Band Transects

Access Table Design Structure for Band Transect

Field Name	Data Type
ProgramCode	Text
Year	Number
EventCode	Text
IslandCode	Text
SiteCode	Text
Species	Number
Transect	Number
CountA	Number
CountB	Number

Sample Size and Database Anomalies

The number of band transects and their size has changed only once since 1983, when data collection began using this method. In 1983 and 1984, 10 band transects at each site were conducted. Each of these transects represented an area of 2 m × 20 m or 40 m². From 1985 to the present, 12 band transects are performed at each site where each transect measures 3 m × 20 m or 60 m².

CountA and CountB: Divers sample from opposite sides of the transect line (CountA and CountB) each covering 30 m² of the total 60 m² transect area (see sampling method protocol). From 1983-1994 both counts A and B were added together by hand before being entered into the database. The combined count was then entered as CountA with CountB as null.

From 1995-present the data for each diver (A and B) are entered separately into the computer as CountA and CountB.

Table 20. Number and size of band transects 1983-present.

Year	# transects sampled	Transect size	Count A	Count B
1983 – 1984	10	40m²	yes	null
1985 – 1994	12	60m²	yes	null
1995 – present	12	60m²	yes	yes

Band Transect Placement

Prior to 1996 random points selected for placement of the quadrats were stratified random. After 1996, the sampling points are systematic with a randomly selected starting point.

Organisms Sampled Information

Table 21. Band transect species sampling history.

Species Name	Species Code	Comments
Undaria pinnatifida	2009.00	Sampling began 2016*
Undaria pinnatifida	2009.50	Sampling began 2016*
Sargassum holderi adult	2016.00	Sampling began in 2010

Sargassum holderi juvenile	2016.50	Sampling began in 2010, discontinued 2014
Tethya aurantia	5002.00	Sampling began in 1983
Stylaster (*Allopora*) *californica*	6001.00	Sampling began in 1983
*Telia lofotensis**	6002.00	Sampling began in 1983*
Lophogorgia chilensis	6006.00	Sampling began in 1983
Muricea fruticosa	6007.00	Sampling began in 1983
*Muricea californica**	6008.00	Sampling began in 1988-1990*
Panulirus interruptus	8001.00	Sampling began in 1983
Haliotis rufescens	9002.00	Sampling began in 1983
Haliotis corrugata	9003.00	Sampling began in 1983
Haliotis fulgens	9004.00	Sampling began in 1983
Kelletia kelletii	9006.00	Sampling began in 1983
Megathura crenulata	9009.00	Sampling began in 1983
Crassadoma (*Hinnites*) *gigantea*	9010.00	Sampling began in 1983
Aplysia californica	9011.00	Sampling began in 1983
*Haliotis assimilis**	9012.00	Sampling began in 1983*
*Haliotis sorenseni**	9013.00	Sampling began in 1983*
*Cryptochiton stelleri**	9015.00	Sampling conducted sporadically 2005-2011, continually sampled from 2012*
Pycnopodia helianthoides	11003.00	Sampling began in 1983
*Lytechinus anamesus**	11004.00	Sampling began in 1983*

*see below

Muricea californica was sporadically sampled from 1988-1990, and was formally added to this protocol in 1991.

Lytechinus anamesus were not sampled at the following sites for the following years due to having very high densities: SCPB 1987, SCYB 1986-90, and ANAR 1986-90. However, *L. anamesus* was counted on 1 m quadrats for those years, but the data collected are not very comparable since the habitat sampled on quadrats differs from the habitat sampled on band transects. Therefore, sampling of *L. anamesus* on 1 m quadrats in place of sampling it on band transects will not be continued.

Sargassum holderi adults were added to band transects in 2010. Beginning in 2015, bands with counts greater than 150 individuals on hlf of the band are subsampled. Only half of the band is sampled, and the subsampled bands are labeled on the datasheet. For data entry purposes, the counts on the subsampled bands are doubled and entered the same as non-subsampled data. This species may be removed from this protocol when densities become too great and it can be adequately sampled on 1 m quadrats and/or 5 m quadrats.

Sargassum holderi juveniles were added to band transects in 2010. This species was removed from this protocol after the 2014 field season due to densities becoming too great to count.

Need to discuss identification issue with *Urticina lofotensis*.

Haliotis sorenseni and *H. assimilis* were added to the band transect data sheet as write-in species in 2011. Since there is not enough room to print both of these species on the data sheets, the names will be written in whenever present. Though these species were formally added as write-in species in 2011, all abalone species are actively sought for on band transects. If any *H. sorenseni* or *H. assimilis* were present, they would have been recorded in the site biological notes, which go back to the year 1990. However even though good site notes were not available

from 1982-1989, we believe no were observed in these years. Site notes were reviewed in 2011 for any recorded observations of these species at KFM sites. The only records found were for individuals found in ARMs or just outside of the site area. Therefore, the database was populated with zeros for all years prior to these species being formally included as write-in species in 2011.

Cryptochiton stelleri was added to the band transect data sheet as a write-in species in 2012. This species had been sampled intermittently from 2005 to 2011. In 2012, *C. stelleri* was formally added as a write-in species in 2012.

Undaria pinnatifida was added as a write in species in 2016, after it was seen for the first time on Anacapa Island Keyhole. In the first year of sampling, *U. pinnatifida* was separated into adult and subadult categories based soley on weather the plants possessed reproductive sporophylls, regardless of size class. Unfortunately only adult plants were entered in 2016 due to poor communication and the excitement at finding this species [in 2016, the onshore side only had adult plants on bands, however for half of the offshore bands the observer did not categorized plants as juvenile and adult thus only adults were entered (due to the higher number of adults present)]. In 2017, it was decided to make the distinction of juvenile, subadult, and adult plants based on the size class of the plant and the level of sporophylls development. The definition for the different *U. pinnatifida* life stages in 2017 were: juveniles have no midrib present, subadults have midrib but not fluted sporophylls, adults have fluted sporophylls. This posed challenges in keeping the data consistent across all years, so it was decided to enter subadults as juveniles in the database. In 2018, the categorizeation of juvenile, subadult and adult plants was further refined to include size classes. The current size classes are: juveniles are less than 0.5 m tall, reproductive sporophyll absent, subadults are greater than 0.5 m tall and not reproductive (can have frills on either side of blade above the holdfast, but lacks mature, dark brown sporophyll), and adults are greater than 0.5 m tall and have with well developed/reproductive sporophylls. The data continues to be collected at a finer scale than it is entered in case these distinctions are deemed useful in the future. All subadults are entered as juveniles.

Sites Sampled Information

Table 22. Band transect site sampling history.

Dates Available	Island Name	Site Code
1982 – Present	San Miguel	WL, HR
	Santa Rosa	JLNO, JLSO, RR
	Santa Cruz	GI, FH, PB, SA
	Anacapa	AR, CC, LC
	Santa Barbara	SESL, AP
1986 – Present	Santa Barbara	CAT
	Santa Cruz	YB
2001 – Present	San Miguel	MM
2003 – 2004	San Clemente	NWH, BSC, EP, HBC
2005 – Present	Santa Rosa	CP, TC, CSAW, SP
	Santa Cruz	DPM, PP, CVP, LS, PRF
	Anacapa	KH, EFC, BSBR, LH
	Santa Barbara	WA, GC, SER