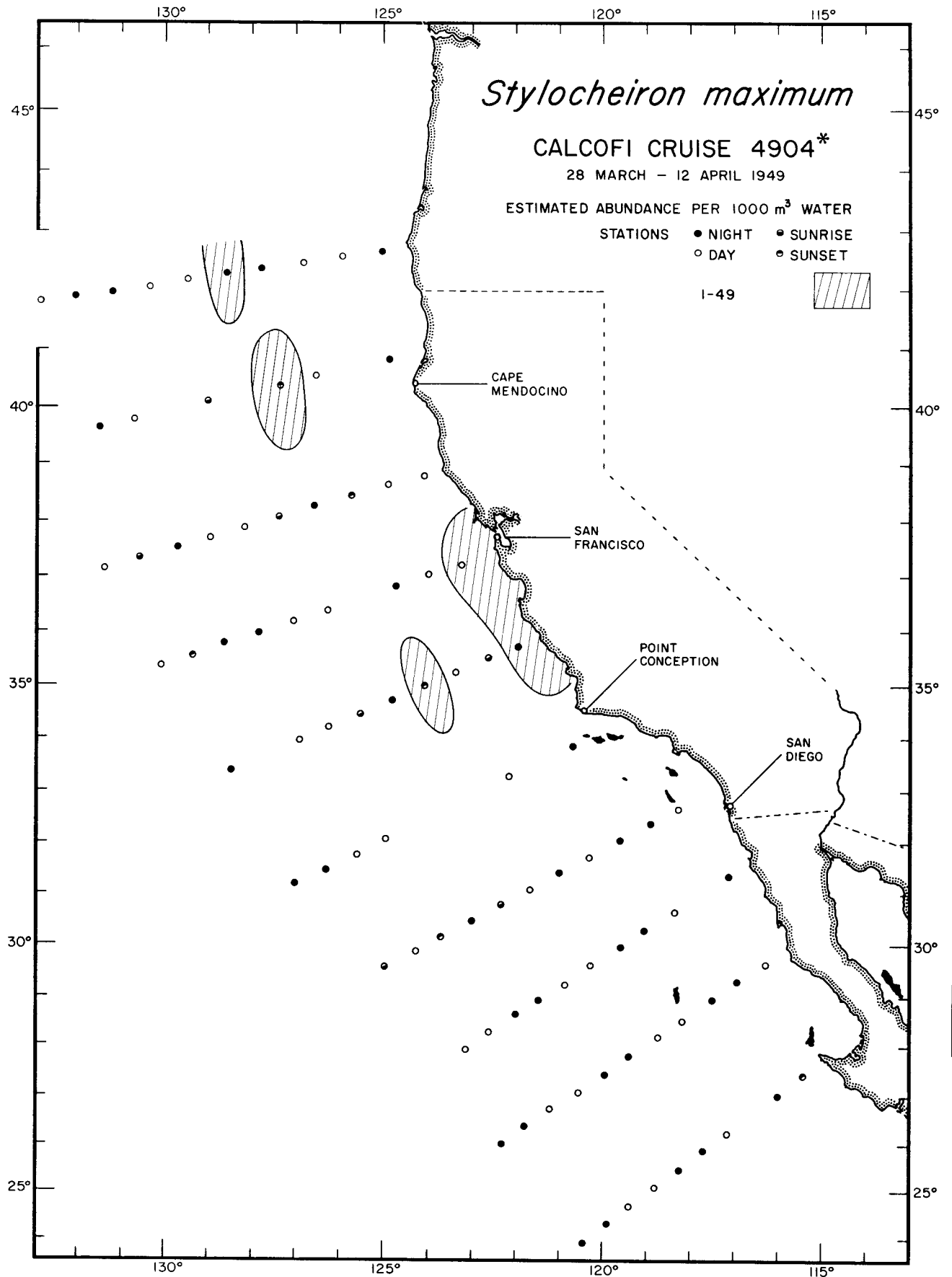
50-499 



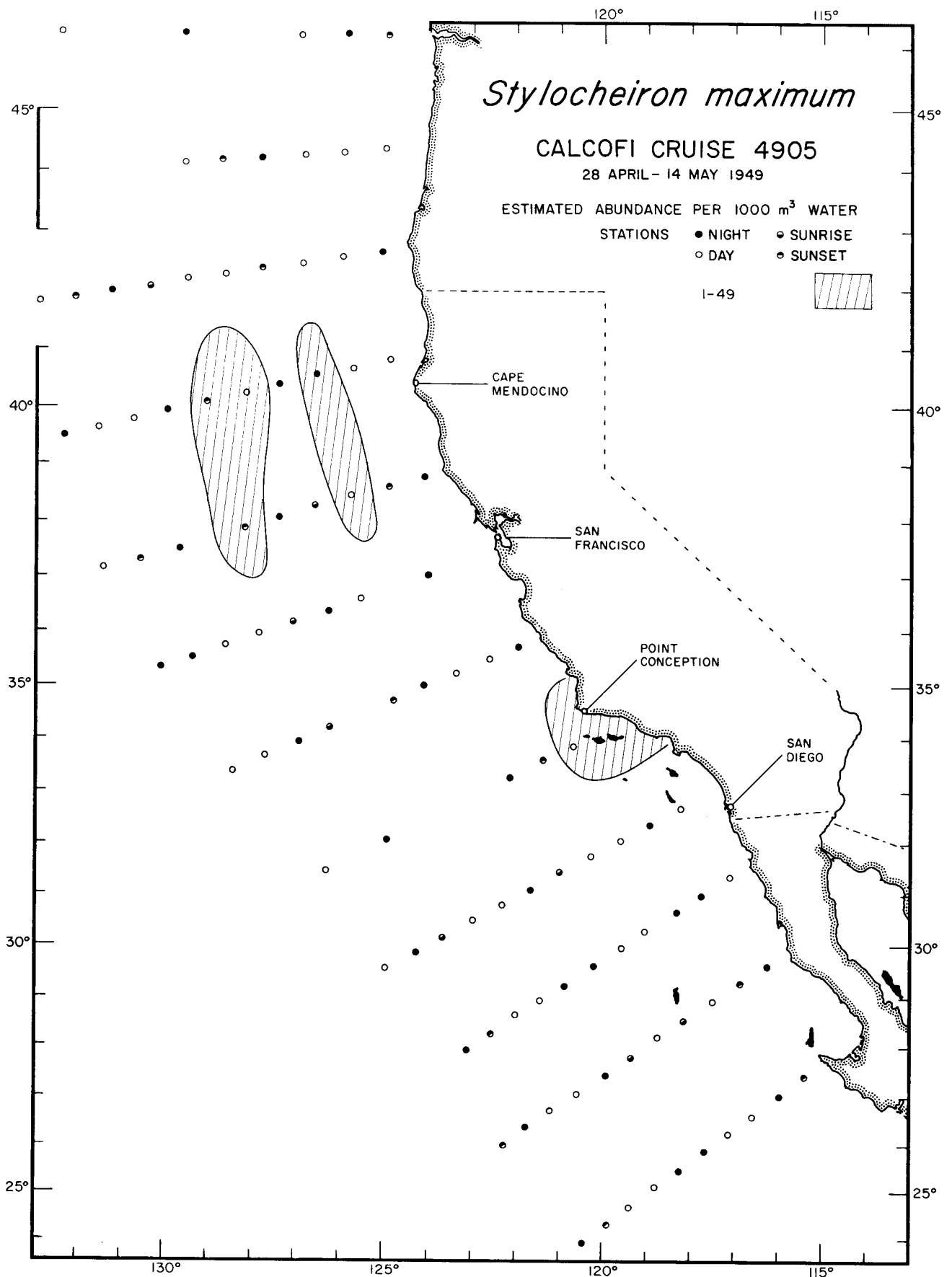
* See Table 1 for Cruise 5004



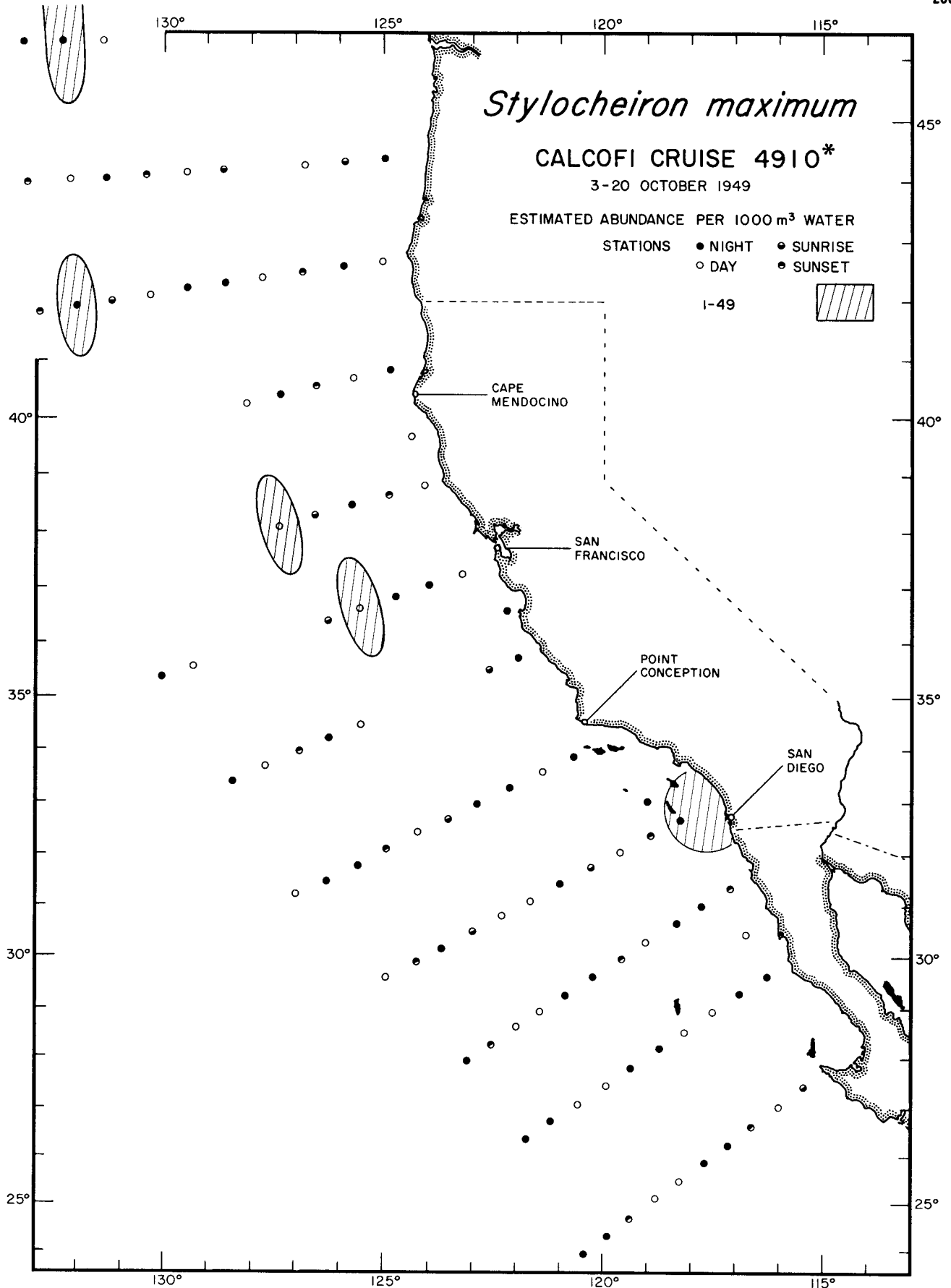
Euphausiacea
Stylocheiron maximum
E. W. SCRIPPS CRUISE VIII



* See Table 1 for Cruise 4903

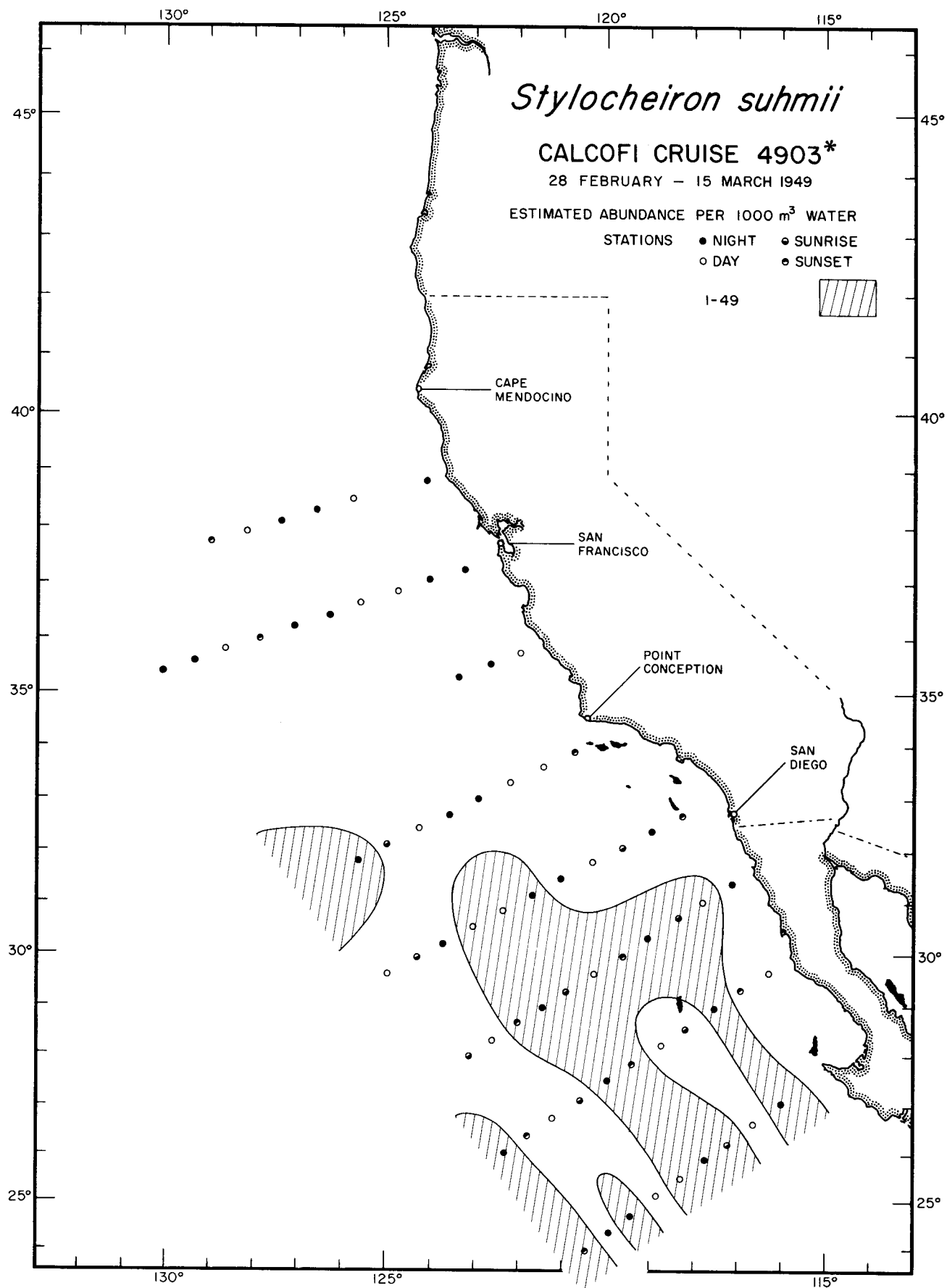


Euphausiacea
Stylocheiron maximum
4905



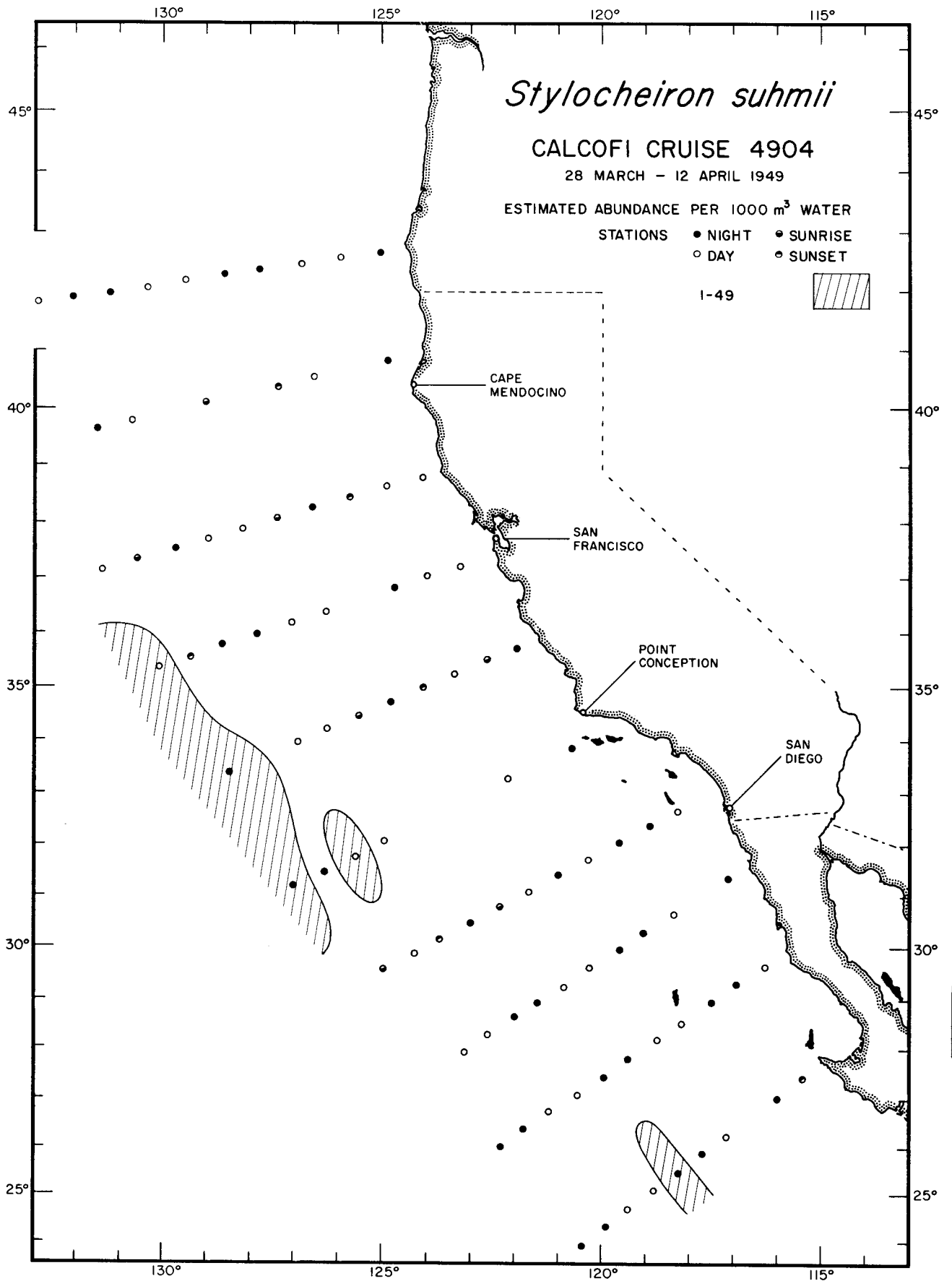
* See Table 1 for Cruises 4906, 7, 8, 9, 11, 5002, 3, 4, 9

Euphausiacea
Stylocheiron maximum
4910

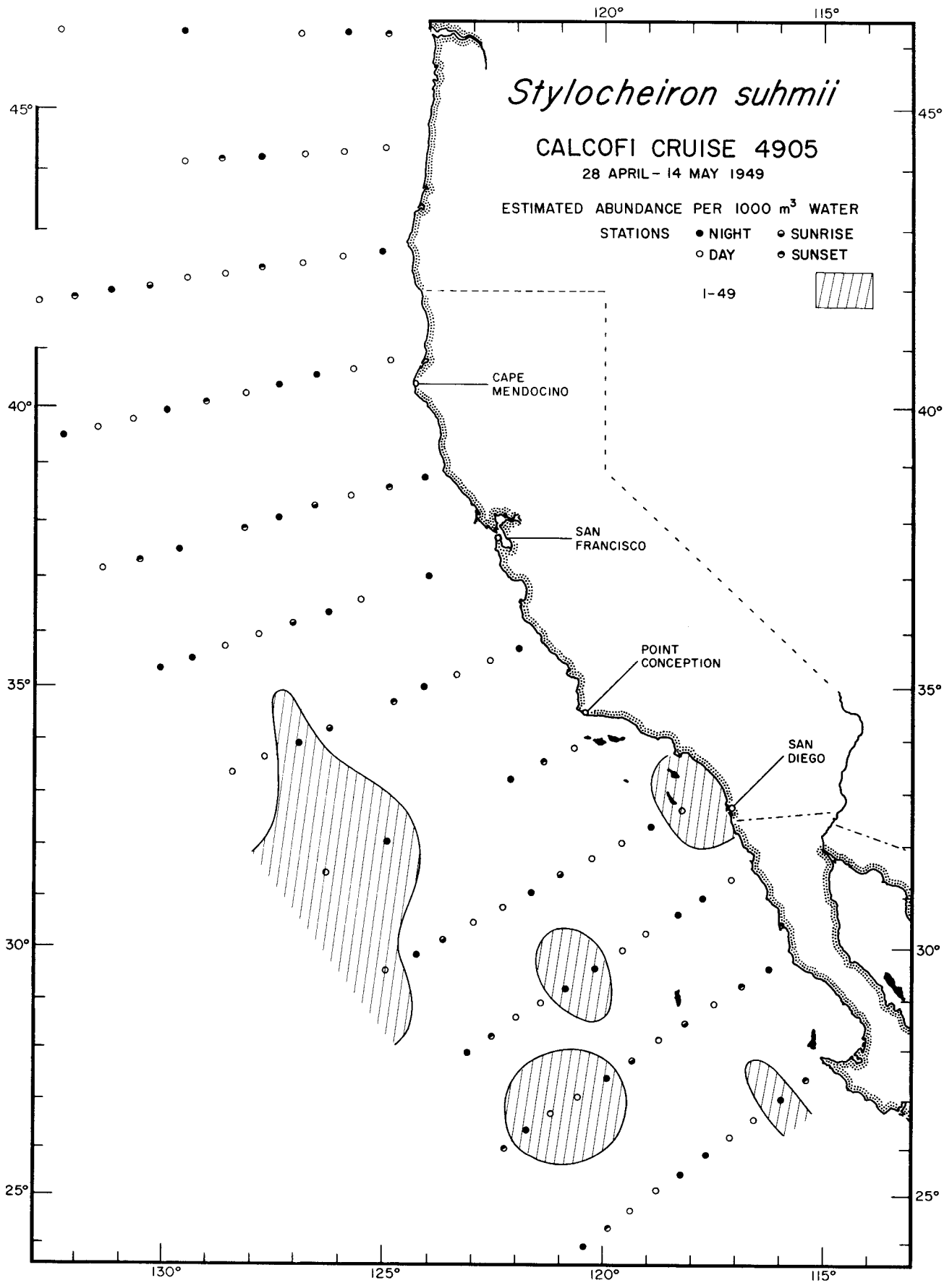


* See Table 1 for Cruise VIII 1939

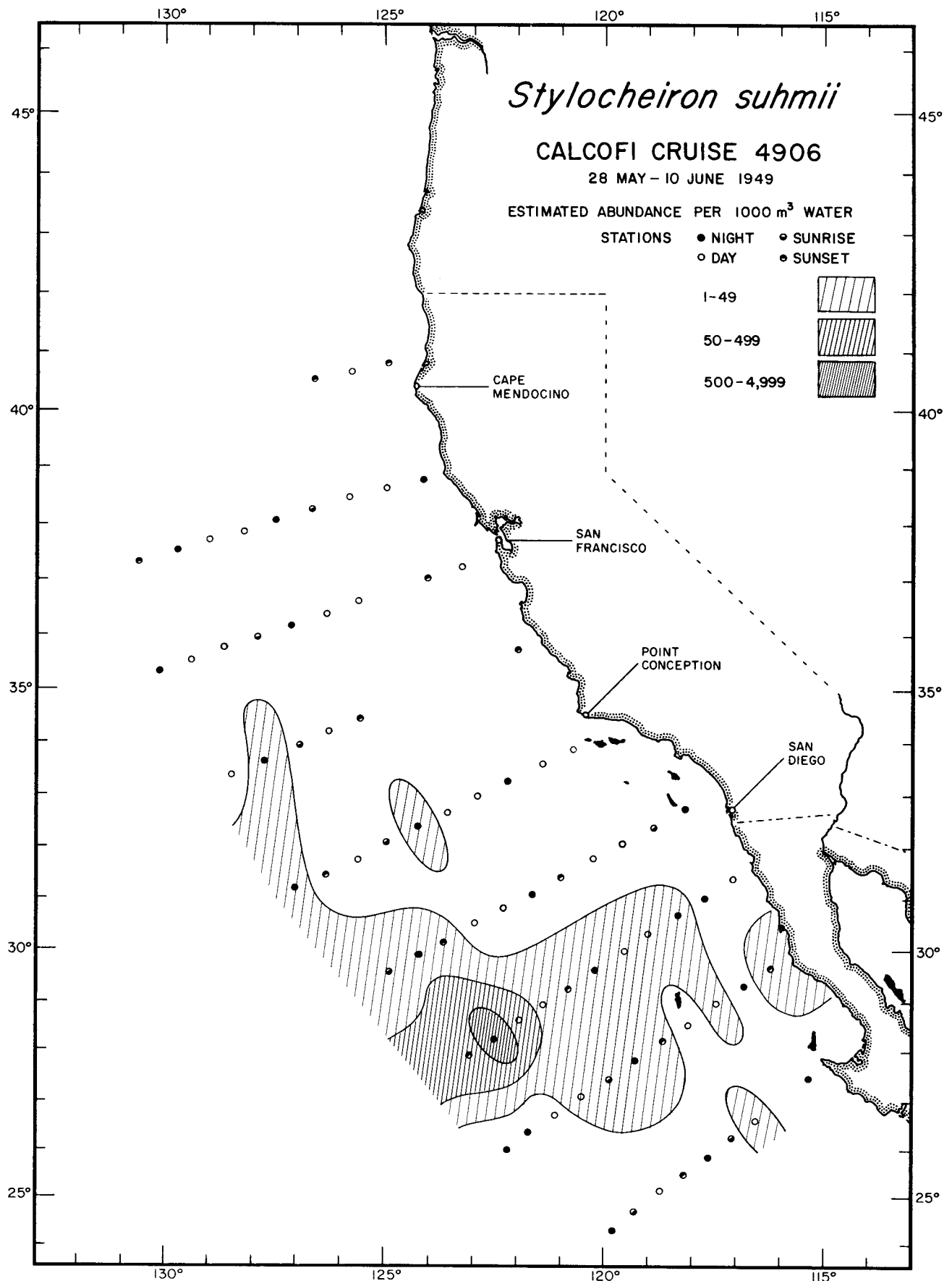
Euphausiacea
Stylocheiron suhmii
4903



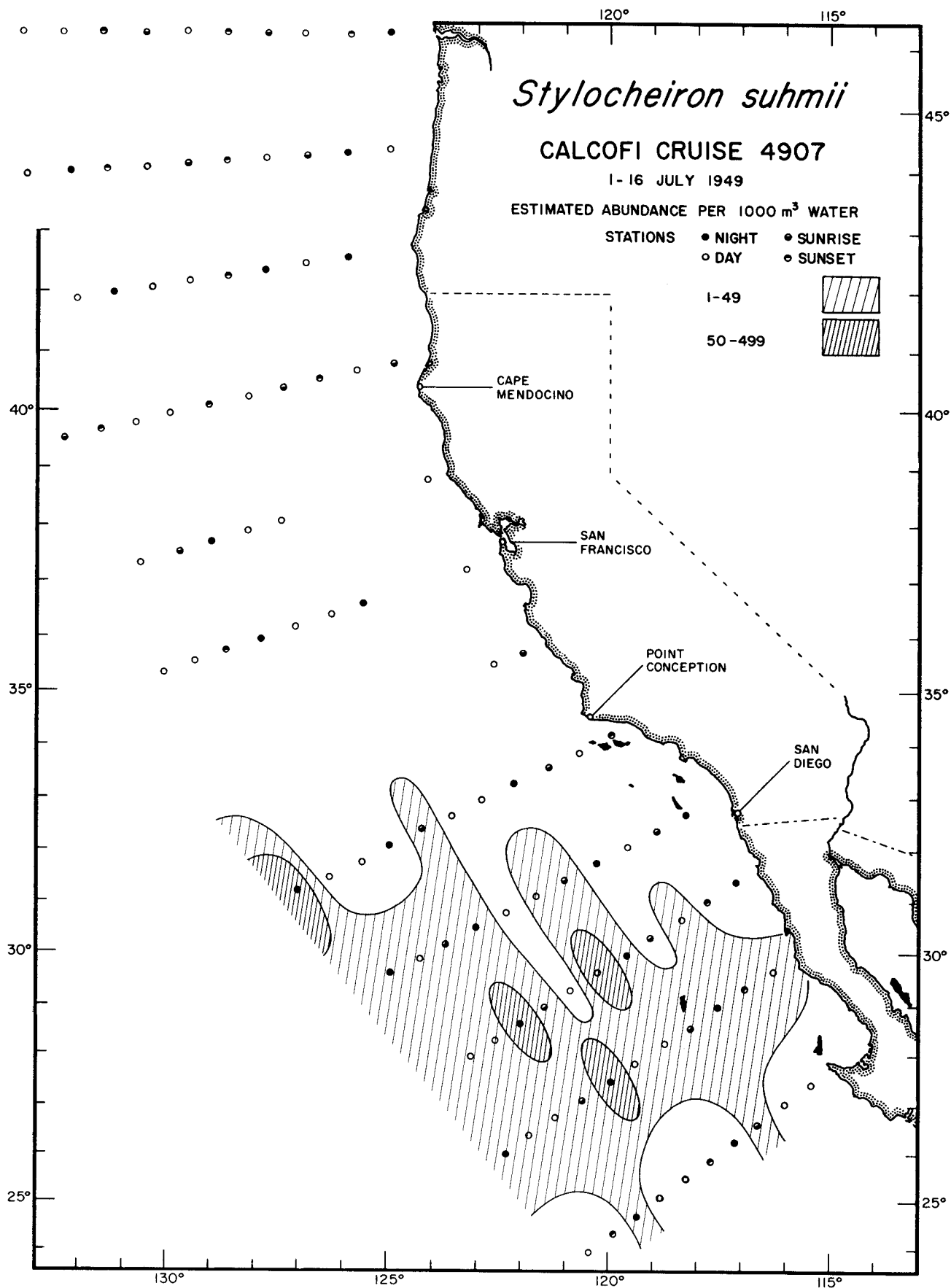
Euphausiacea
Stylocheiron suhmii
4904



Euphausiacea
Stylocheiron suhmii
4905



Euphausiacea
Stylocheiron suhmii
4906



Stylocheiron suhmii

CALCOFI CRUISE 4907

1-16 JULY 1949

ESTIMATED ABUNDANCE PER 1000 m³ WATER

STATIONS ● NIGHT ○ DAY ● SUNRISE ○ SUNSET

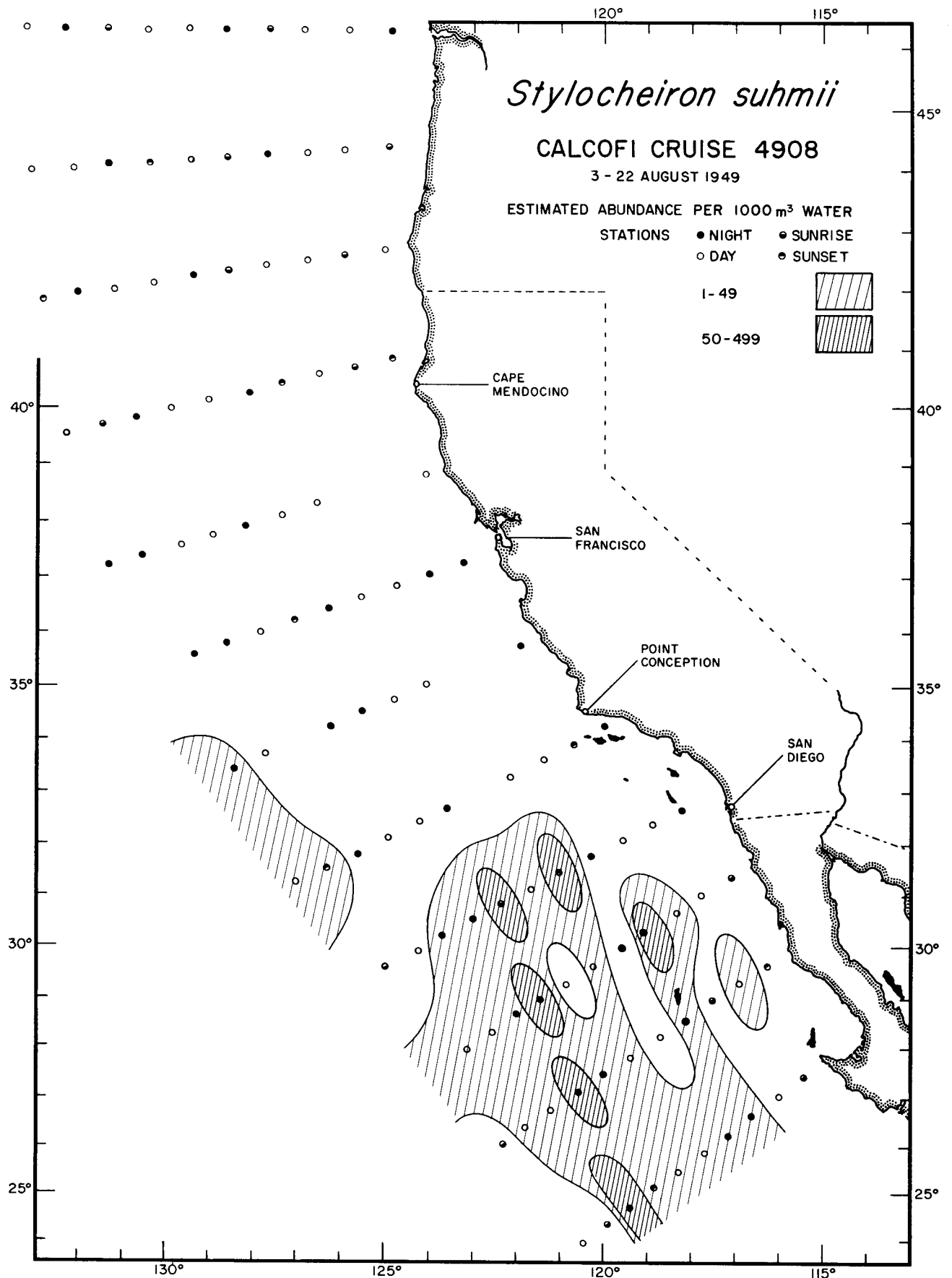
1-49 [diagonal hatching]

50-499 [cross-hatching]

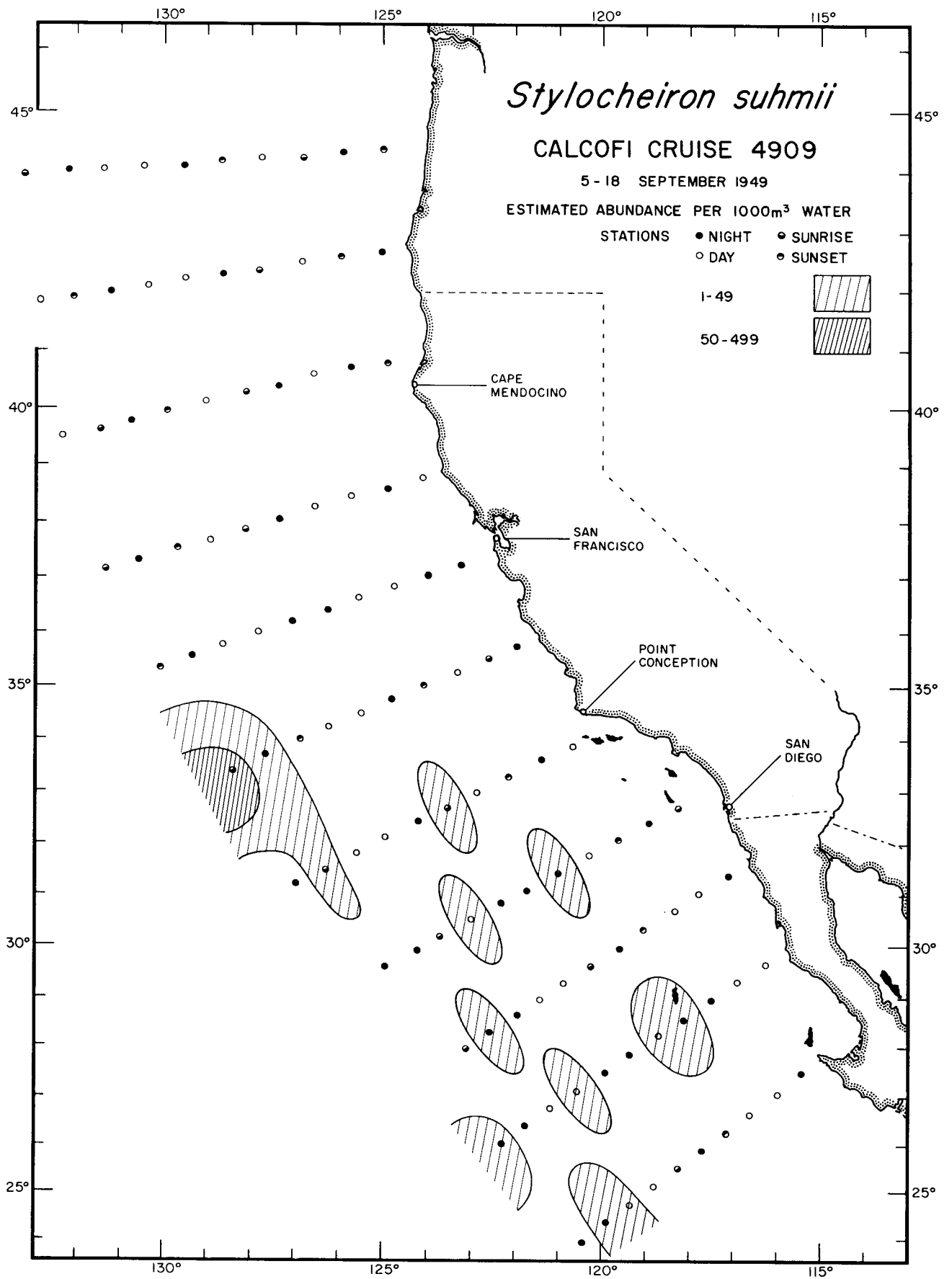
Euphausiacea

Stylocheiron suhmii

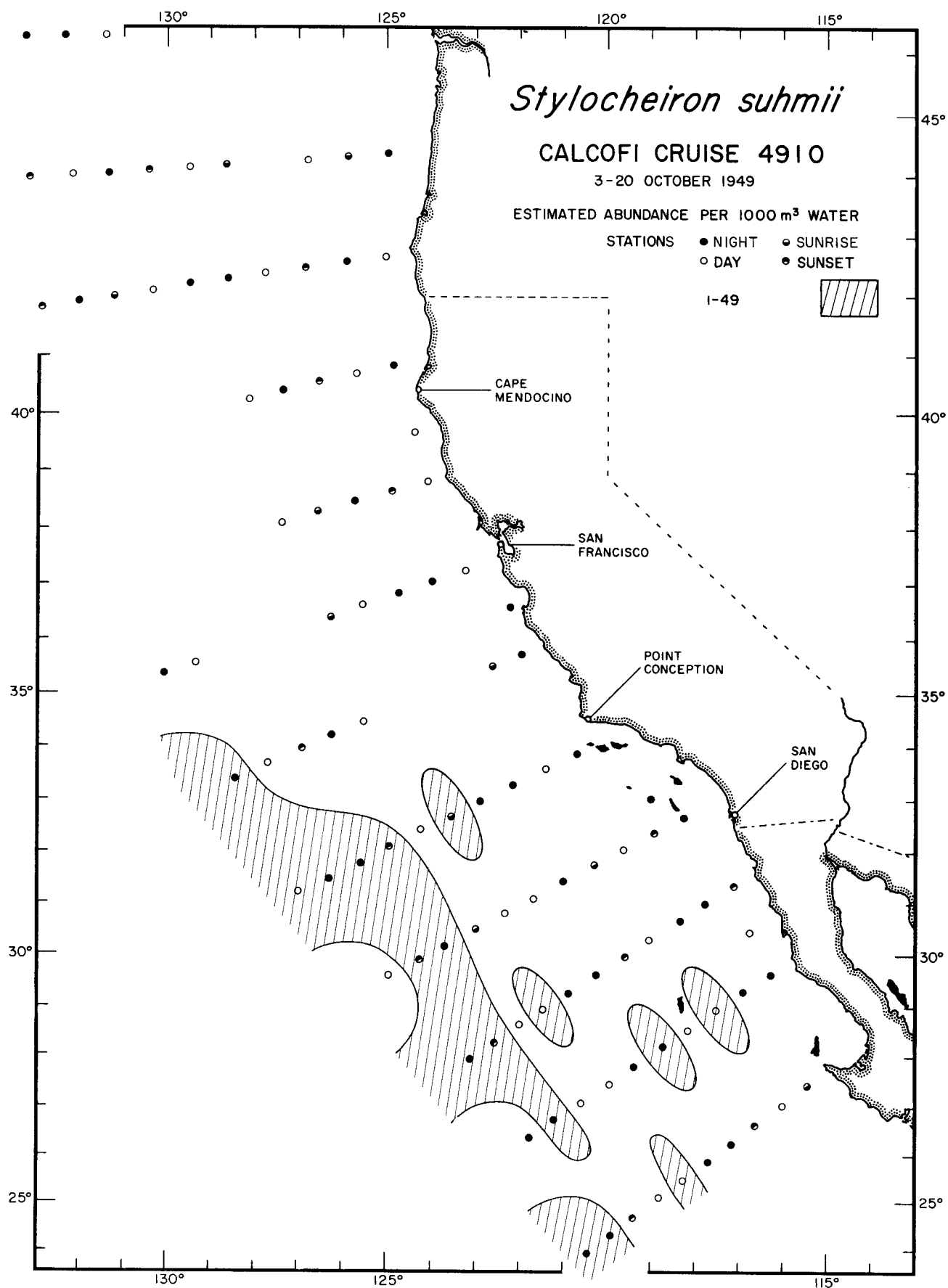
4907



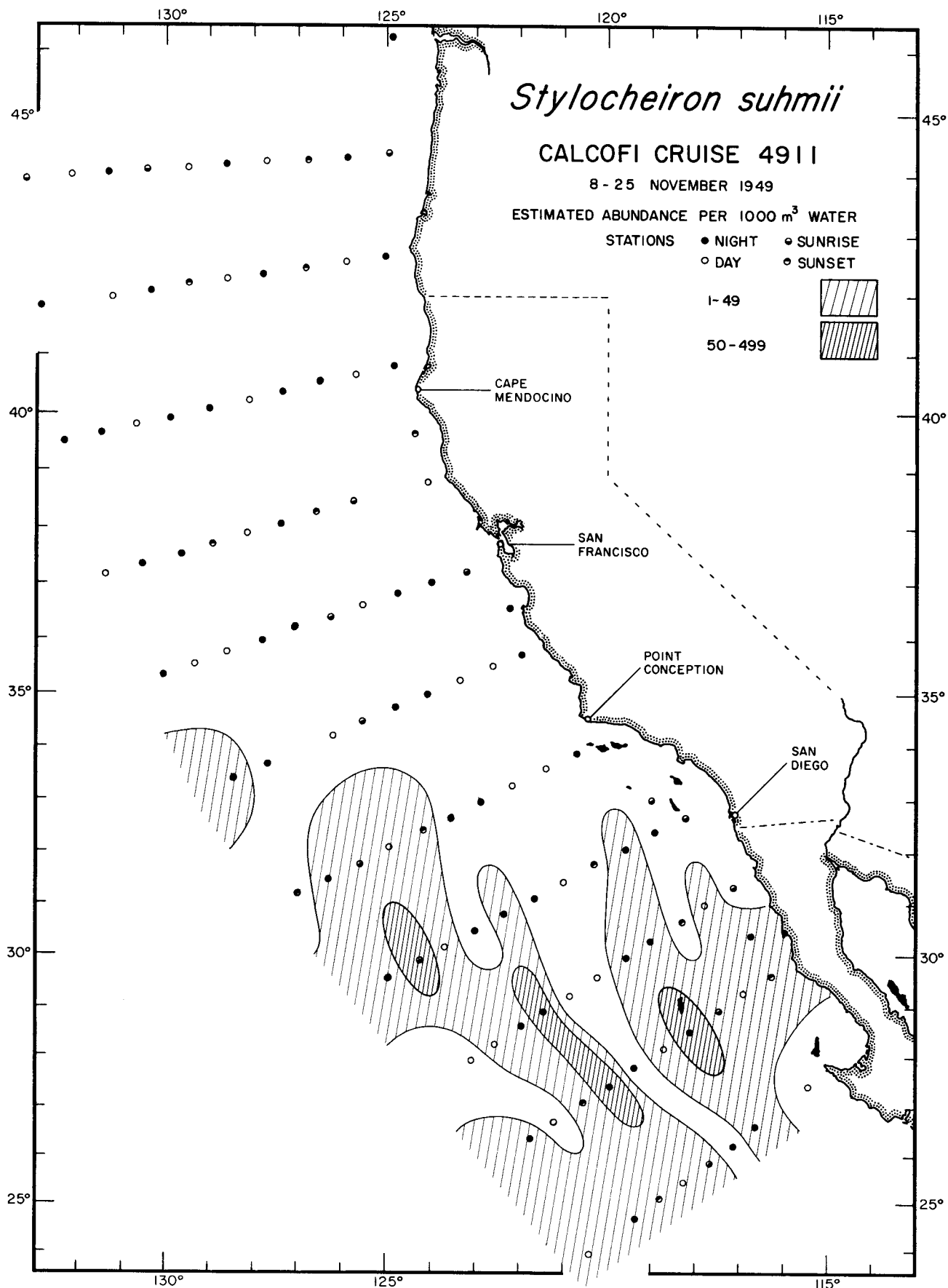
Euphausiacea
Stylocheiron suhmii
4908



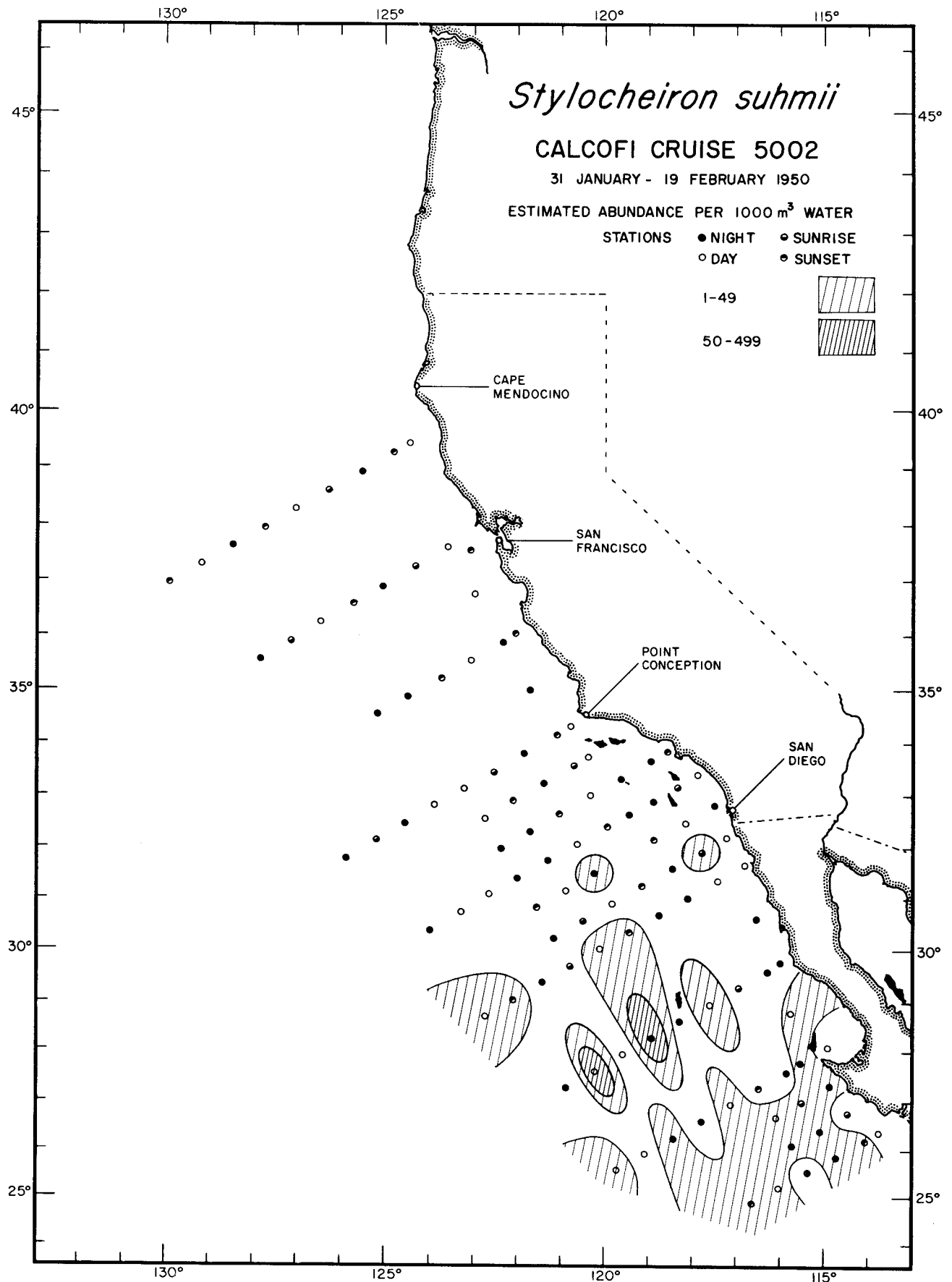
Euphausiacea
Stylocheiron suhmii
4909



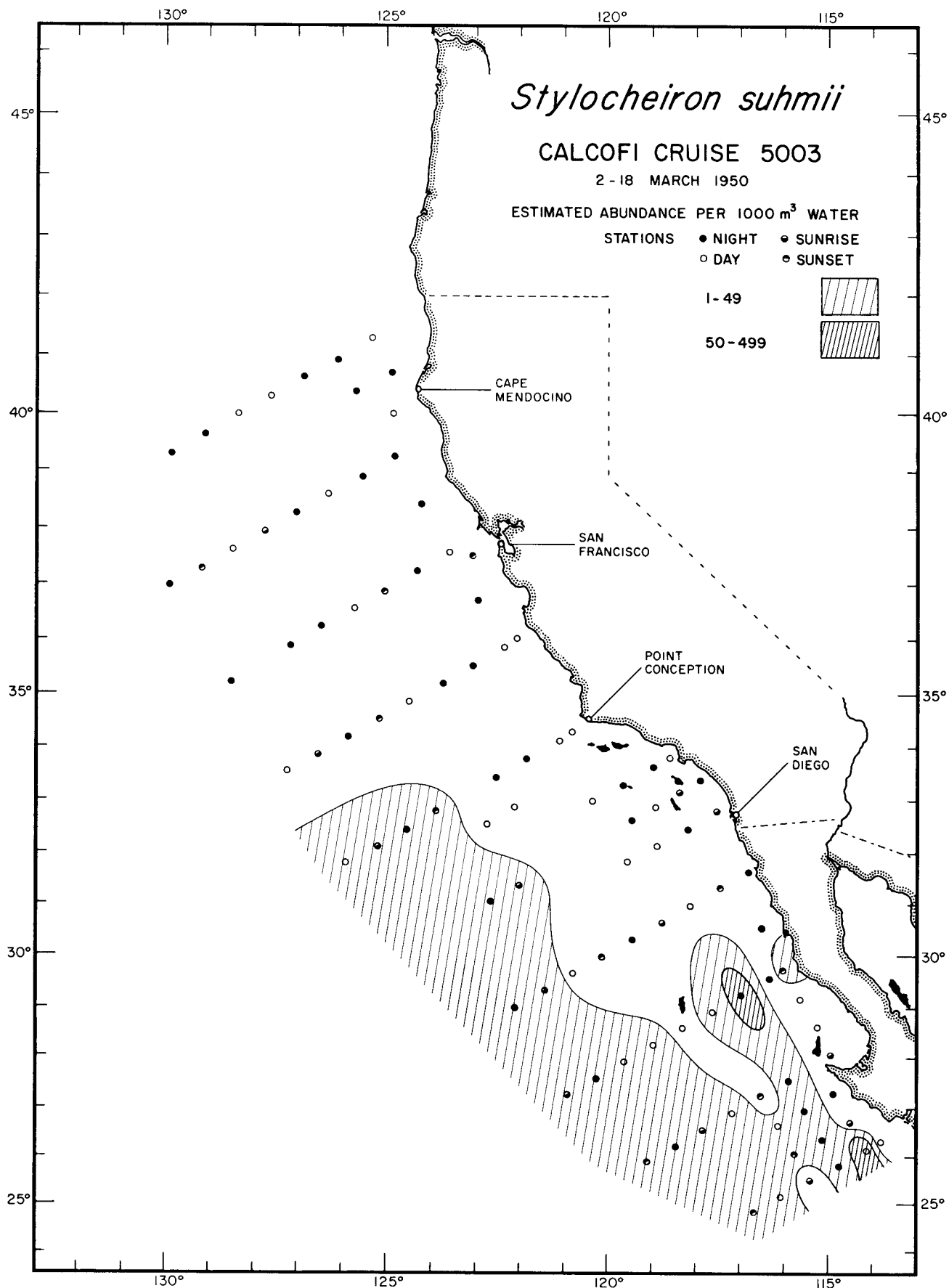
Euphausiacea
Stylocheiron suhmii
4910



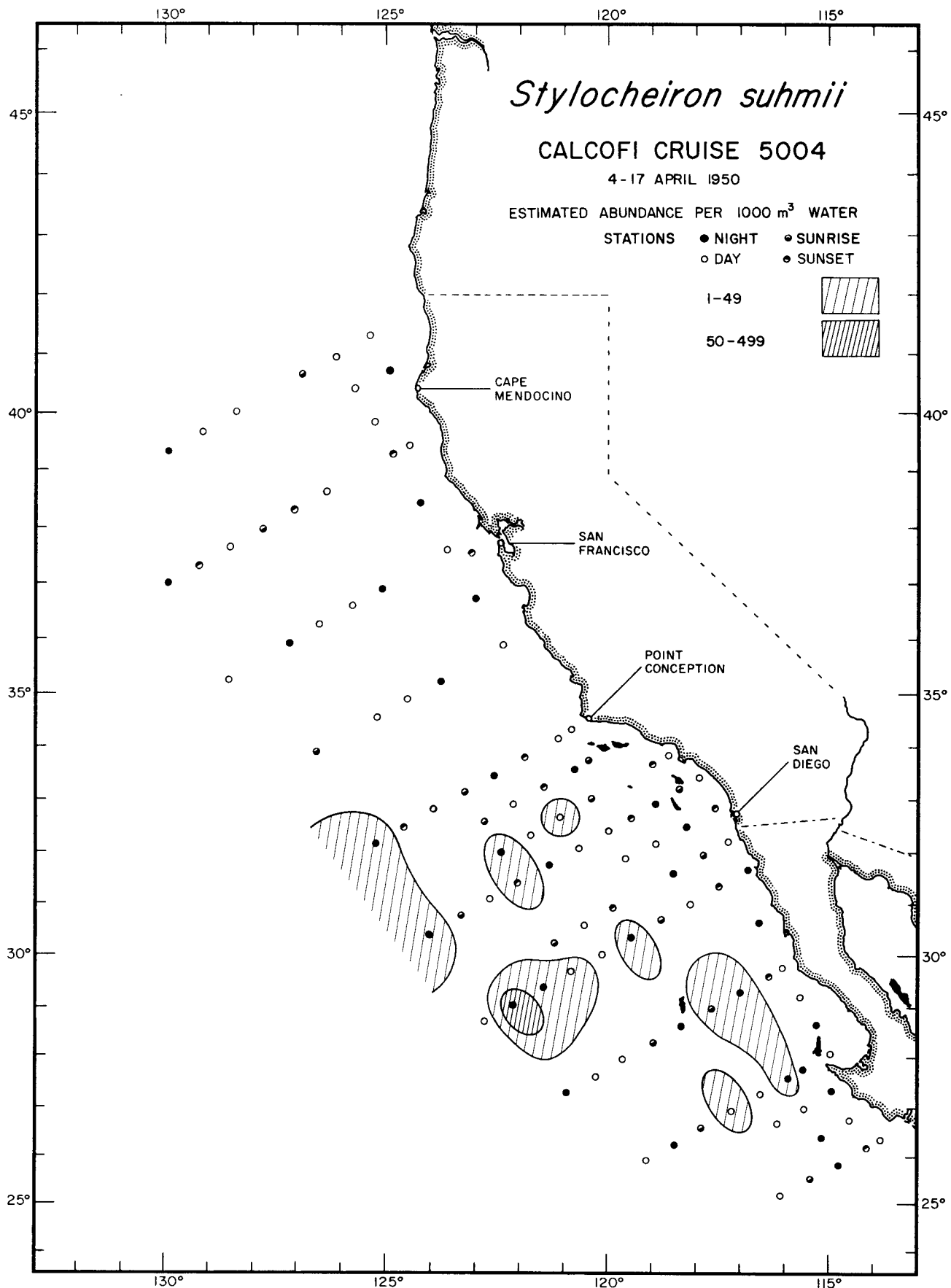
Euphausiacea
Stylocheiron suhmii
4911



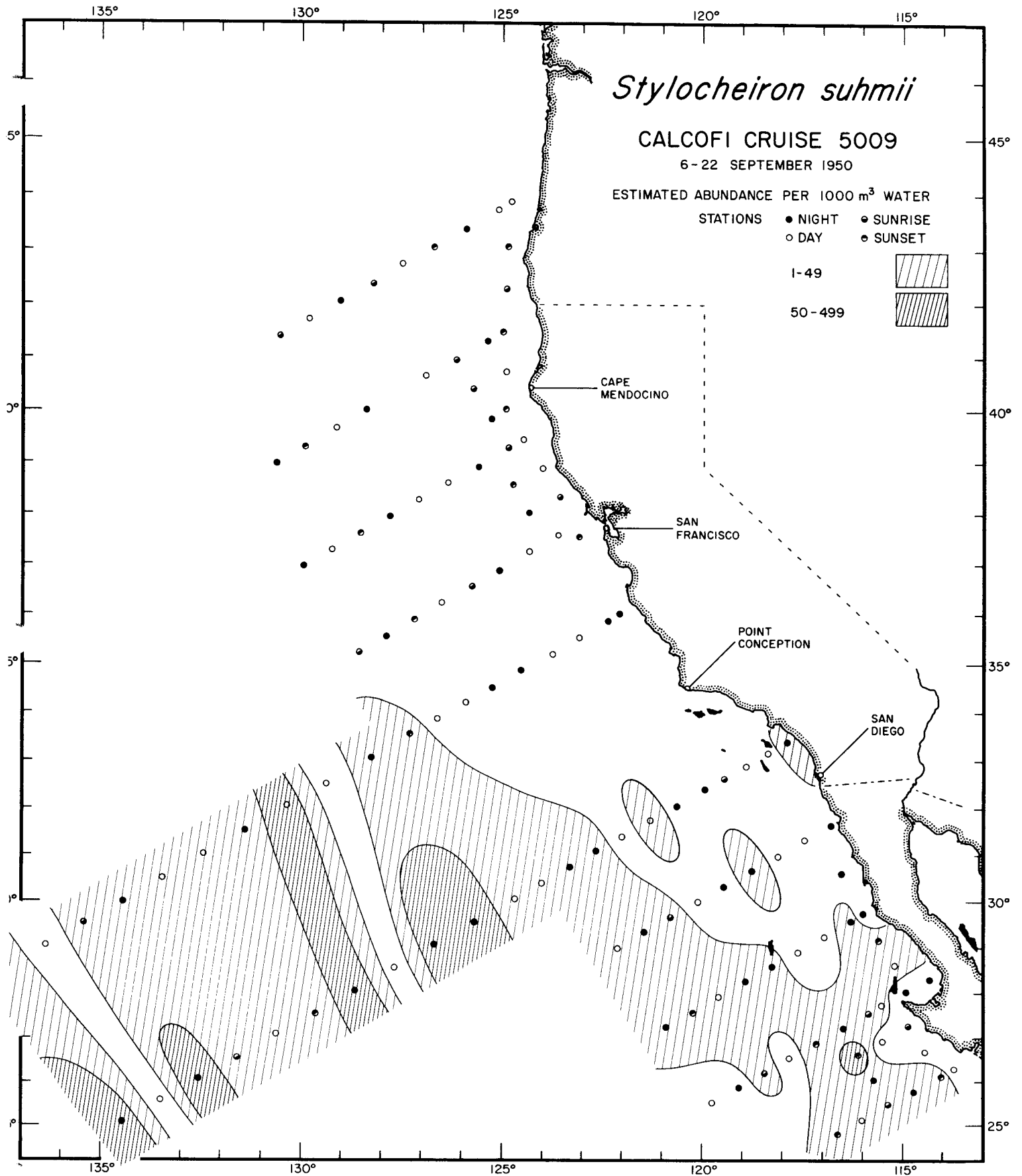
Euphausiacea
Stylocheiron suhmii
5002



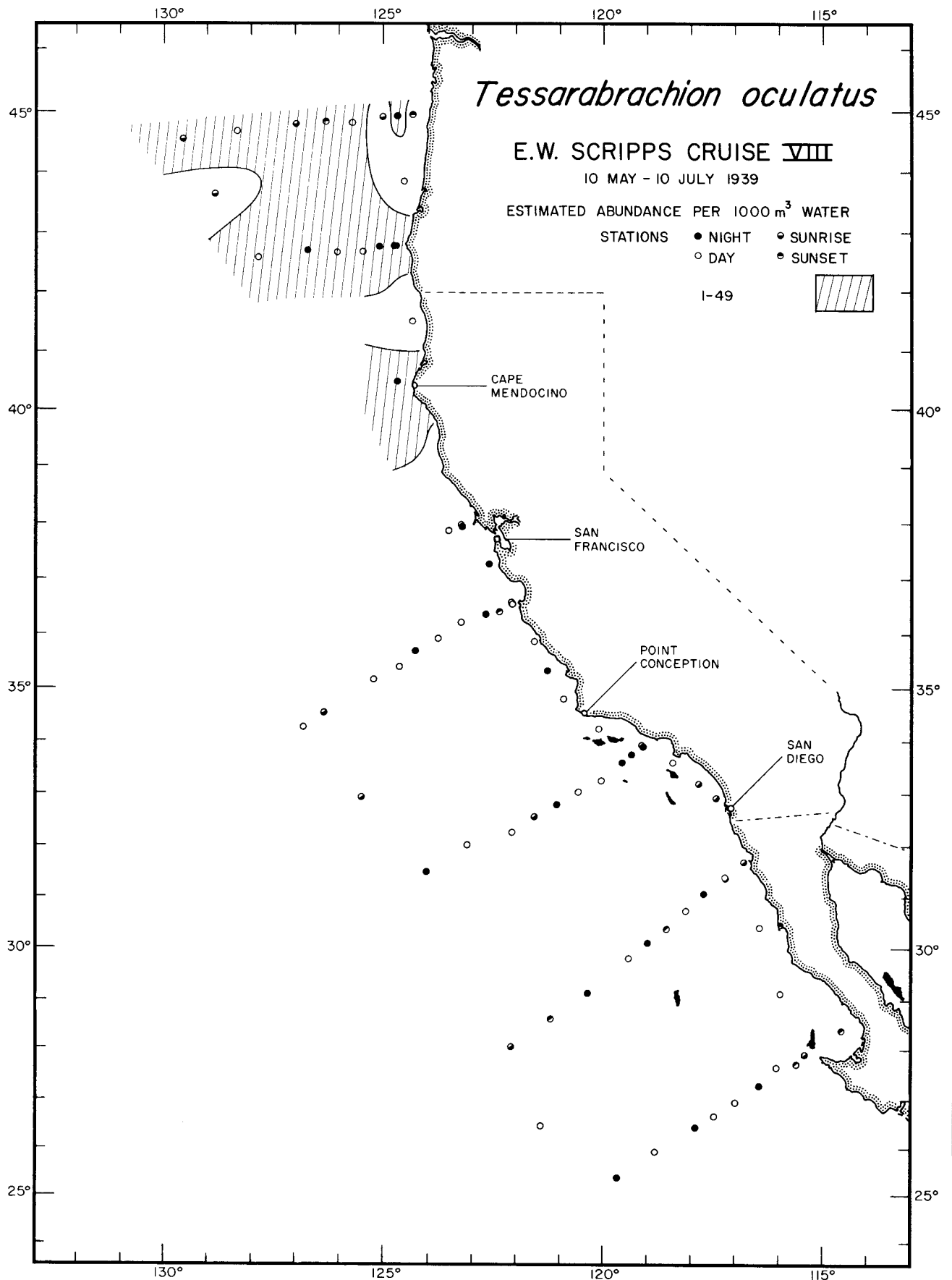
Euphausiacea
Stylocheiron suhmii
5003



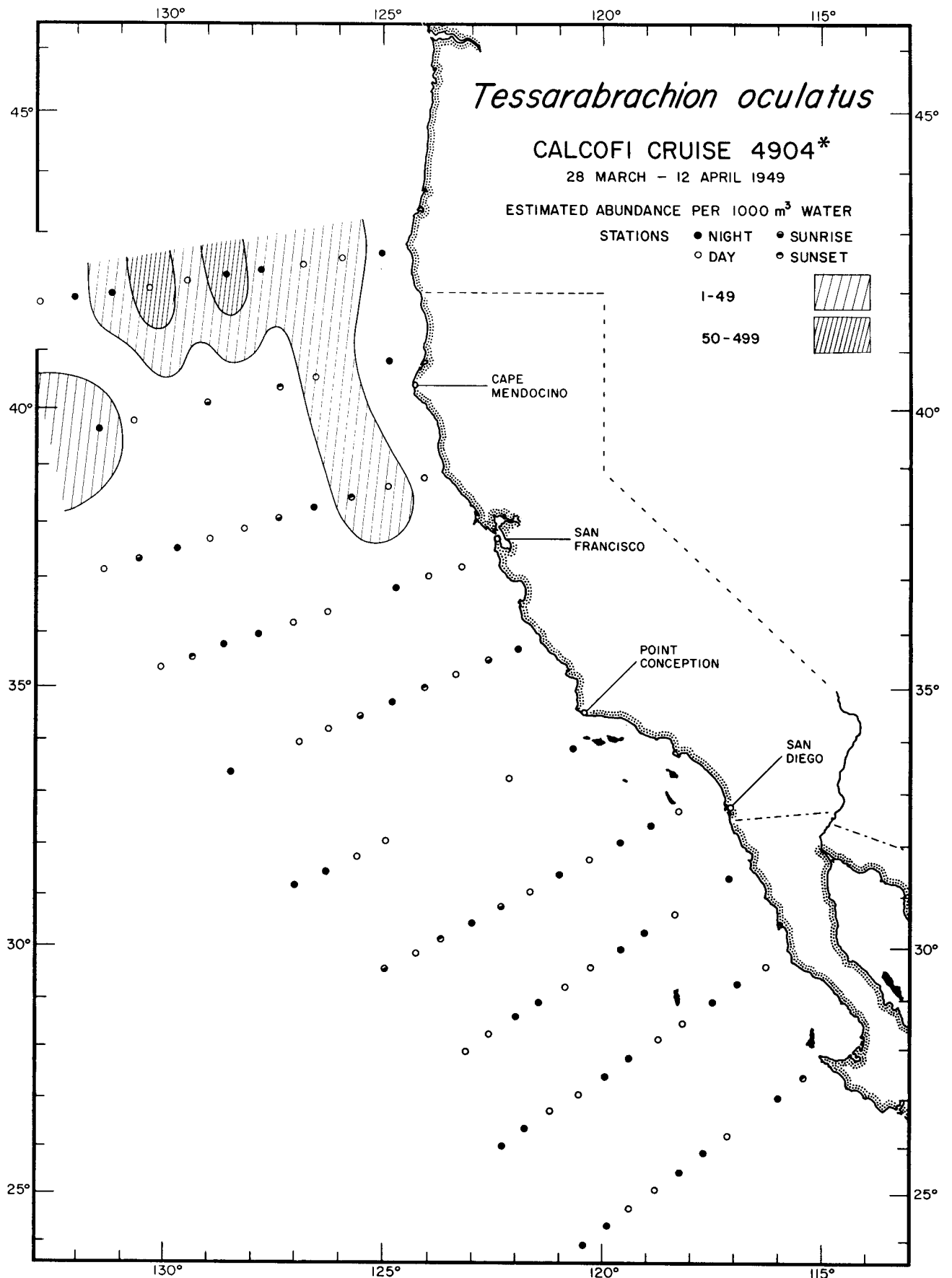
Euphausiacea
Stylocheiron suhmii
5004



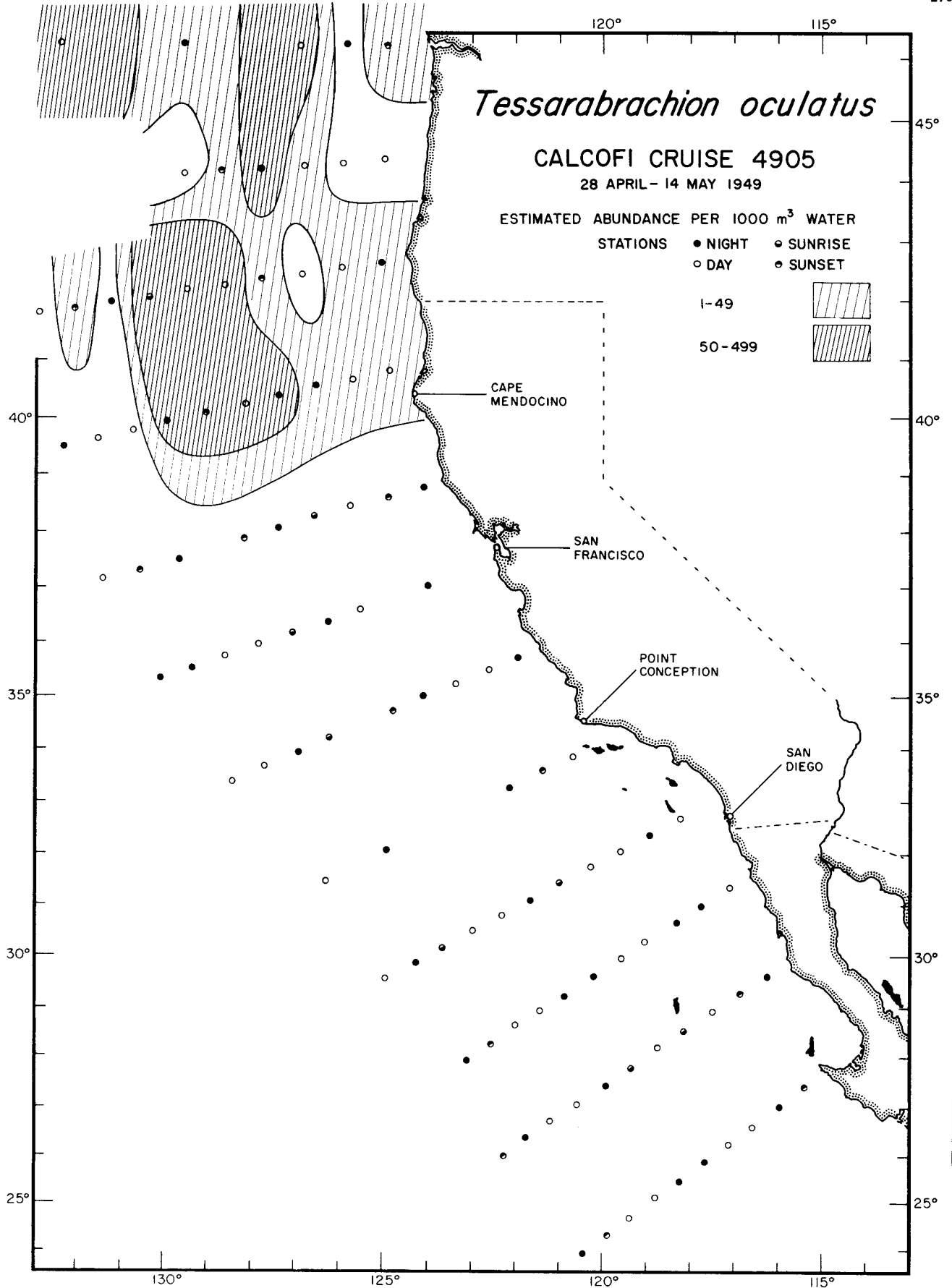
Euphausiacea
Stylocheiron suhmii
5009



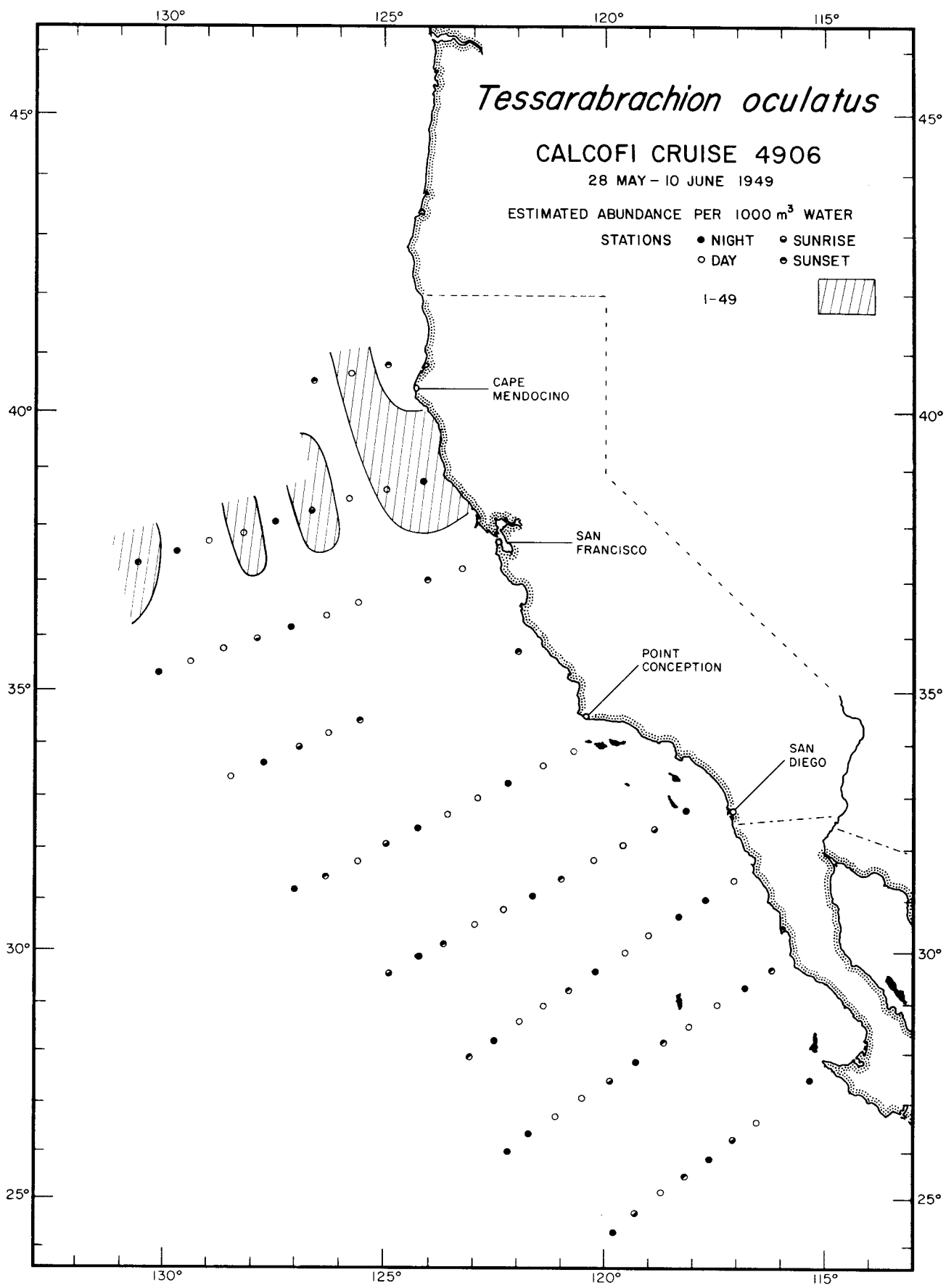
Euphausiacea
Tessarabrachion oculatus
E. W. SCRIPPS CRUISE VIII



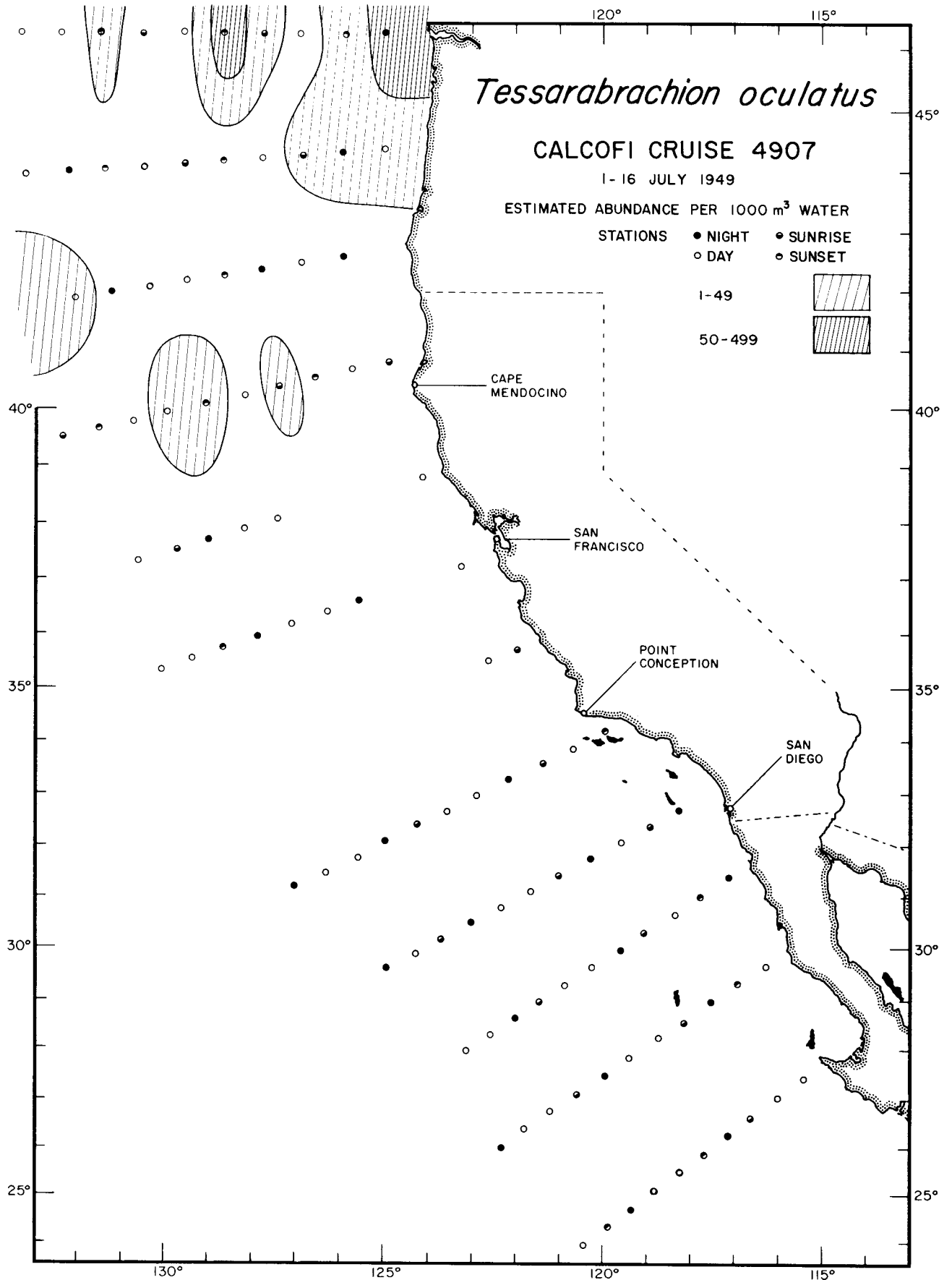
* See Table 1 for Cruise 4903



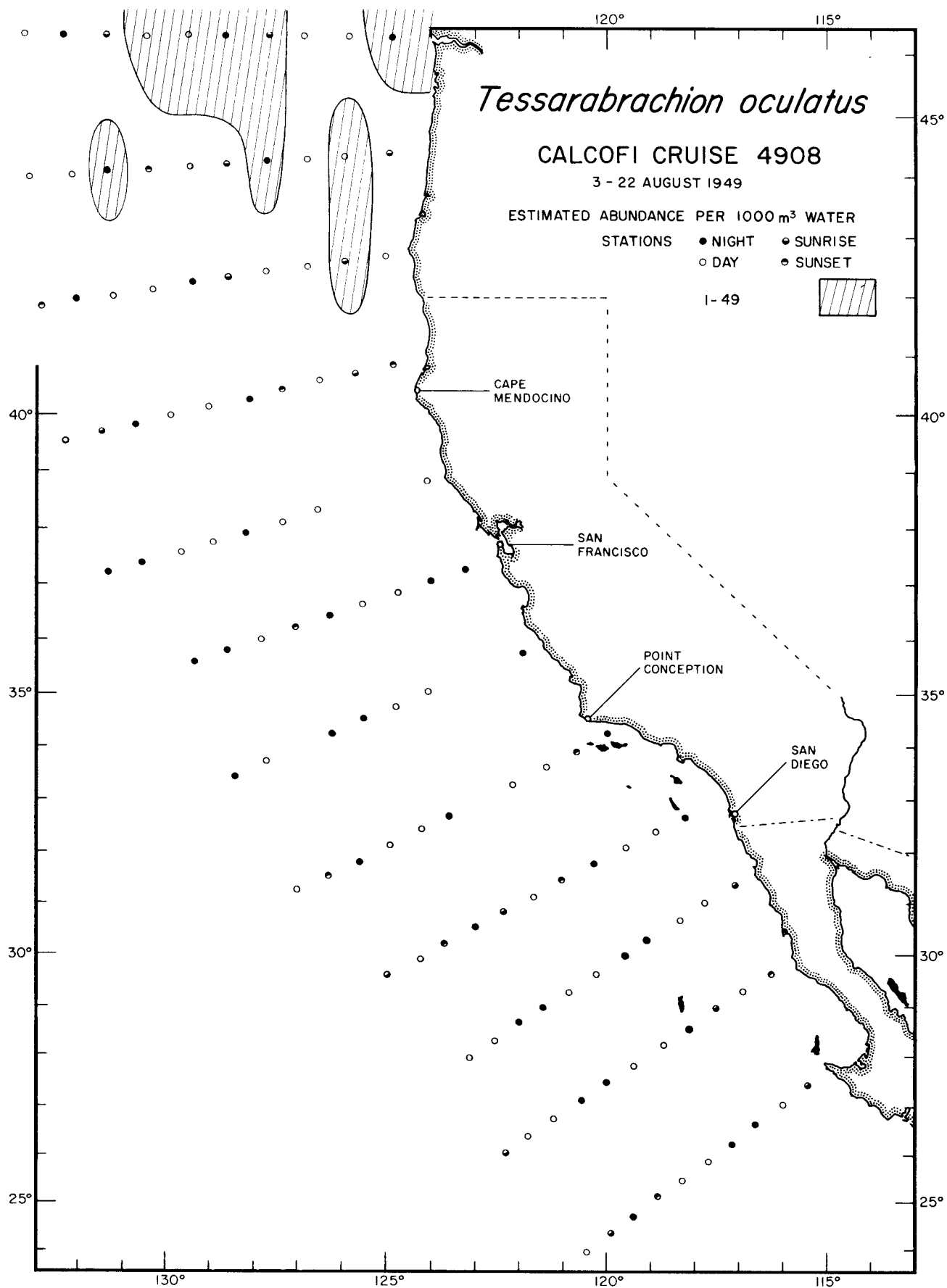
Euphausiacea
Tessarabrachion oculatus
4905



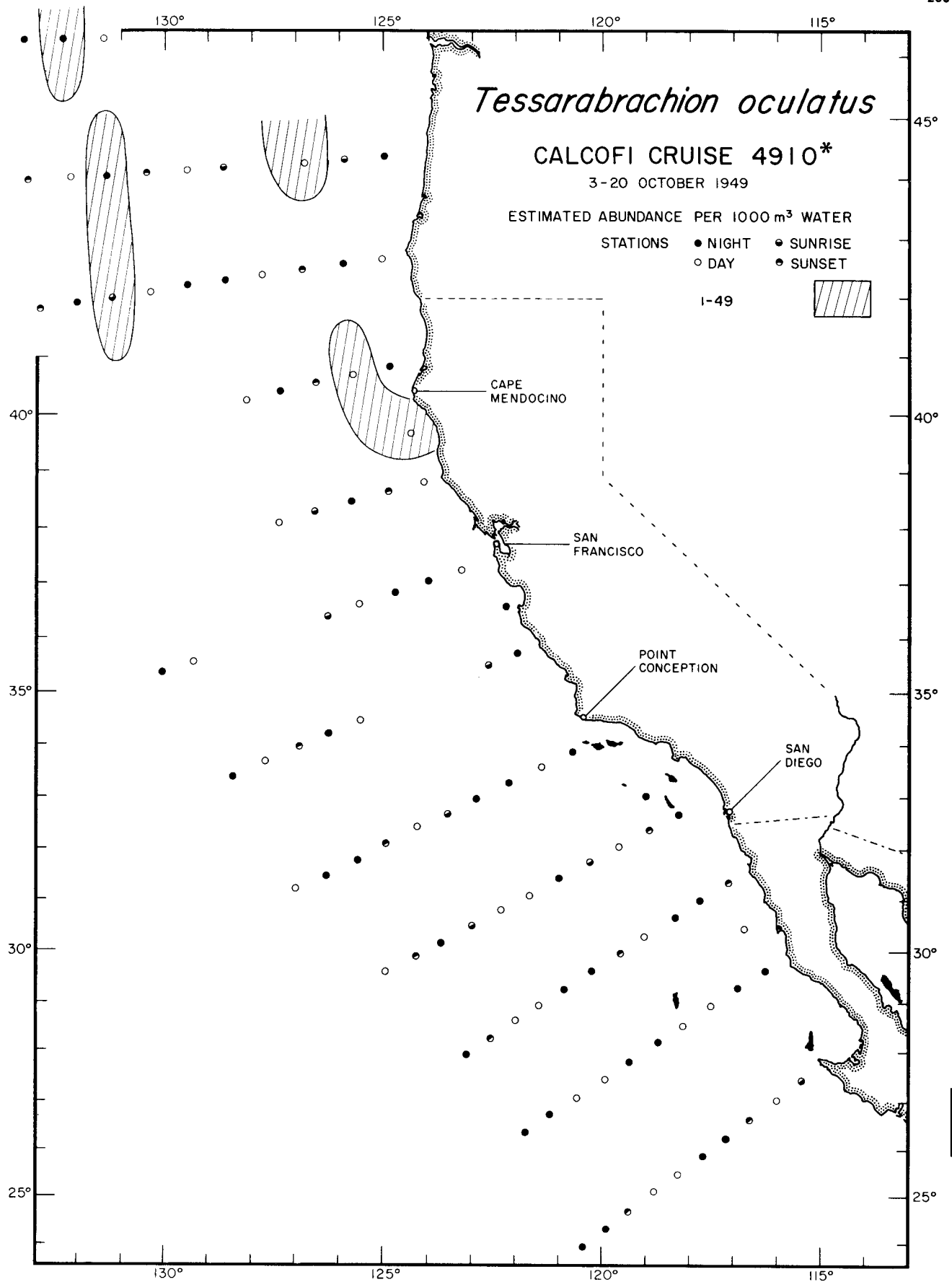
Euphausiacea
Tessarabrachion oculatus
4906



Euphausiacea
Tessarabrachion oculatus
4907

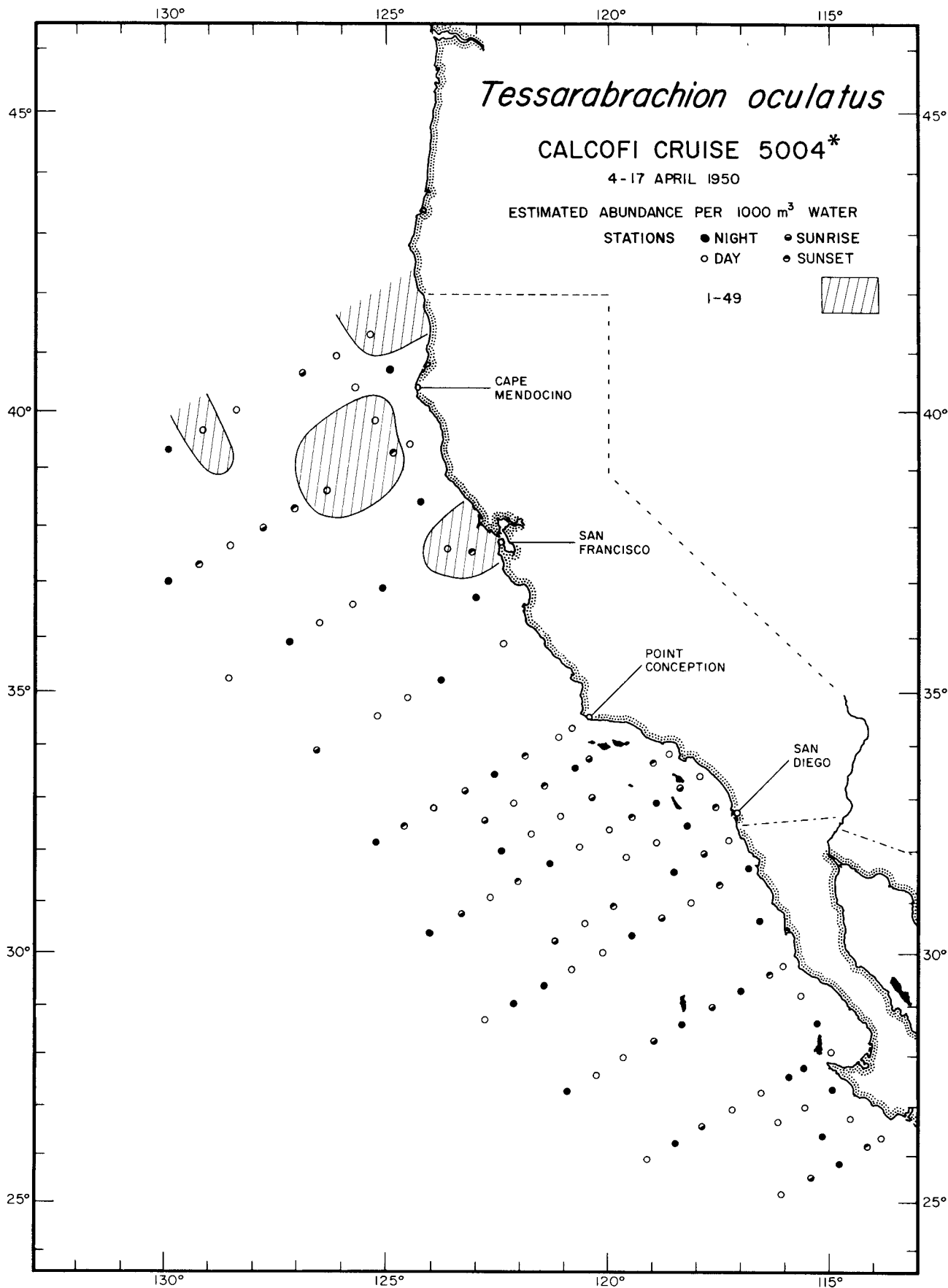


Euphausiacea
Tessarabrachion oculatus
4908



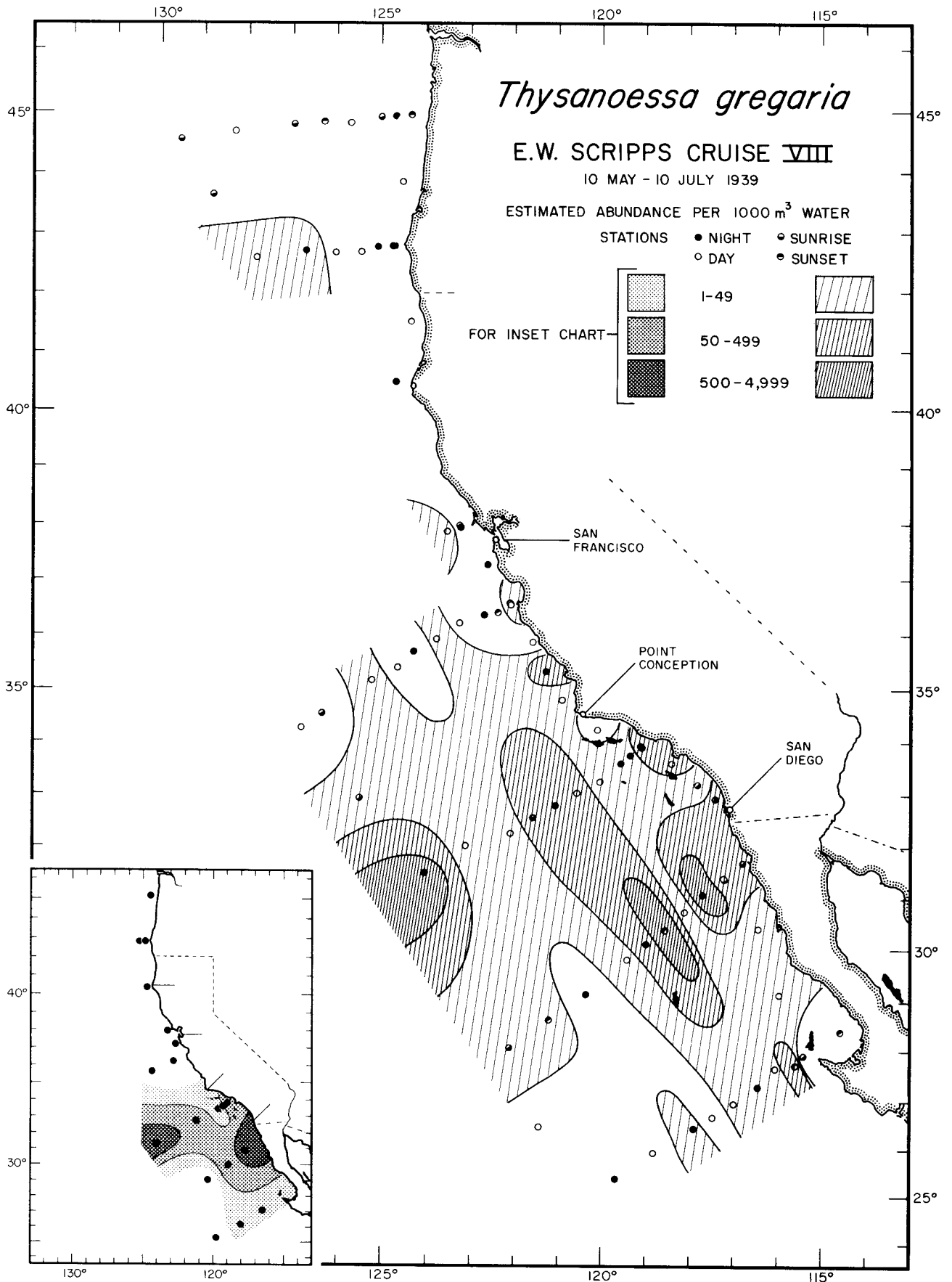
* See Table 1 for Cruise 4909

Euphausiacea
Tessarabrachion oculatus
4910

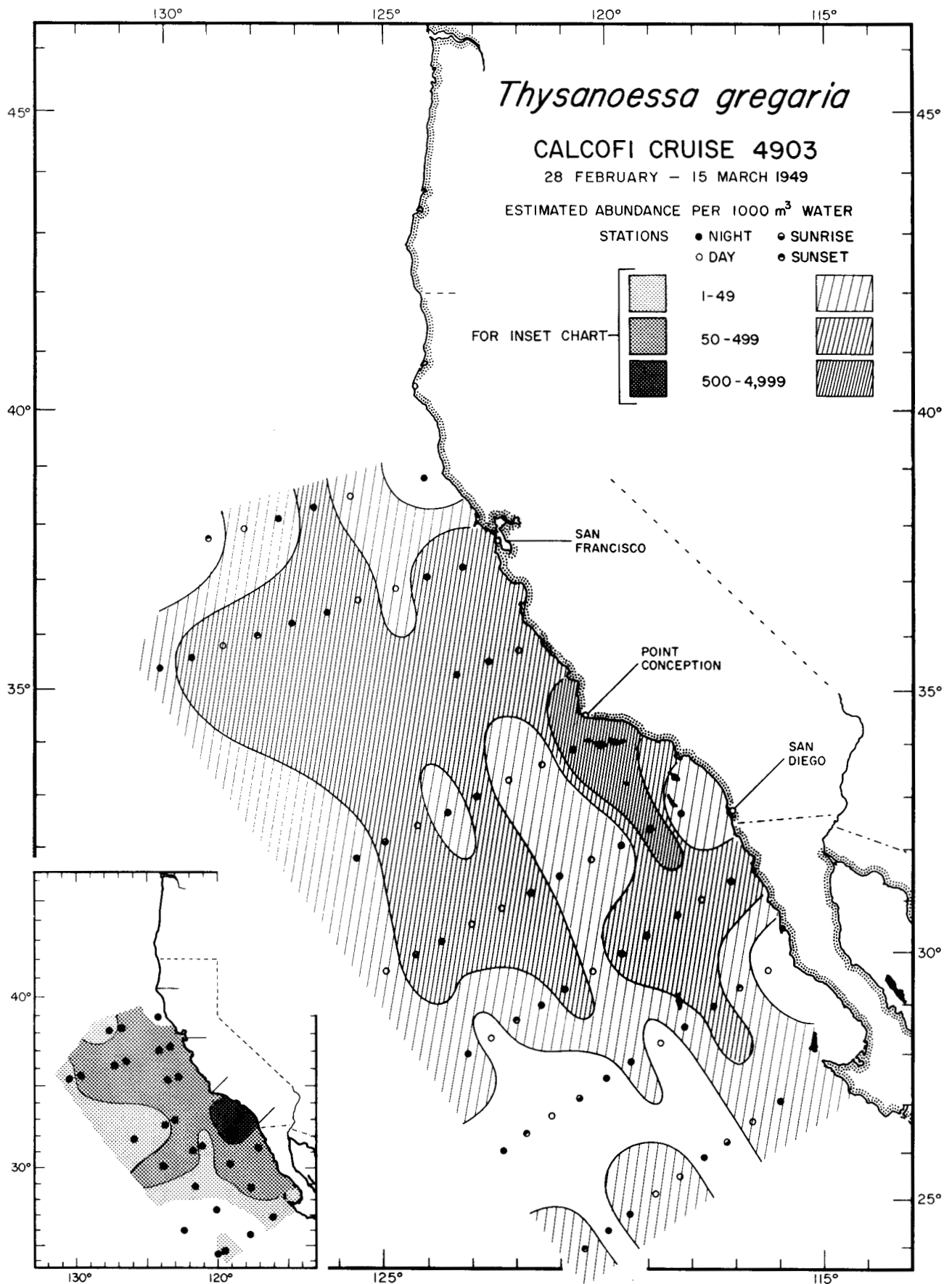


* See Table 1 for Cruises 4911, 5002, 3, 9

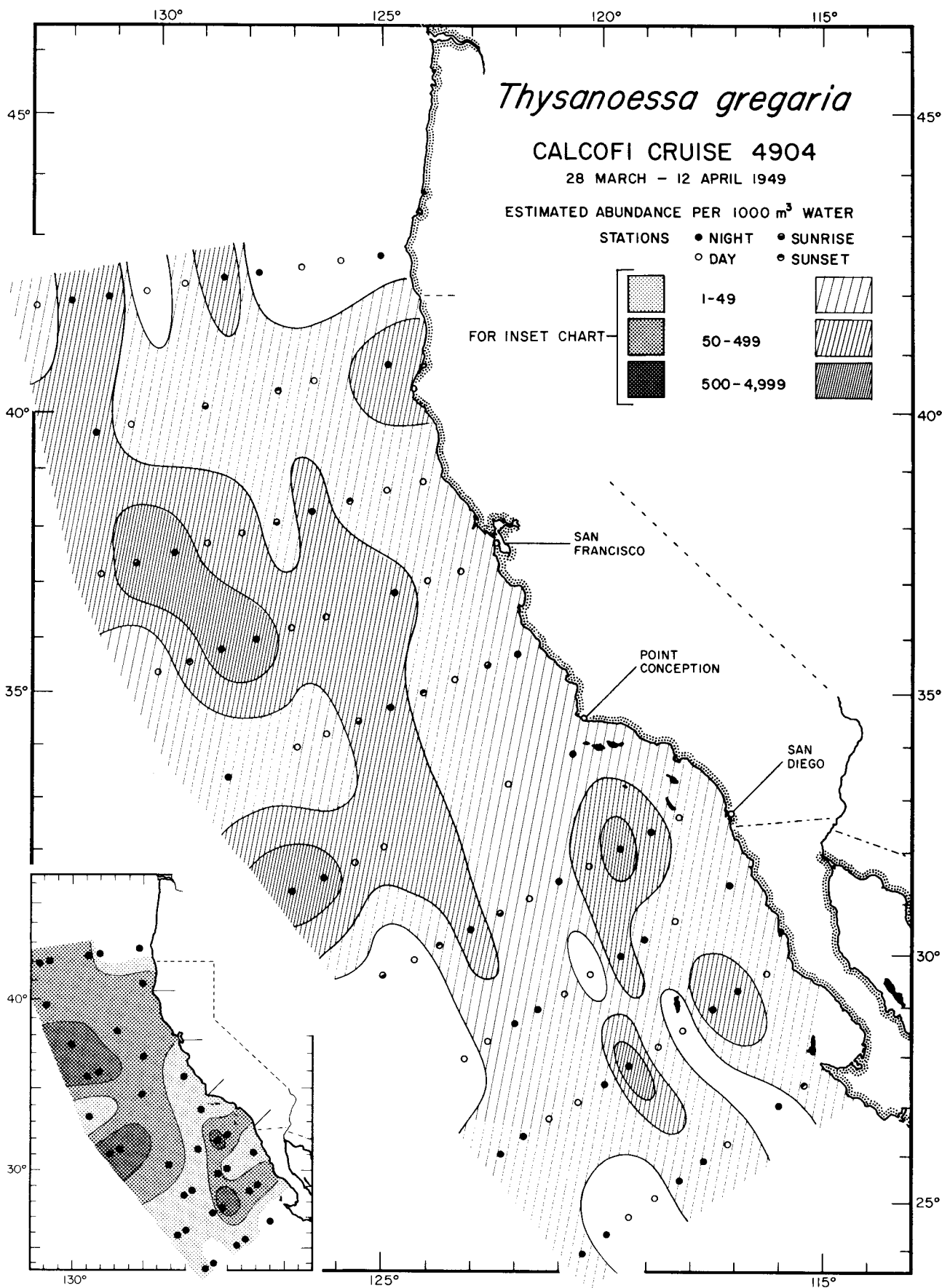
Euphausiacea
Tessarabrachion oculatus
5004



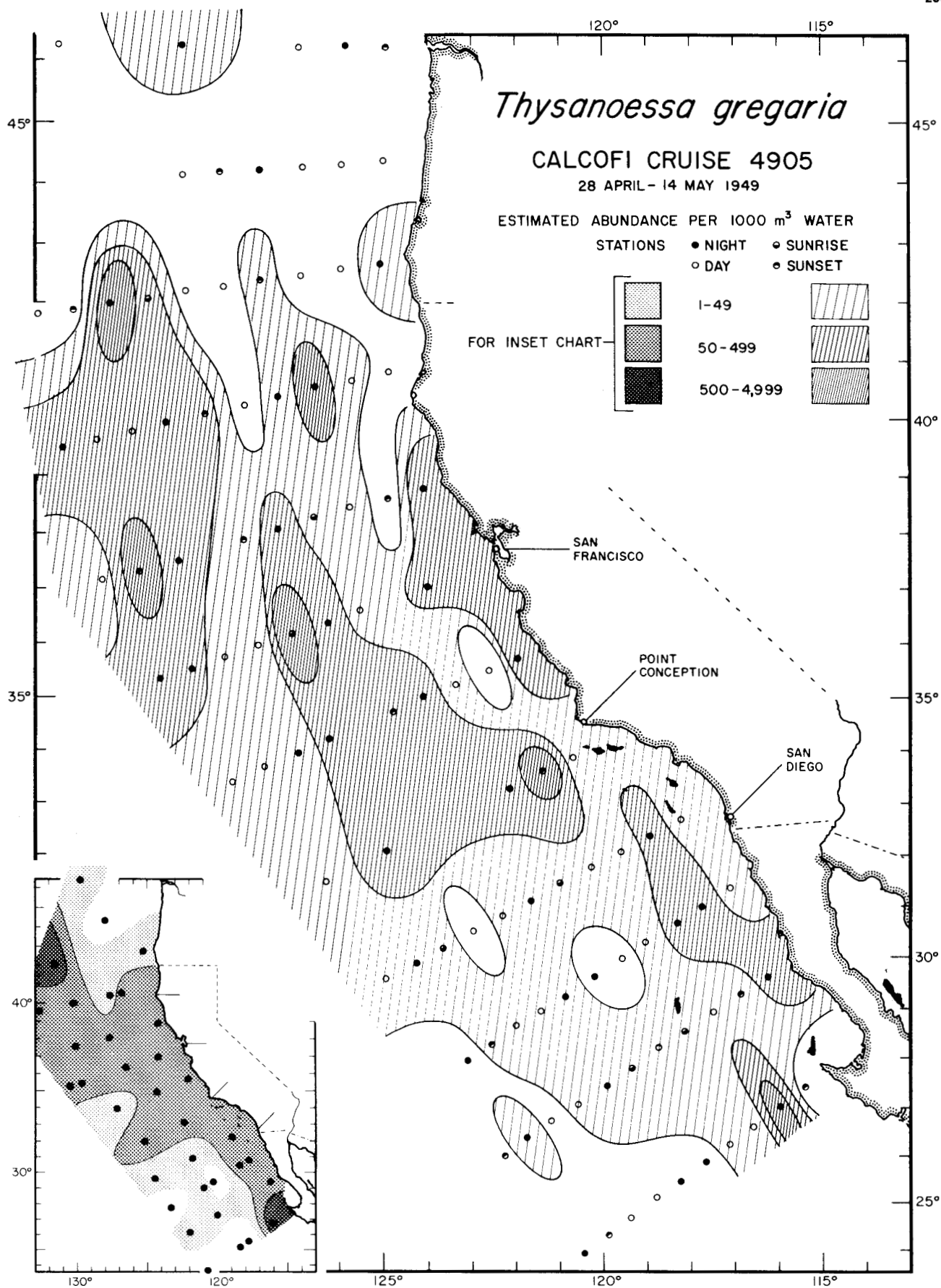
Euphausiacea
Thysanoessa gregaria
E. W. SCRIPPS CRUISE VIII



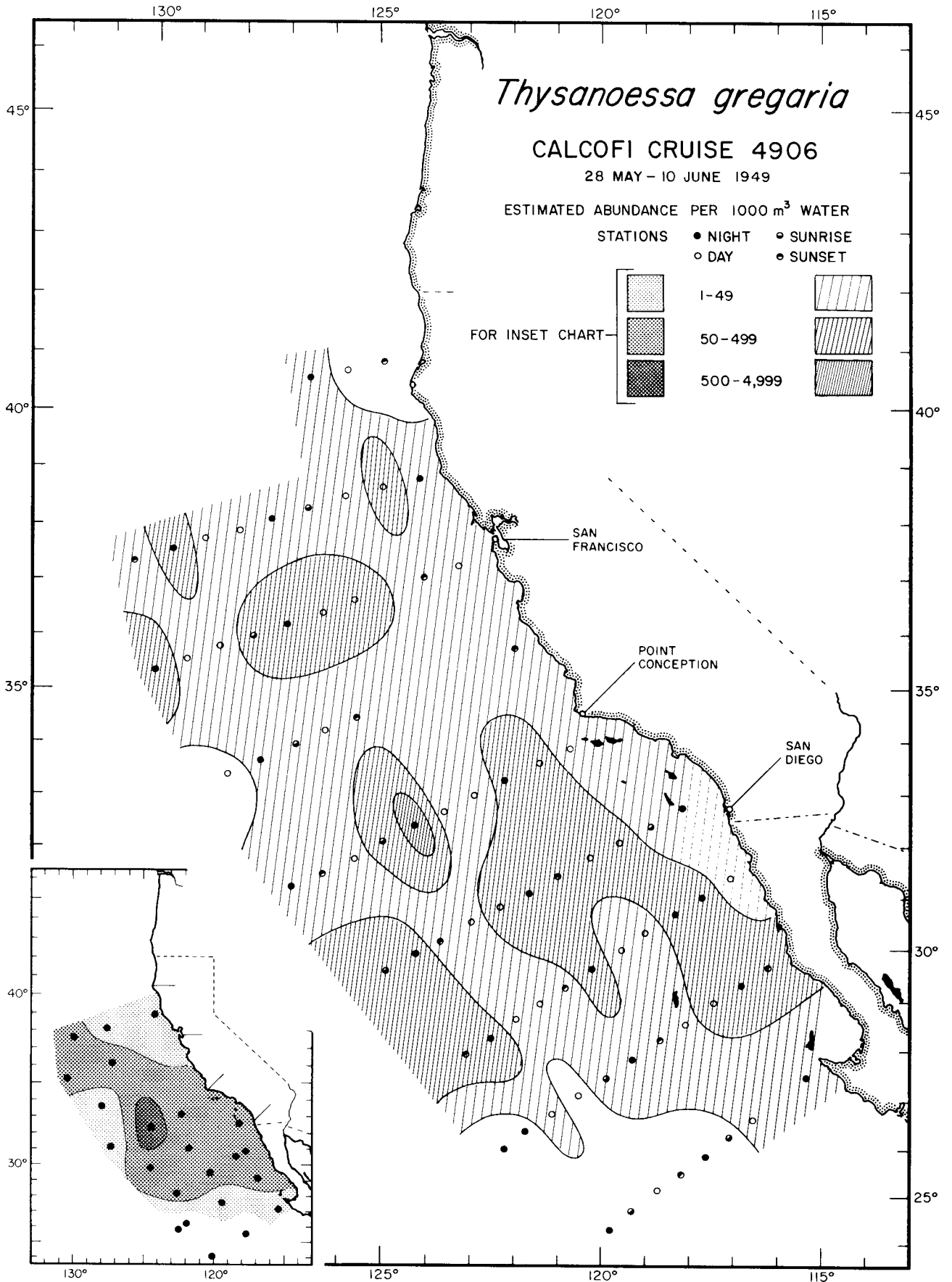
Euphausiacea
Thysanoessa gregaria
4903



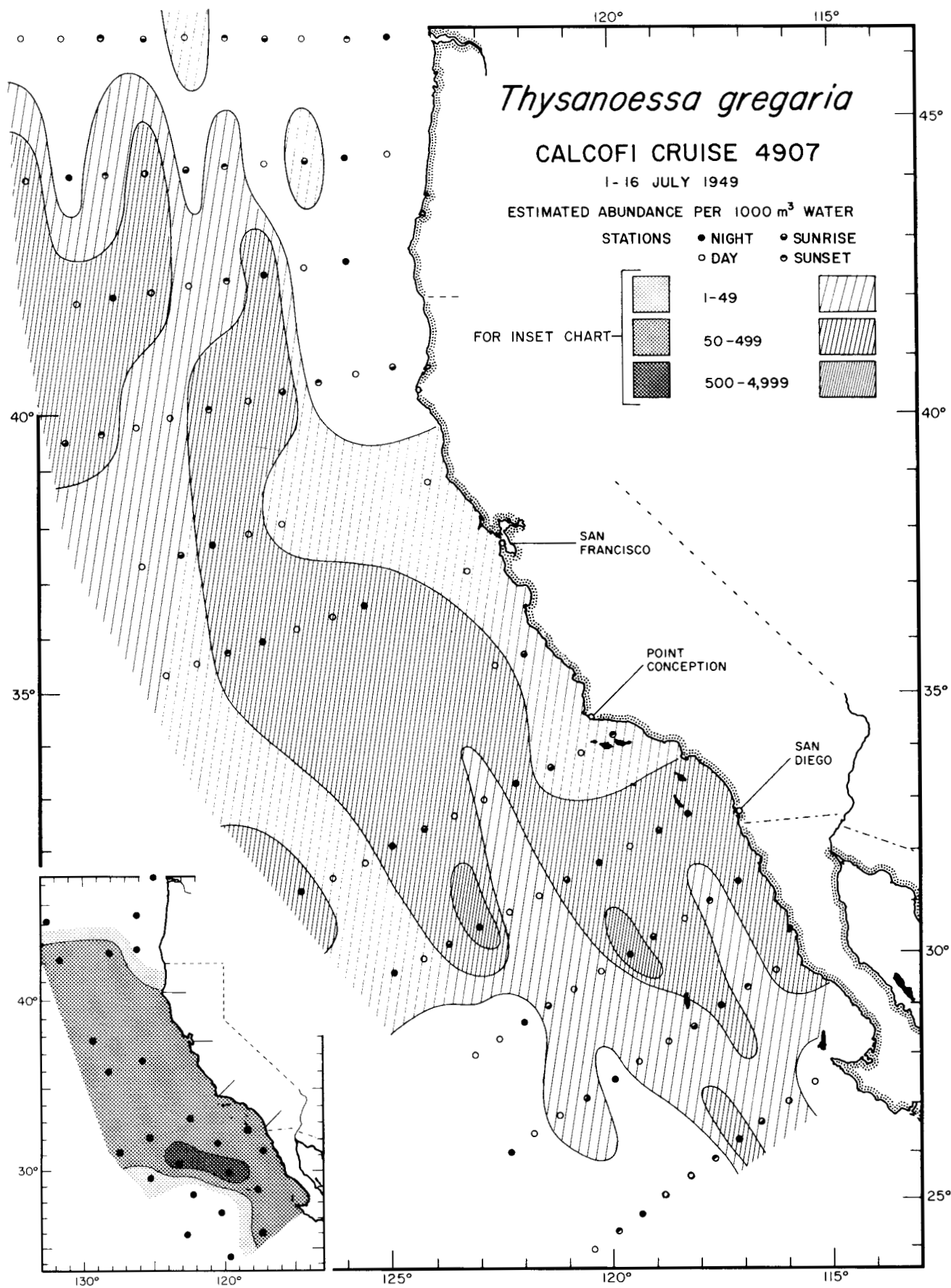
Euphausiacea
Thysanoessa gregaria
4904



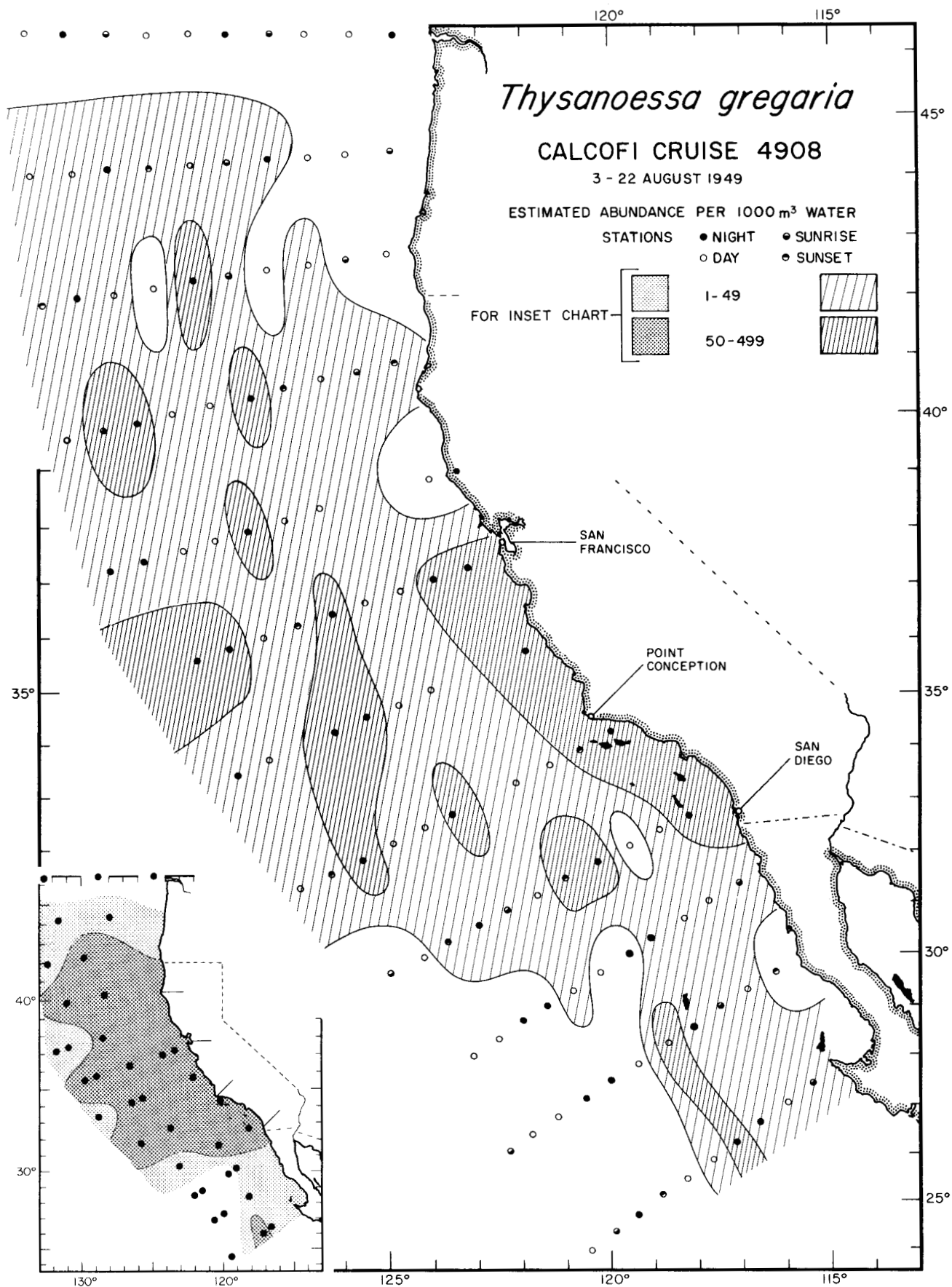
Euphausiacea
Thysanoessa gregaria
4905



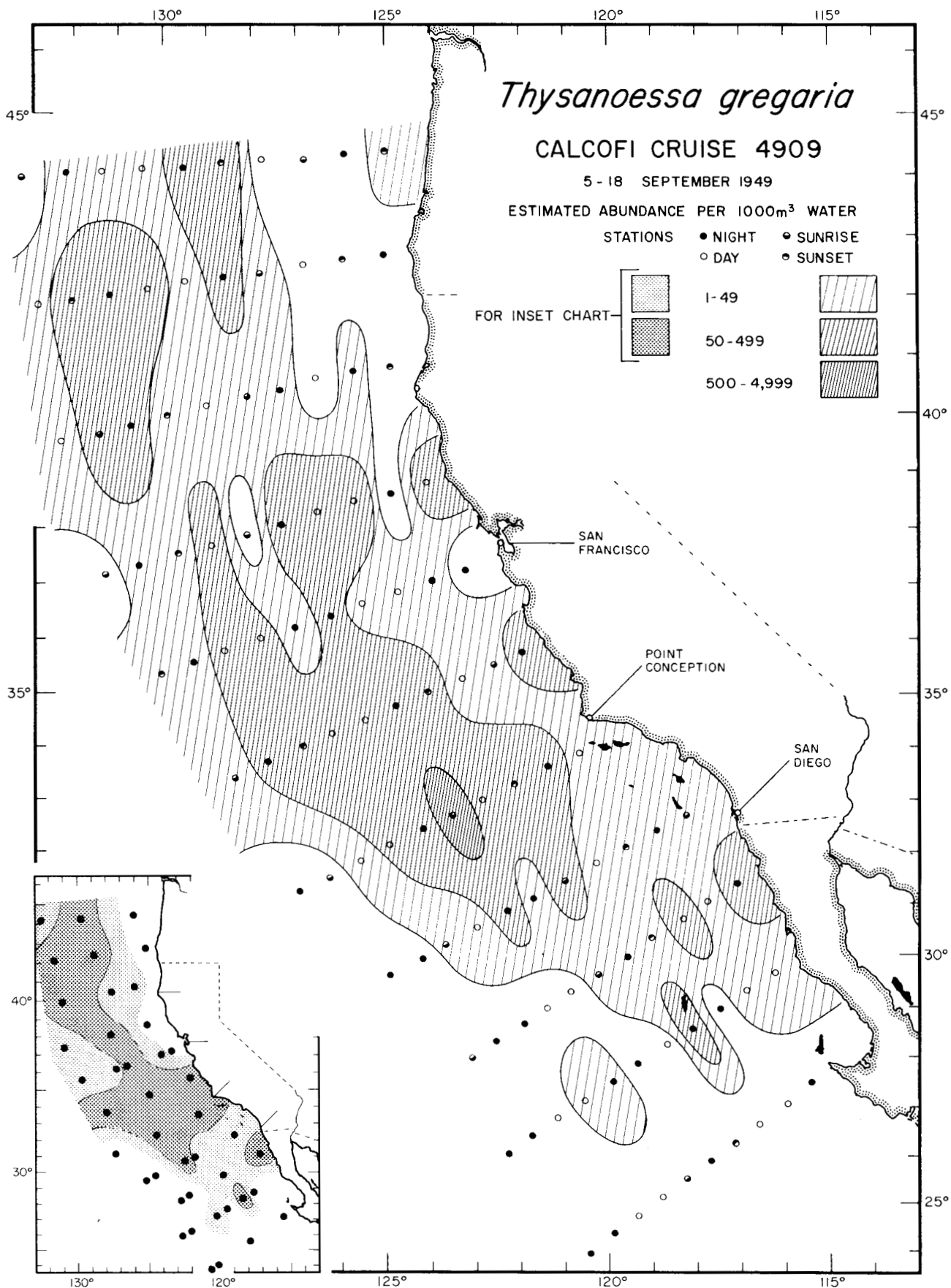
Euphausiacea
Thysanoessa gregaria
4906



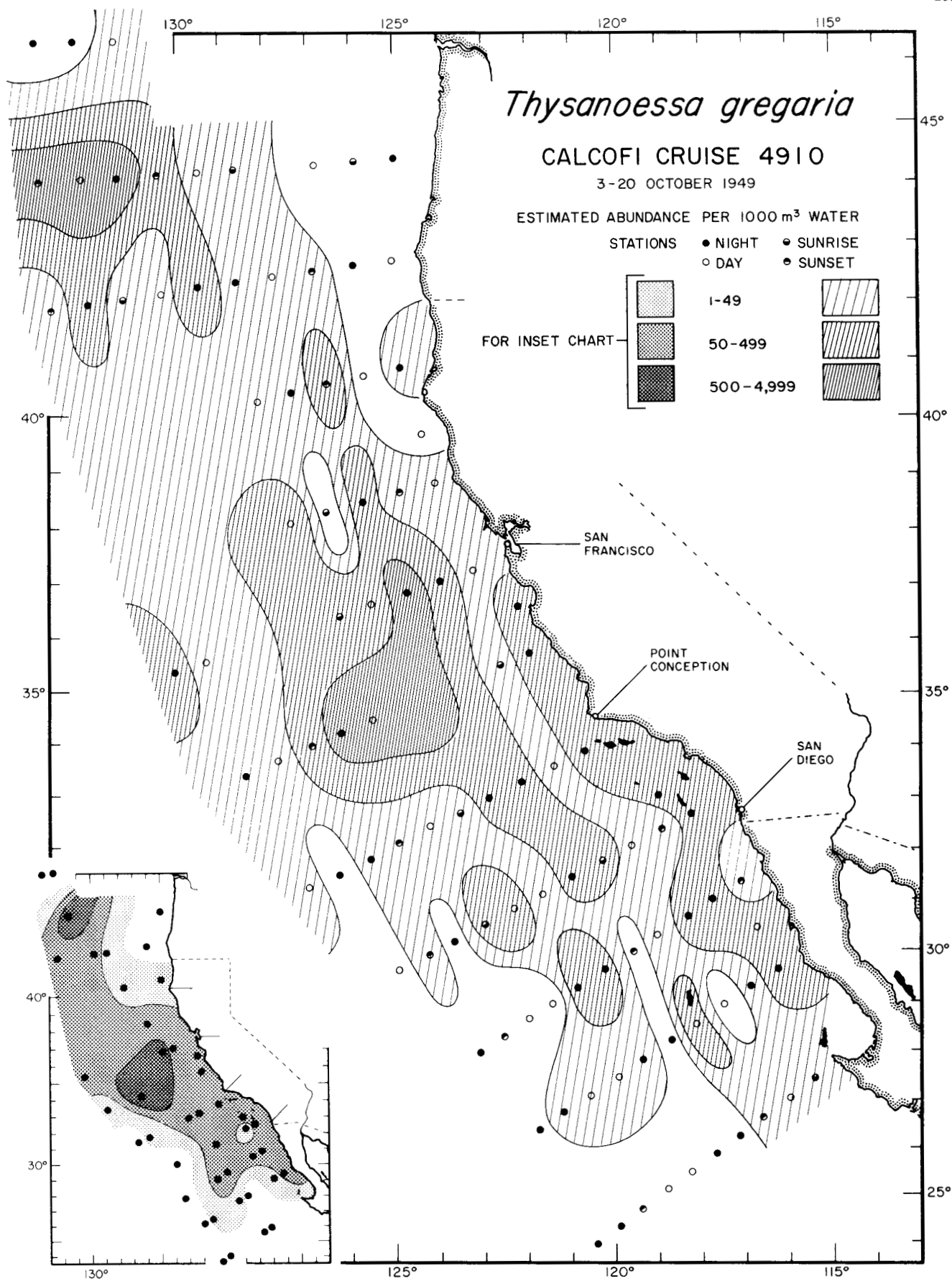
Euphausiacea
Thysanoessa gregaria
 4907



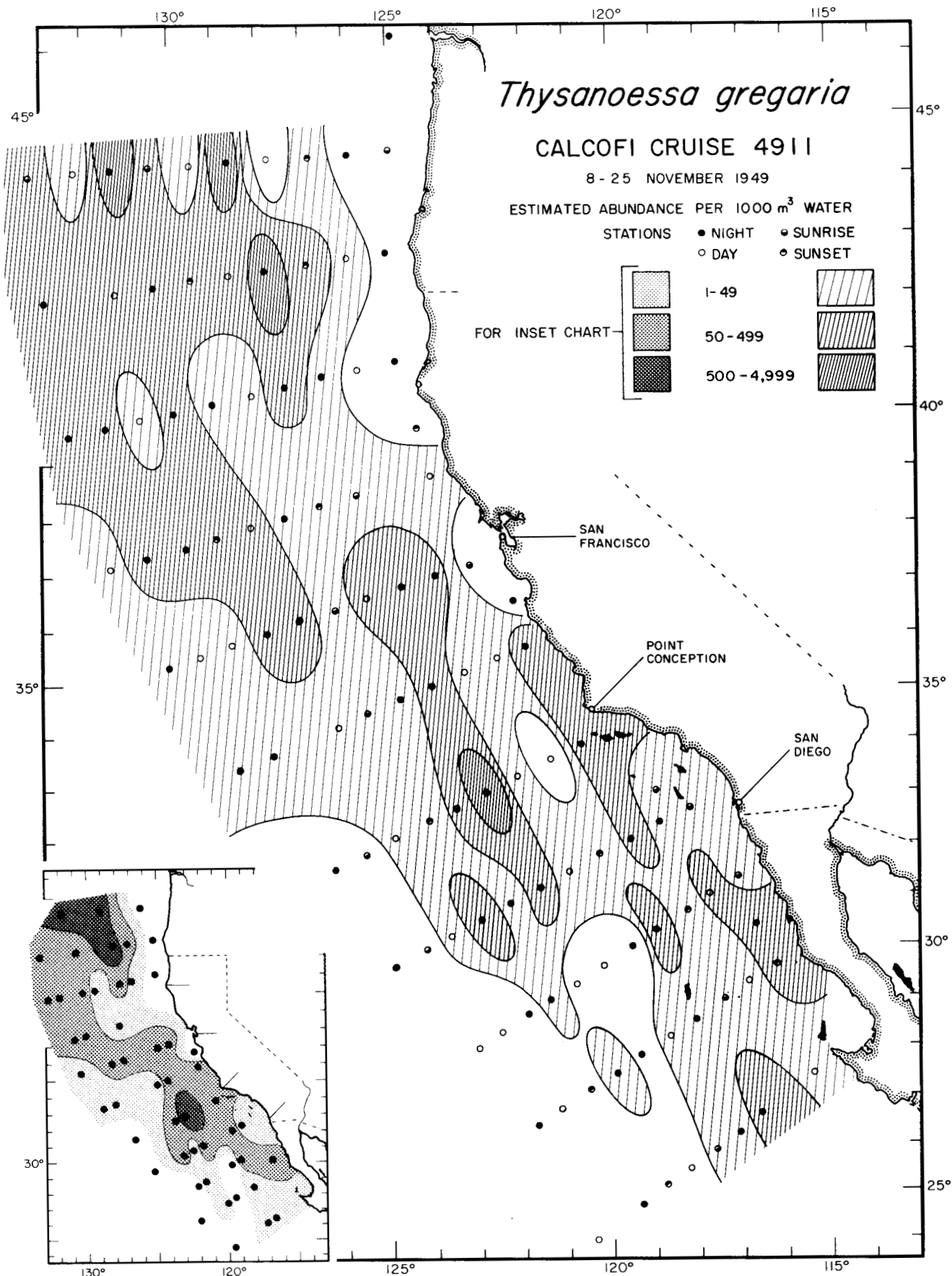
Euphausiacea
Thysanoessa gregaria
4908



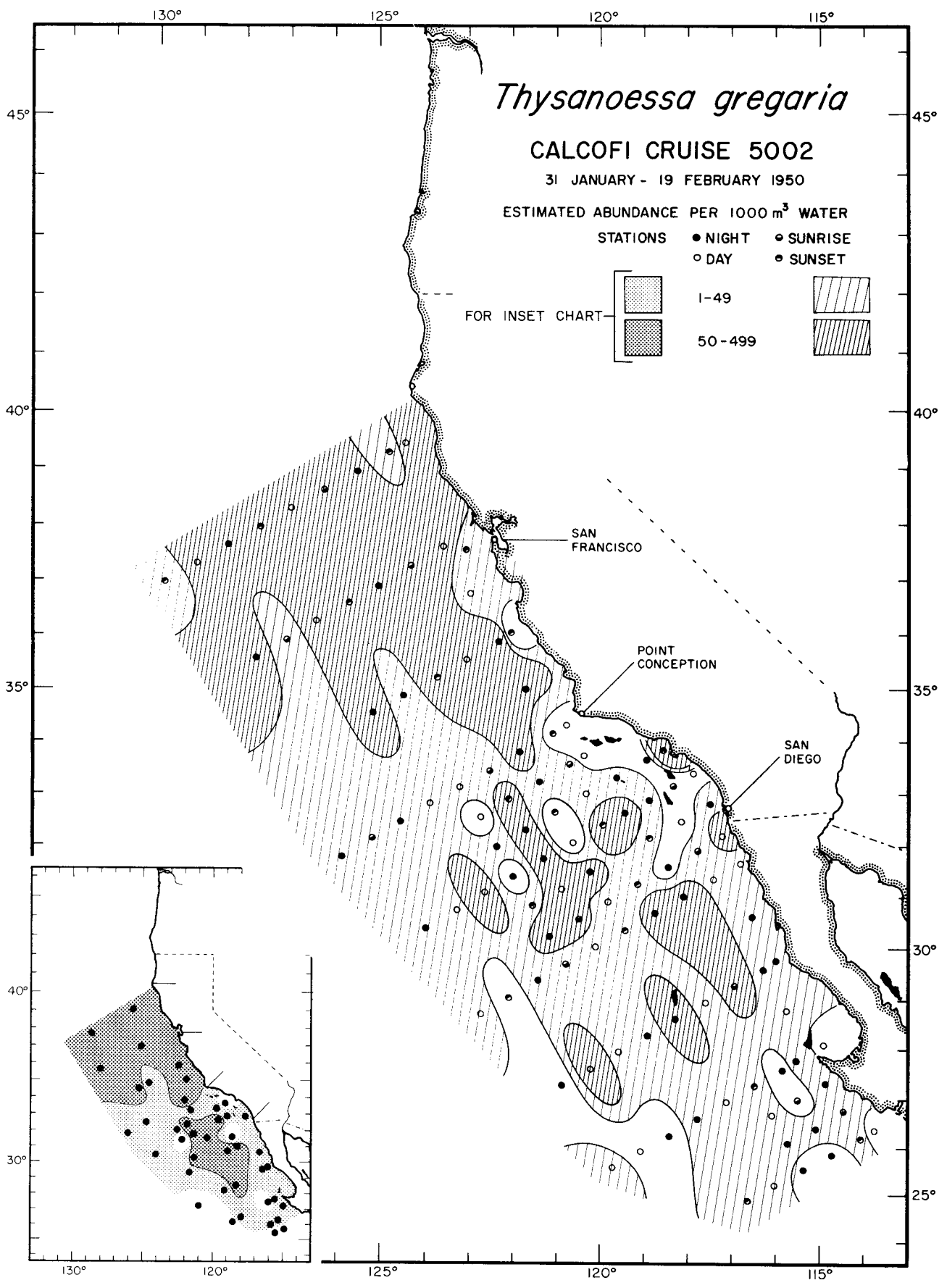
Euphausiacea
Thysanoessa gregaria
4909



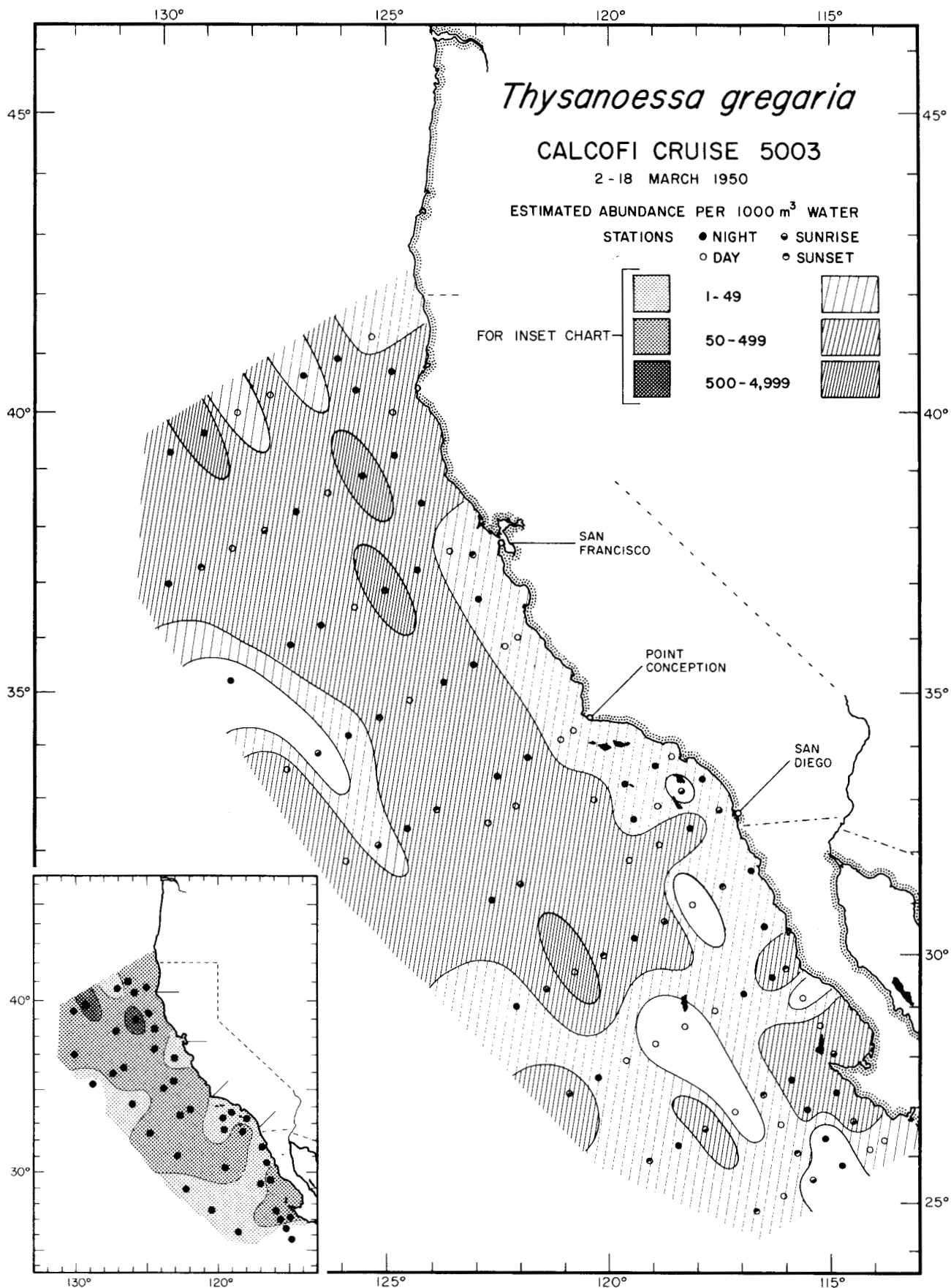
Euphausiacea
Thysanoessa gregaria
4910



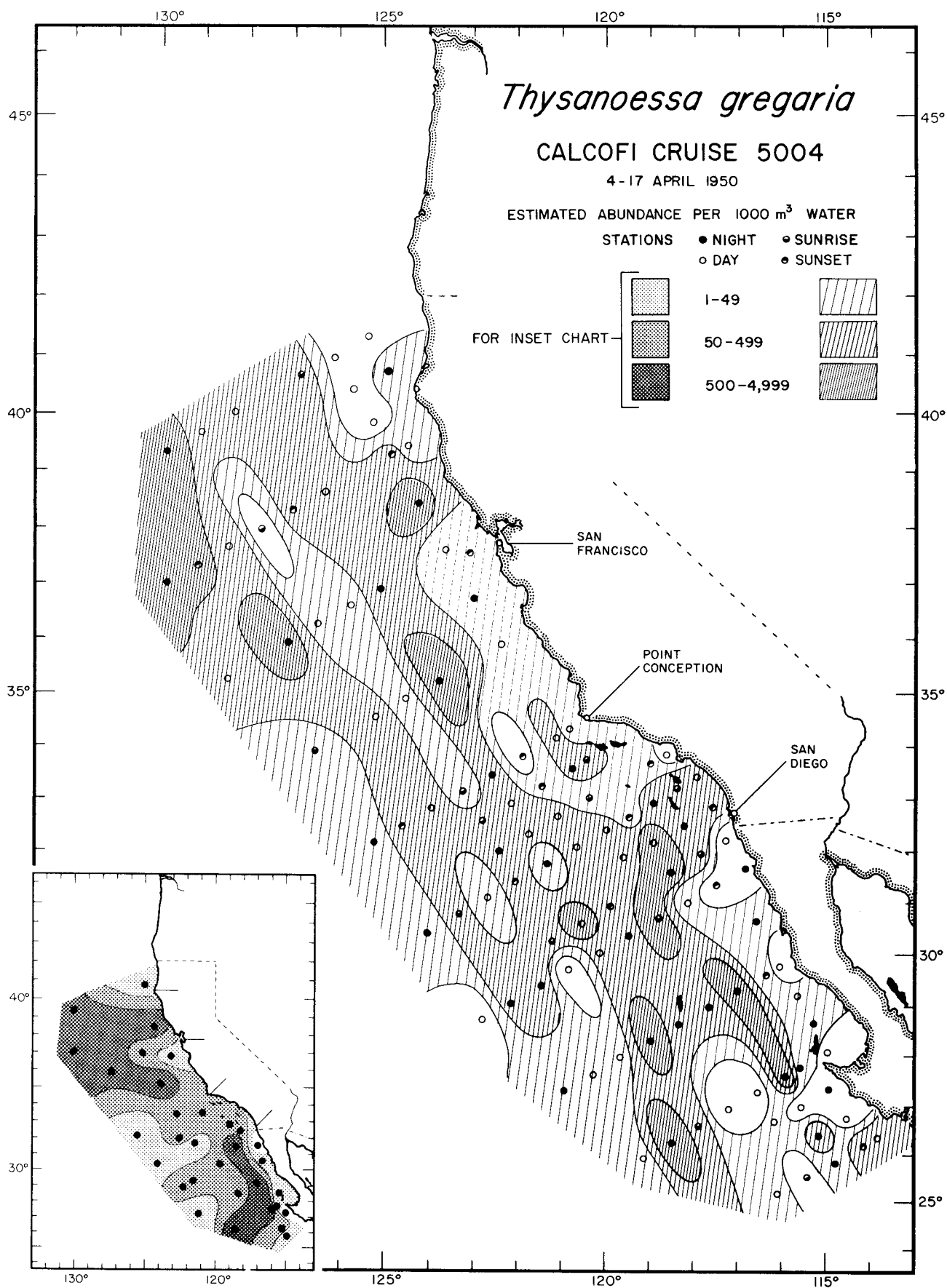
Euphausiacea
Thysanoessa gregaria
 4911



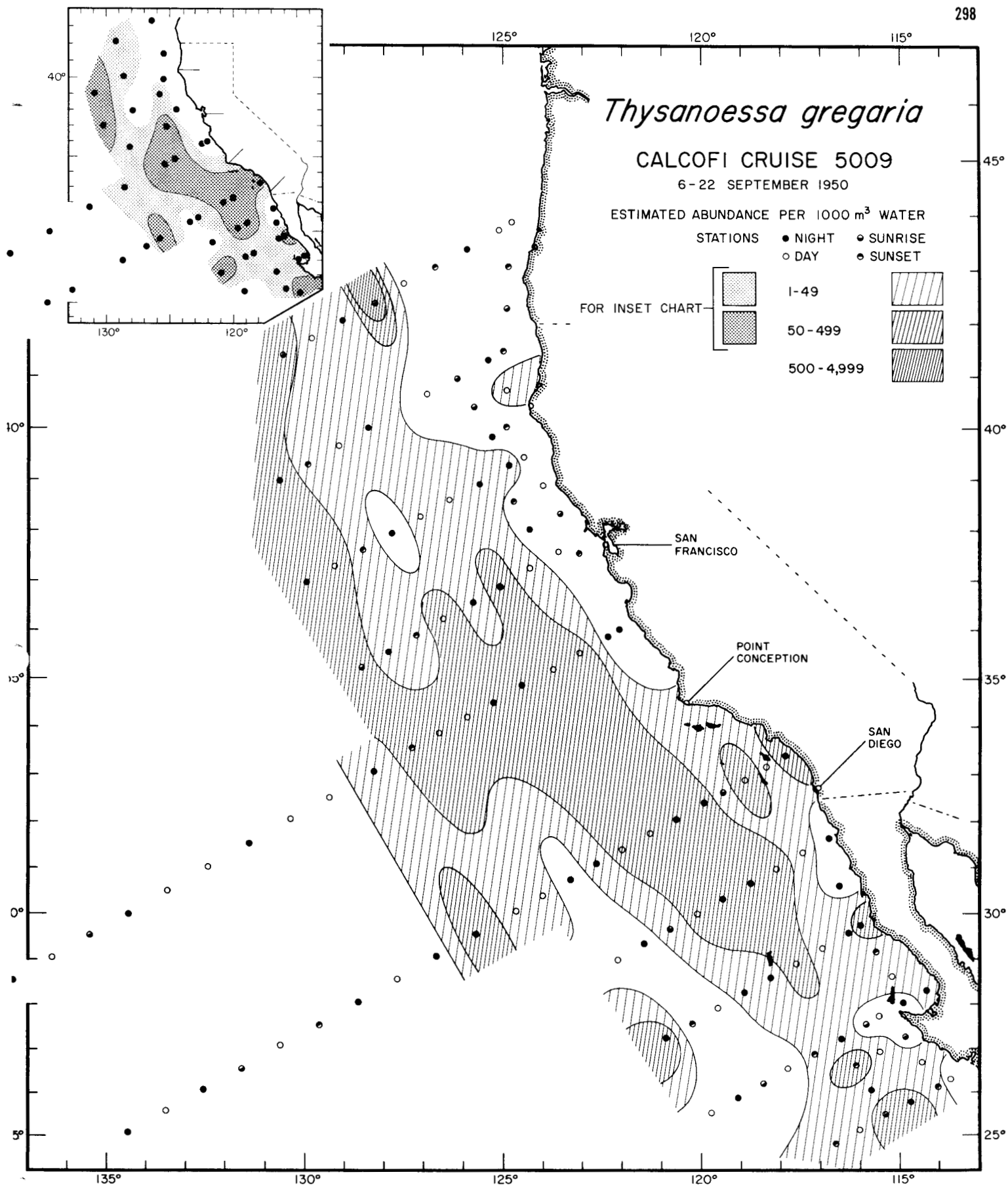
Euphausiacea
Thysanoessa gregaria
5002



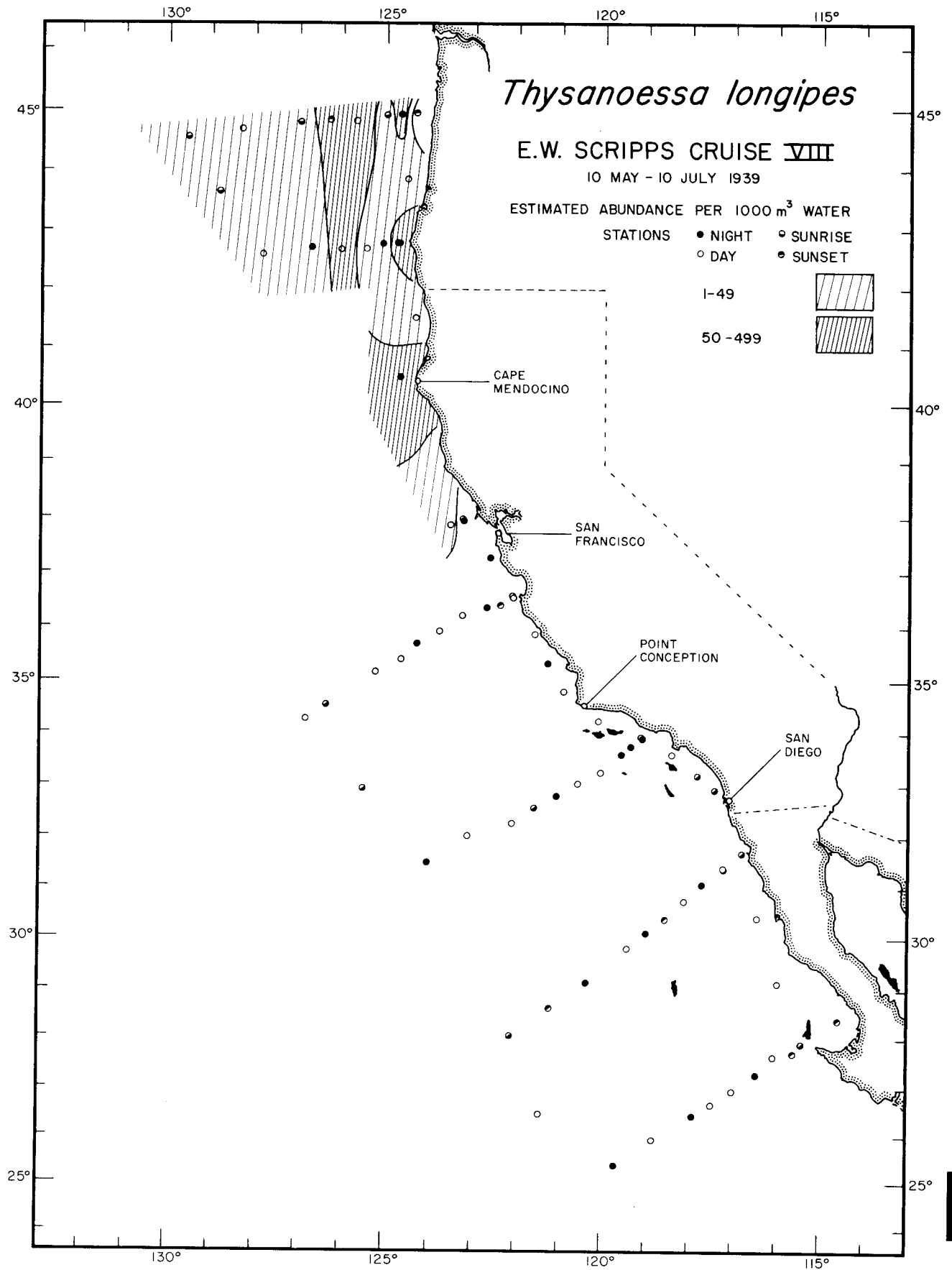
Euphausiacea
Thysanoessa gregaria
 5003



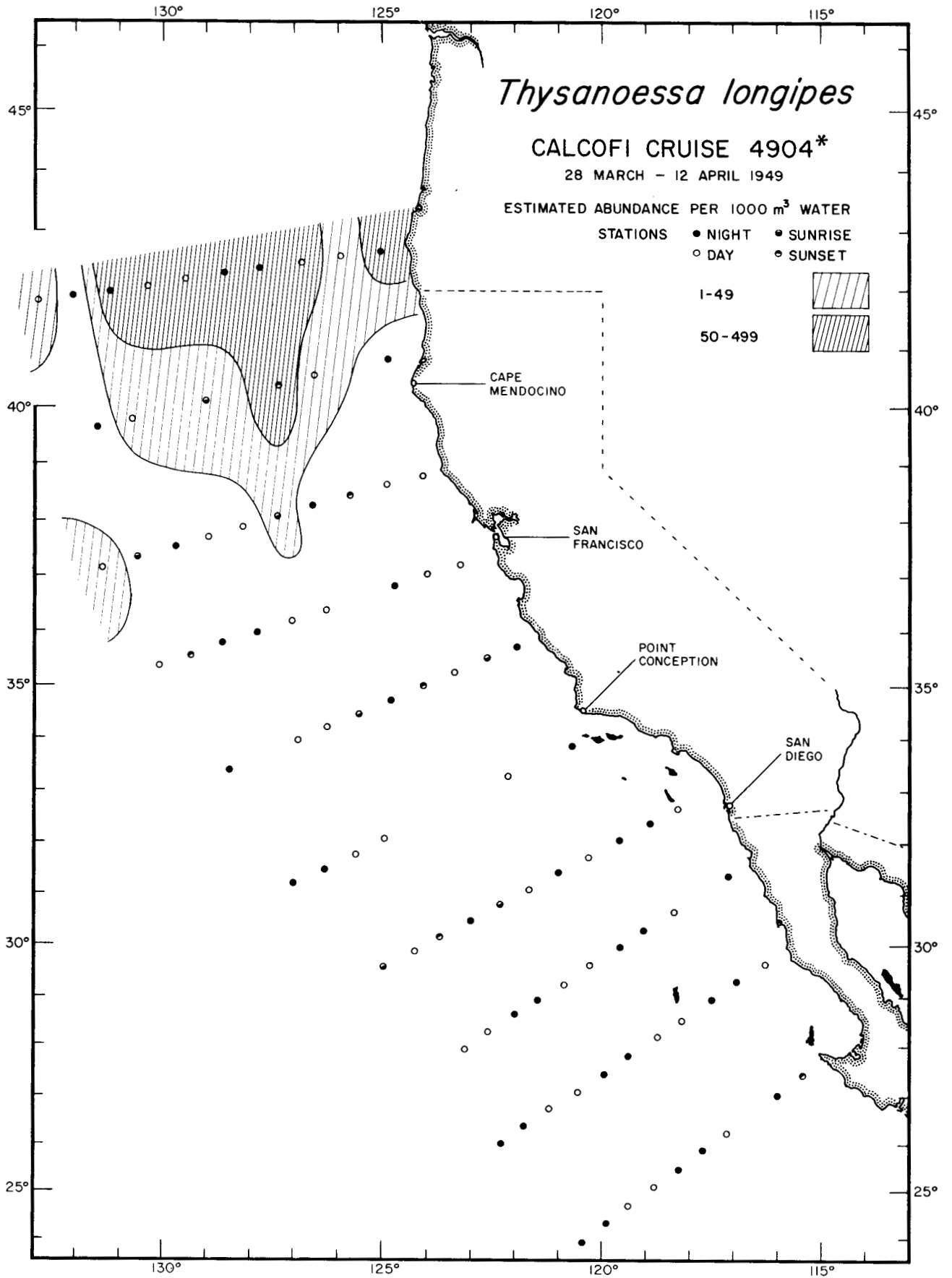
Euphausiacea
Thysanoessa gregaria
 5004



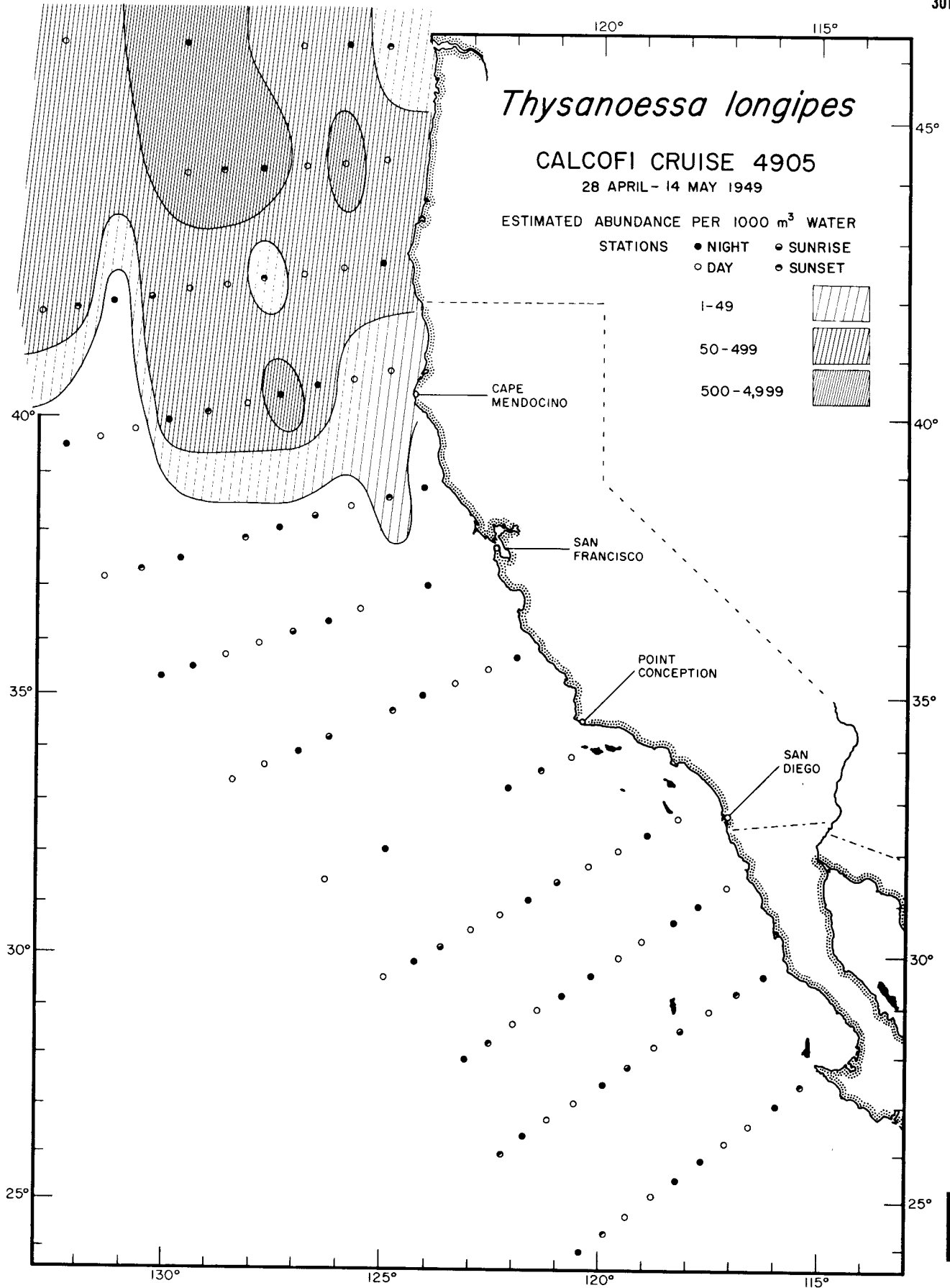
Euphausiacea
Thysanoessa gregaria
5009



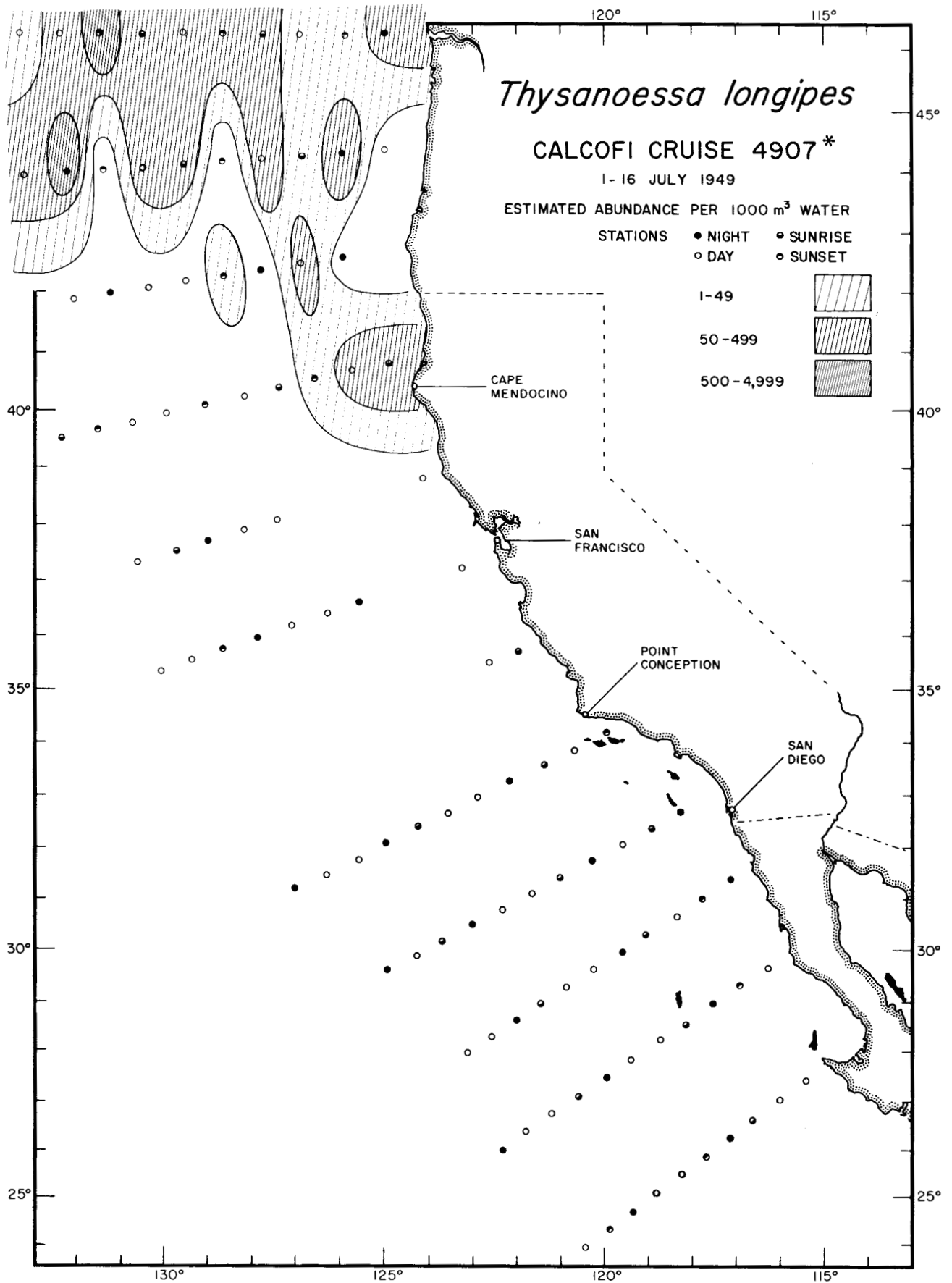
Euphausiacea
Thysanoessa longipes
E.W. SCRIPPS CRUISE VIII



* See Table 1 for Cruise 4903

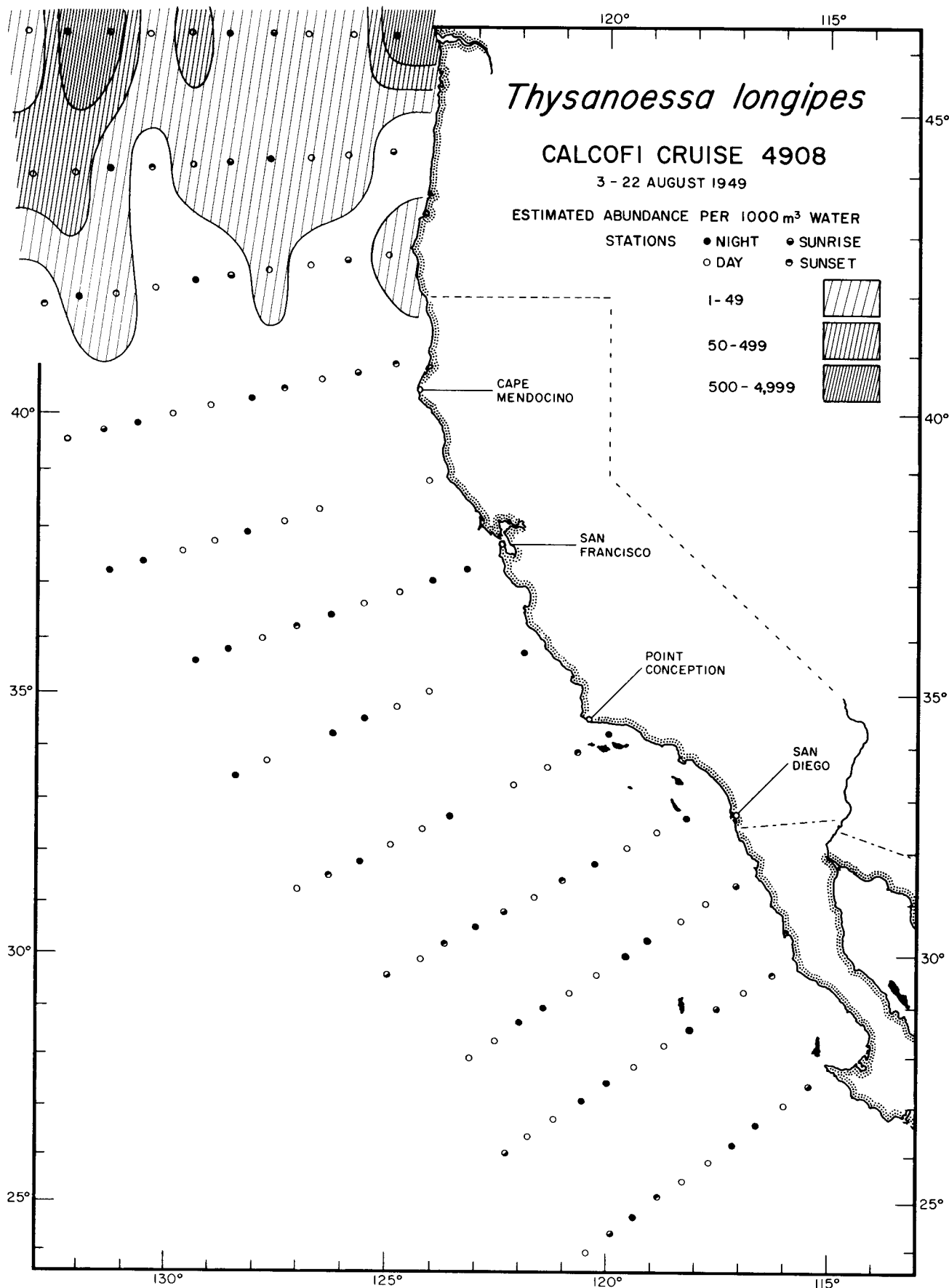


Euphausiacea
Thysanoessa longipes
4905

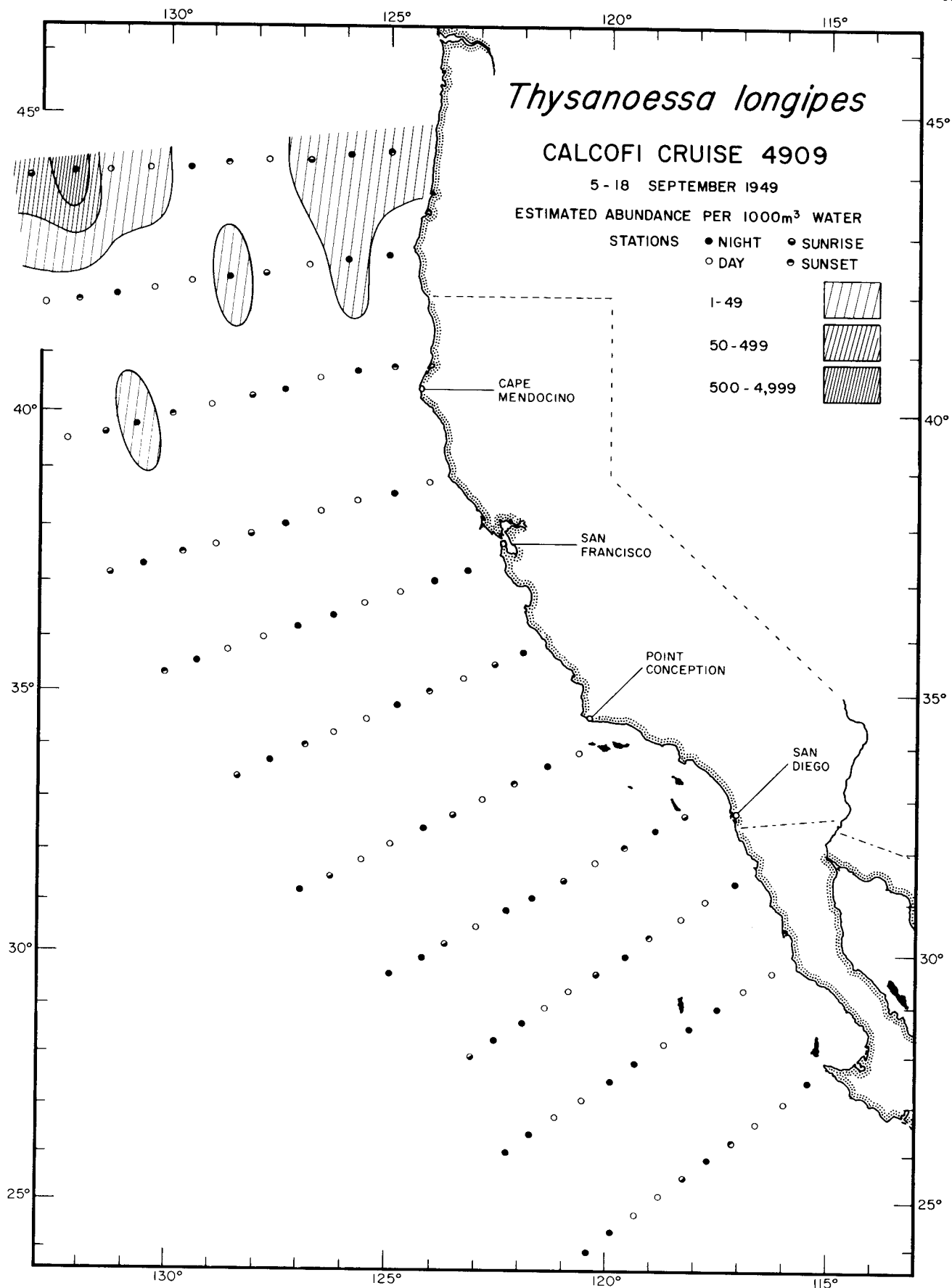


* See Table 1 for Cruise 4906

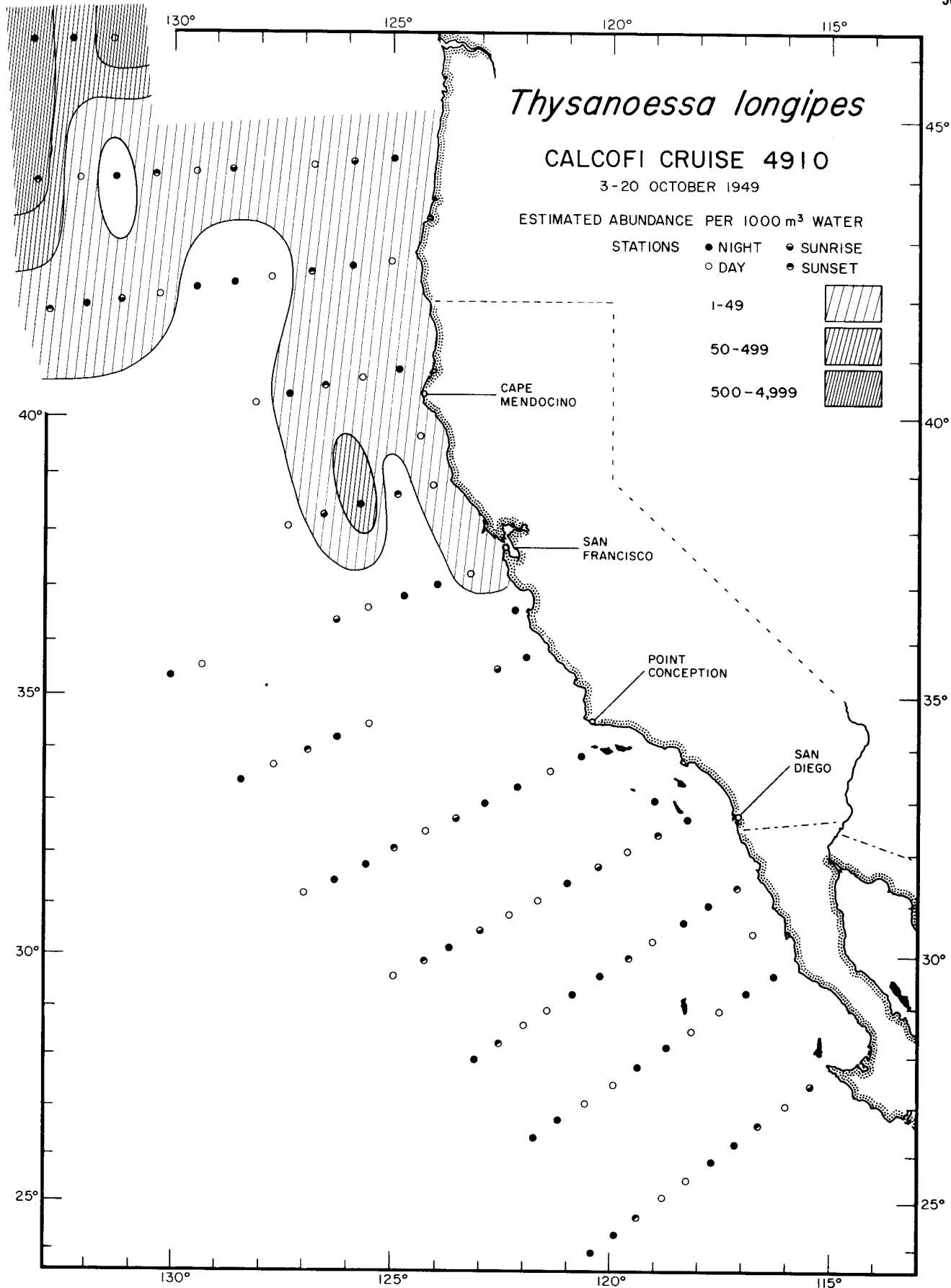
Euphausiacea
Thysanoessa longipes
4907



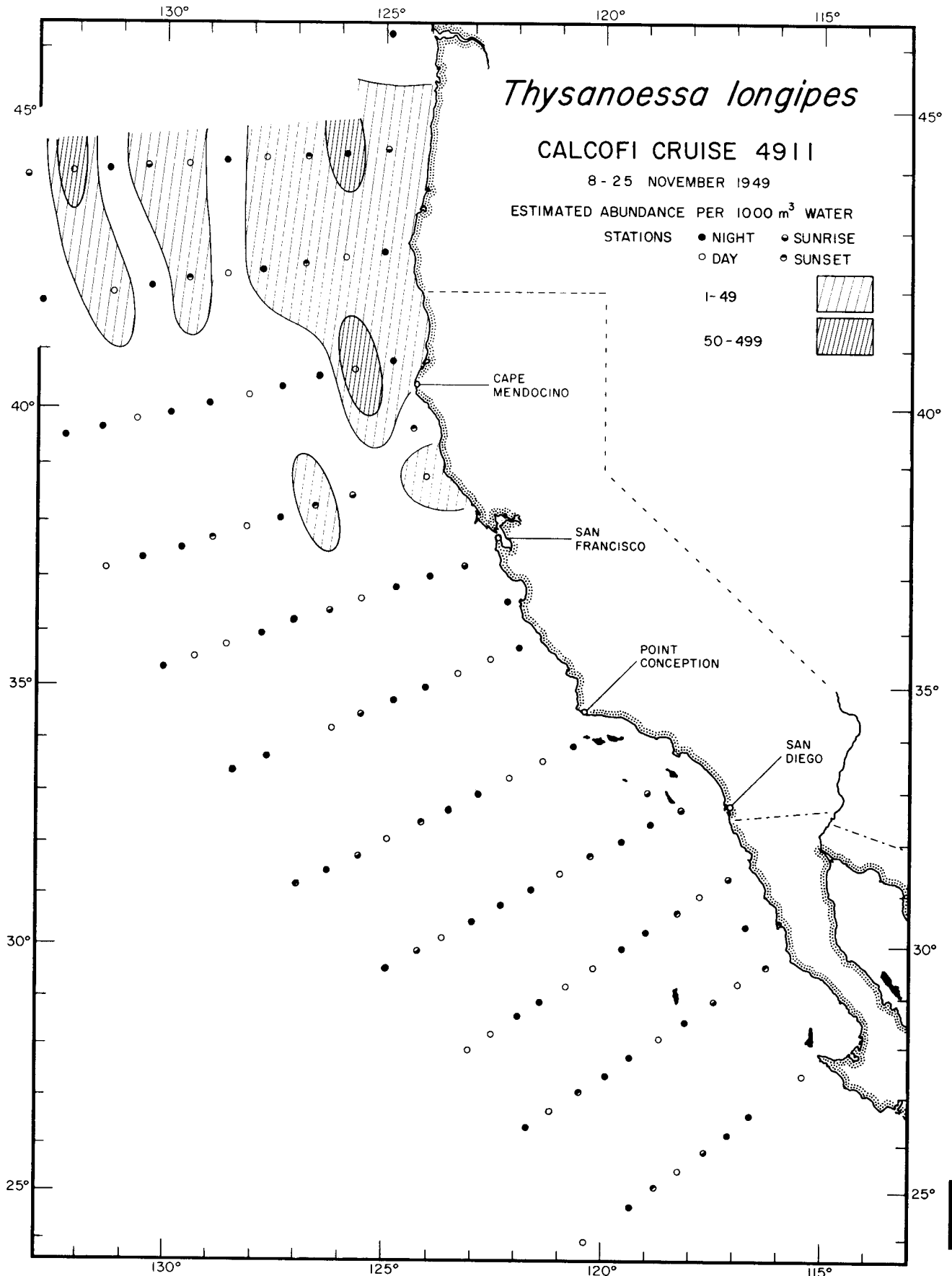
Euphausiacea
Thysanoessa longipes
4908



Euphausiacea
Thysanoessa longipes
4909

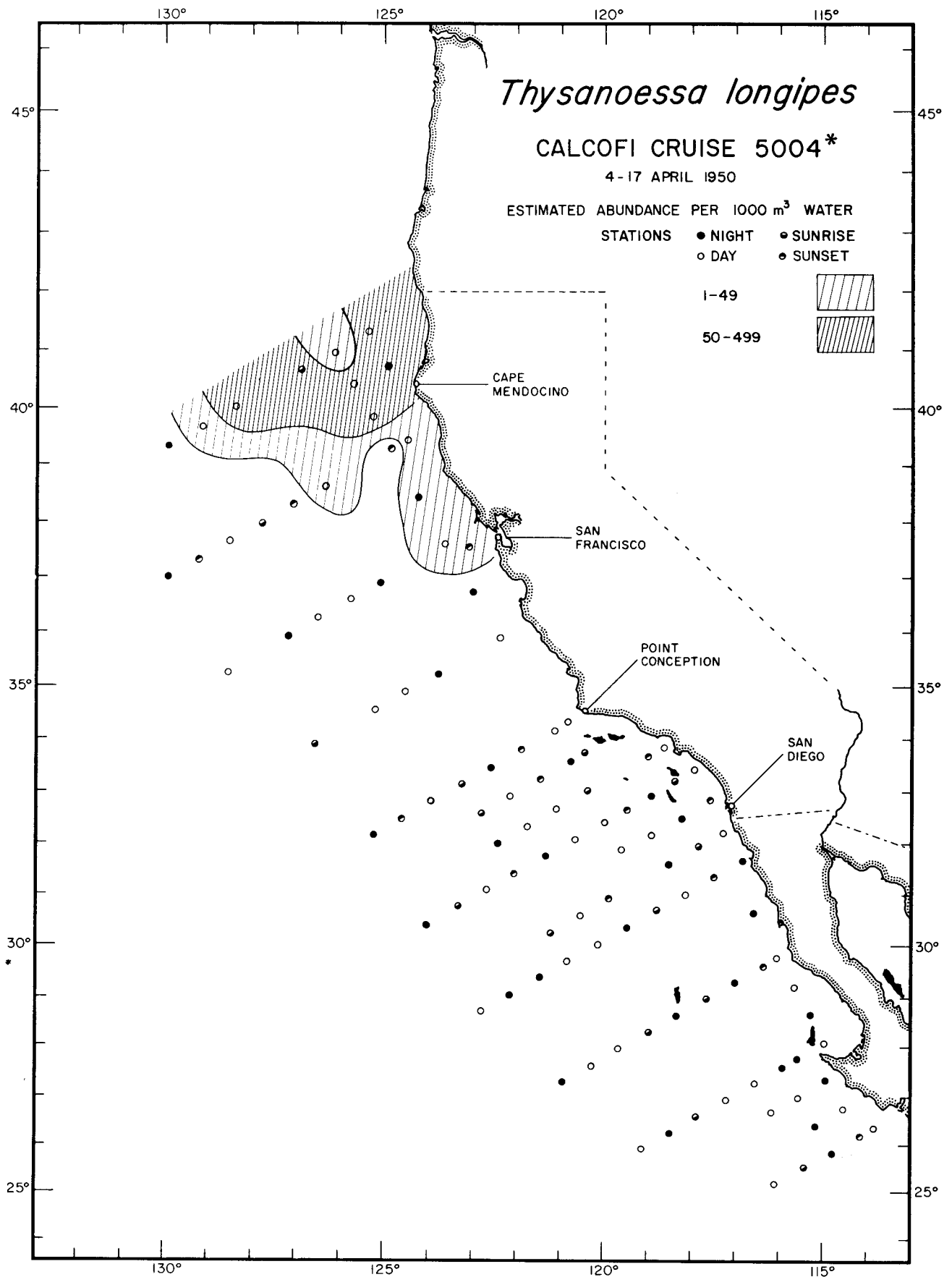


Euphausiacea
Thysanoessa longipes
4910

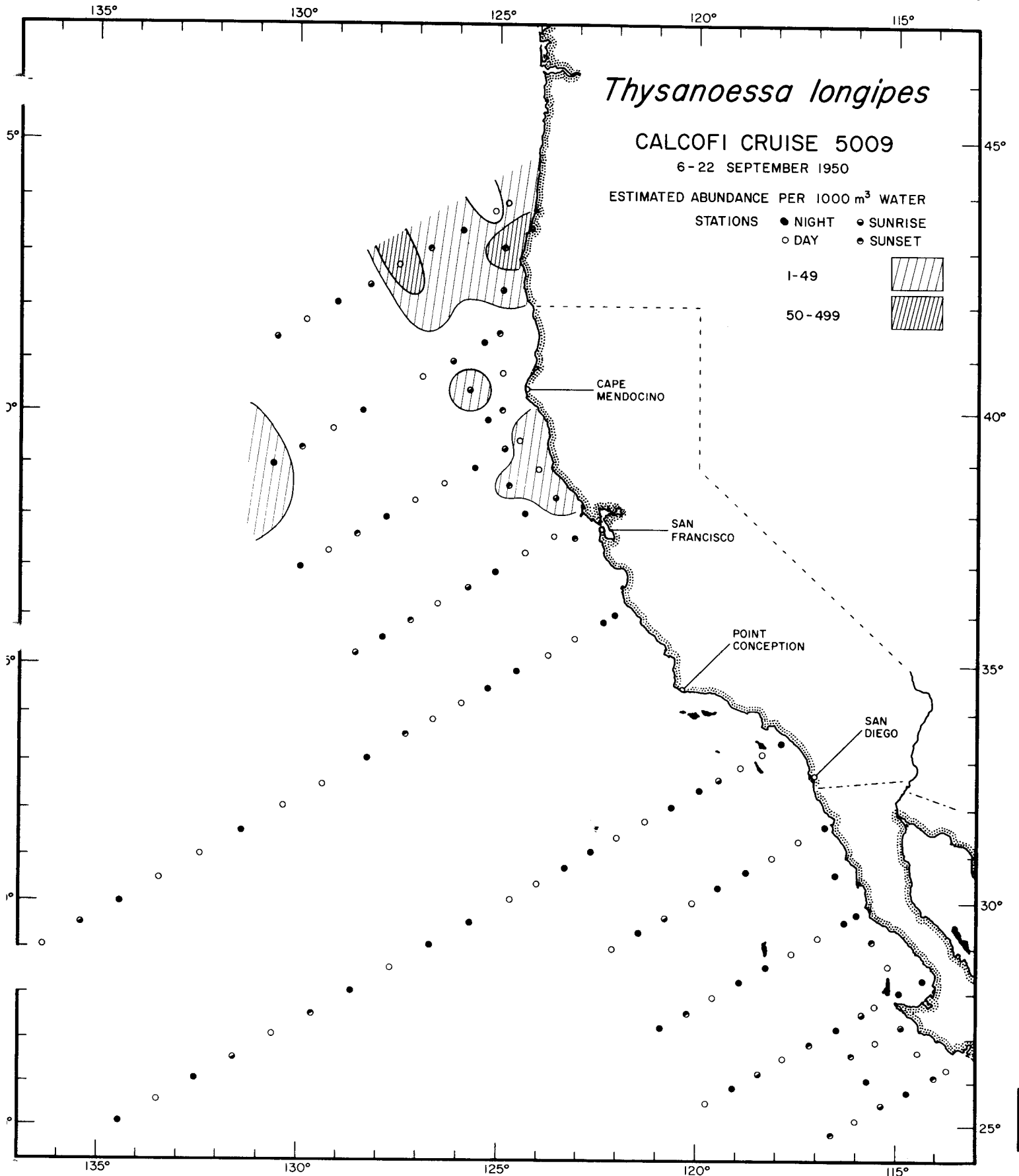


Euphausiacea
Thysanoessa longipes

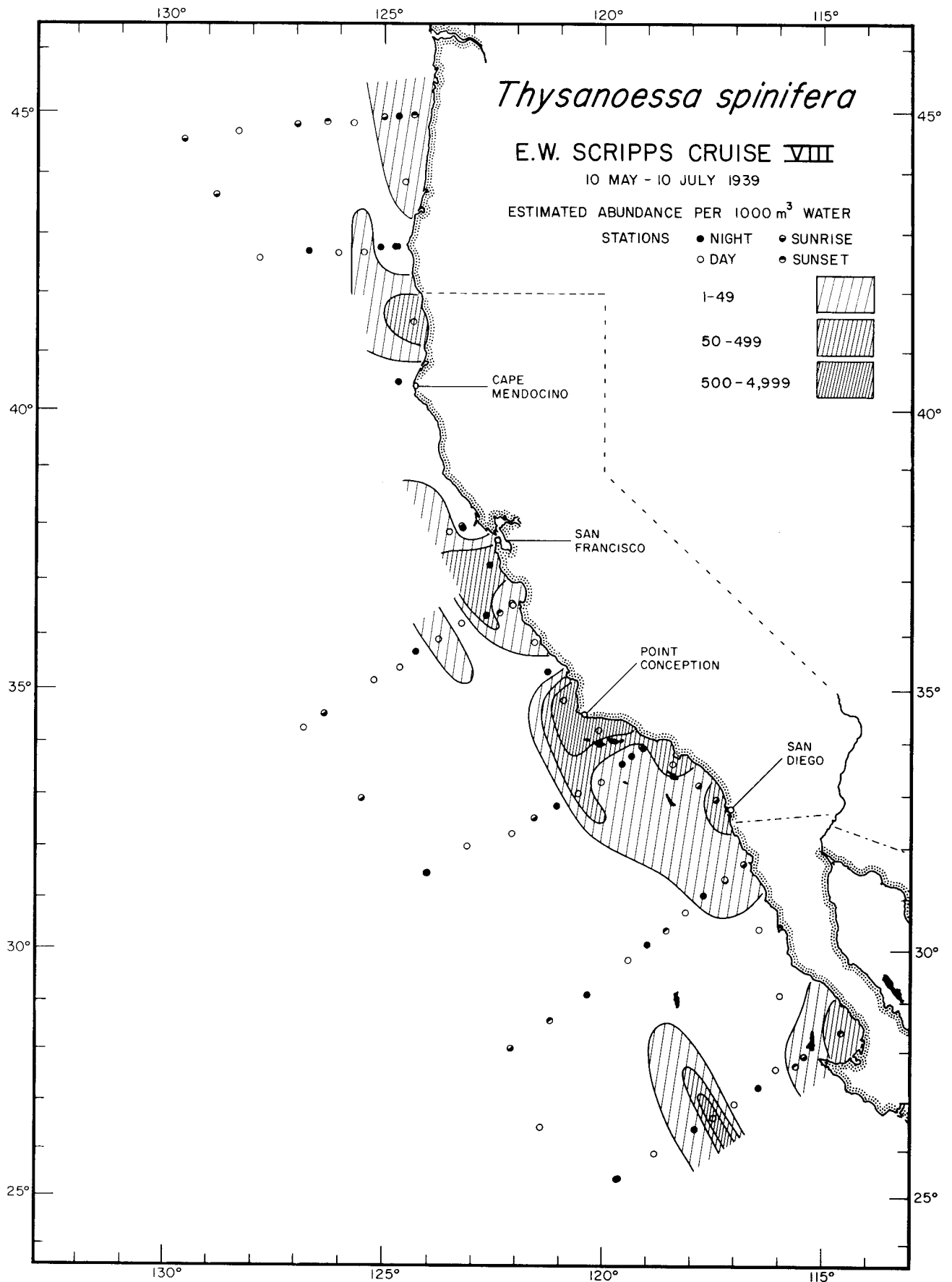
4911



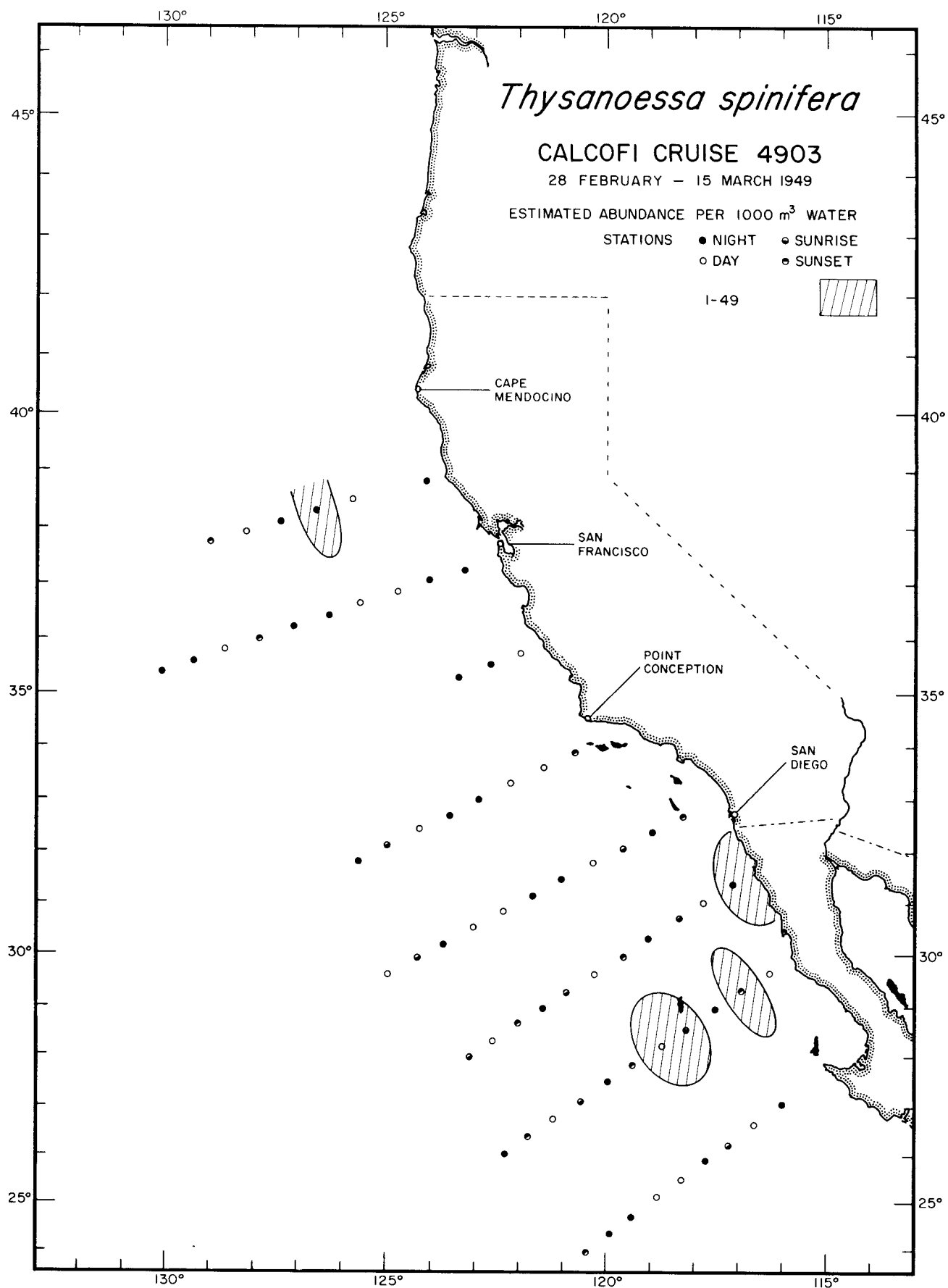
* See Table 1 for Cruises 5002, 3



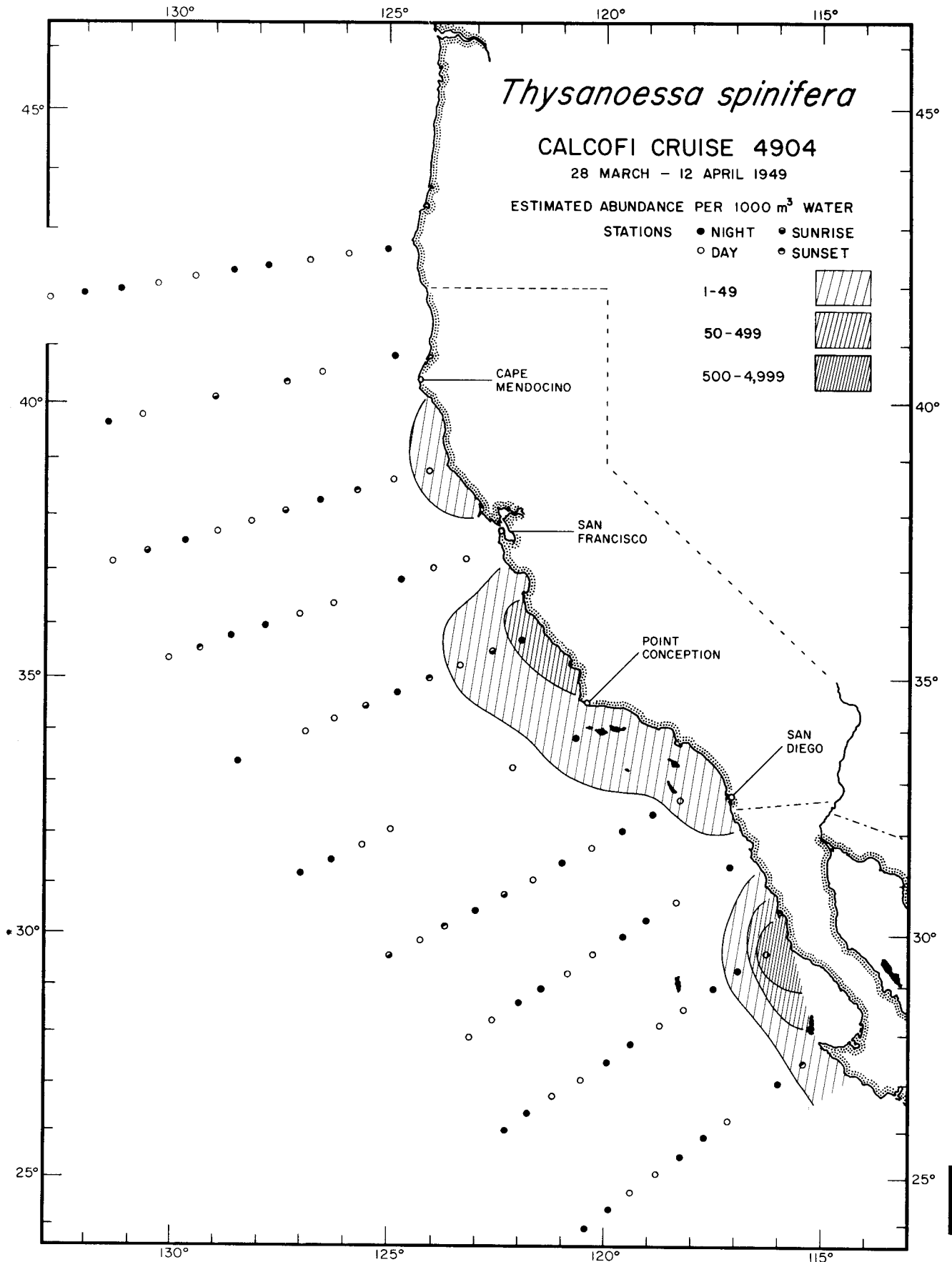
Euphausiacea
Thysanoessa longipes
5009



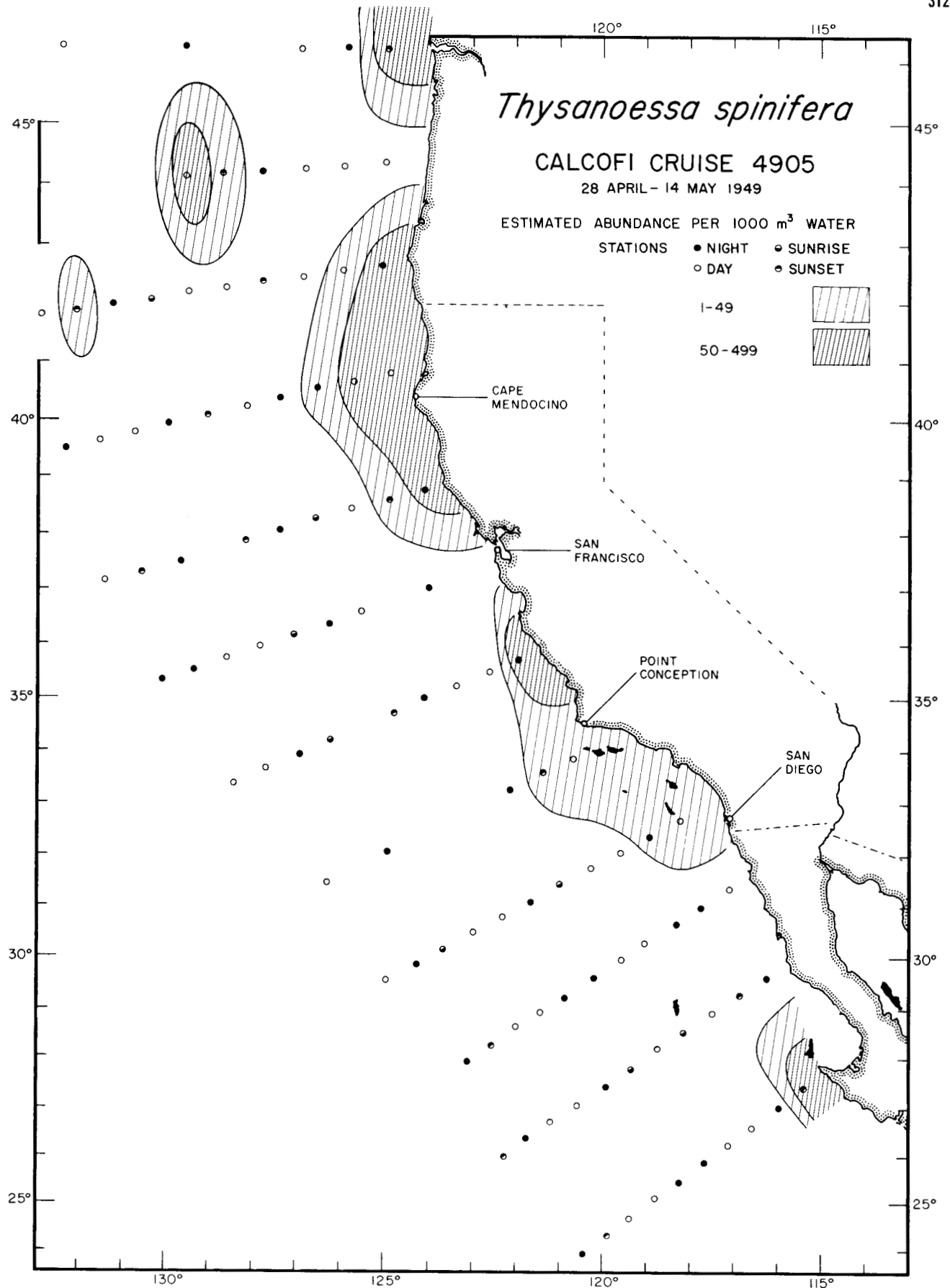
Euphausiacea
Thysanoessa spinifera
E. W. SCRIPPS CRUISE VIII



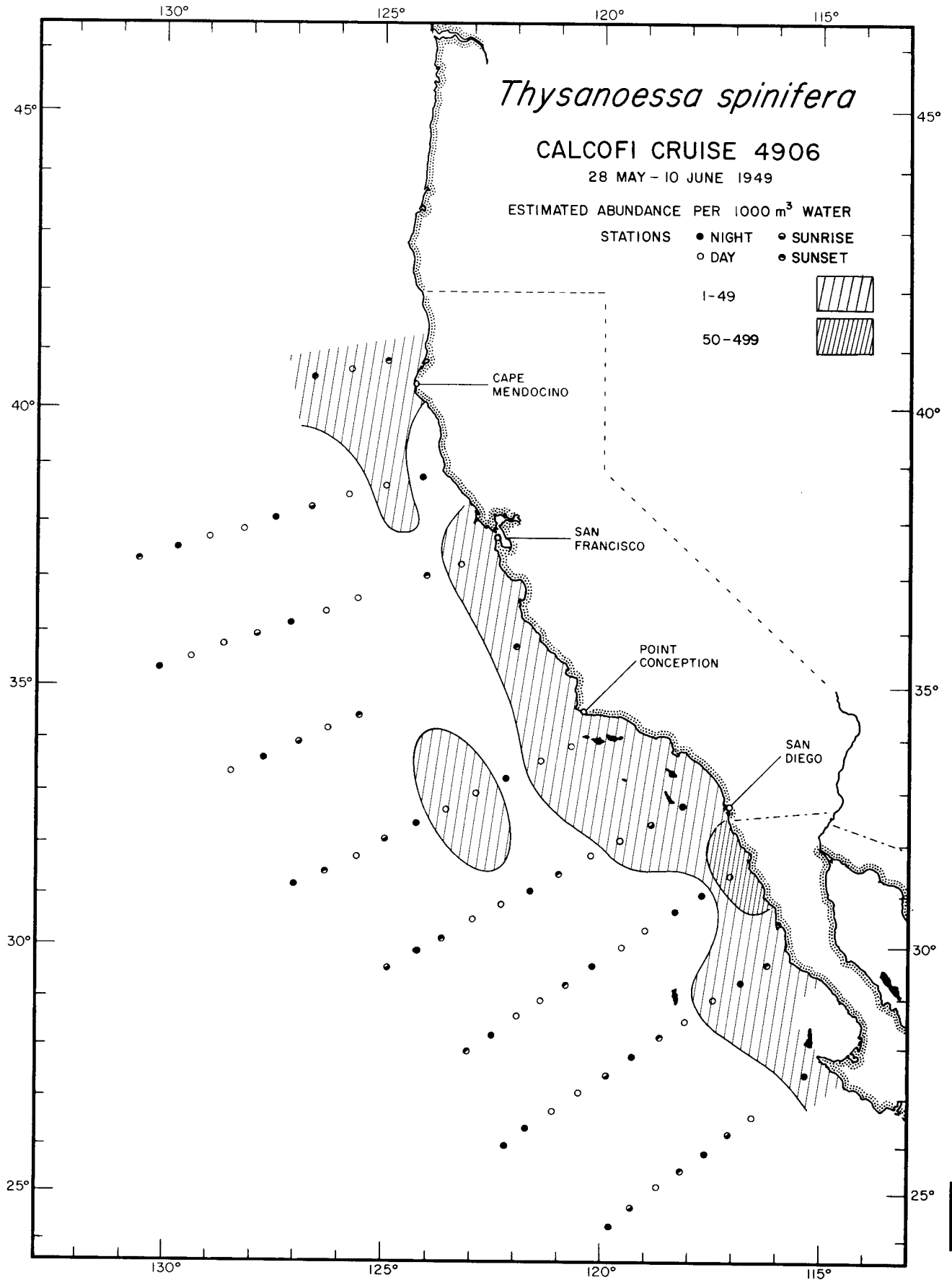
Euphausiacea
Thysanoessa spinifera
4903



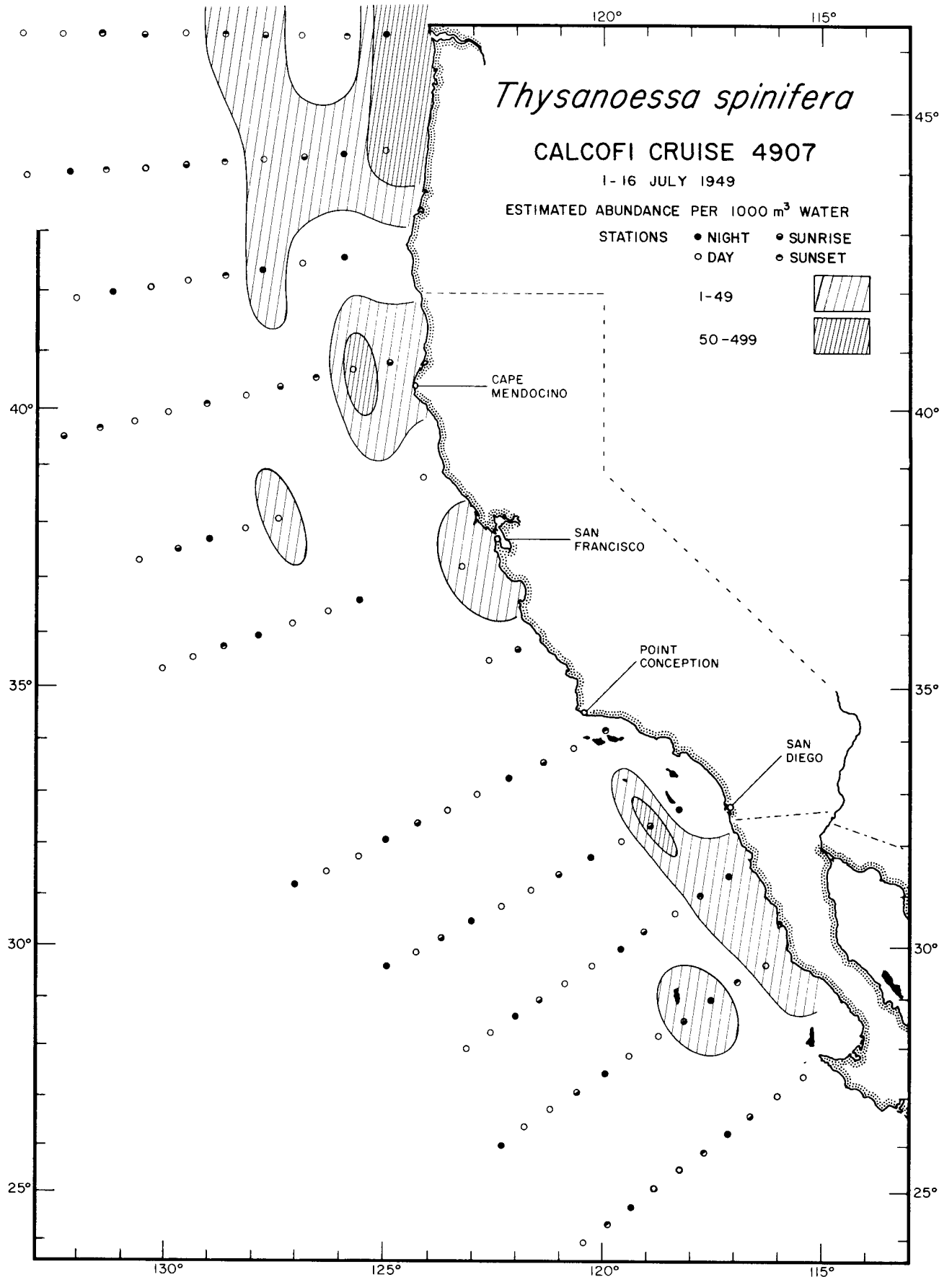
Euphausiacea
Thysanoessa spinifera
4904



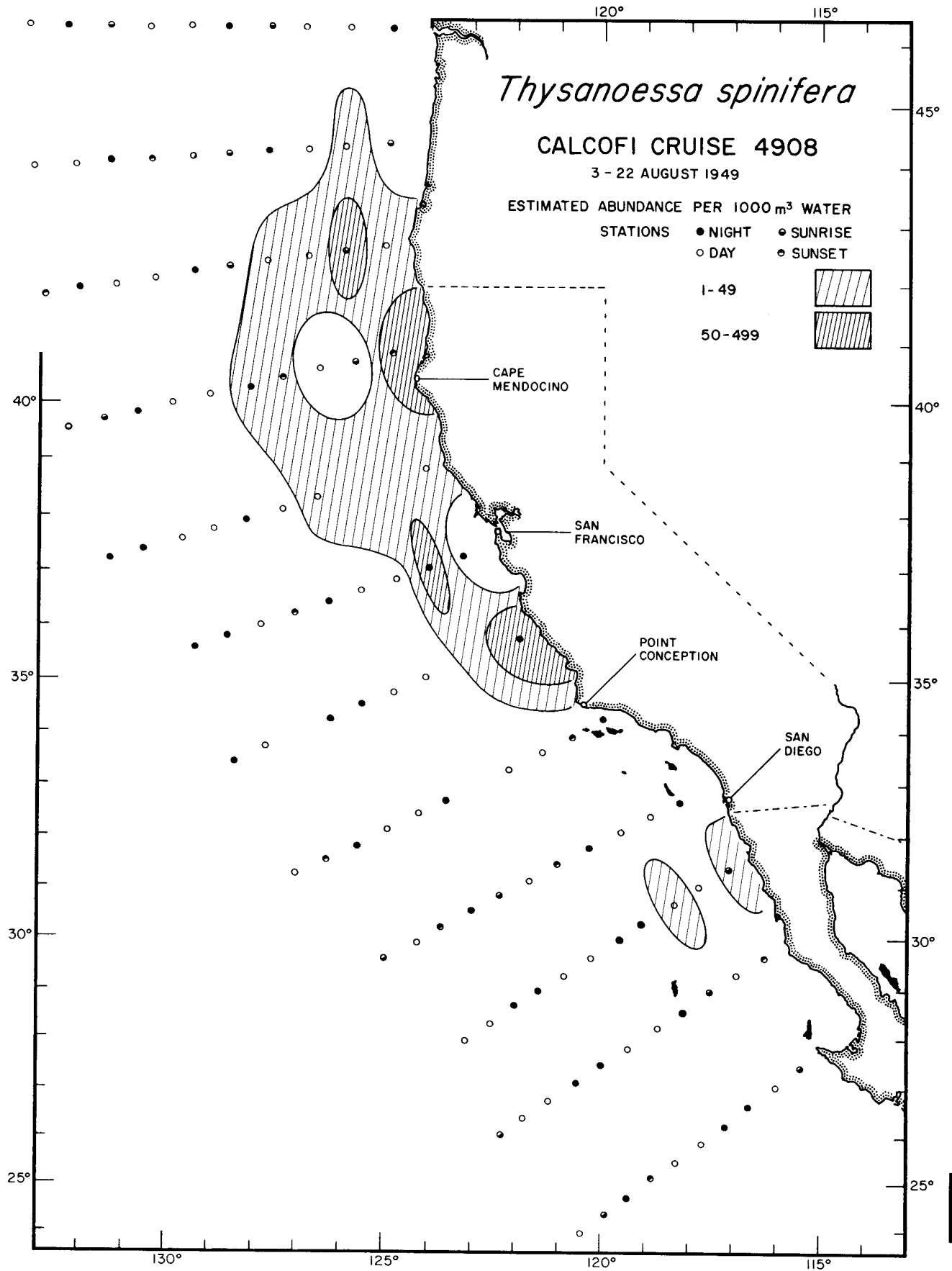
Euphausiacea
Thysanoessa spinifera
4905



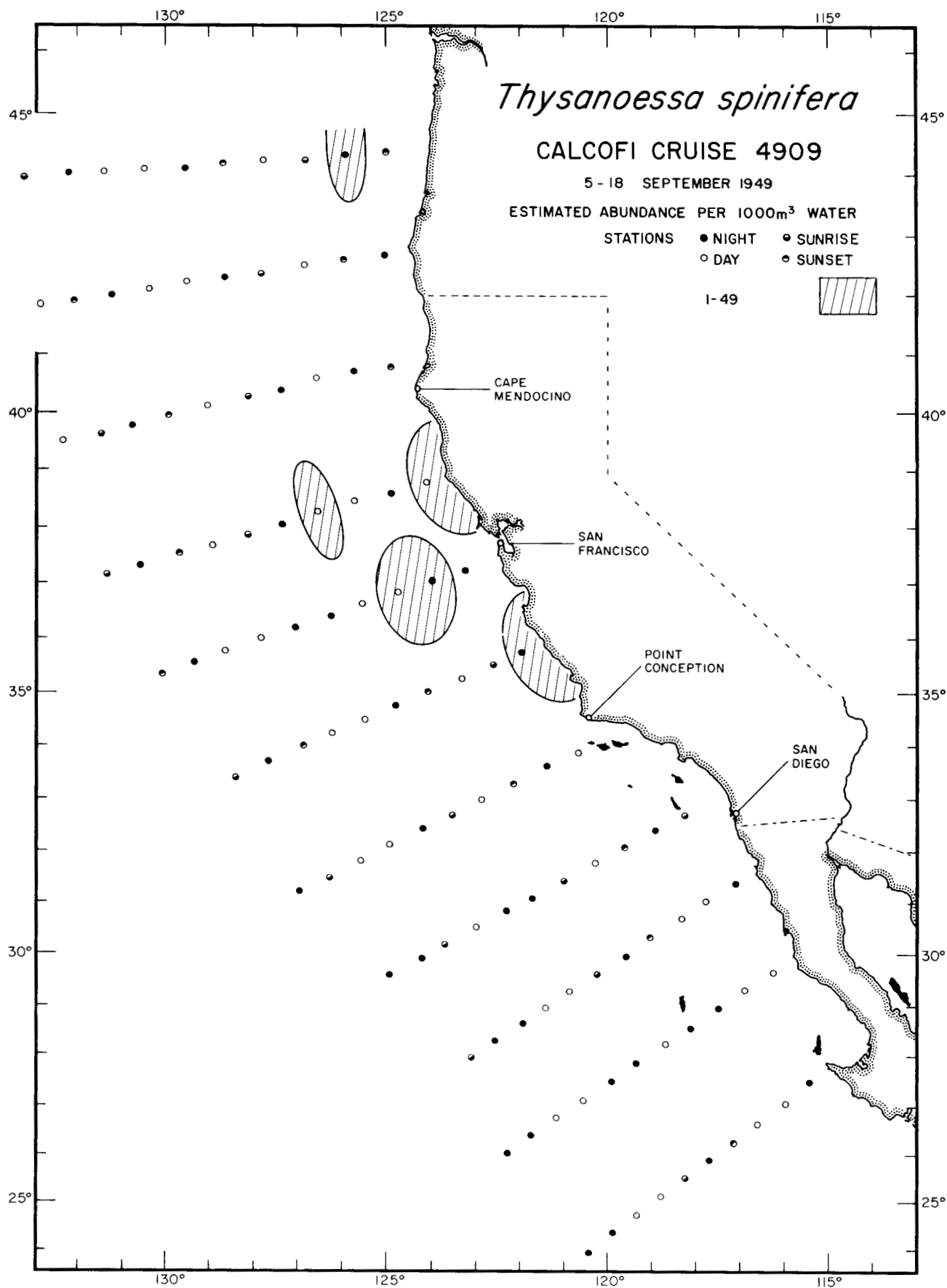
Euphausiacea
Thysanoessa spinifera
4906



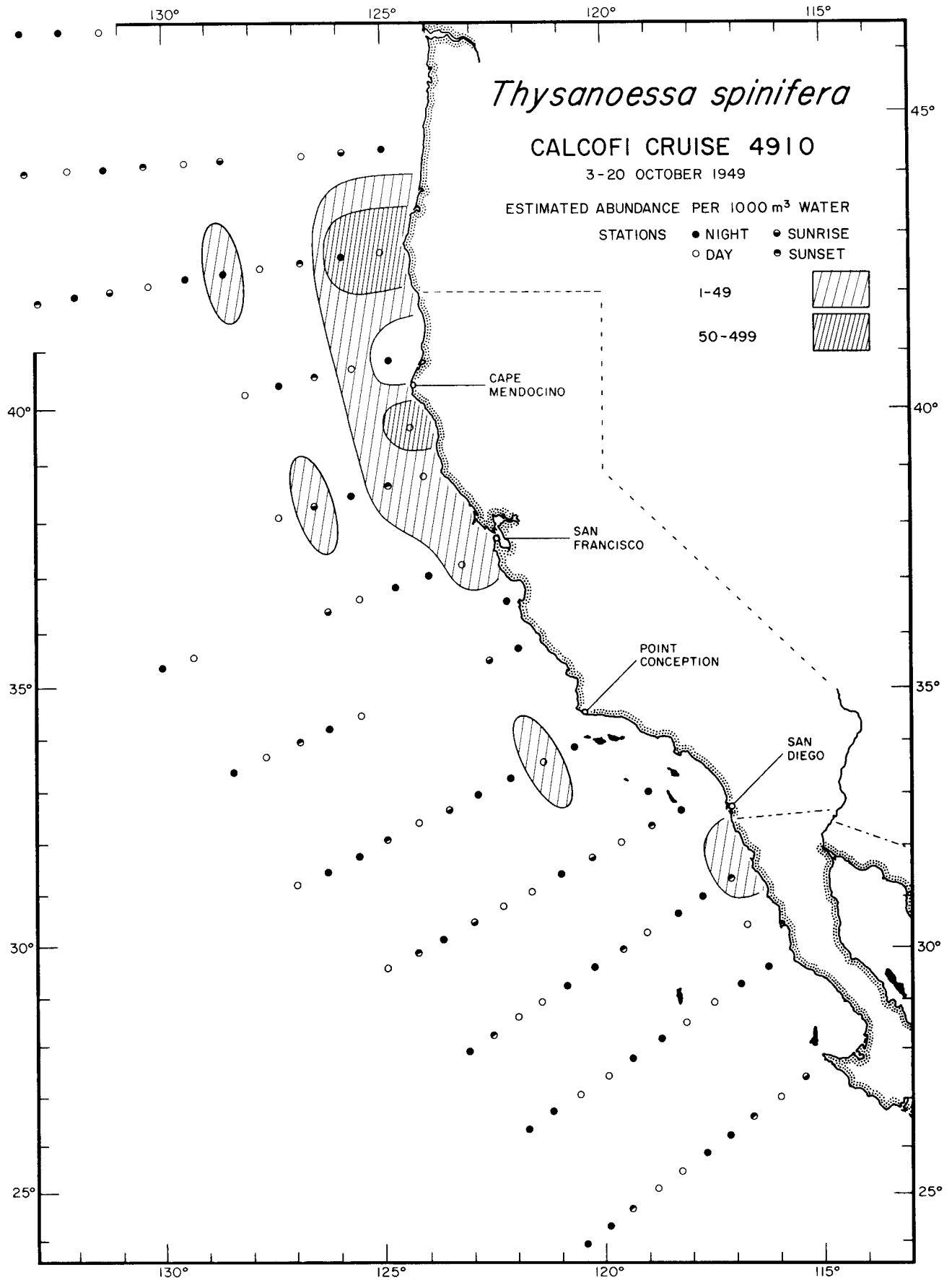
Euphausiacea
Thysanoessa spinifera
4907



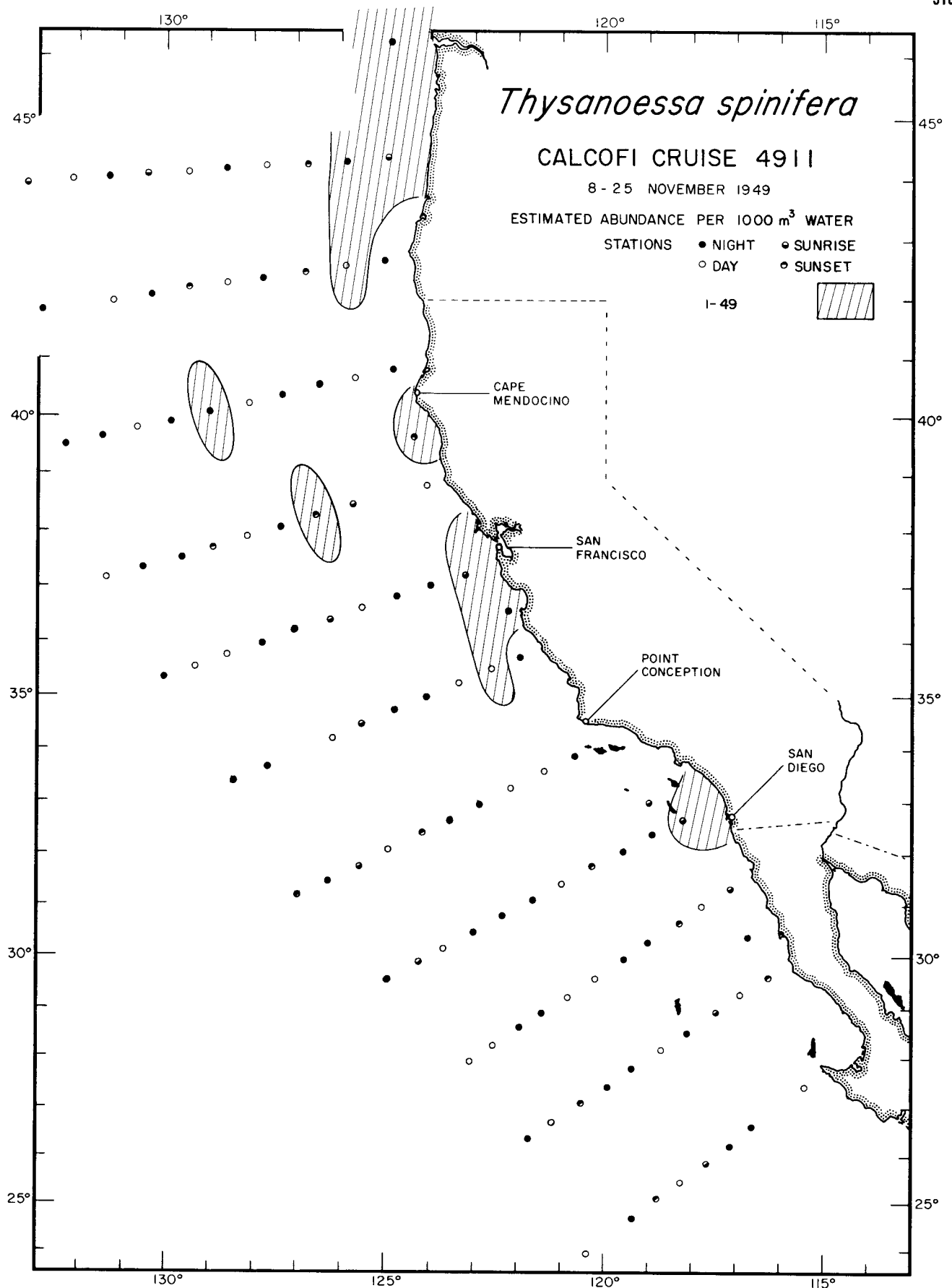
Euphausiacea
Thysanoessa spinifera
4908



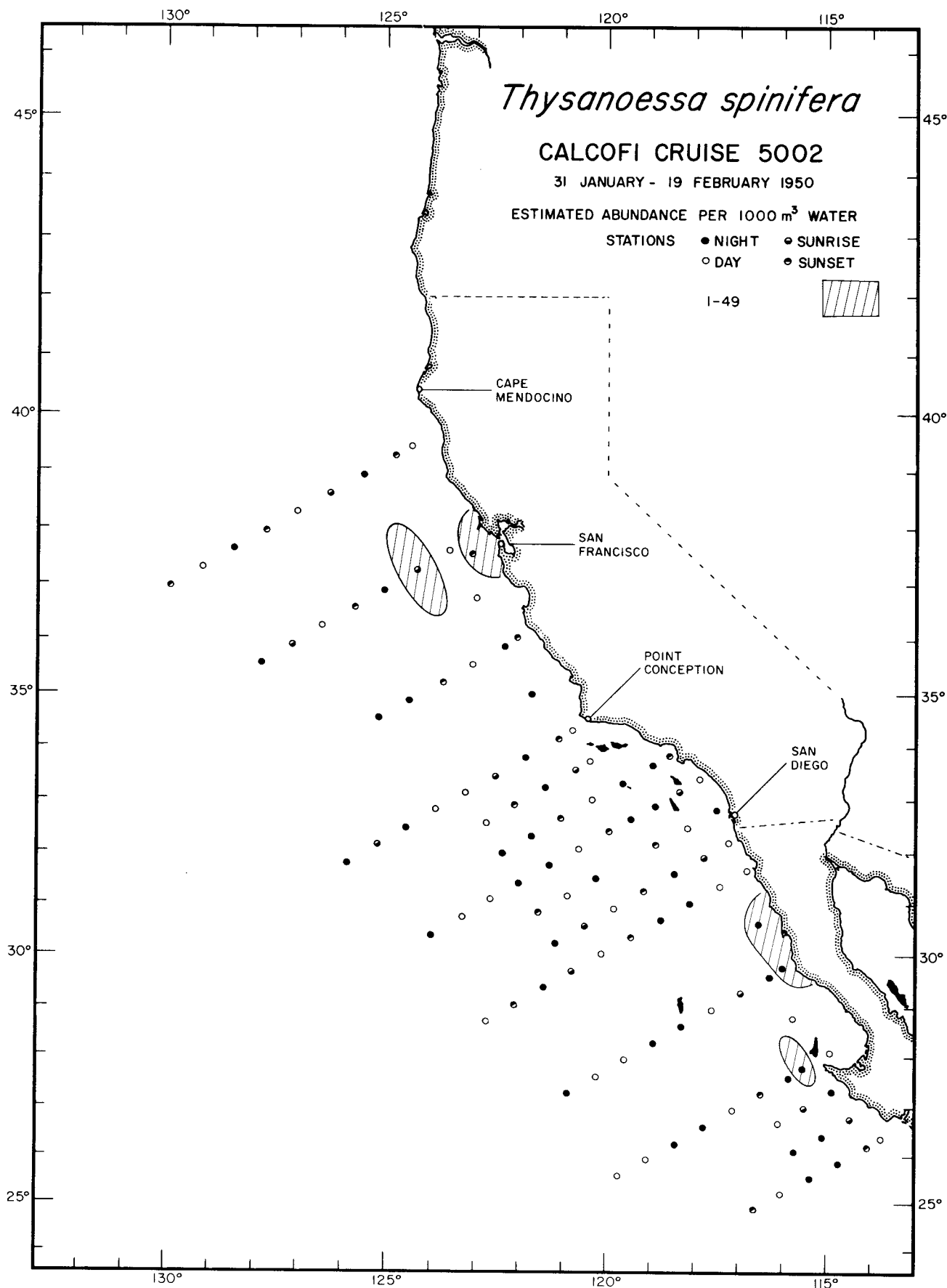
Euphausiacea
Thysanoessa spinifera
4909



Euphausiacea
Thysanoessa spinifera
 4910



Euphausiacea
Thysanoessa spinifera
 4911



Thysanoessa spinifera

CALCOFI CRUISE 5002

31 JANUARY - 19 FEBRUARY 1950

ESTIMATED ABUNDANCE PER 1000 m³ WATER

STATIONS ● NIGHT ○ DAY
■ SUNRISE □ SUNSET

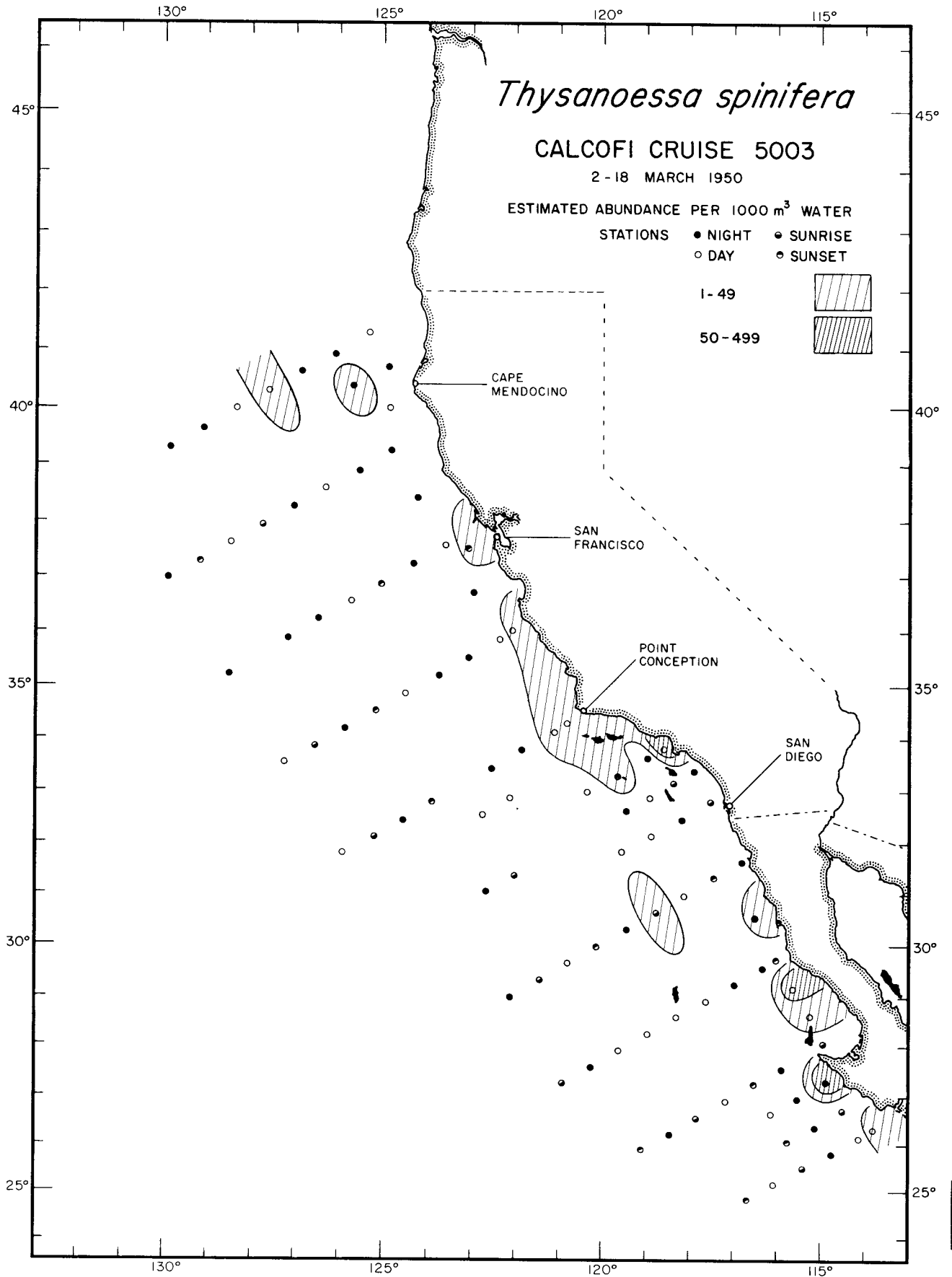
1-49 [hatched box]

CAPE MENDOCINO

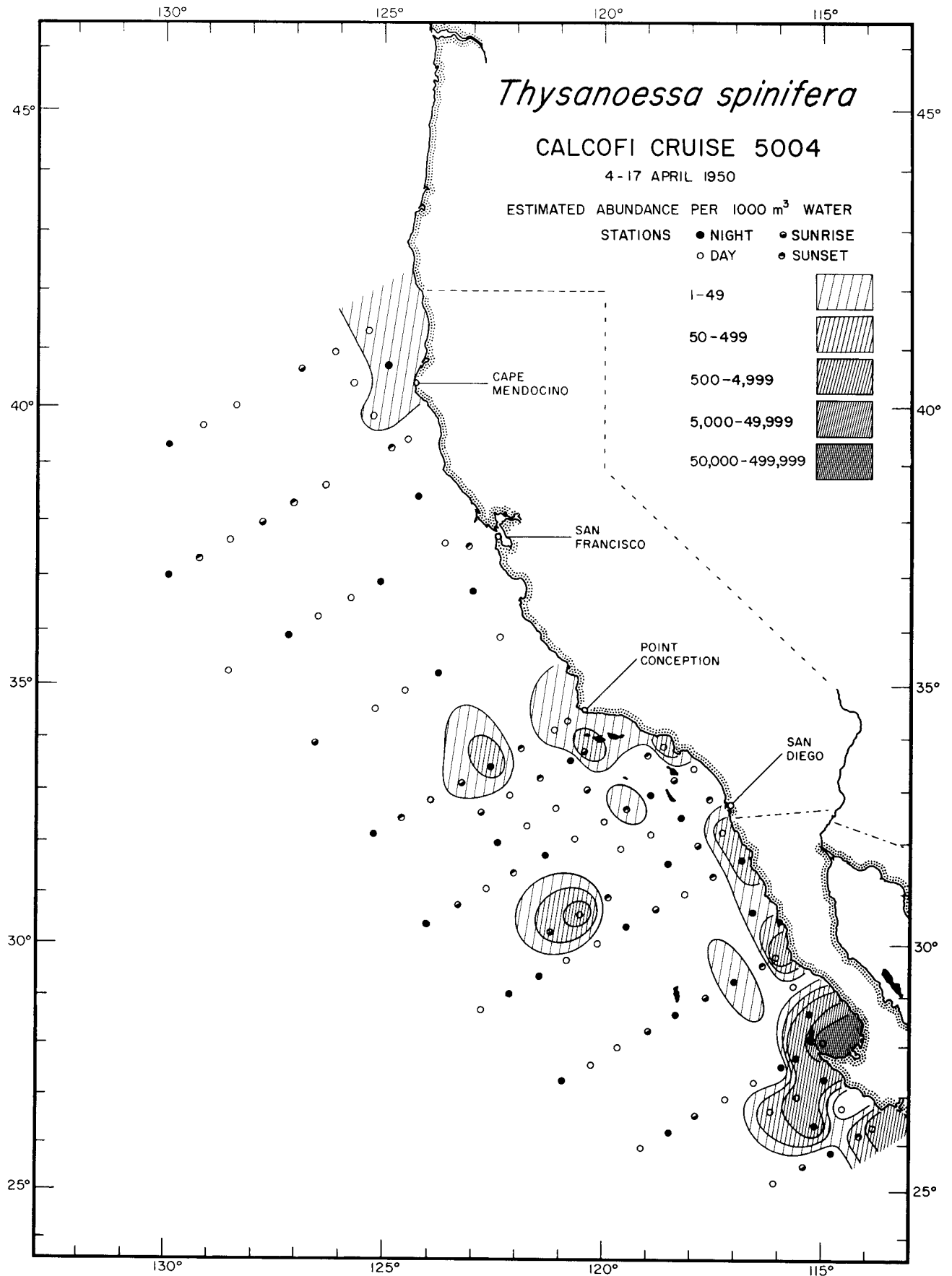
SAN FRANCISCO

POINT CONCEPTION

SAN DIEGO



Euphausiacea
Thysanoessa spinifera
5003



Euphausiacea
Thysanoessa spinifera
5004

135° 130° 125° 120° 115°

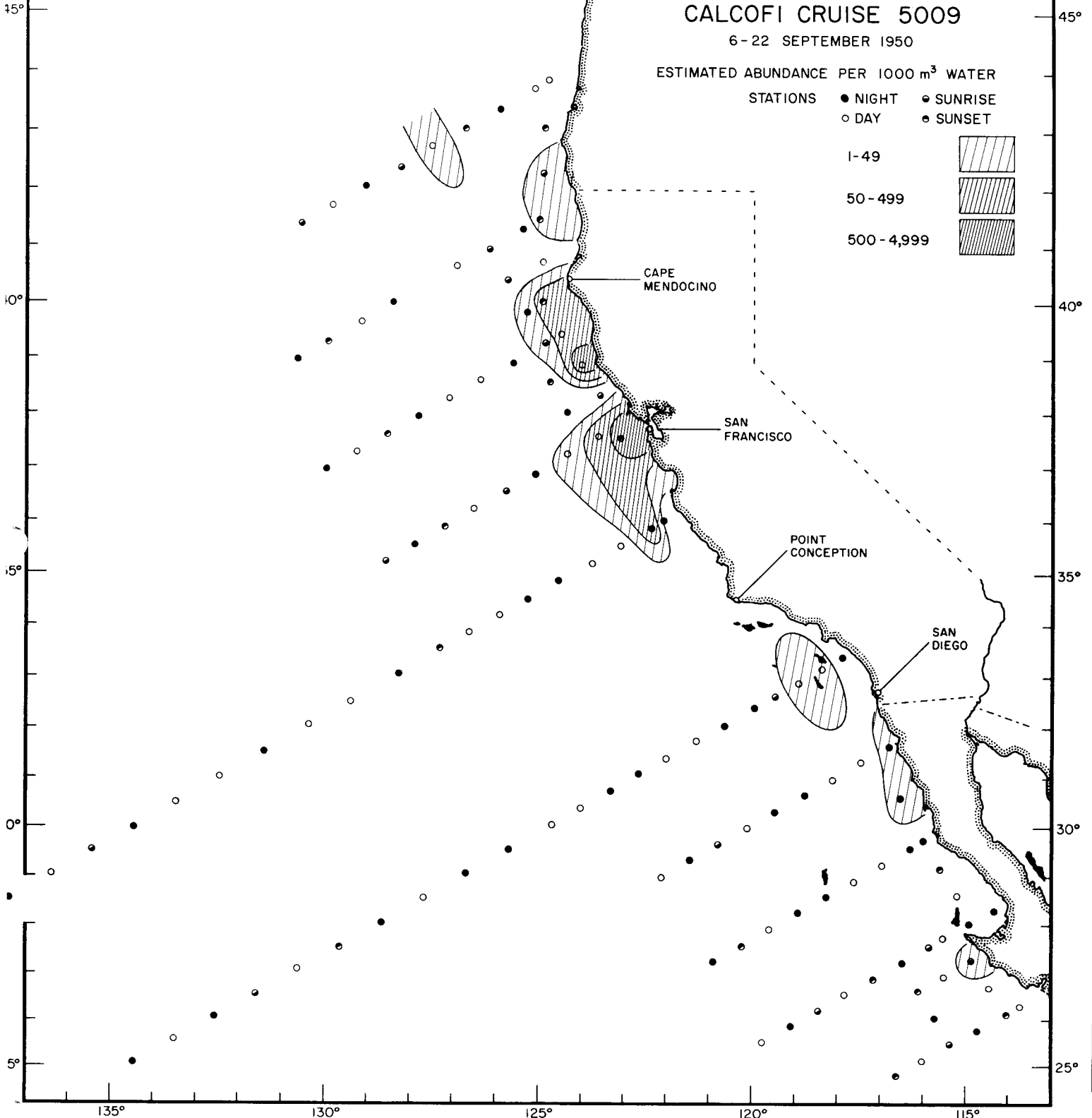
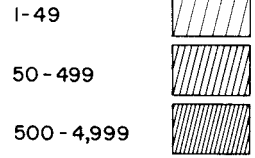
Thysanoessa spinifera

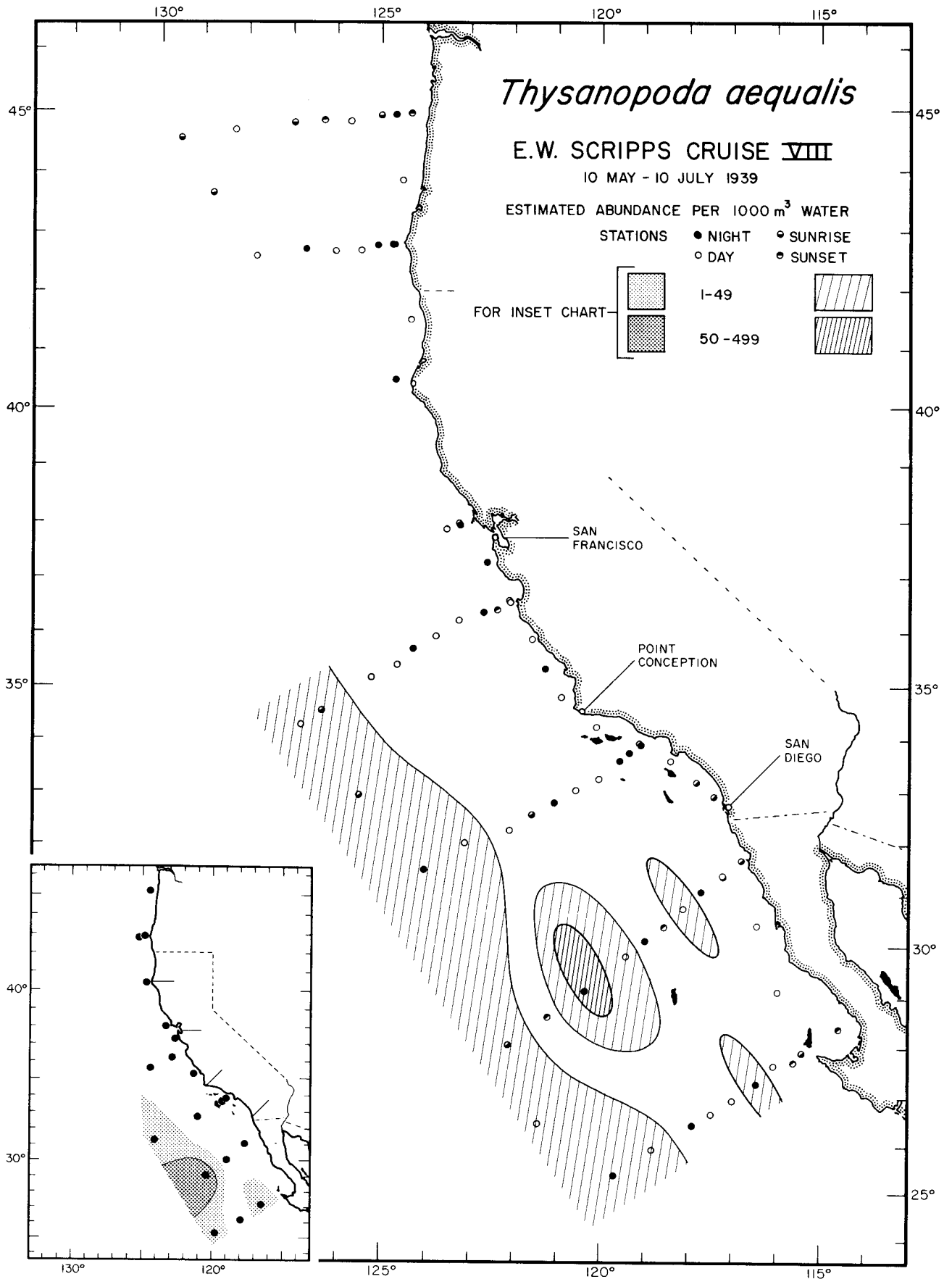
CALCOFI CRUISE 5009

6-22 SEPTEMBER 1950

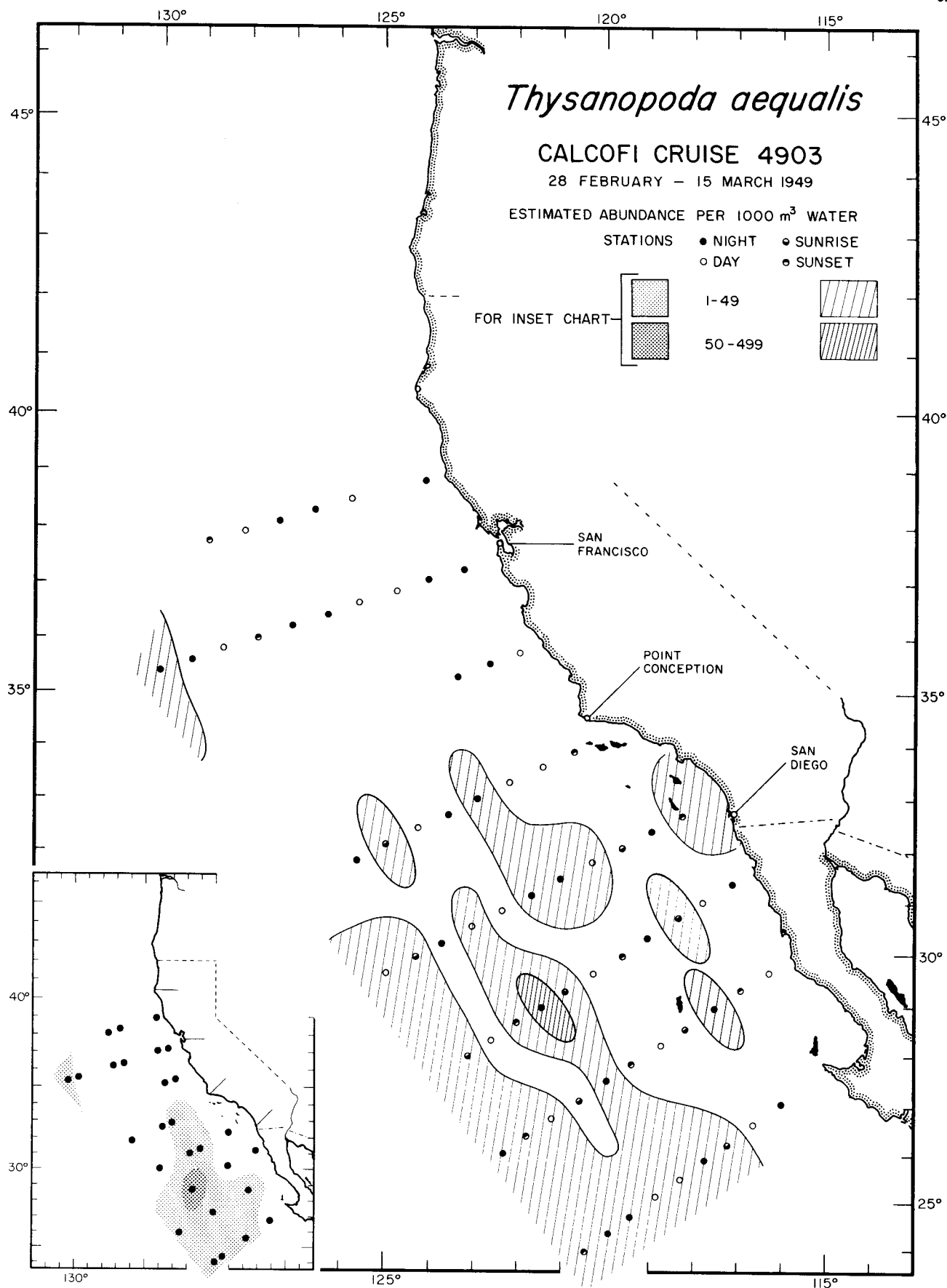
ESTIMATED ABUNDANCE PER 1000 m³ WATER

STATIONS ● NIGHT ○ DAY ● SUNRISE ● SUNSET

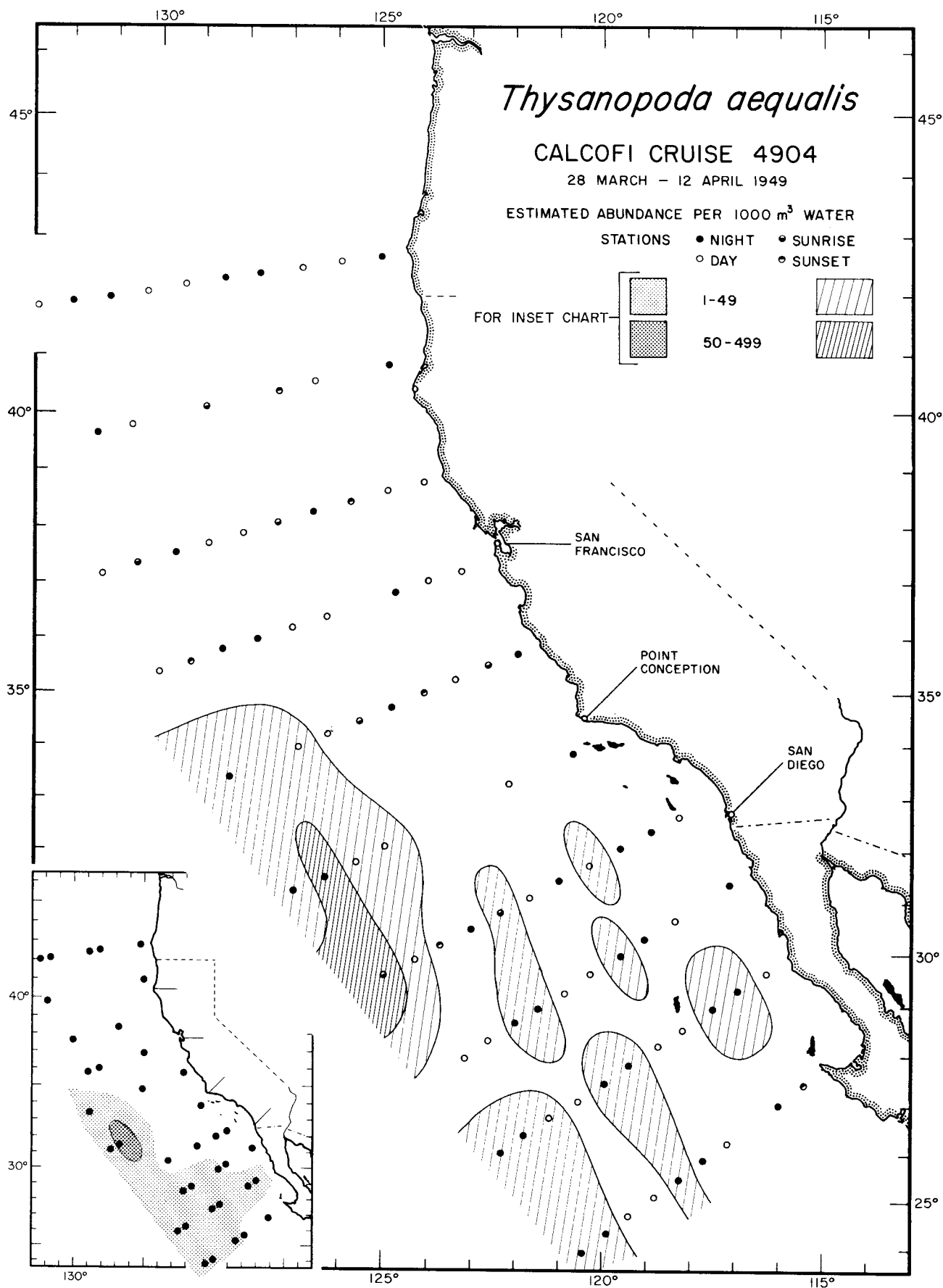




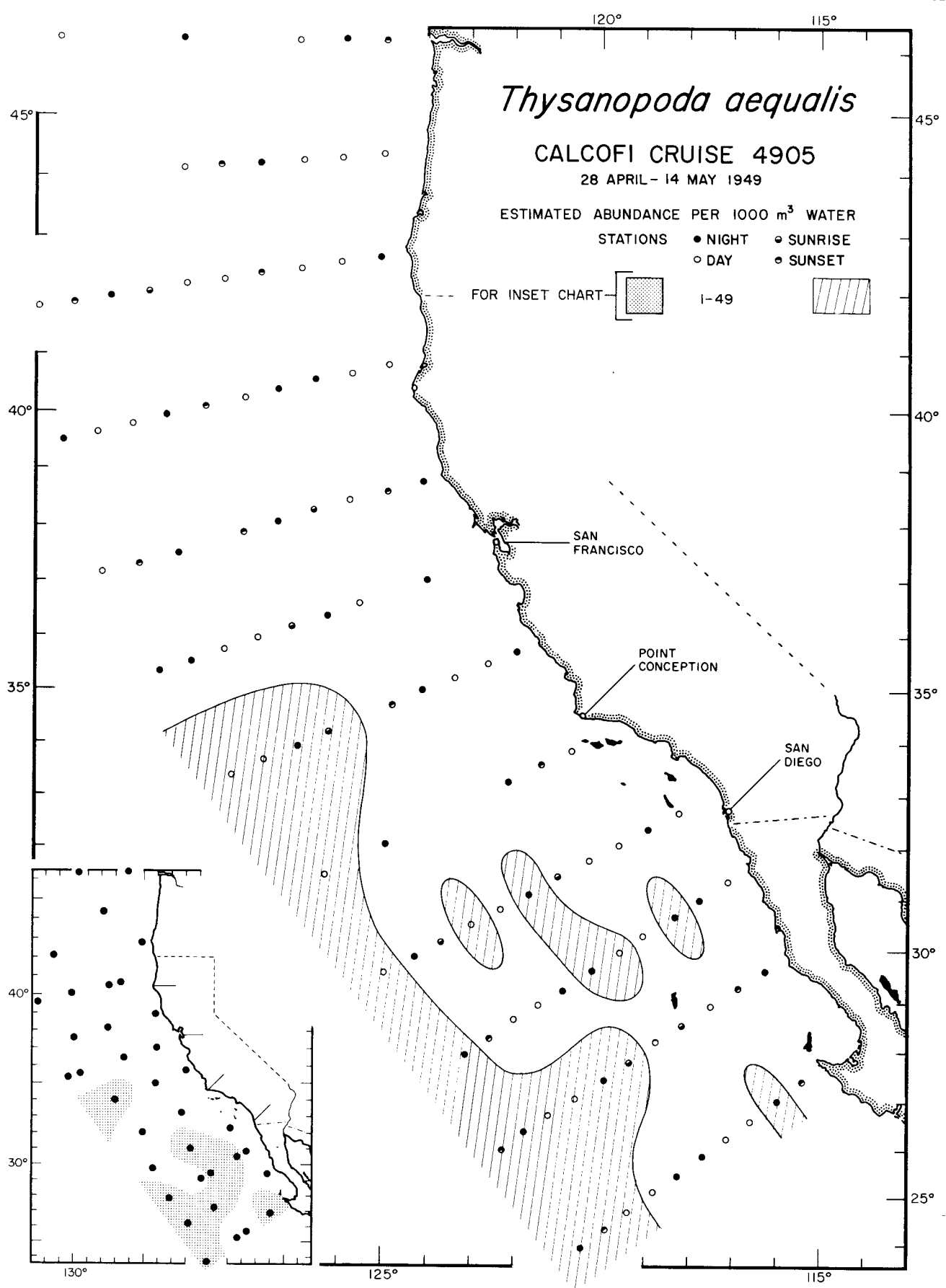
Euphausiacea
Thysanopoda aequalis
E. W. SCRIPPS CRUISE VIII



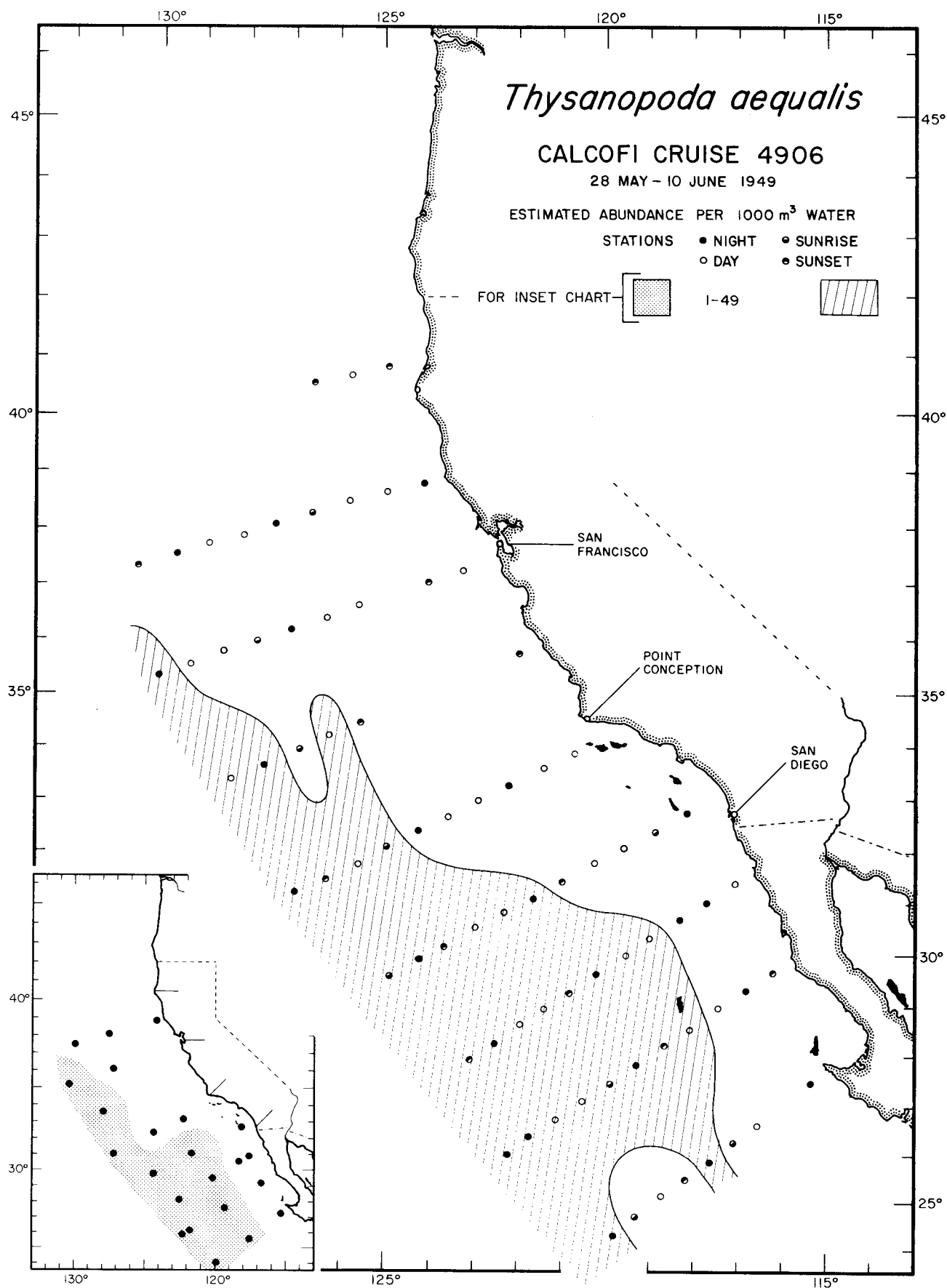
Euphausiacea
Thysanopoda aequalis
4903



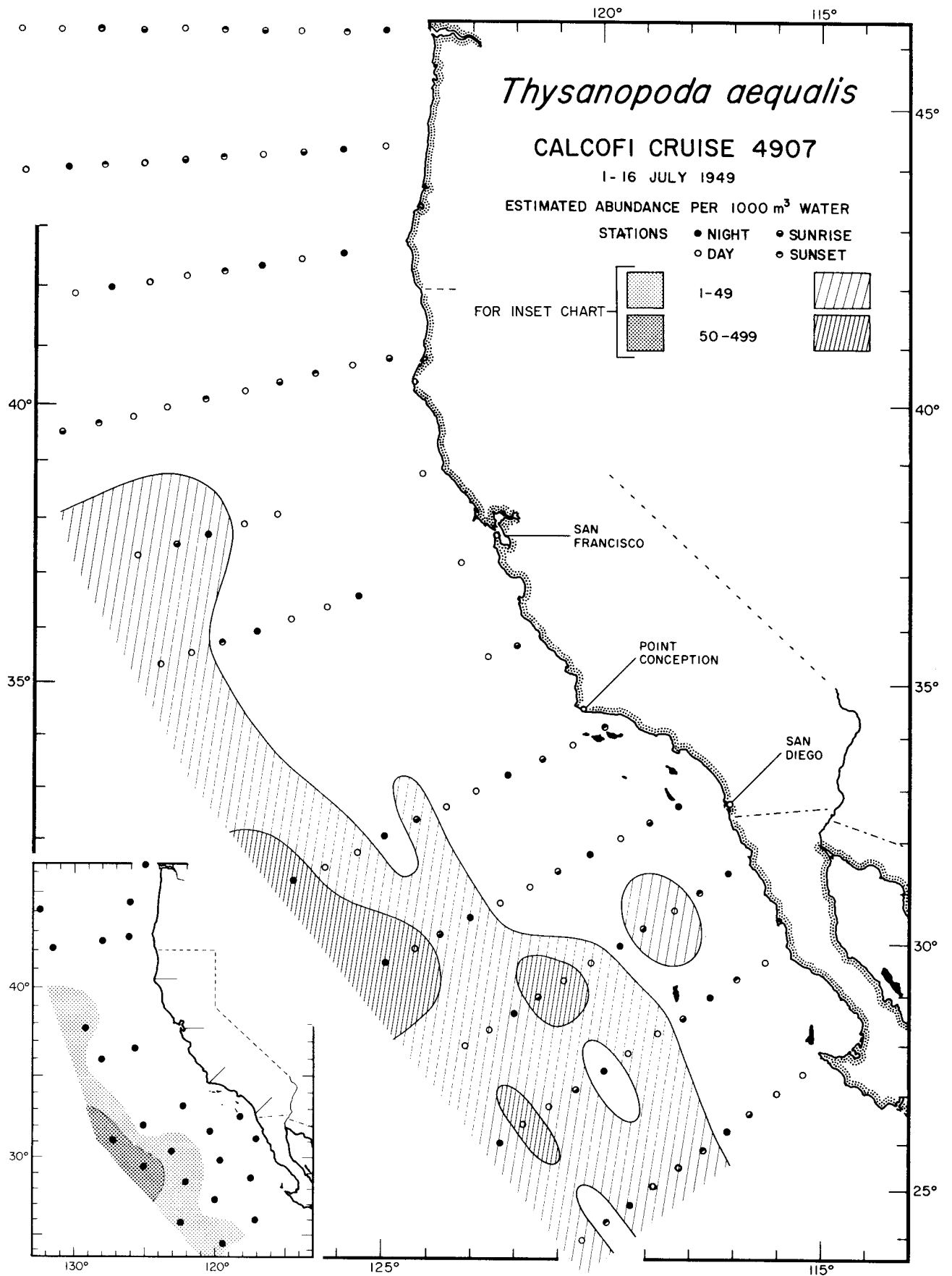
Euphausiacea
Thysanopoda aequalis
4904



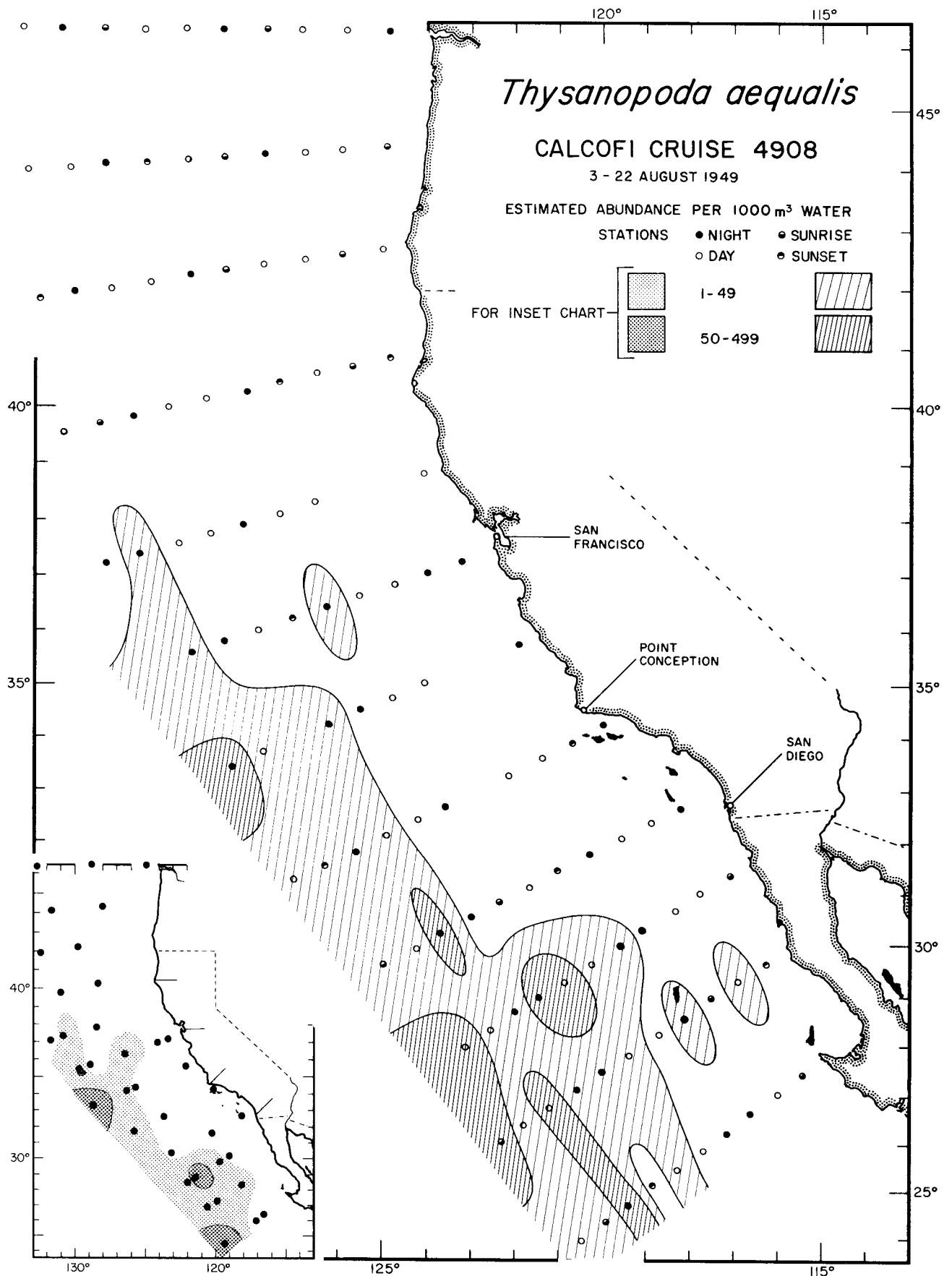
Euphausiacea
Thysanopoda aequalis
4905



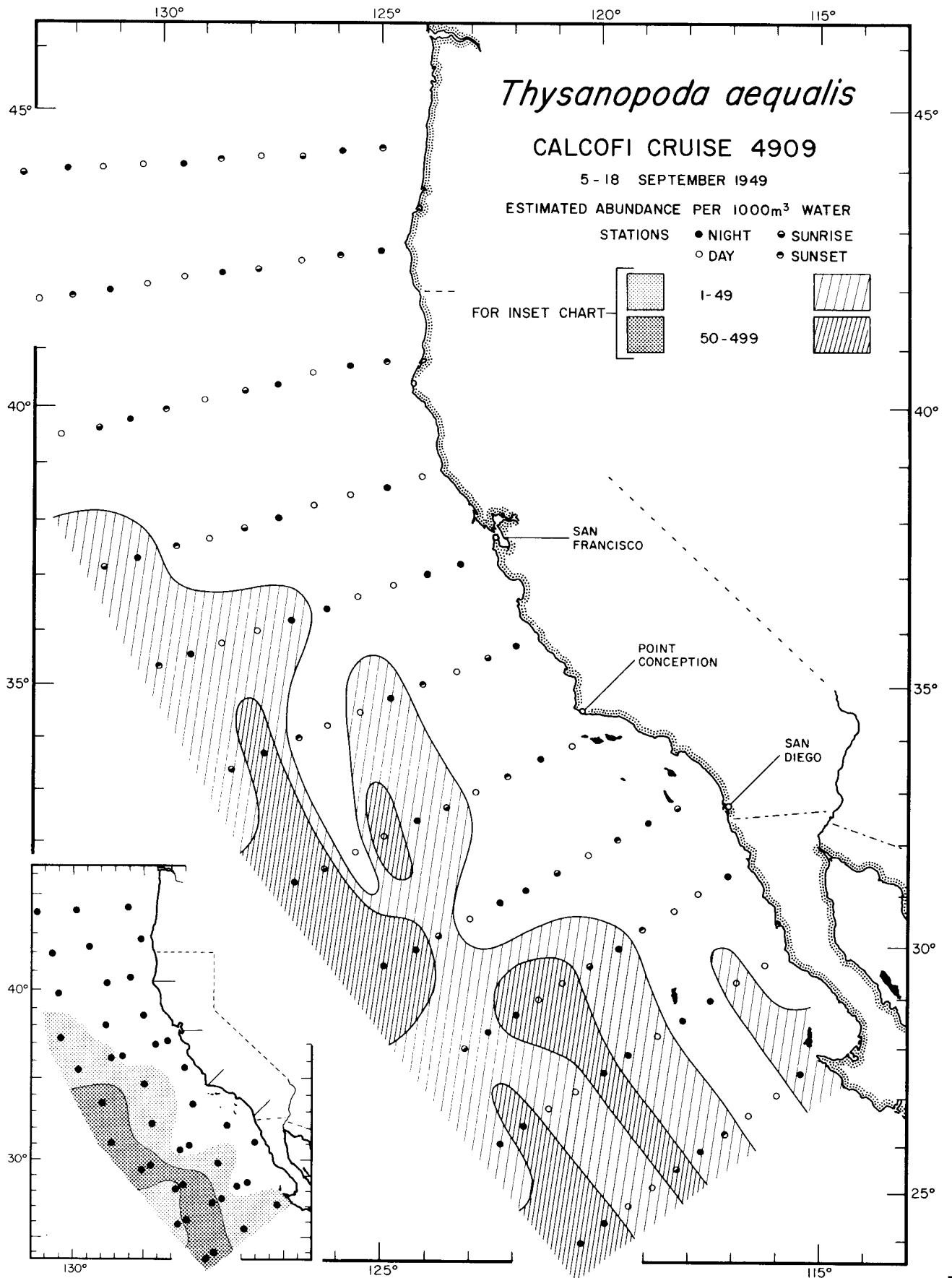
Euphausiacea
Thysanopoda aequalis
4906



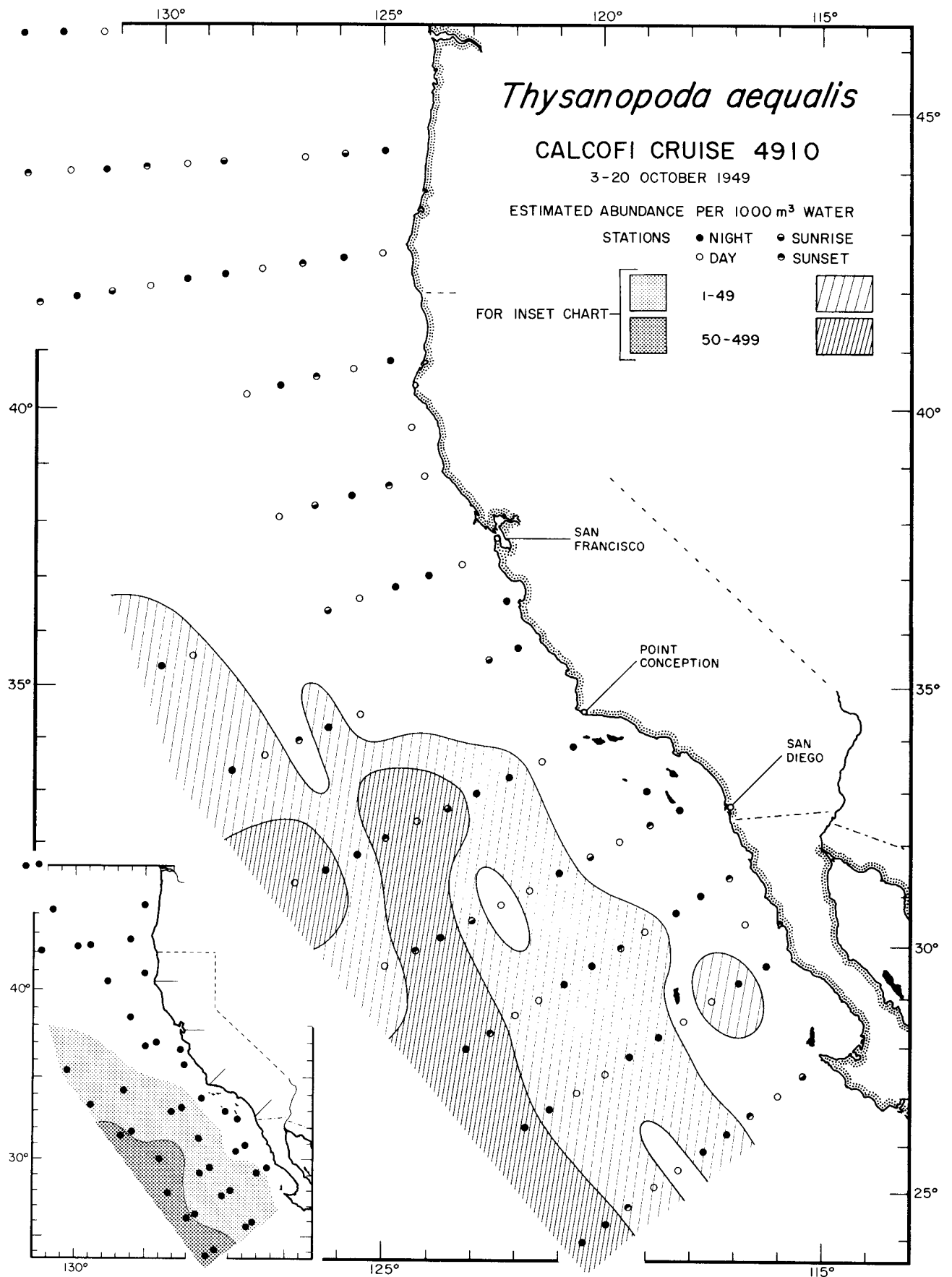
Euphausiacea
Thysanopoda aequalis
4907



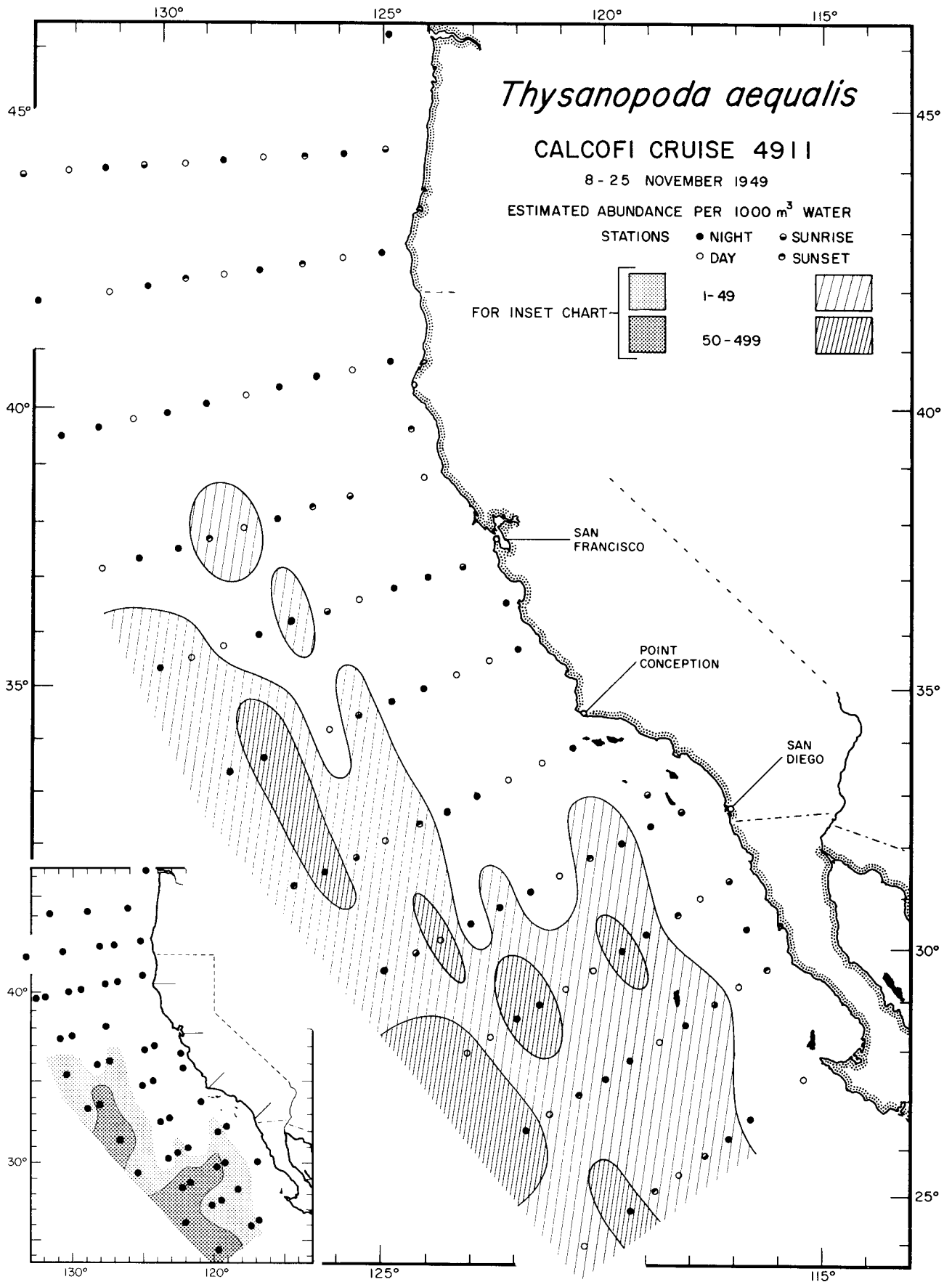
Euphausiacea
Thysanopoda aequalis
4908



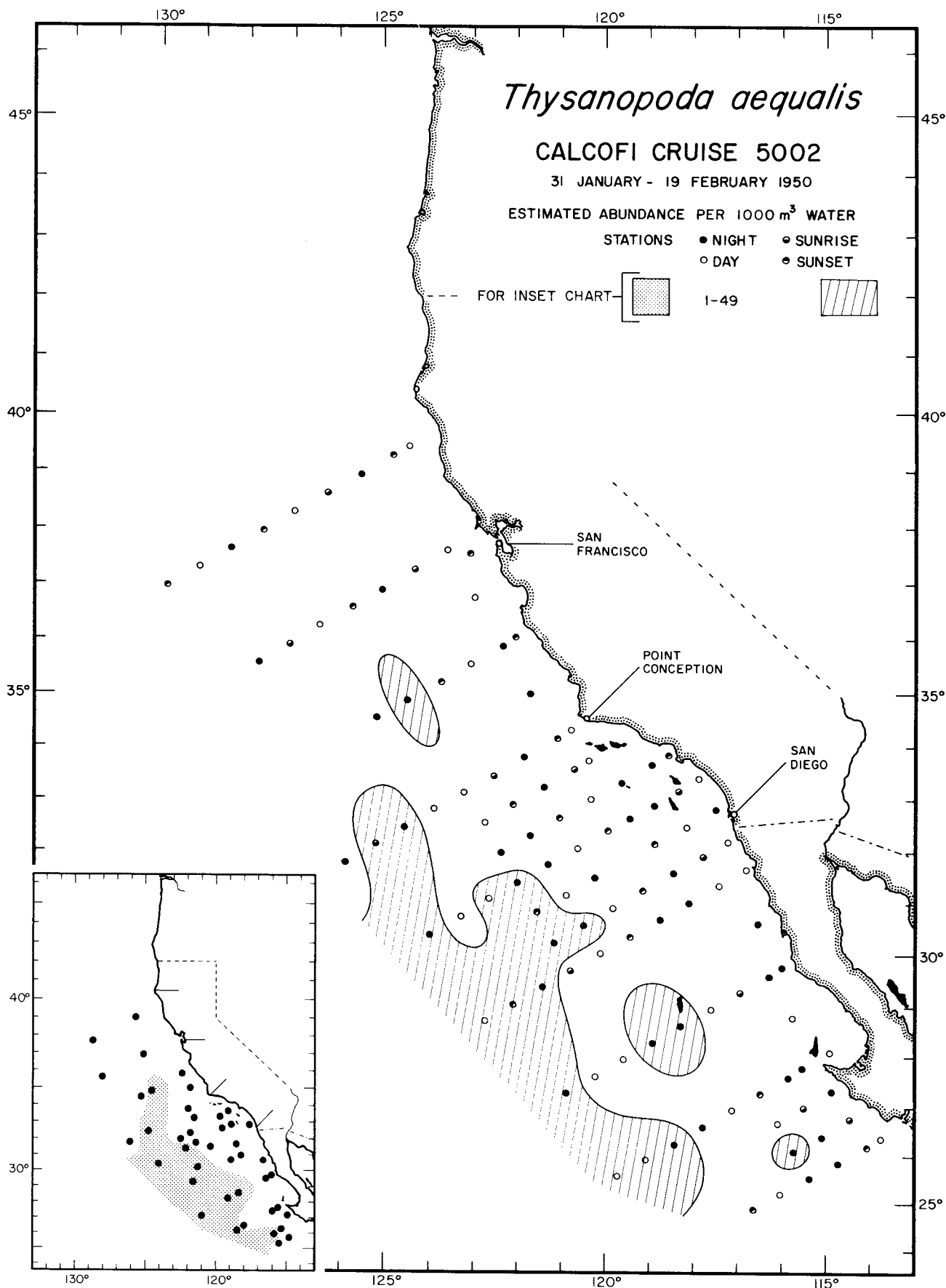
Euphausiacea
Thysanopoda aequalis
4909



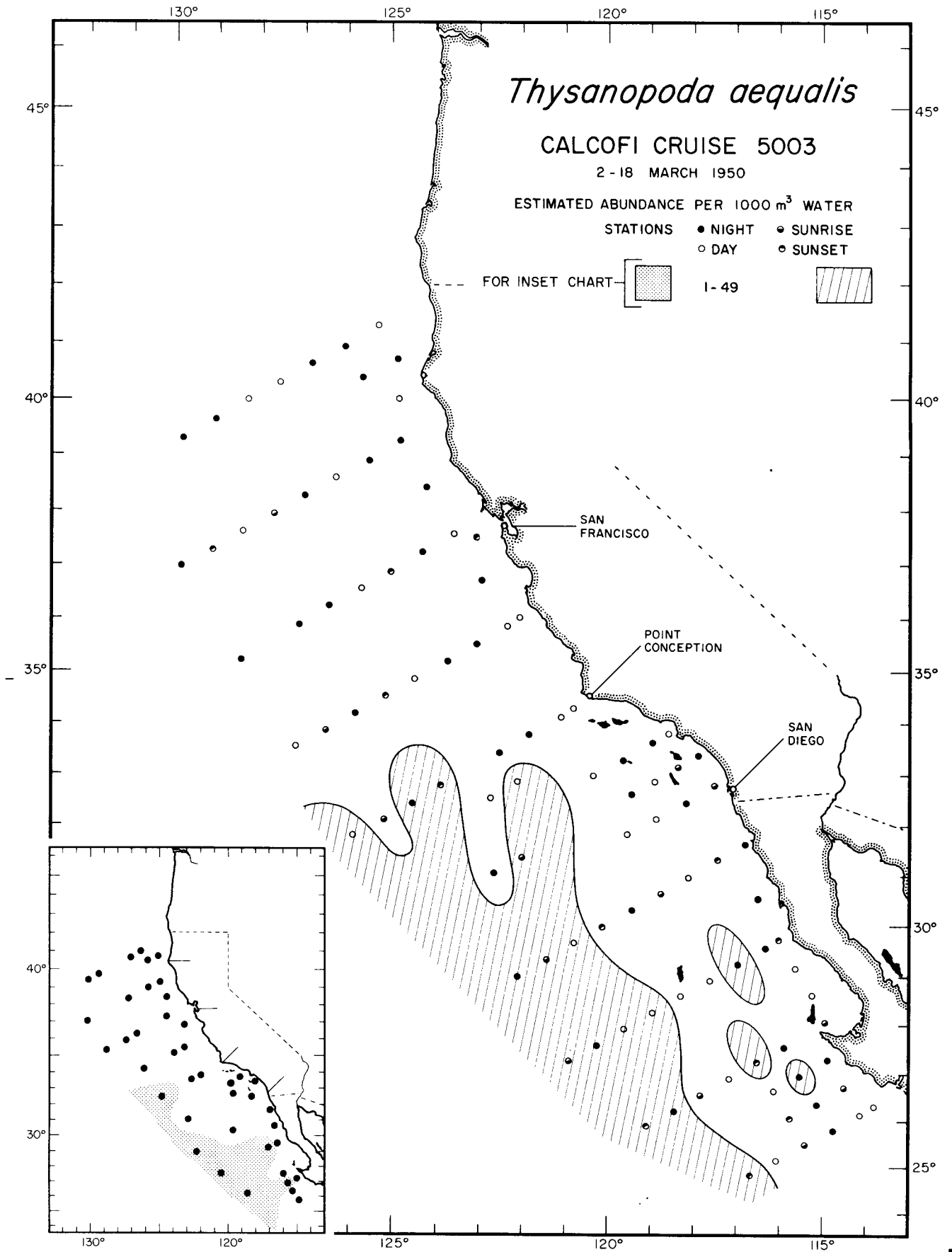
Euphausiacea
Thysanopoda aequalis
4910



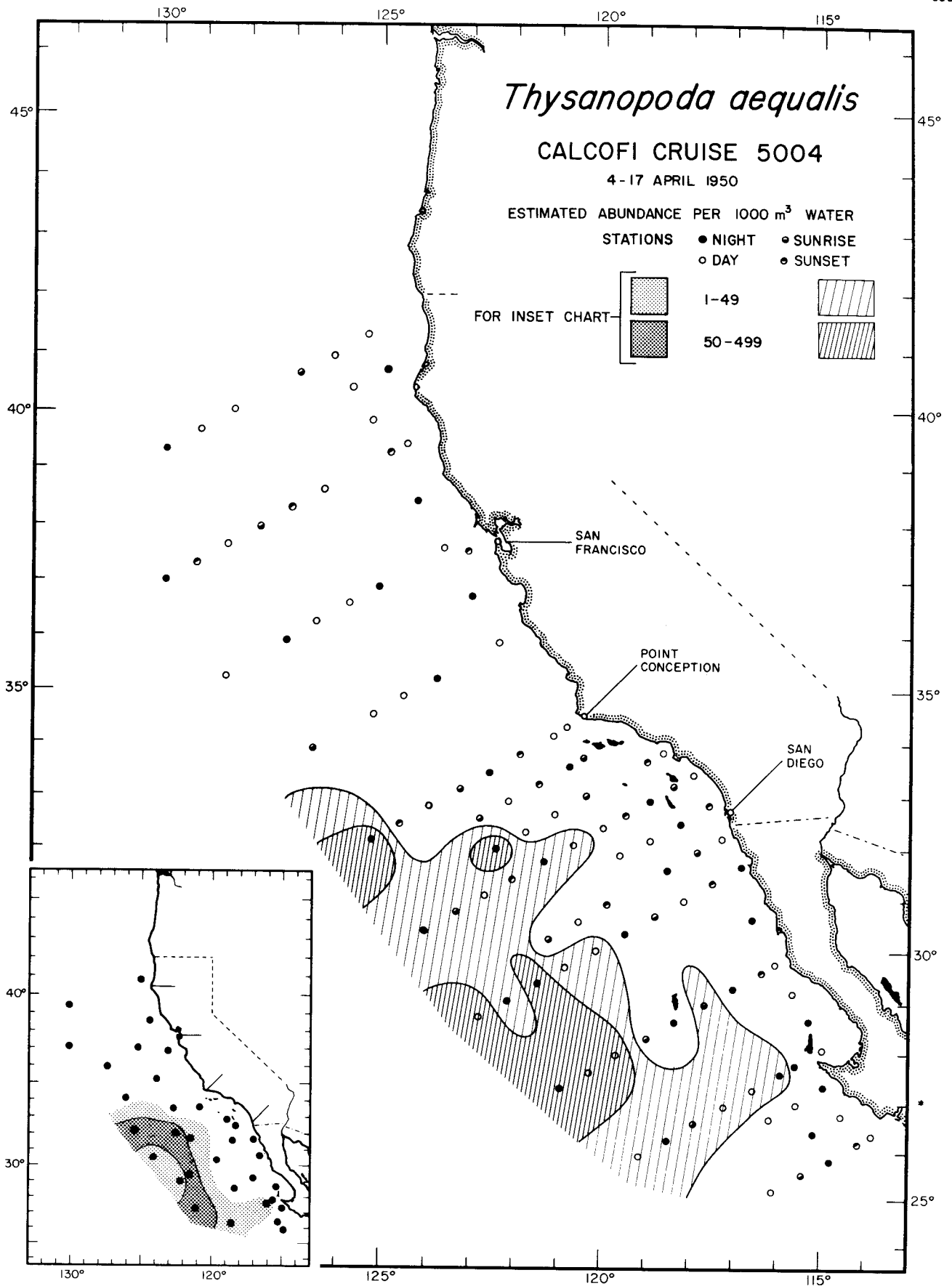
Euphausiacea
Thysanopoda aequalis
4911



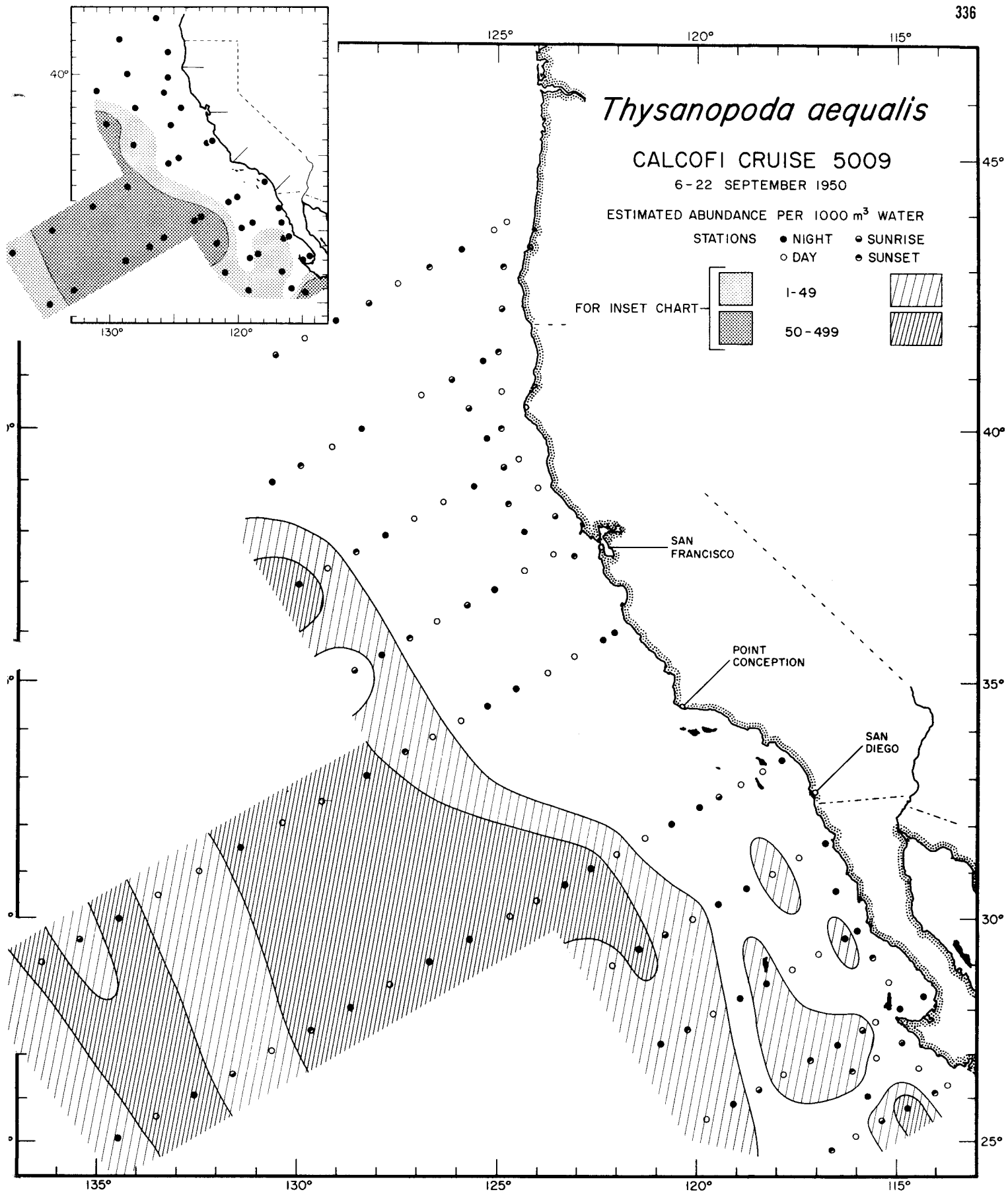
Euphausiacea
Thysanopoda aequalis
5002



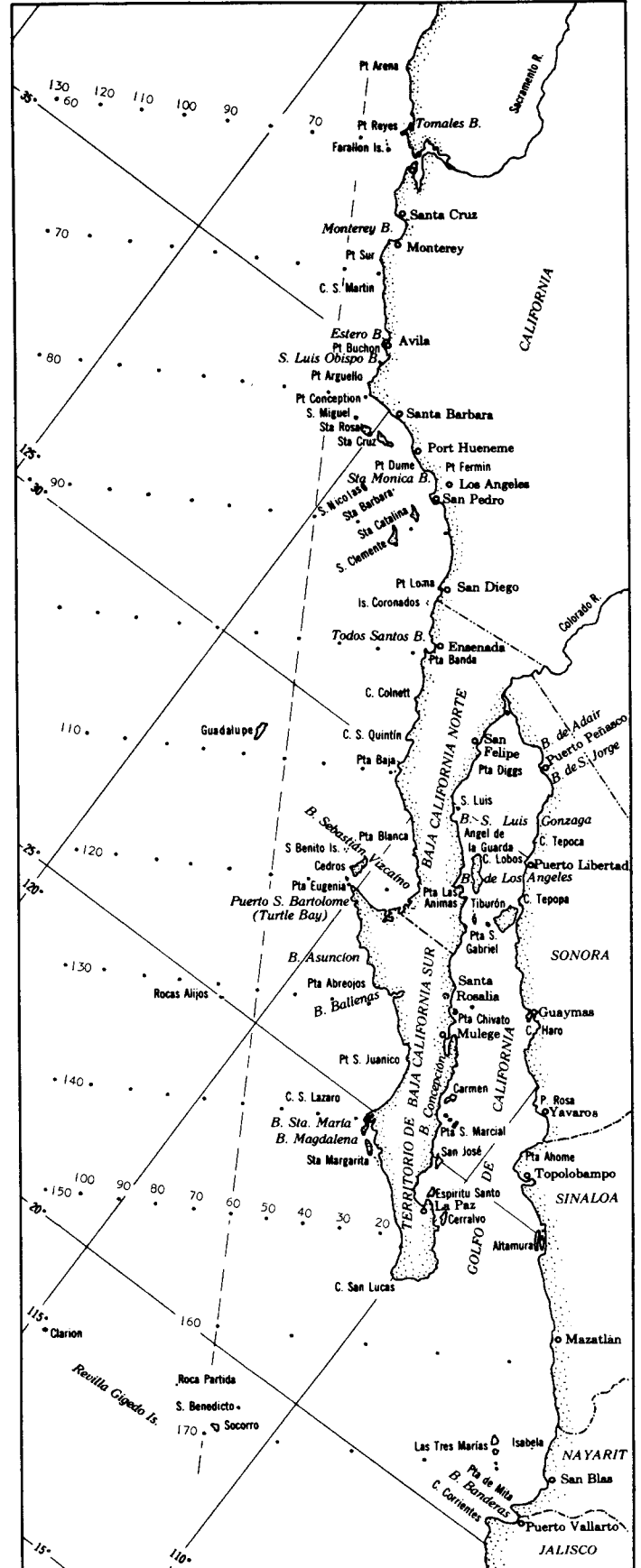
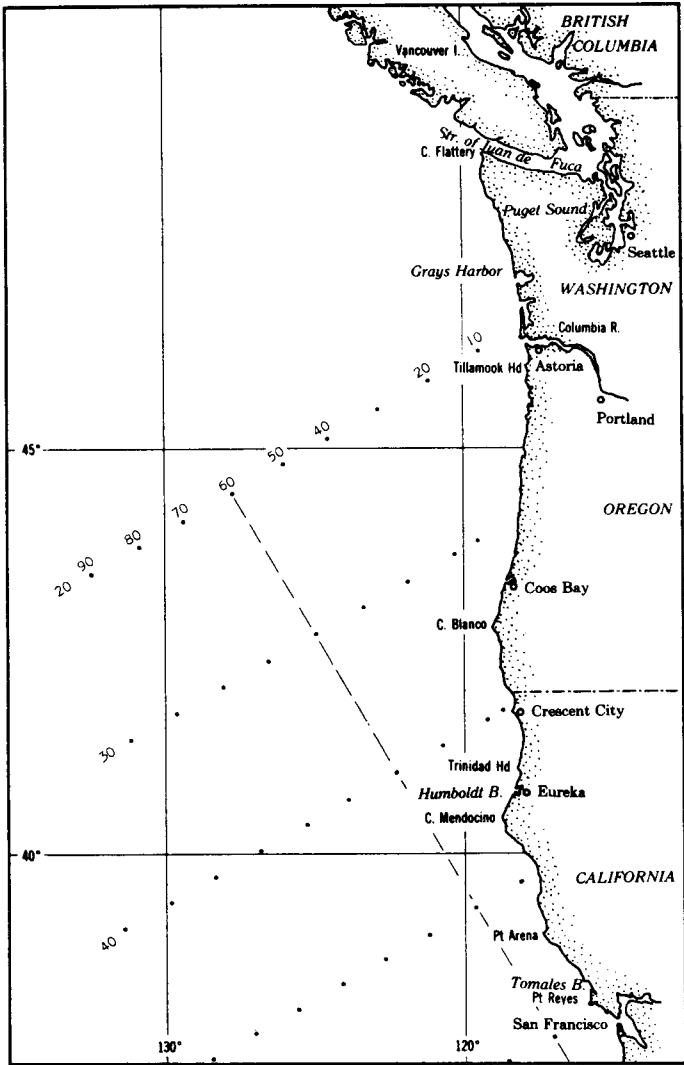
Euphausiacea
Thysanopoda aequalis
5003



Euphausiacea
Thysanopoda aequalis
5004



Euphausiacea
Thysanopoda aequalis
5009



These maps are designed to show essential details of the area most intensively studied by the California Cooperative Oceanic Fisheries Investigations. This is approximately the same area as is shown in color on the front cover. Geographical place names are those most commonly used in the various publications emerging from the research. The cardinal station lines extending southwestward from the coast are shown. They are 120 miles apart. Additional lines are utilized as needed and can be as closely spaced as 12 miles apart and still have individual numbers. The stations along the lines are numbered with respect to the station 60 line, the numbers increasing to the west and decreasing to the east. Most of them are 40 miles apart, and are numbered in groups of 10. This permits adding stations as close as 4 miles apart as needed. An example of the usual identification is 120.65. This station is on line 120, 20 nautical miles southwest of station 60.

The projection of the front cover is Lambert's Azimuthal Equal Area Projection. The detail maps are a Mercator projection.

CONTENTS

Edward Brinton

Distributional atlas of Euphausicea (Crustacea) in the
California Current region, Part II.

v

Charts

1 - 336