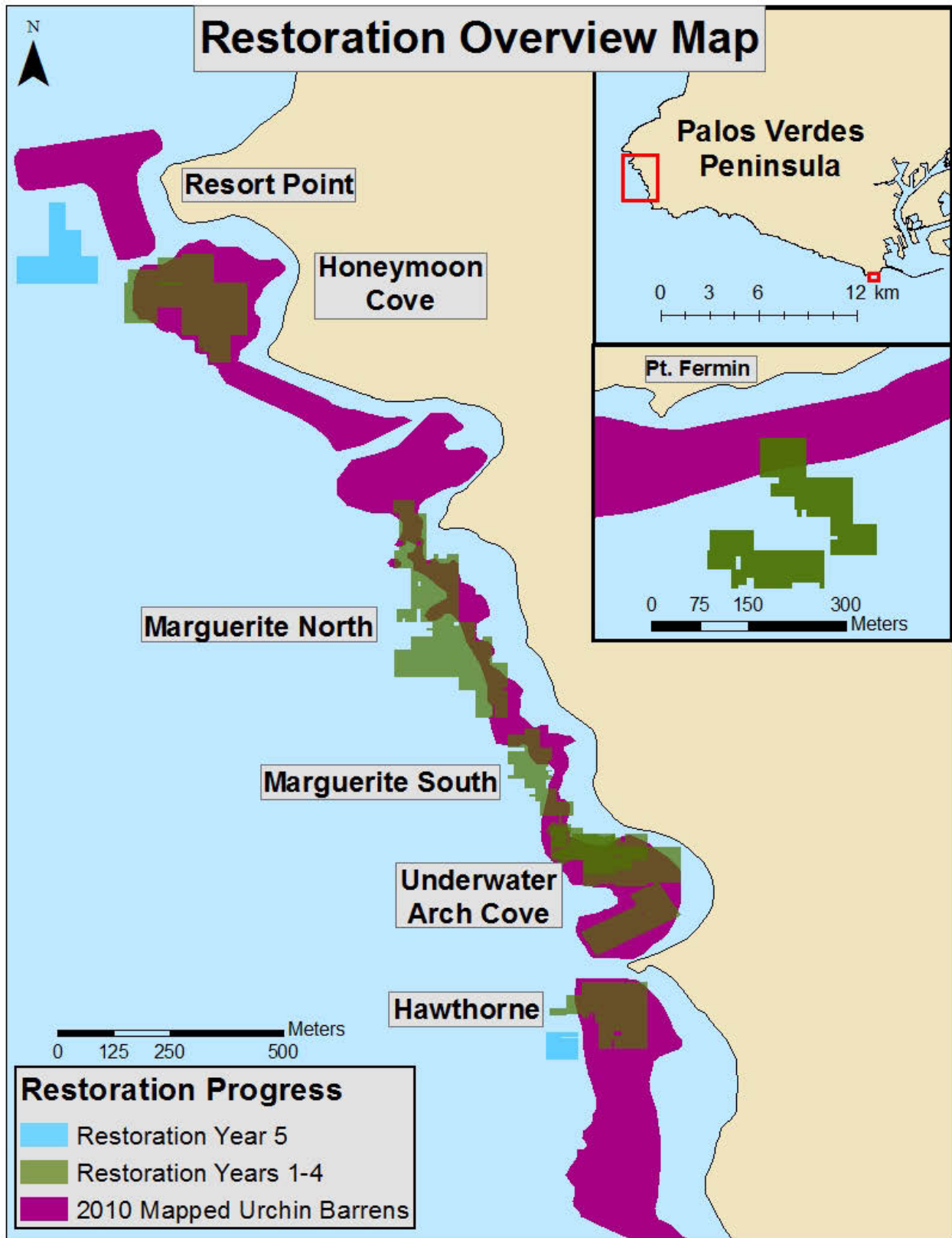
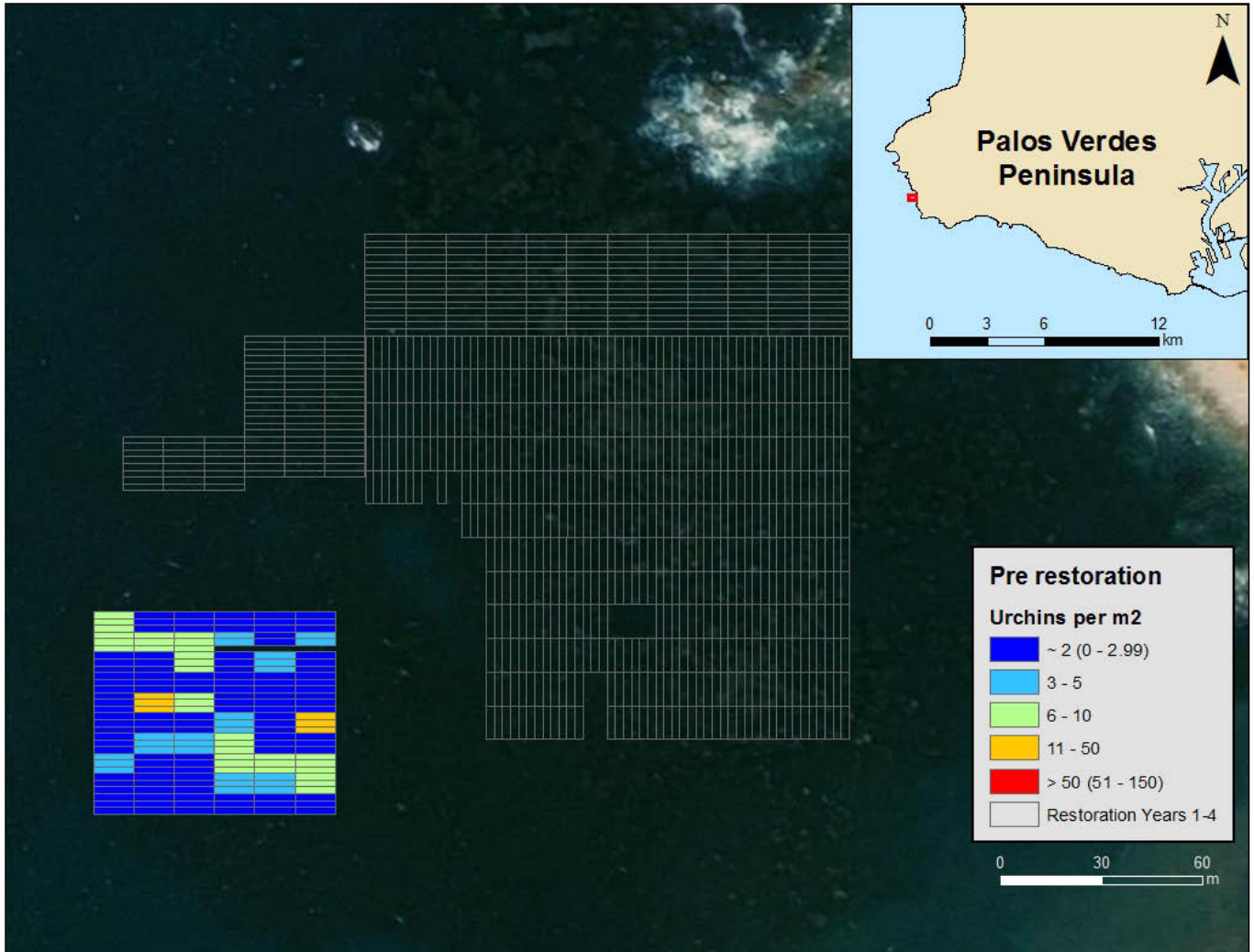


Appendix A: Palos Verdes Kelp restoration Project Map Images

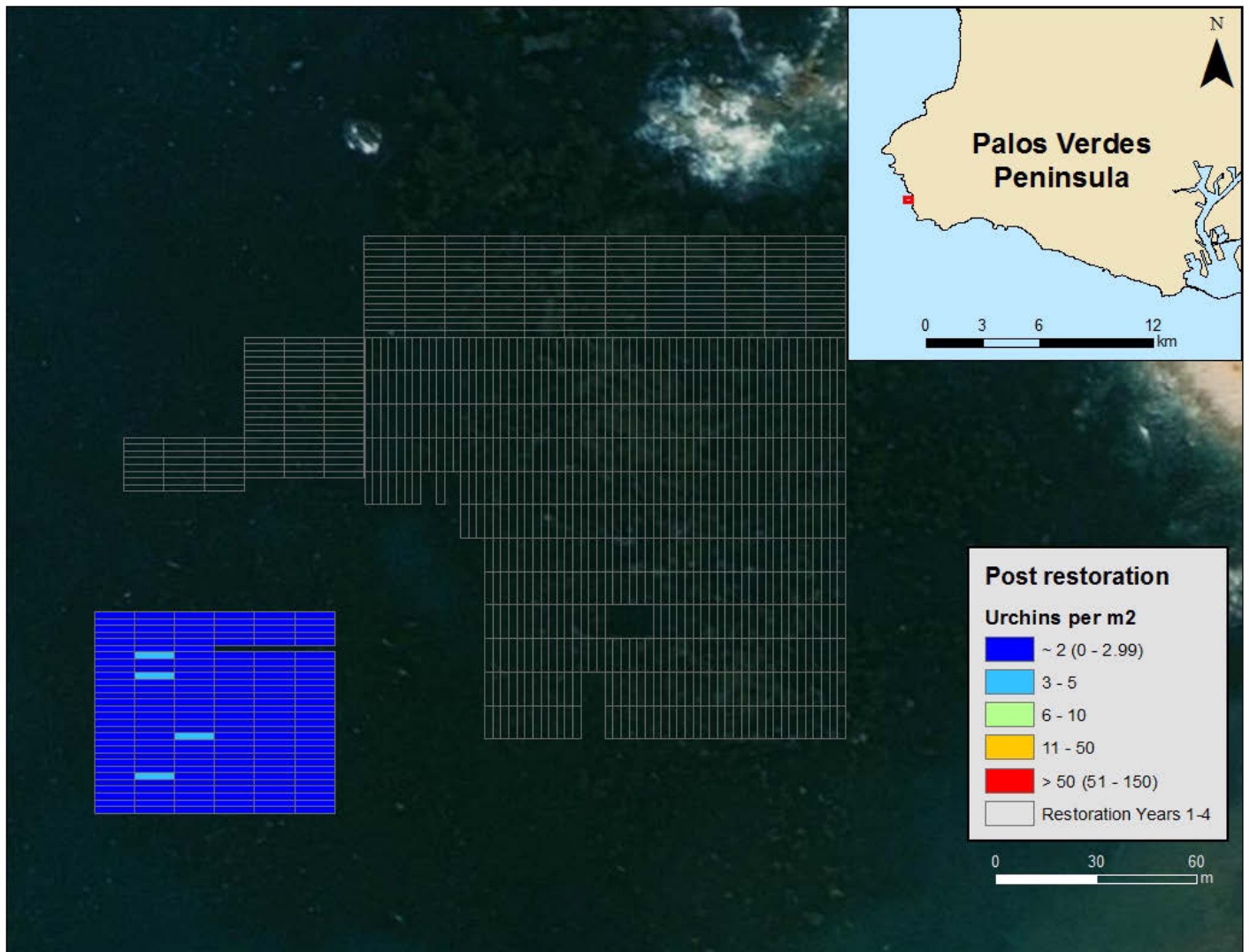


Map A1. Overview of the project area along the Palos Verdes Peninsula showing the urchin barren extent (purple) mapped in 2010. The locations of restoration areas completed in years 1 through 4 are in green, areas restored in year 5 are blue.

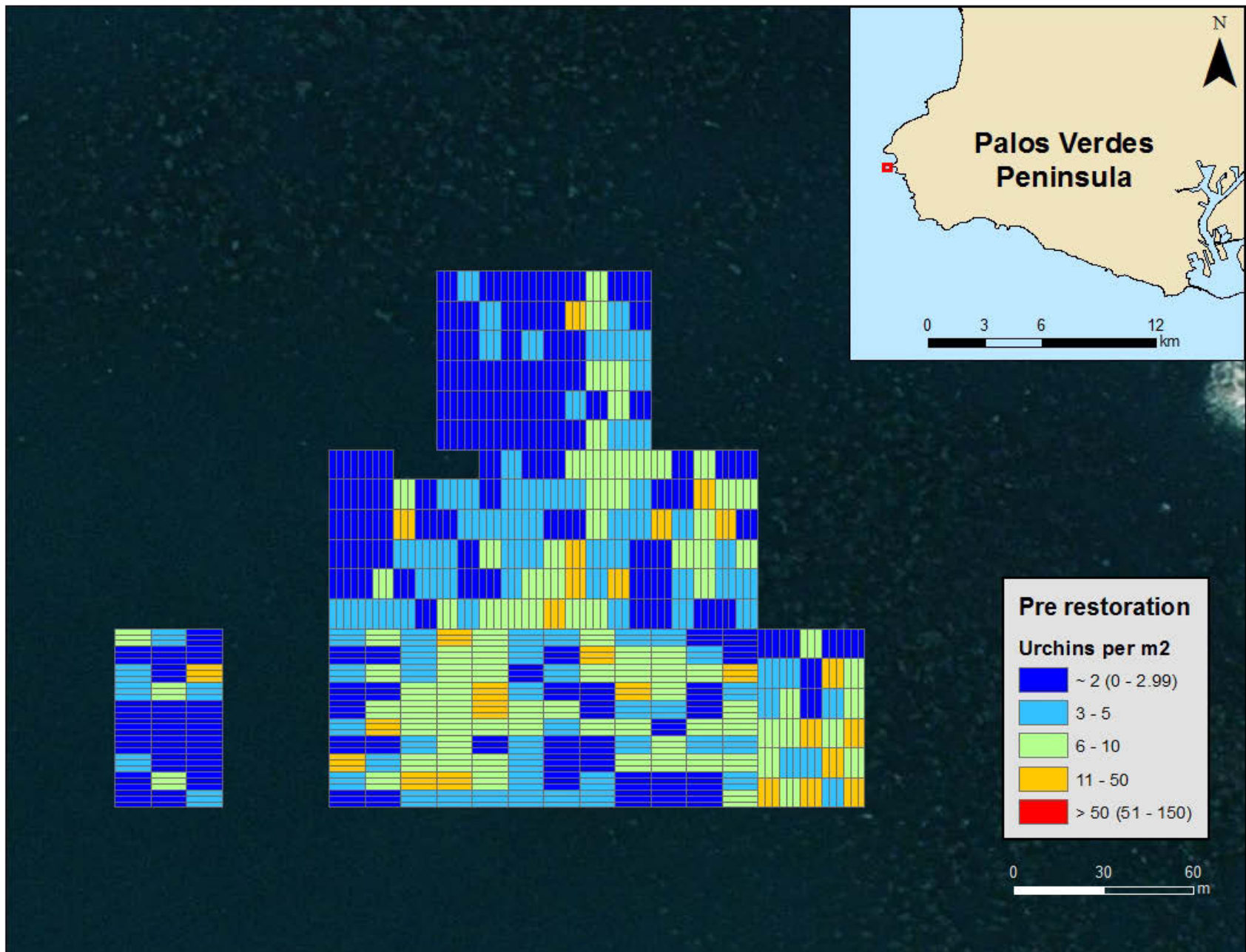
Pre and Post Restoration Urchin Density Maps –July 1, 2013 through June 30, 2017



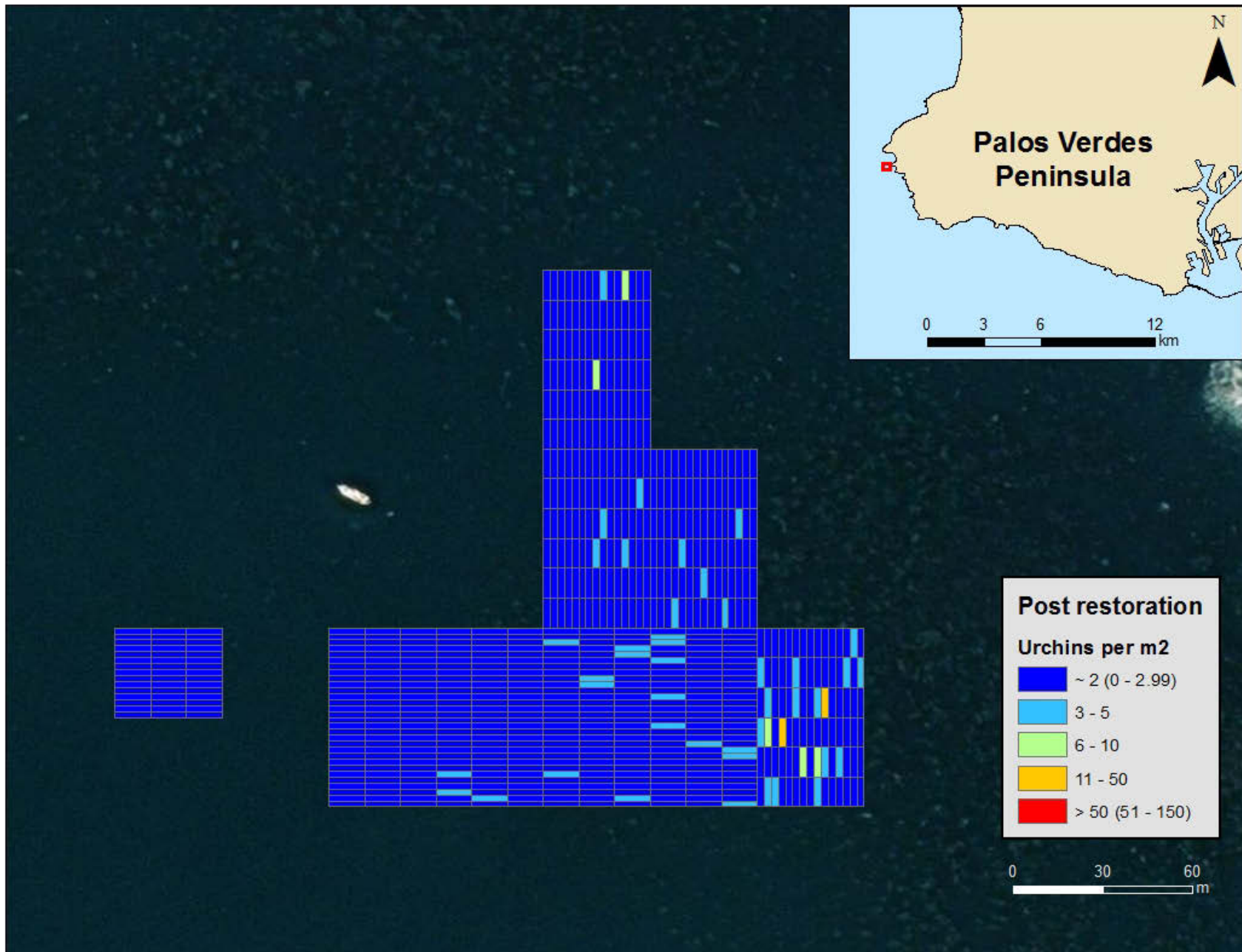
Map A2. Density of *S. purpuratus* (individuals per square meter) pre-restoration in Hawthorne, Palos Verdes, California.



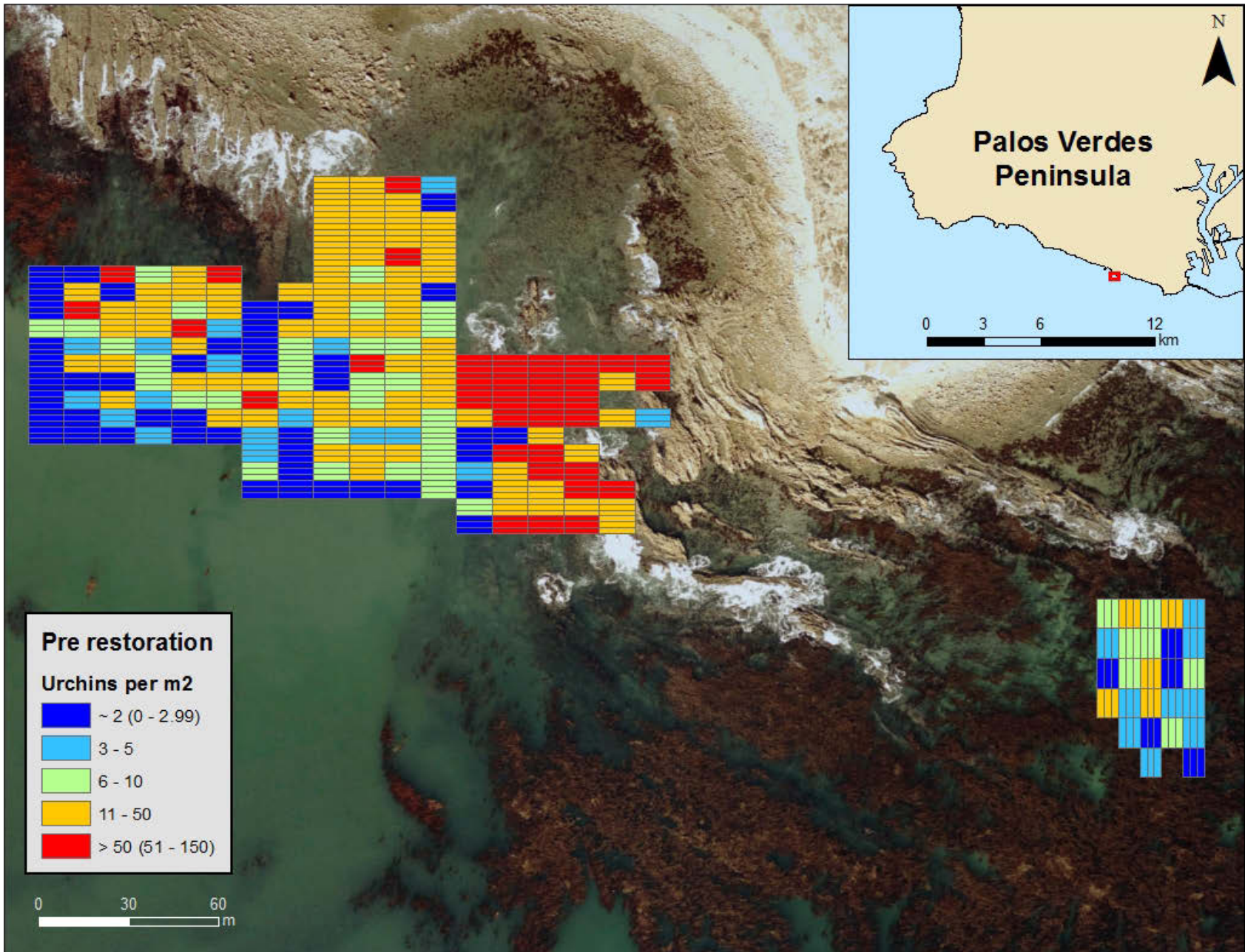
Map A3. Density of *S. purpuratus* (individuals per square meter) post-restoration in Hawthorne, Palos Verdes, California.



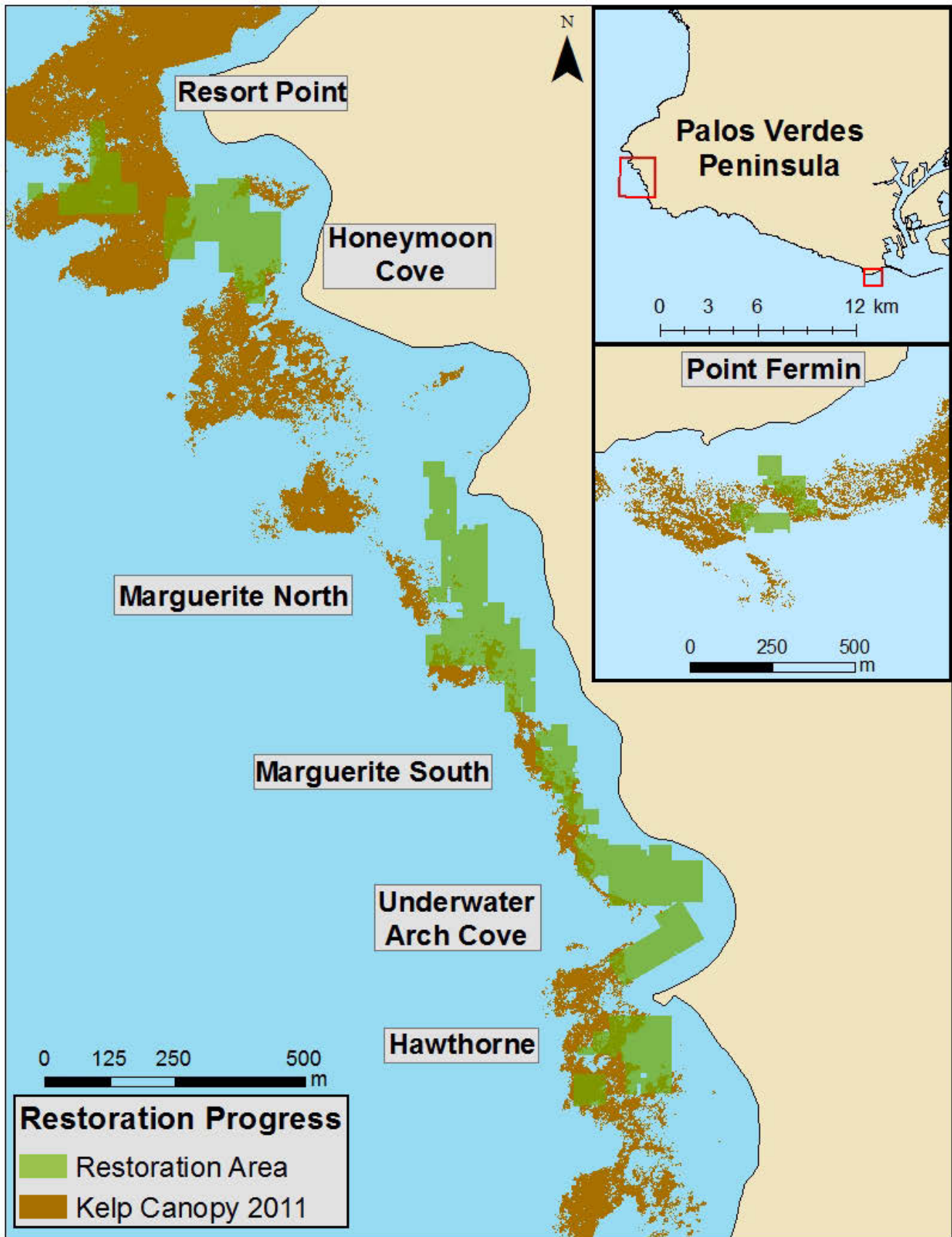
Map A4. Density of *S. purpuratus* (individuals per square meter) pre-restoration in Resort Point, Palos Verdes, California.



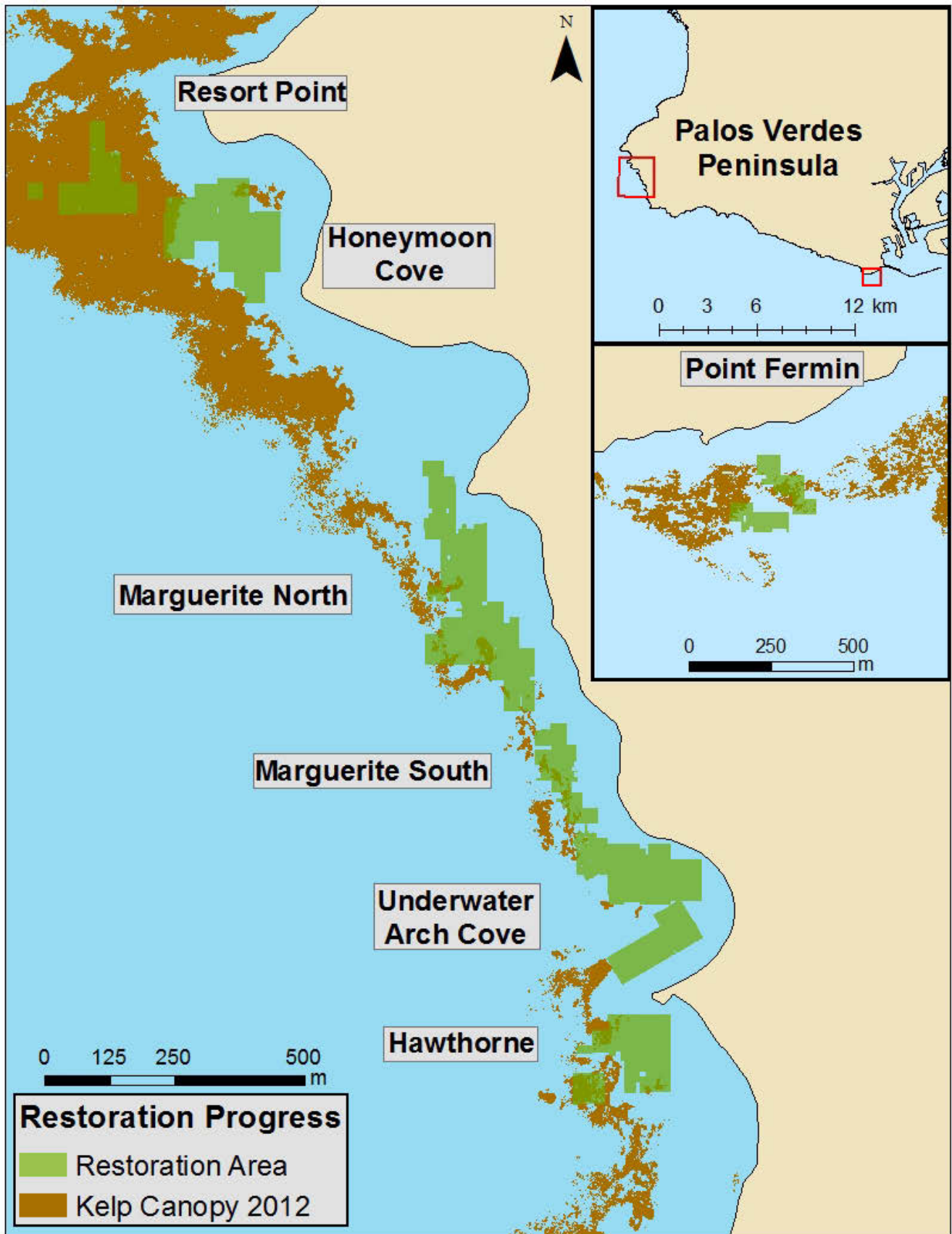
Map A5. Density of *S. purpuratus* (individuals per square meter) pre-restoration in Resort Point, Palos Verdes, California.



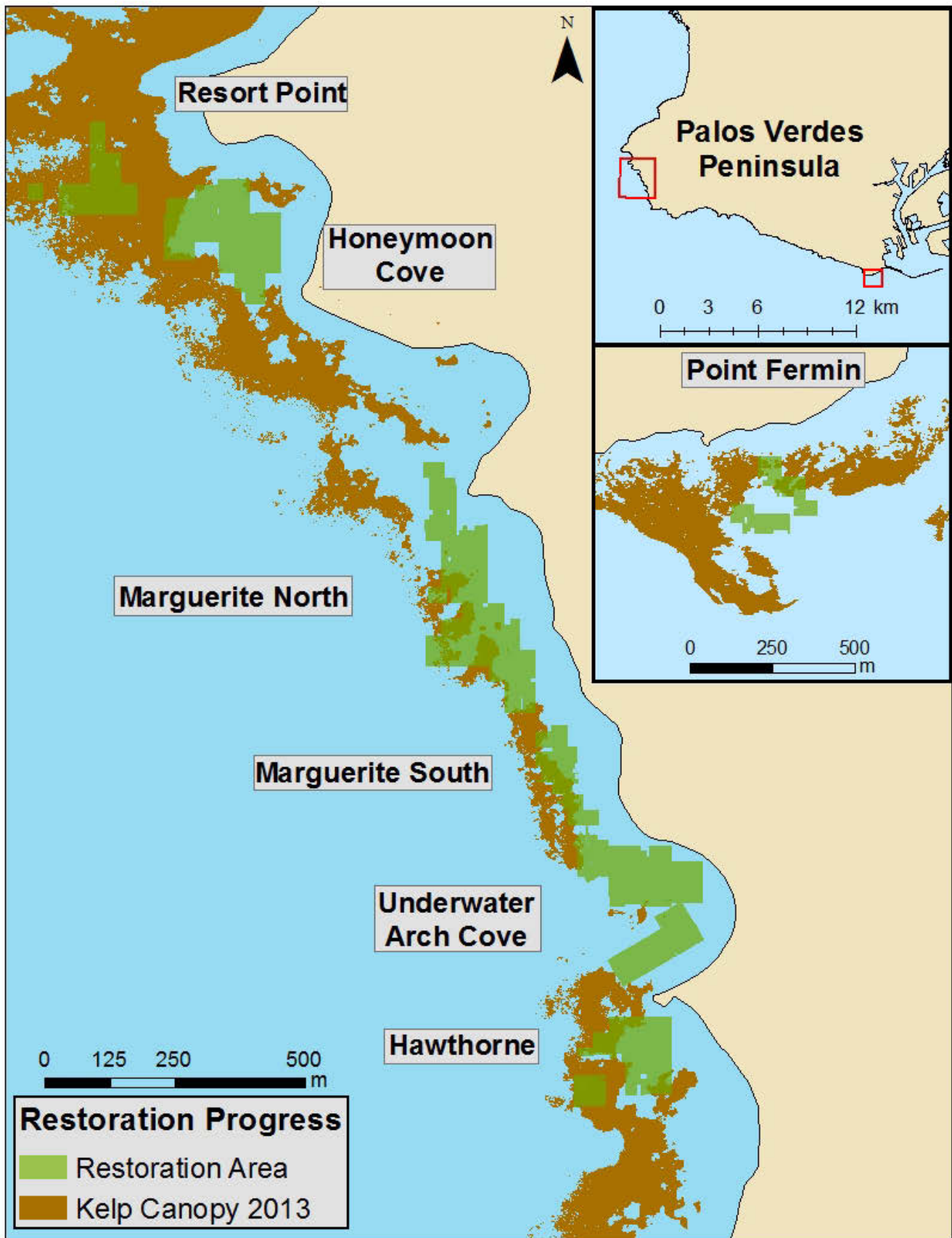
Map A6. Density of *S. purpuratus* (individuals per square meter) pre-restoration in Whites Point, Palos Verdes, California.



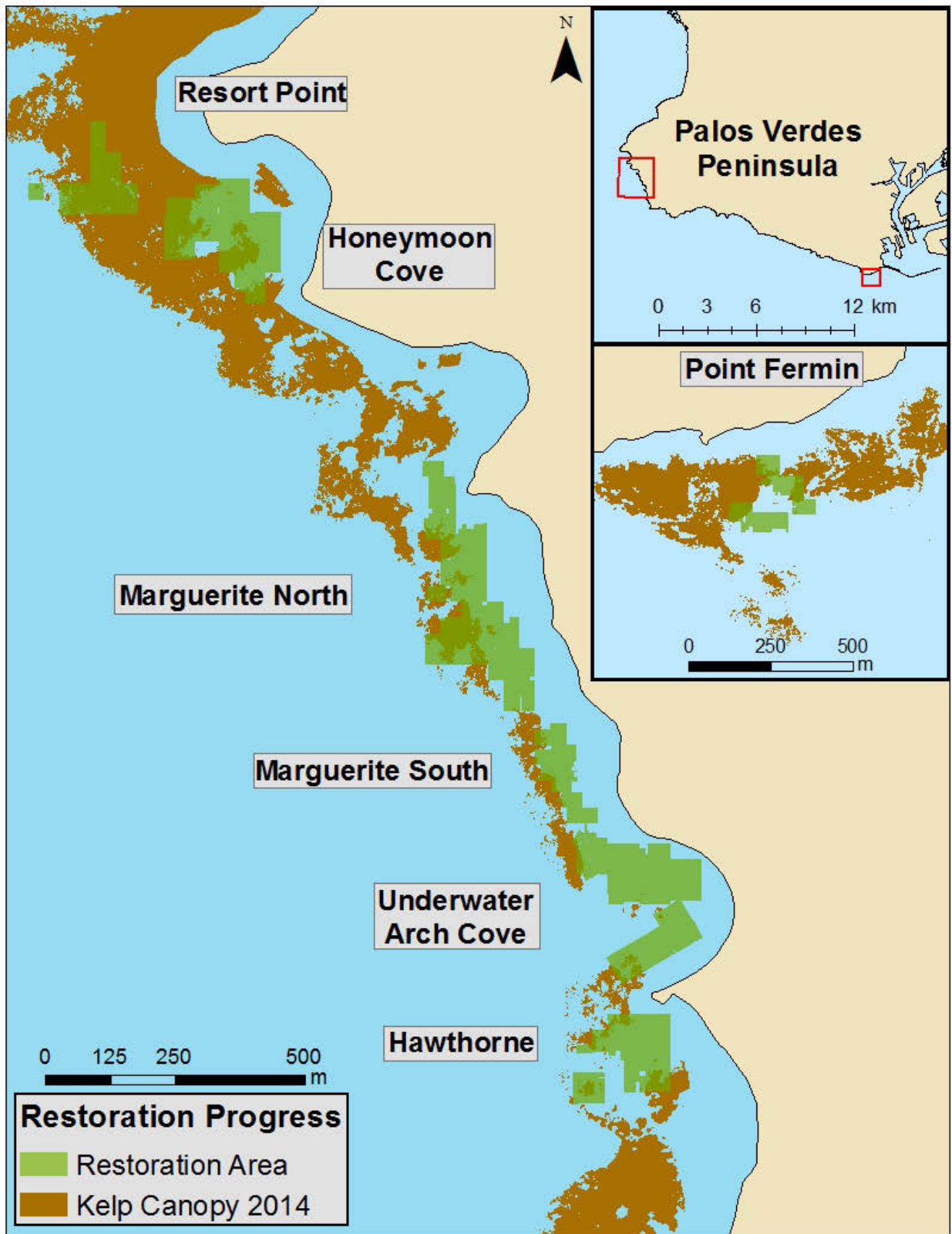
Map A7. Aerial kelp canopy coverage (*Macrocystis pyrifera*) from 2011. Data provided by MBC Applied Environmental. Canopy coverage is represented in brown while restoration areas are in green.



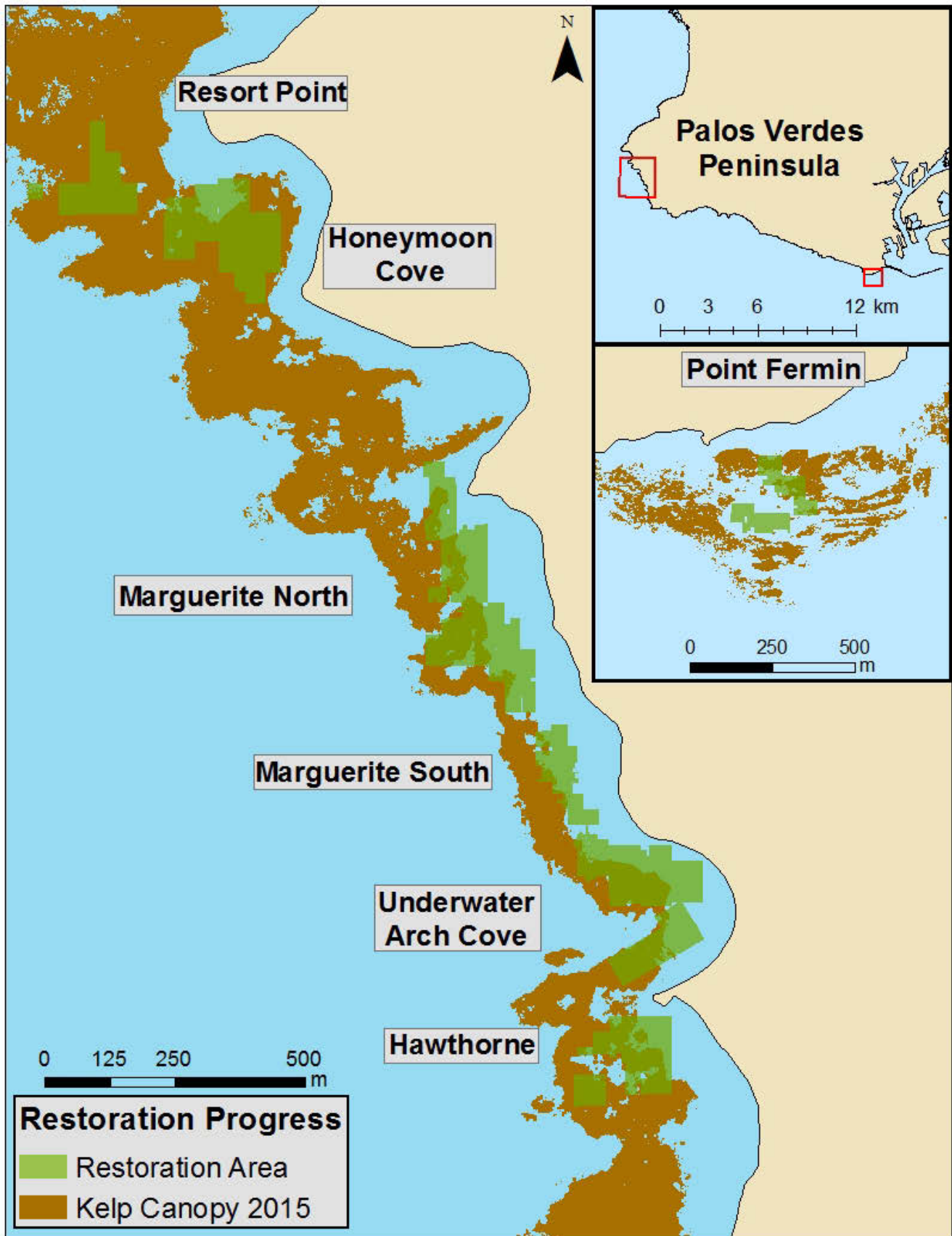
Map A8. Aerial kelp canopy coverage (*Macrocystis pyrifera*) from 2012. Data provided by MBC Applied Environmental. Canopy coverage is represented in brown while restoration areas are in green.



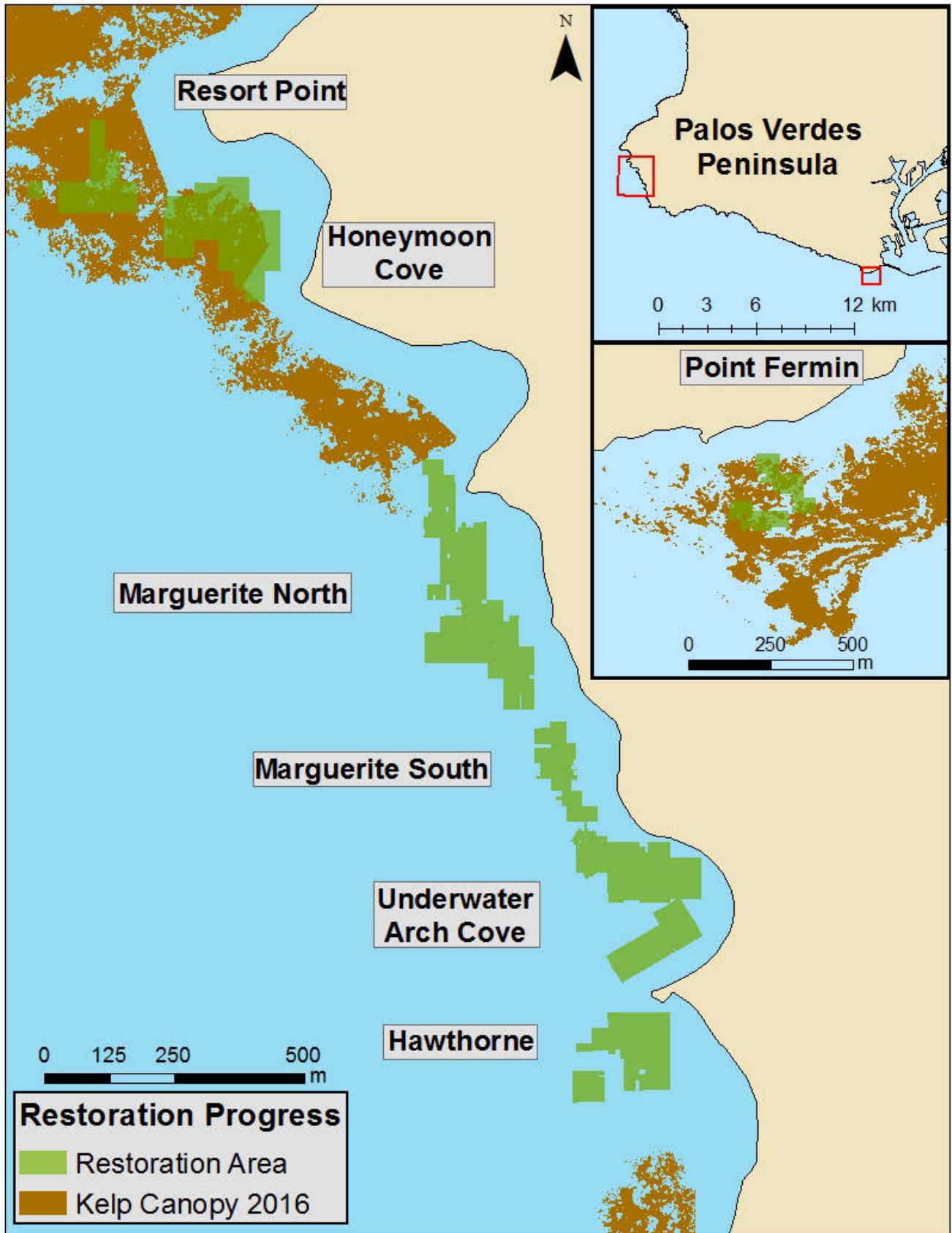
Map A9. Aerial kelp canopy coverage (*Macrocystis pyrifera*) from 2013. Data provided by MBC Applied Environmental. Canopy coverage is represented in brown while restoration areas are in green.



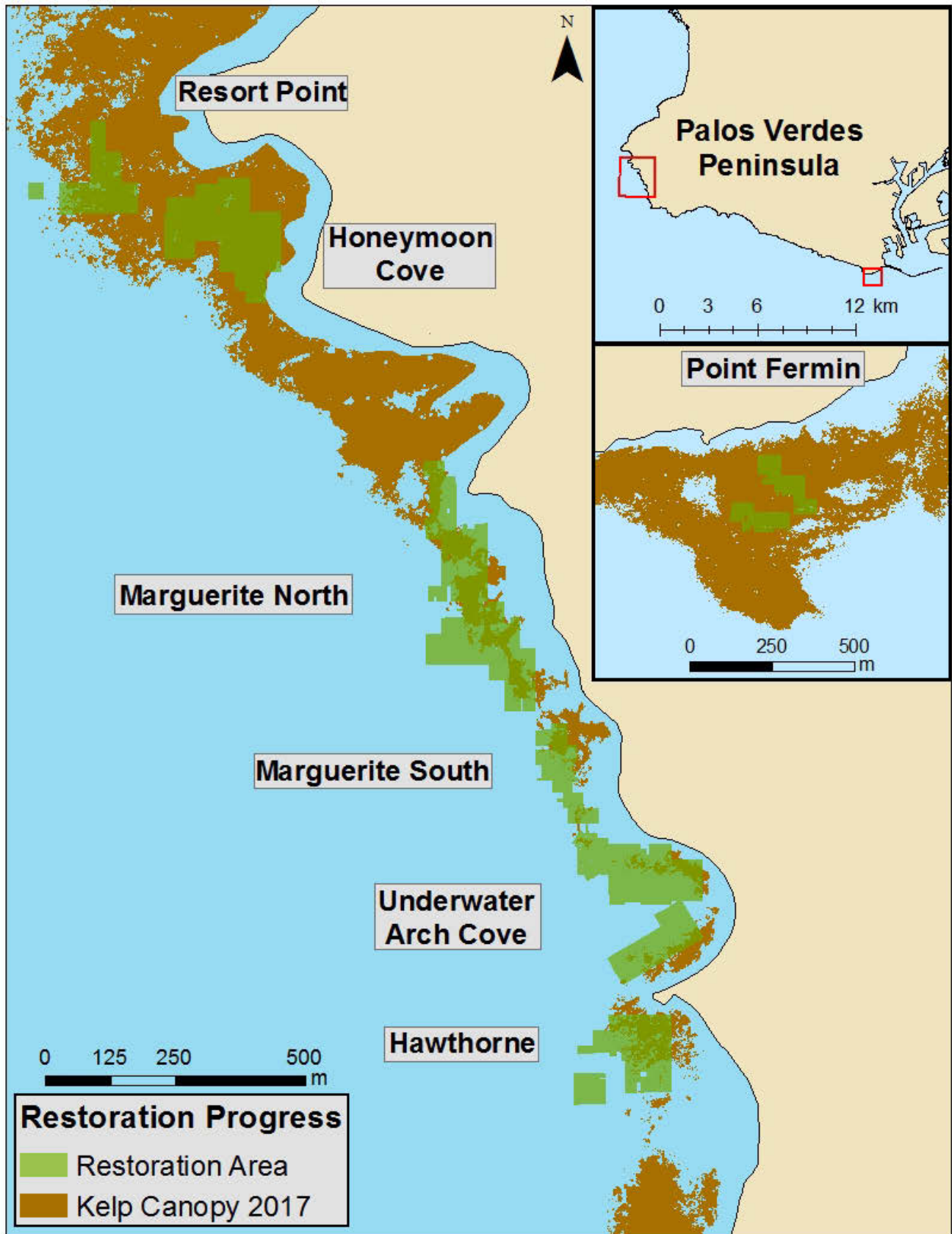
Map A10. Aerial kelp canopy coverage (*Macrocystis pyrifera*) from 2014. Data provided by MBC Applied Environmental. Canopy coverage is represented in brown while restoration areas are in green.



Map A11. Aerial kelp canopy coverage (*Macrocystis pyrifera*) from 2015. Data provided by MBC Applied Environmental. Canopy coverage is represented in brown while restoration areas are in green.



Map A12. Aerial kelp canopy coverage (*Macrocystis pyrifera*) from 2016. Data provided by MBC Applied Environmental. Canopy coverage is represented in brown while restoration areas are in green.



Map A13. Aerial kelp canopy coverage (*Macrocystis pyrifera*) from 2017. Data provided by MBC Applied Environmental. Canopy coverage is represented in brown while restoration areas are in green.

Appendix B: CRANE Data Tables 2011 – 2018.

For all tables included in Appendix B, site designations are color coded as follows: Blue – Control, Yellow – Restoration, and Reference – Green.

Restoration began in 2015 at the site Marguerite Central (previously a control site) and was completed in the fall of 2016. Marguerite Central is designated as Restoration for the 2017 surveys. Hawthorne Control was added as a previous control site by Vantuna Research Group of Occidental College as this isolated reef within the cove maintained low urchin densities, high giant kelp densities, and is a West facing site similar to our restoration sites included in this report.

Table B1. CRANE Survey Metadata.

		Survey Dates					Spring	Summer			
Designation	Site	2011	2012	2013	2014	2015	2016	2016	2017	2018	
Control	Abalone Cove Kelp West	8/31/2011	6/22/2012	6/21/2013	7/25/2014	9/2/2015	2/10/2016	6/29/2016	7/21/2017	7/18/2018	
	Christmas Tree Cove	2/7/2011	2/29/2012	5/10/2013	1/15/2015	11/13/2015	–	7/26/2016	7/25/2017	7/18/2018	
	Hawthorne Control	5/13/2011	7/6/2012	6/18/2013	6/19/2014	9/23/2015	–	9/16/2016	9/15/2017	6/22/2018	
Restoration	Underwater Arch Cove	2/7/2011	6/12/2012	6/13/2013	7/11/2014	9/23/2015	2/10/2016	6/22/2016	7/18/2017	6/22/2018	
	Honeymoon Cove	1/28/2011	3/13/2012	5/31/2013	7/2/2014	8/19/2015	2/10/2016	6/22/2016	7/18/2017	6/22/2018	
	Hawthorne Restoration	5/3/2011	6/12/2012	6/11/2013	6/19/2014	10/7/2015	–	9/30/2016	8/25/2017	7/11/2018	
Reference	Ridges North	8/12/2011	7/17/2012	4/26/2013	10/29/2014	9/11/2015	–	6/3/2016	6/30/2017	7/11/2018	
	Rocky Point North	6/24/2011	6/29/2012	7/2/2013	7/11/2014	9/25/2015	2/10/2016	6/10/2016	6/29/2017	7/6/2018	
	Point Vicente West	10/12/2011	8/10/2012	4/24/2013	4/18/2014	9/23/2015	2/10/2016	6/22/2016	7/25/2017	7/18/2018	
		Bottom Temperature (°C)					Spring	Summer			
Designation	Site	2011	2012	2013	2014	2015	2016	2016	2017	2018	
Control	Abalone Cove Kelp West	18.0	13.0	18.0	16.9	18.8	13.9	17.5	18.0	18.7	
	Christmas Tree Cove	15.0	11.1	17.0	15.5	17.0	–	18.0	17.5	19.3	
	Hawthorne Control	15.0	18.0	16.5	17.0	21.5	–	19.0	18.0	18.0	
Restoration	Underwater Arch Cove	15.0	19.0	15.0	15.8	21.5	13.9	15.0	18.5	18.0	
	Honeymoon Cove	15.0	11.5	18.0	16.5	18.8	13.9	16.2	20.3	18.3	
	Hawthorne Restoration	14.4	19.0	17.0	17.0	21.0	–	18.0	16.8	20.6	
Reference	Ridges North	18.0	16.6	13.7	19.8	21.0	–	15.0	17.9	22.0	
	Rocky Point North	18.0	15.0	18.0	21.0	21.0	13.9	14.3	16.8	19.5	
	Point Vicente West	11.0	19.0	13.2	13.5	21.0	13.9	15.2	19.7	19.5	
		Coordinates									
Designation	Site	Latitude	Longitude								
Control	Abalone Cove Kelp West	33.73940	-118.38809								
	Christmas Tree Cove	33.76150	-118.42014								
	Hawthorne Control	33.74737	-118.41526								
Restoration	Underwater Arch Cove	33.75291	-118.41499								
	Honeymoon Cove	33.76459	-118.42406								
	Hawthorne Restoration	33.75068	-118.41558								
Reference	Ridges North	33.78697	-118.42065								
	Rocky Point North	33.77966	-118.42739								
	Point Vicente West	33.74073	-118.41283								

Table B2. Fish Species Richness (total number of species)

Designation	Site	2011	2012	2013	2014	2015	2016	2017	2018
Control	Abalone Cove Kelp West	7	7	10	9	8	17	9	11
	Christmas Tree Cove	0	0	6	5	10	7	6	11
	Hawthorne Control	7	8	11	9	12	11	7	8
Restoration	Underwater Arch Cove	6	9	6	12	8	8	11	9
	Honeymoon Cove	0	2	4	8	5	12	7	8
	Hawthorne Restoration	10	6	8	7	10	13	12	12
Reference	Ridges North	6	11	7	6	5	10	5	12
	Rocky Point North	8	8	8	9	6	7	9	11
	Point Vicente West	8	6	10	11	12	14	9	11

Yellow indicates when the three original restoration sites (Underwater Arch, Honeymoon Cove, and Hawthorne Restoration) were completed.

<i>Lytechinus pictus</i>	Control	Abalone Cove Kelp West	—	—	—	—	—	—	—	—
		Christmas Tree Cove	—	—	—	—	—	—	—	—
		Hawthorne Control	—	—	—	—	—	—	—	—
	Restoration	Underwater Arch Cove	—	—	—	—	—	—	—	—
		Honeymoon Cove	—	—	—	—	—	—	—	—
		Hawthorne Restoration	—	—	—	0.8 ± 0.8	—	—	—	—
	Reference	Ridges North	—	—	—	—	—	—	—	—
		Rocky Point North	—	—	—	—	—	—	—	—
		Point Vicente West	—	—	—	—	—	—	—	—
<i>Macrocystis pyrifera</i>	Control	Abalone Cove Kelp West	4.2 ± 4.2	—	—	—	56.7 ± 11.7	52.9 ± 7.3	74.2 ± 19.2	71.3 ± 5.4
		Christmas Tree Cove	—	—	—	36.7 ± 1.7	10 ± 3.3	155 ± 61.7	55 ± 10	76.7 ± 4.8
		Hawthorne Control	—	5.8 ± 2.5	—	10 ± 6.7	44.2 ± 9.2	156.7 ± 11.7	80 ± 3.3	66.3 ± 14.9
	Restoration	Underwater Arch Cove	—	—	—	25 ± 0	45.8 ± 4.2	—	39.2 ± 5.8	95 ± 14.4
		Honeymoon Cove	1.7 ± 1.7	—	—	7.5 ± 7.5	118.3 ± 0	88.8 ± 40.4	110.8 ± 25.8	105.4 ± 11.3
		Hawthorne Restoration	3.3 ± 3.3	—	—	3.3 ± 3.3	56.7 ± 3.3	1.7 ± 1.7	158.3 ± 20	65.4 ± 7.7
	Reference	Ridges North	67.5 ± 15.8	151.7 ± 13.3	69.2 ± 22.5	87.5 ± 4.2	37.5 ± 12.5	13.3 ± 3.3	78.3 ± 16.7	42.5 ± 6
		Rocky Point North	110 ± 15	20 ± 3.3	76.7 ± 15	319.2 ± 169.2	27.5 ± 0.8	57.1 ± 35	54.2 ± 2.5	57.9 ± 7.9
		Point Vicente West	28.3 ± 6.7	27.5 ± 10.8	12.5 ± 0.8	5.8 ± 2.5	13.3 ± 8.3	29.6 ± 19.7	69.2 ± 12.5	41.7 ± 7.6
<i>Macrocystis pyrifera Stipes</i>	Control	Abalone Cove Kelp West	22.5 ± 22.5	—	—	—	345 ± 60	437.9 ± 81.1	332.5 ± 10.8	484.2 ± 65.4
		Christmas Tree Cove	—	—	—	243.3 ± 81.7	36.7 ± 15	735 ± 3.3	497.5 ± 82.5	557.9 ± 40.5
		Hawthorne Control	—	24.2 ± 12.5	—	24.2 ± 15.8	440 ± 130	800.8 ± 87.5	822.5 ± 35.8	350 ± 53.2
	Restoration	Underwater Arch Cove	—	—	—	67.5 ± 2.5	183.3 ± 10	—	162.5 ± 42.5	303.8 ± 69.1
		Honeymoon Cove	3.3 ± 3.3	—	—	25.8 ± 25.8	564.2 ± 15.8	312.5 ± 168	481.7 ± 75	680.8 ± 65
		Hawthorne Restoration	31.7 ± 31.7	—	—	6.7 ± 6.7	354.2 ± 25.8	6.7 ± 6.7	839.2 ± 232.5	612.1 ± 34.3
	Reference	Ridges North	830.8 ± 315.8	590 ± 186.7	531.7 ± 70	280 ± 6.7	300 ± 55	32.5 ± 12.5	550 ± 191.7	506.3 ± 88.6
		Rocky Point North	1084.2 ± 107.5	235 ± 20	986.7 ± 196.7	1097.5 ± 619.2	157.5 ± 19.2	182.1 ± 120.5	544.2 ± 19.2	621.3 ± 131.9
		Point Vicente West	449.2 ± 219.2	195 ± 36.7	136.7 ± 8.3	35 ± 18.3	159.2 ± 89.2	147.1 ± 112.5	585.8 ± 69.2	363.8 ± 59.9
<i>Megastrea undosa</i>	Control	Abalone Cove Kelp West	—	—	—	—	4.2 ± 0.8	20 ± 7.7	26.7 ± 13.3	78.8 ± 11
		Christmas Tree Cove	—	5.8 ± 2.5	—	5 ± 1.7	1.7 ± 0	8.3 ± 1.7	6.7 ± 5	18.3 ± 3.4
		Hawthorne Control	11.7 ± 8.3	3.3 ± 0	0.8 ± 0.8	2.5 ± 0.8	7.5 ± 0.8	9.2 ± 5.8	87.5 ± 7.5	50.4 ± 15.8
	Restoration	Underwater Arch Cove	—	—	—	0.8 ± 0.8	5 ± 5	31.3 ± 5.6	13.3 ± 13.3	66.3 ± 17.8
		Honeymoon Cove	2.5 ± 0.8	—	0.8 ± 0.8	0.8 ± 0.8	9.2 ± 0.8	5 ± 3.9	26.7 ± 8.3	112.9 ± 24.5
		Hawthorne Restoration	0.8 ± 0.8	—	—	0.8 ± 0.8	25 ± 25	15.8 ± 5.8	52.5 ± 9.2	99.2 ± 15
	Reference	Ridges North	15 ± 13.3	6.7 ± 0	6.7 ± 5	—	—	—	—	1.7 ± 1.2
		Rocky Point North	27.5 ± 9.2	25.8 ± 4.2	4.2 ± 0.8	0.8 ± 0.8	3.3 ± 0	1.3 ± 1.3	0.8 ± 0.8	2.1 ± 1.3
		Point Vicente West	—	—	0.8 ± 0.8	—	1.7 ± 0	0.8 ± 0.8	3.3 ± 1.7	5.4 ± 1.4
<i>Megathura crenulata</i>	Control	Abalone Cove Kelp West	3.3 ± 1.7	2.5 ± 0.8	4.2 ± 2.5	5 ± 1.7	1.7 ± 1.7	1.7 ± 1.7	0.8 ± 0.8	1.7 ± 1
		Christmas Tree Cove	—	—	—	—	—	—	—	—
		Hawthorne Control	0.8 ± 0.8	0.8 ± 0.8	2.5 ± 2.5	2.5 ± 0.8	—	—	—	—
	Restoration	Underwater Arch Cove	0.8 ± 0.8	2.5 ± 0.8	1.7 ± 1.7	0.8 ± 0.8	0.8 ± 0.8	—	—	—
		Honeymoon Cove	—	1.7 ± 0	—	0.8 ± 0.8	—	0.8 ± 0.8	—	—
		Hawthorne Restoration	7.5 ± 0.8	5 ± 1.7	5 ± 1.7	3.3 ± 1.7	—	—	1.7 ± 1.7	—
	Reference	Ridges North	—	—	0.8 ± 0.8	—	—	—	—	—
		Rocky Point North	—	2.5 ± 2.5	—	0.8 ± 0.8	—	—	—	—
		Point Vicente West	17.5 ± 2.5	6.7 ± 1.7	6.7 ± 5	8.3 ± 1.7	—	—	—	—
<i>Muricea californica</i>	Control	Abalone Cove Kelp West	—	4.2 ± 0.8	0.8 ± 0.8	—	0.8 ± 0.8	0.8 ± 0.8	—	—
		Christmas Tree Cove	—	—	—	—	—	—	—	—
		Hawthorne Control	—	—	—	—	—	—	—	—
	Restoration	Underwater Arch Cove	—	—	—	—	—	—	—	—
		Honeymoon Cove	—	—	—	—	—	—	—	—
		Hawthorne Restoration	—	—	—	—	—	—	—	—
	Reference	Ridges North	—	—	—	—	—	—	—	—
		Rocky Point North	—	—	—	—	—	—	—	—
		Point Vicente West	—	—	—	0.8 ± 0.8	—	—	—	—

<i>Panulirus interruptus</i>	Control	Abalone Cove Kelp West	0.8 ± 0.8	—	—	—	—	3.8 ± 3.2	—	4.2 ± 2.2	
		Christmas Tree Cove	—	—	—	—	5 ± 3.3	1.7 ± 0	1.7 ± 1.7	0.4 ± 0.4	
		Hawthorne Control	—	—	—	—	2.5 ± 2.5	—	—	0.4 ± 0.4	
	Restoration	Underwater Arch Cove	—	—	0.8 ± 0.8	—	—	—	0.4 ± 0.4	—	1.7 ± 1.2
		Honeymoon Cove	—	—	—	—	—	—	0.8 ± 0.5	0.8 ± 0.8	0.4 ± 0.4
		Hawthorne Restoration	—	—	—	1.7 ± 1.7	—	—	8.3 ± 8.3	6.7 ± 5	1.7 ± 1.2
	Reference	Ridges North	0.8 ± 0.8	1.7 ± 1.7	5.8 ± 5.8	0.8 ± 0.8	5 ± 5	3.3 ± 3.3	—	—	—
		Rocky Point North	—	—	1.7 ± 1.7	2.5 ± 2.5	1.7 ± 0	—	—	—	—
		Point Vicente West	2.5 ± 0.8	0.8 ± 0.8	1.7 ± 1.7	0.8 ± 0.8	5 ± 5	0.8 ± 0.8	5 ± 3.3	6.3 ± 4.1	—
<i>Parastichopus parvimensis</i>	Control	Abalone Cove Kelp West	1.7 ± 1.7	3.3 ± 0	5 ± 0	2.5 ± 0.8	—	0.4 ± 0.4	0.8 ± 0.8	—	
		Christmas Tree Cove	2.5 ± 0.8	2.5 ± 2.5	6.7 ± 1.7	0.8 ± 0.8	—	—	—	—	
		Hawthorne Control	2.5 ± 2.5	1.7 ± 1.7	0.8 ± 0.8	0.8 ± 0.8	—	—	—	—	
	Restoration	Underwater Arch Cove	2.5 ± 0.8	—	—	—	—	—	—	—	0.4 ± 0.4
		Honeymoon Cove	0.8 ± 0.8	2.5 ± 0.8	1.7 ± 1.7	1.7 ± 1.7	—	—	—	—	—
		Hawthorne Restoration	0.8 ± 0.8	1.7 ± 0	2.5 ± 2.5	4.2 ± 2.5	—	—	0.8 ± 0.8	0.4 ± 0.4	—
	Reference	Ridges North	—	—	—	—	—	—	—	—	—
		Rocky Point North	—	—	—	—	—	—	—	—	—
		Point Vicente West	—	0.8 ± 0.8	1.7 ± 1.7	0.8 ± 0.8	—	—	—	—	—
<i>Patiria miniata</i>	Control	Abalone Cove Kelp West	20.8 ± 5.8	11.7 ± 1.7	5 ± 1.7	2.5 ± 2.5	—	—	—	—	
		Christmas Tree Cove	7.5 ± 2.5	32.5 ± 15.8	—	—	—	—	—	—	
		Hawthorne Control	16.7 ± 0	5 ± 3.3	—	0.8 ± 0.8	—	—	—	—	
	Restoration	Underwater Arch Cove	10.8 ± 2.5	21.7 ± 1.7	—	—	—	—	0.4 ± 0.4	—	0.4 ± 0.4
		Honeymoon Cove	35 ± 10	8.3 ± 0	20 ± 5	—	—	—	—	—	—
		Hawthorne Restoration	1.7 ± 1.7	0.8 ± 0.8	0.8 ± 0.8	—	—	—	—	—	—
	Reference	Ridges North	—	—	—	—	—	—	—	—	—
		Rocky Point North	—	—	—	—	—	—	—	—	—
		Point Vicente West	—	—	0.8 ± 0.8	0.8 ± 0.8	—	—	—	—	—
<i>Peltodoris nobilis</i>	Control	Abalone Cove Kelp West	—	—	0.8 ± 0.8	—	—	—	—	—	
		Christmas Tree Cove	—	—	—	—	—	—	—	—	
		Hawthorne Control	—	—	—	—	—	—	—	—	
	Restoration	Underwater Arch Cove	—	—	—	—	—	—	—	—	—
		Honeymoon Cove	—	—	—	—	—	—	—	—	—
		Hawthorne Restoration	—	—	—	—	—	—	—	—	—
	Reference	Ridges North	—	—	—	—	—	—	—	—	—
		Rocky Point North	—	—	—	—	—	—	—	—	—
		Point Vicente West	—	—	—	—	—	—	—	—	—
<i>Pisaster brevispinus</i>	Control	Abalone Cove Kelp West	—	0.8 ± 0.8	—	—	—	—	—	—	
		Christmas Tree Cove	—	—	—	—	—	—	—	—	
		Hawthorne Control	—	—	4.2 ± 2.5	—	—	—	—	—	
	Restoration	Underwater Arch Cove	—	—	—	—	—	—	—	—	—
		Honeymoon Cove	—	—	—	—	—	—	—	—	—
		Hawthorne Restoration	—	—	—	—	—	—	—	—	—
	Reference	Ridges North	—	—	—	—	—	—	—	—	—
		Rocky Point North	—	—	—	—	—	—	—	—	—
		Point Vicente West	—	—	—	—	—	—	—	—	—
<i>Pisaster giganteus</i>	Control	Abalone Cove Kelp West	25 ± 1.7	33.3 ± 10	23.3 ± 5	0.8 ± 0.8	—	0.4 ± 0.4	—	—	
		Christmas Tree Cove	5 ± 1.7	13.3 ± 5	0.8 ± 0.8	—	—	—	—	—	
		Hawthorne Control	14.2 ± 2.5	15.8 ± 7.5	37.5 ± 2.5	—	—	—	—	—	
	Restoration	Underwater Arch Cove	6.7 ± 1.7	15.8 ± 2.5	—	—	—	—	—	—	—
		Honeymoon Cove	6.7 ± 1.7	3.3 ± 0	1.7 ± 0	—	—	—	—	—	—
		Hawthorne Restoration	6.7 ± 0	6.7 ± 1.7	7.5 ± 4.2	—	—	—	—	—	—
	Reference	Ridges North	—	2.5 ± 0.8	4.2 ± 2.5	—	—	—	—	—	—
		Rocky Point North	1.7 ± 1.7	—	1.7 ± 1.7	—	—	—	—	—	—
		Point Vicente West	21.7 ± 8.3	8.3 ± 3.3	1—	—	—	—	—	—	—

<i>Pisaster ochraceus</i>	Control	Abalone Cove Kelp West	30 ± 5	3.3 ± 0	5 ± 3.3	—	—	0.8 ± 0.5	—	0.4 ± 0.4
		Christmas Tree Cove	5 ± 3.3	7.5 ± 4.2	3.3 ± 1.7	—	—	—	—	—
		Hawthorne Control	25.8 ± 15.8	34.2 ± 4.2	2.5 ± 0.8	—	—	—	—	—
	Restoration	Underwater Arch Cove	20.8 ± 5.8	12.5 ± 2.5	1.7 ± 0	—	—	—	—	0.8 ± 0.5
		Honeymoon Cove	9.2 ± 4.2	3.3 ± 1.7	1.7 ± 1.7	—	—	—	—	—
		Hawthorne Restoration	5 ± 1.7	9.2 ± 0.8	5 ± 0	—	—	0.8 ± 0.8	—	0.4 ± 0.4
	Reference	Ridges North	—	—	—	—	—	—	—	—
		Rocky Point North	—	—	—	—	—	—	—	—
		Point Vicente West	23.3 ± 6.7	8.3 ± 3.3	5 ± 1.7	—	—	—	—	—
<i>Pterygophora californica</i>	Control	Abalone Cove Kelp West	—	—	—	—	—	—	—	—
		Christmas Tree Cove	—	—	—	—	—	—	—	—
		Hawthorne Control	—	—	—	—	—	—	—	—
	Restoration	Underwater Arch Cove	—	—	—	—	—	—	—	—
		Honeymoon Cove	—	—	—	—	—	—	—	—
		Hawthorne Restoration	—	—	—	—	—	—	—	—
	Reference	Ridges North	—	—	—	—	—	—	—	—
		Rocky Point North	—	—	—	—	—	—	—	—
		Point Vicente West	—	—	0.8 ± 0.8	—	—	—	0.8 ± 0.8	—
<i>Sargassum horneri</i>	Control	Abalone Cove Kelp West	—	—	—	—	—	202.1 ± 136.3	6.7 ± 5	37.1 ± 11.9
		Christmas Tree Cove	—	—	—	—	96.7 ± 31.7	—	—	1.7 ± 1.7
		Hawthorne Control	—	—	—	—	—	0.8 ± 0.8	—	0.4 ± 0.4
	Restoration	Underwater Arch Cove	—	—	—	—	—	14.2 ± 14.2	—	—
		Honeymoon Cove	—	—	—	—	—	45 ± 33.5	0.8 ± 0.8	3.3 ± 1.8
		Hawthorne Restoration	—	—	—	—	164.2 ± 19.2	0.8 ± 0.8	—	—
	Reference	Ridges North	—	—	—	—	—	27.5 ± 22.5	—	—
		Rocky Point North	—	—	—	—	5 ± 1.7	46.7 ± 24.7	2.5 ± 2.5	—
		Point Vicente West	—	—	—	—	—	1.3 ± 0.8	—	—
<i>Sargassum muticum</i>	Control	Abalone Cove Kelp West	—	—	—	—	2.5 ± 2.5	159.2 ± 159.2	—	2.9 ± 2.9
		Christmas Tree Cove	—	—	—	—	0.8 ± 0.8	—	—	—
		Hawthorne Control	—	—	—	—	—	—	—	—
	Restoration	Underwater Arch Cove	—	—	—	—	—	6.3 ± 6.3	—	10.4 ± 8.3
		Honeymoon Cove	—	—	—	—	—	—	—	—
		Hawthorne Restoration	—	—	—	—	—	—	—	—
	Reference	Ridges North	—	—	—	—	—	—	—	—
		Rocky Point North	—	—	—	—	—	5 ± 2.5	—	—
		Point Vicente West	—	—	—	—	—	—	—	—
<i>Sargassum sp</i>	Control	Abalone Cove Kelp West	—	—	—	—	—	—	—	—
		Christmas Tree Cove	—	—	—	—	—	—	—	—
		Hawthorne Control	0.8 ± 0.8	—	—	—	32.5 ± 20.8	—	—	—
	Restoration	Underwater Arch Cove	—	—	—	—	—	—	—	—
		Honeymoon Cove	—	—	—	—	—	—	—	—
		Hawthorne Restoration	—	—	—	—	—	—	—	—
	Reference	Ridges North	—	—	—	—	0.8 ± 0.8	—	—	—
		Rocky Point North	—	—	—	—	—	—	—	—
		Point Vicente West	—	—	—	—	—	—	—	—
<i>Strongylocentrotus franciscanus</i>	Control	Abalone Cove Kelp West	464.2 ± 220.8	165.8 ± 129.2	110 ± 10	50 ± 11.7	0.8 ± 0.8	6.3 ± 2.8	4.2 ± 2.5	20.4 ± 8.3
		Christmas Tree Cove	11.7 ± 0	36.7 ± 3.3	14.2 ± 5.8	—	—	—	—	0.4 ± 0.4
		Hawthorne Control	65.8 ± 25.8	120 ± 51.7	44.2 ± 17.5	12.5 ± 4.2	10 ± 8.3	0.8 ± 0.8	0.8 ± 0.8	2.1 ± 2.1
	Restoration	Underwater Arch Cove	54.2 ± 17.5	33.3 ± 13.3	23.3 ± 18.3	42.5 ± 7.5	2.5 ± 0.8	1.3 ± 0.4	5.8 ± 0.8	10 ± 2.5
		Honeymoon Cove	63.3 ± 1.7	44.2 ± 0.8	34.2 ± 4.2	11.7 ± 1.7	7.5 ± 2.5	1.3 ± 0.8	0.8 ± 0.8	2.1 ± 1
		Hawthorne Restoration	110.8 ± 85.8	106.7 ± 6.7	51.7 ± 0	37.5 ± 10.8	2.5 ± 0.8	0.8 ± 0.8	9.2 ± 4.2	6.7 ± 3.6
	Reference	Ridges North	2.5 ± 0.8	37.5 ± 37.5	7.5 ± 0.8	4.2 ± 0.8	0.8 ± 0.8	—	—	—
		Rocky Point North	5 ± 5	9.2 ± 9.2	1.7 ± 1.7	0.8 ± 0.8	—	—	—	—
		Point Vicente West	31.7 ± 10	55.8 ± 27.5	32.5 ± 4.2	26.7 ± 10	2.5 ± 0.8	2.1 ± 0.8	—	—

Table B5. Fish Density (individuals per 100 meters squared).

Species	Designation	Site	#/100 m ² ± SE							
			2011	2012	2013	2014	2015	2016	2017	2018
<i>Anisotremus davidsonii</i>	Control	Abalone Cove Kelp West	—	—	—	—	—	—	—	—
		Christmas Tree Cove	—	—	—	—	—	0.4 ± 0.4	—	—
		Hawthorne Control	—	—	—	—	—	—	—	0.2 ± 0.2
	Restoration	Underwater Arch Cove	—	—	—	—	0.4 ± 0.4	—	—	—
		Honeymoon Cove	—	—	—	—	—	0.4 ± 0.3	2.5 ± 2.5	—
		Hawthorne Restoration	—	—	—	—	0.8 ± 0.8	5.8 ± 4.2	—	0.2 ± 0.2
	Reference	Ridges North	—	—	—	—	—	0.4 ± 0.4	—	9.4 ± 6
		Rocky Point North	—	—	—	—	—	—	5.4 ± 4.9	8.8 ± 6
		Point Vicente West	—	—	—	—	—	—	—	—
<i>Atherinopsidae</i>	Control	Abalone Cove Kelp West	—	—	—	—	—	—	—	—
		Christmas Tree Cove	—	—	—	—	—	—	—	9.6 ± 6.2
		Hawthorne Control	2.1 ± 2.1	—	—	—	20 ± 12.2	—	0.8 ± 0.8	—
	Restoration	Underwater Arch Cove	—	—	—	—	—	—	—	—
		Honeymoon Cove	—	—	—	—	—	—	—	—
		Hawthorne Restoration	—	—	—	—	—	—	54.6 ± 47.6	—
	Reference	Ridges North	—	—	—	—	—	—	—	—
		Rocky Point North	—	—	—	—	—	—	—	—
		Point Vicente West	—	—	—	—	—	0.2 ± 0.2	—	—
<i>Brachyistius frenatus</i>	Control	Abalone Cove Kelp West	—	—	—	—	0.4 ± 0.4	1 ± 0.8	—	0.6 ± 0.4
		Christmas Tree Cove	—	—	—	—	—	—	—	1.3 ± 0.5
		Hawthorne Control	—	—	—	—	2.1 ± 2.1	1.7 ± 1.2	—	0.6 ± 0.4
	Restoration	Underwater Arch Cove	—	—	—	1.3 ± 1.3	—	—	—	—
		Honeymoon Cove	—	—	—	—	—	—	0.8 ± 0.8	0.2 ± 0.2
		Hawthorne Restoration	—	—	—	—	—	—	—	2.7 ± 1.5
	Reference	Ridges North	0.4 ± 0.4	0.4 ± 0.4	—	—	—	—	—	—
		Rocky Point North	1.7 ± 0.7	0.4 ± 0.4	0.8 ± 0.8	0.4 ± 0.4	—	—	0.4 ± 0.4	2.5 ± 0.6
		Point Vicente West	0.4 ± 0.4	2.5 ± 1.6	0.8 ± 0.5	—	14.2 ± 5.9	0.8 ± 0.8	33.8 ± 16.9	29.6 ± 17.9
<i>Chromis punctipinnis</i>	Control	Abalone Cove Kelp West	14.6 ± 7.6	—	4.2 ± 4.2	4.6 ± 2.7	—	5.8 ± 5.8	0.8 ± 0.8	—
		Christmas Tree Cove	—	—	—	—	—	—	—	0.4 ± 0.3
		Hawthorne Control	—	—	—	—	—	—	—	1.3 ± 0.8
	Restoration	Underwater Arch Cove	1.3 ± 1.3	1.3 ± 1.3	0.4 ± 0.4	2.1 ± 0.8	—	10.6 ± 5.6	2.5 ± 2.5	0.6 ± 0.3
		Honeymoon Cove	—	—	—	—	—	1.3 ± 1.3	—	—
		Hawthorne Restoration	0.4 ± 0.4	—	—	—	—	10.4 ± 10.4	—	—
	Reference	Ridges North	—	—	—	—	—	—	—	—
		Rocky Point North	0.4 ± 0.4	—	—	—	—	—	—	0.4 ± 0.4
		Point Vicente West	—	—	—	8.3 ± 5.5	—	12.7 ± 10.6	—	0.2 ± 0.2
<i>Damalichthys vacca</i>	Control	Abalone Cove Kelp West	—	—	—	—	—	0.2 ± 0.2	—	—
		Christmas Tree Cove	—	—	—	—	—	—	—	—
		Hawthorne Control	—	—	—	0.4 ± 0.4	—	—	—	—
	Restoration	Underwater Arch Cove	—	—	—	0.4 ± 0.4	—	—	—	0.2 ± 0.2
		Honeymoon Cove	—	—	—	0.4 ± 0.4	—	—	—	—
		Hawthorne Restoration	—	—	—	—	—	—	0.4 ± 0.4	—
	Reference	Ridges North	—	—	—	0.4 ± 0.4	—	—	—	—
		Rocky Point North	—	—	—	—	—	—	—	—
		Point Vicente West	—	0.8 ± 0.5	—	0.4 ± 0.4	—	—	—	—

<i>Hypsypops rubicundus</i>	Control	Abalone Cove Kelp West	4.6 ± 0.8	4.6 ± 1.3	2.5 ± 1.1	1.7 ± 1.2	0.8 ± 0.8	1 ± 0.4	6.7 ± 2.6	5.6 ± 0.9
		Christmas Tree Cove	—	—	—	—	0.8 ± 0.5	0.8 ± 0.8	1.3 ± 0.4	1.7 ± 1
		Hawthorne Control	3.3 ± 2.3	2.9 ± 2	1.7 ± 0	1.7 ± 0.7	4.6 ± 2.3	1.3 ± 0.4	4.6 ± 1.7	4.8 ± 0.8
	Restoration	Underwater Arch Cove	1.3 ± 0.8	0.8 ± 0.8	0.4 ± 0.4	3.3 ± 1.5	3.3 ± 1.9	3.8 ± 0.9	6.3 ± 3.8	4.8 ± 0.7
		Honeymoon Cove	—	—	—	—	—	1.3 ± 0.8	0.8 ± 0.8	1.5 ± 0.6
		Hawthorne Restoration	1.7 ± 0.7	2.9 ± 0.4	6.7 ± 0.7	4.6 ± 0.4	10.8 ± 2	18.8 ± 3.6	21.3 ± 8.8	6.7 ± 1.3
	Reference	Ridges North	—	0.4 ± 0.4	1.7 ± 1.7	1.7 ± 1.7	—	2.1 ± 0.4	0.8 ± 0.8	1.5 ± 0.7
		Rocky Point North	1.7 ± 0.7	2.1 ± 1	1.7 ± 0.7	—	0.8 ± 0.5	0.8 ± 0.3	—	2.7 ± 1
		Point Vicente West	5 ± 1.7	2.1 ± 0.8	5.4 ± 1.8	7.9 ± 3	7.9 ± 2.3	5.4 ± 0.6	5 ± 1.7	4.8 ± 1.5
<i>Labrisomus xanti</i>	Control	Abalone Cove Kelp West	—	—	—	—	—	—	—	—
		Christmas Tree Cove	—	—	—	—	—	—	—	—
		Hawthorne Control	—	—	—	—	—	—	—	—
	Restoration	Underwater Arch Cove	—	—	—	—	—	—	—	—
		Honeymoon Cove	—	—	—	—	—	—	—	—
		Hawthorne Restoration	—	—	—	—	—	0.4 ± 0.4	—	0.2 ± 0.2
	Reference	Ridges North	—	—	—	—	—	—	—	—
		Rocky Point North	—	—	—	—	—	—	—	—
		Point Vicente West	—	—	—	—	—	—	—	—
<i>Lythrypnus dalli</i>	Control	Abalone Cove Kelp West	—	—	—	—	—	—	—	—
		Christmas Tree Cove	—	—	—	—	—	—	—	—
		Hawthorne Control	—	—	—	—	—	—	—	—
	Restoration	Underwater Arch Cove	—	0.4 ± 0.4	—	—	—	—	—	—
		Honeymoon Cove	—	—	—	—	—	—	—	—
		Hawthorne Restoration	—	—	—	—	—	—	—	—
	Reference	Ridges North	—	—	—	—	—	—	—	—
		Rocky Point North	—	—	—	—	—	—	—	—
		Point Vicente West	—	—	—	—	—	—	—	—
<i>Medialuna californiensis</i>	Control	Abalone Cove Kelp West	—	—	0.4 ± 0.4	0.8 ± 0.5	—	0.4 ± 0.3	—	—
		Christmas Tree Cove	—	—	—	0.4 ± 0.4	5.4 ± 4.4	—	—	—
		Hawthorne Control	—	—	—	0.4 ± 0.4	2.5 ± 2	—	—	—
	Restoration	Underwater Arch Cove	—	—	—	—	2.5 ± 1.4	—	—	—
		Honeymoon Cove	—	—	—	—	—	0.2 ± 0.2	—	—
		Hawthorne Restoration	0.4 ± 0.4	—	—	—	4.6 ± 2.3	1.3 ± 0.4	—	0.4 ± 0.3
	Reference	Ridges North	—	—	—	—	—	2.1 ± 1.3	—	—
		Rocky Point North	—	—	—	—	—	0.6 ± 0.6	—	—
		Point Vicente West	0.4 ± 0.4	—	—	—	2.5 ± 0.8	1 ± 0.5	0.8 ± 0.8	—
<i>Oxyjulius californica</i>	Control	Abalone Cove Kelp West	5.4 ± 1.7	0.4 ± 0.4	—	—	0.8 ± 0.8	0.8 ± 0.6	—	—
		Christmas Tree Cove	—	—	—	1.3 ± 1.3	—	0.4 ± 0.4	—	—
		Hawthorne Control	0.8 ± 0.5	1.7 ± 0.7	0.4 ± 0.4	0.4 ± 0.4	0.4 ± 0.4	—	—	—
	Restoration	Underwater Arch Cove	—	0.4 ± 0.4	0.8 ± 0.8	1.7 ± 1.2	—	—	—	—
		Honeymoon Cove	—	—	—	0.8 ± 0.8	2.9 ± 1.3	0.2 ± 0.2	12.1 ± 5.6	—
		Hawthorne Restoration	5 ± 3.4	1.3 ± 0.8	1.7 ± 1.2	2.1 ± 1.6	1.7 ± 0.7	2.9 ± 1	—	0.2 ± 0.2
	Reference	Ridges North	—	—	—	0.8 ± 0.8	—	—	—	0.2 ± 0.2
		Rocky Point North	0.4 ± 0.4	0.8 ± 0.5	—	0.4 ± 0.4	—	—	—	—
		Point Vicente West	13.3 ± 6.7	2.1 ± 1	1.3 ± 0.4	23.3 ± 7.9	—	—	8.8 ± 8.2	—

<i>Sebastes carnatus</i>	Control	Abalone Cove Kelp West	—	—	—	—	—	—	—	—
		Christmas Tree Cove	—	—	—	—	—	—	—	—
		Hawthorne Control	—	—	—	—	—	—	—	—
	Restoration	Underwater Arch Cove	—	—	—	—	—	—	—	—
		Honeymoon Cove	—	—	—	—	—	—	—	—
		Hawthorne Restoration	—	—	—	—	—	—	—	—
	Reference	Ridges North	—	—	—	—	—	—	—	—
		Rocky Point North	—	—	—	—	—	—	—	—
		Point Vicente West	—	—	—	0.4 ± 0.4	—	—	—	—
<i>Sebastes chrysomelas</i>	Control	Abalone Cove Kelp West	—	—	—	—	—	0.2 ± 0.2	—	—
		Christmas Tree Cove	—	—	—	—	—	—	—	—
		Hawthorne Control	—	—	—	—	—	—	—	—
	Restoration	Underwater Arch Cove	—	—	—	—	—	—	—	—
		Honeymoon Cove	—	—	—	—	—	—	—	—
		Hawthorne Restoration	—	—	—	—	—	—	—	—
	Reference	Ridges North	—	—	—	—	—	—	—	—
		Rocky Point North	—	—	—	—	—	—	—	—
		Point Vicente West	—	—	—	0.8 ± 0.5	—	—	—	—
<i>Sebastes mystinus</i>	Control	Abalone Cove Kelp West	—	—	—	—	—	—	—	—
		Christmas Tree Cove	—	—	—	—	—	—	—	—
		Hawthorne Control	—	—	—	—	—	—	—	—
	Restoration	Underwater Arch Cove	—	—	—	—	—	—	—	—
		Honeymoon Cove	—	—	—	—	—	—	—	—
		Hawthorne Restoration	—	—	—	—	—	—	—	—
	Reference	Ridges North	—	—	—	—	—	—	—	—
		Rocky Point North	—	—	—	—	—	—	—	—
		Point Vicente West	—	—	—	—	—	—	—	—
<i>Sebastes rastrelliger</i>	Control	Abalone Cove Kelp West	—	—	—	—	—	—	—	—
		Christmas Tree Cove	—	—	—	—	—	—	—	—
		Hawthorne Control	0.4 ± 0.4	—	—	—	—	—	—	—
	Restoration	Underwater Arch Cove	—	—	—	0.8 ± 0.8	—	—	—	—
		Honeymoon Cove	—	—	—	—	—	—	—	—
		Hawthorne Restoration	—	—	—	—	—	—	—	—
	Reference	Ridges North	—	—	—	—	—	—	—	—
		Rocky Point North	—	—	0.4 ± 0.4	—	—	—	—	—
		Point Vicente West	—	—	0.4 ± 0.4	—	—	—	—	—

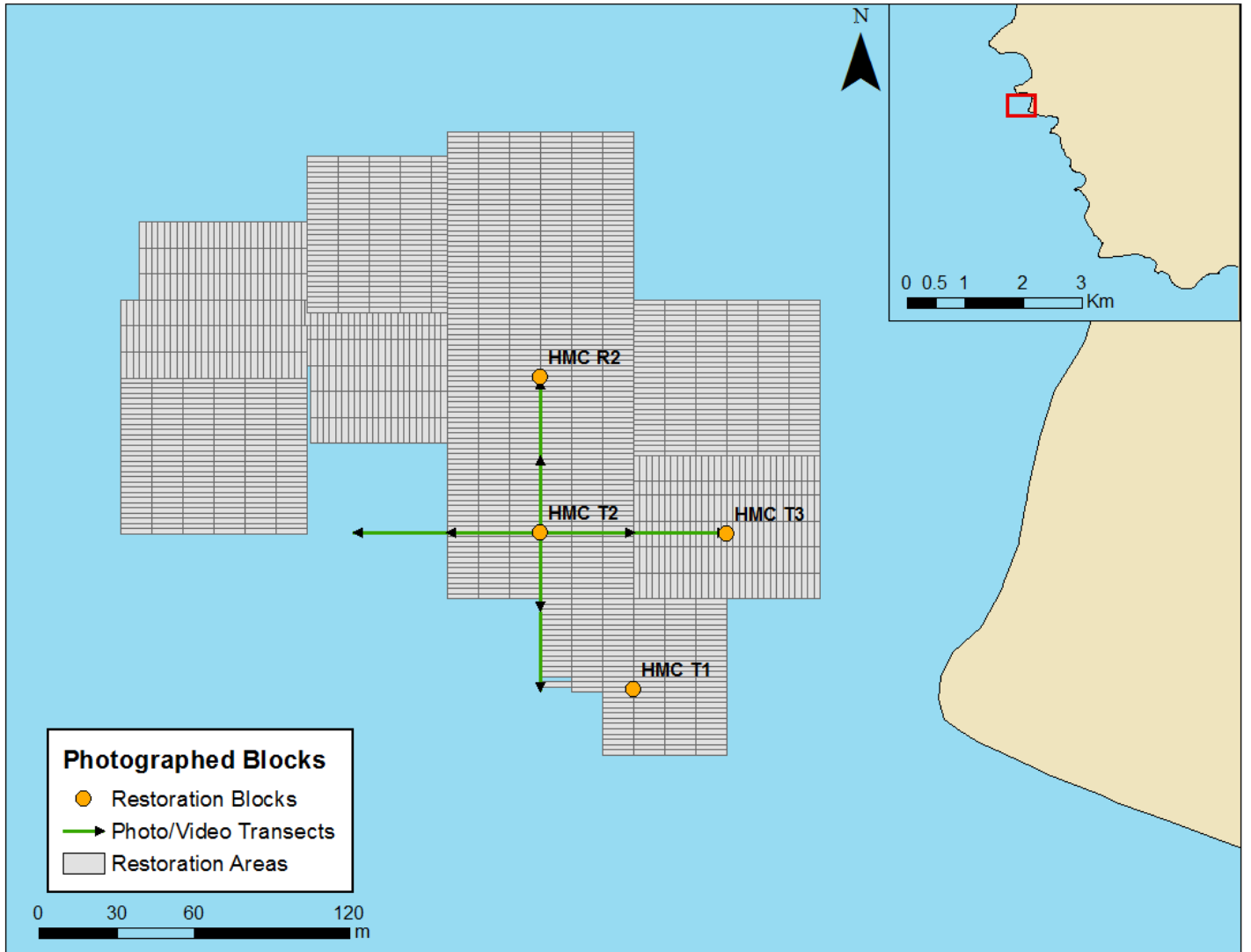
Table B6. Fish Biomass (individuals per 100 meters squared).

Species	Designation	Site	g/100 m ² ± SE								
			2011	2012	2013	2014	2015	2016	2017	2018	
<i>Anisotremus davidsonii</i>	Control	Abalone Cove Kelp West	—	—	—	—	—	—	—	—	—
		Christmas Tree Cove	—	—	—	—	1.6 ± 1.6	7.2 ± 7.2	—	—	—
		Hawthorne Control	—	—	—	—	—	—	—	—	51.7 ± 51.7
	Restoration	Underwater Arch Cove	—	—	—	—	50.5 ± 50.5	—	—	—	—
		Honeymoon Cove	—	—	—	—	—	19.9 ± 13	119.4 ± 119.4	—	—
		Hawthorne Restoration	—	—	—	—	101 ± 101	174.7 ± 126.5	—	—	10 ± 10
	Reference	Ridges North	—	—	—	—	—	—	5.3 ± 5.3	—	532.2 ± 331.3
		Rocky Point North	—	—	—	—	—	—	—	1154.1 ± 1127.7	973.9 ± 521
		Point Vicente West	—	—	—	—	—	—	—	—	—
<i>Atherinopsidae</i>	Control	Abalone Cove Kelp West	—	—	—	—	—	—	—	—	—
		Christmas Tree Cove	—	—	—	—	—	—	—	—	175 ± 117.8
		Hawthorne Control	50.1 ± 50.1	—	—	—	—	277.6 ± 45.5	—	35.4 ± 35.4	—
	Restoration	Underwater Arch Cove	—	—	—	—	—	—	—	—	—
		Honeymoon Cove	—	—	—	—	—	—	—	—	—
		Hawthorne Restoration	—	—	—	—	—	—	—	995.2 ± 930.8	—
	Reference	Ridges North	—	—	—	—	—	—	—	—	—
		Rocky Point North	—	—	—	4.1 ± 4.1	—	—	—	—	—
		Point Vicente West	—	—	—	—	—	—	12.7 ± 12.7	—	—
<i>Brachyistius frenatus</i>	Control	Abalone Cove Kelp West	—	—	—	—	—	4.3 ± 4.3	19.4 ± 18.6	0.4 ± 0.4	2.4 ± 1.7
		Christmas Tree Cove	—	—	—	—	—	—	—	—	14.6 ± 9.3
		Hawthorne Control	—	—	—	—	—	29.9 ± 29.9	10.2 ± 6	—	15.2 ± 10
	Restoration	Underwater Arch Cove	—	—	—	31.9 ± 31.9	—	—	—	—	—
		Honeymoon Cove	—	—	—	—	—	—	—	3.6 ± 2.2	5.3 ± 5.3
		Hawthorne Restoration	—	—	—	—	—	—	—	—	15.1 ± 9.7
	Reference	Ridges North	8.1 ± 8.1	6 ± 6	—	—	—	—	—	—	—
		Rocky Point North	40.9 ± 18.5	13.7 ± 13.7	12.4 ± 12.4	10.6 ± 10.6	—	—	—	1.2 ± 1.2	19.6 ± 4.2
		Point Vicente West	10.6 ± 10.6	26.8 ± 17.1	11 ± 7.6	—	—	135.3 ± 62.5	29.3 ± 29.3	217.6 ± 123.9	177.8 ± 107.7
<i>Chromis punctipinnis</i>	Control	Abalone Cove Kelp West	254.2 ± 143.6	—	145.1 ± 86.6	254.3 ± 113.2	—	—	139.3 ± 93.7	32.5 ± 32.5	12.9 ± 7.1
		Christmas Tree Cove	—	—	—	—	—	—	—	—	18.2 ± 12
		Hawthorne Control	—	28.3 ± 28.3	21.5 ± 21.5	—	—	29.7 ± 29.7	4.5 ± 2.9	—	49.7 ± 33.5
	Restoration	Underwater Arch Cove	60.3 ± 60.3	39.1 ± 39.1	13 ± 13	79.7 ± 39.7	8.6 ± 8.6	245.6 ± 134.6	120.6 ± 120.6	—	25.2 ± 13
		Honeymoon Cove	—	—	—	—	—	49.4 ± 49.4	—	—	—
		Hawthorne Restoration	20.1 ± 20.1	—	8 ± 5.7	—	—	27.3 ± 27.3	282.9 ± 247.7	5.1 ± 5.1	—
	Reference	Ridges North	—	—	—	—	—	—	—	—	—
		Rocky Point North	10.2 ± 10.2	—	—	—	—	—	—	—	10.2 ± 10.2
		Point Vicente West	—	—	75.4 ± 75.4	290.4 ± 195.3	9.4 ± 7.4	370.9 ± 319.4	—	—	3 ± 3
<i>Damalichthys vacca</i>	Control	Abalone Cove Kelp West	9.3 ± 9.3	—	—	3.8 ± 3.8	—	—	12.2 ± 12.2	—	—
		Christmas Tree Cove	—	—	—	—	—	—	—	—	—
		Hawthorne Control	—	—	—	24.3 ± 24.3	—	—	—	—	—
	Restoration	Underwater Arch Cove	—	—	—	56.6 ± 56.6	—	—	—	—	28.3 ± 28.3
		Honeymoon Cove	—	—	—	56.6 ± 56.6	—	—	—	—	—
		Hawthorne Restoration	—	—	—	—	—	—	—	56.6 ± 56.6	—
	Reference	Ridges North	—	—	—	56.6 ± 56.6	—	—	—	—	—
		Rocky Point North	—	—	—	—	—	—	—	—	—
		Point Vicente West	—	116.4 ± 106.8	—	109 ± 109	—	—	—	—	—
<i>Embiotoca jacksoni</i>	Control	Abalone Cove Kelp West	100.7 ± 62.7	64.7 ± 64.7	218.2 ± 164.7	134.7 ± 86.2	70.7 ± 70.7	51.4 ± 22.9	191.6 ± 152.9	45.2 ± 17.8	
		Christmas Tree Cove	—	—	14.7 ± 14.7	64.7 ± 64.7	24.2 ± 24.2	192.7 ± 119.1	2.7 ± 2.7	21.6 ± 14.3	
		Hawthorne Control	48.3 ± 27.9	214 ± 127	48.3 ± 27.9	—	33.6 ± 28.4	25.8 ± 22.4	14.2 ± 8.4	19.9 ± 11.3	
	Restoration	Underwater Arch Cove	453.2 ± 371.9	14.7 ± 14.7	24.2 ± 24.2	83.8 ± 83.8	42.5 ± 21.6	4.3 ± 4.3	24.2 ± 24.2	213.2 ± 48.4	
		Honeymoon Cove	—	64.7 ± 64.7	—	2.7 ± 2.7	—	18.2 ± 13	6.3 ± 5.1	66.2 ± 41.6	
		Hawthorne Restoration	173.3 ± 46.6	91.4 ± 34.1	266.2 ± 116.2	214.9 ± 136.7	1294.9 ± 1294.9	89.8 ± 89.8	126.8 ± 60.3	0.8 ± 0.8	
	Reference	Ridges North	26.9 ± 23.4	1.7 ± 1.7	—	—	—	—	64.7 ± 64.7	—	13 ± 8.6
		Rocky Point North	313.2 ± 179	366.8 ± 153.2	138.3 ± 138.3	83.8 ± 61.1	43.2 ± 25.3	55.1 ± 51.8	—	61.1 ± 43.8	
		Point Vicente West	78.4 ± 43.5	64.7 ± 64.7	677.7 ± 183.7	474.5 ± 160.9	78.9 ± 61.5	107.5 ± 58.3	—	71.3 ± 70.4	

<i>Gibbonsia elegans</i>	Control	Abalone Cove Kelp West	—	—	—	—	—	—	—	0.4 ± 0.4
		Christmas Tree Cove	—	—	—	—	—	—	—	—
		Hawthorne Control	—	—	—	—	—	—	—	—
	Restoration	Underwater Arch Cove	—	—	—	—	—	—	6.8 ± 6.8	—
		Honeymoon Cove	—	—	—	—	—	—	—	—
		Hawthorne Restoration	—	—	—	—	—	—	—	—
	Reference	Ridges North	—	8.8 ± 8.8	—	—	—	—	—	—
		Rocky Point North	—	—	—	—	—	—	—	—
		Point Vicente West	—	—	—	—	—	—	—	—
<i>Girella nigricans</i>	Control	Abalone Cove Kelp West	41.2 ± 32	216 ± 216	647.9 ± 647.9	278.7 ± 203.8	—	355.9 ± 227.3	—	277 ± 140.6
		Christmas Tree Cove	—	—	—	—	339.7 ± 339.7	—	62.7 ± 62.7	31.4 ± 31.4
		Hawthorne Control	—	125.5 ± 125.5	62.7 ± 62.7	26.1 ± 26.1	479.8 ± 231.6	26.1 ± 26.1	—	—
	Restoration	Underwater Arch Cove	284.7 ± 251.1	16.9 ± 16.9	—	26.1 ± 26.1	—	61.9 ± 61.9	52.2 ± 30.1	42.6 ± 16.5
		Honeymoon Cove	—	—	—	—	186.6 ± 186.6	27.7 ± 21.2	—	—
		Hawthorne Restoration	338.1 ± 117.7	100.7 ± 59.3	186.6 ± 118.7	—	863.9 ± 863.9	216 ± 216	901.4 ± 646.3	—
	Reference	Ridges North	—	3.8 ± 3.8	—	—	—	—	—	21.5 ± 14.5
		Rocky Point North	—	125.5 ± 125.5	—	434.3 ± 255.7	463.7 ± 269	340.4 ± 185.2	—	—
		Point Vicente West	—	—	463.7 ± 269	771.8 ± 524.9	62.7 ± 62.7	181.3 ± 104.9	777.5 ± 530.2	119.4 ± 78.2
<i>Gobiidae</i>	Control	Abalone Cove Kelp West	—	—	—	—	—	—	—	—
		Christmas Tree Cove	—	—	—	—	—	0.3 ± 0.2	—	—
		Hawthorne Control	—	—	—	—	—	—	—	—
	Restoration	Underwater Arch Cove	—	—	—	—	—	—	—	—
		Honeymoon Cove	—	—	—	—	—	—	—	—
		Hawthorne Restoration	—	—	—	—	—	—	—	—
	Reference	Ridges North	—	—	0.6 ± 0.6	—	—	—	—	—
		Rocky Point North	—	—	—	—	—	—	—	—
		Point Vicente West	—	—	—	—	—	0.9 ± 0.6	—	—
<i>Haemulon californiensis</i>	Control	Abalone Cove Kelp West	—	—	—	—	—	46.2 ± 30.2	—	—
		Christmas Tree Cove	—	—	—	—	—	—	—	—
		Hawthorne Control	—	—	—	—	—	—	—	—
	Restoration	Underwater Arch Cove	—	—	—	—	—	—	—	—
		Honeymoon Cove	—	—	—	—	—	—	—	—
		Hawthorne Restoration	—	—	—	—	—	—	—	—
	Reference	Ridges North	—	—	—	—	—	—	—	72 ± 67.5
		Rocky Point North	—	—	—	—	—	—	164.2 ± 164.2	4904.8 ± 1887.8
		Point Vicente West	—	—	—	—	—	—	—	—
<i>Halichoeres semicinctus</i>	Control	Abalone Cove Kelp West	—	70.9 ± 70.9	—	—	65.9 ± 17.6	96.6 ± 30.4	529 ± 234.9	97.2 ± 27.6
		Christmas Tree Cove	—	—	—	35 ± 35	147.3 ± 41	—	14.1 ± 14.1	12.7 ± 8.4
		Hawthorne Control	—	70 ± 70	14.1 ± 14.1	—	47.6 ± 17.5	121.7 ± 37	438.2 ± 75.4	71.1 ± 46.6
	Restoration	Underwater Arch Cove	70 ± 40.4	—	35 ± 35	46.4 ± 46.4	65.2 ± 21	80.8 ± 40	1129.7 ± 774.4	180.4 ± 60.5
		Honeymoon Cove	—	—	—	120 ± 79.7	5.1 ± 3.6	151.5 ± 32.9	1103.6 ± 320.8	129.2 ± 51.9
		Hawthorne Restoration	70 ± 70	—	—	—	110.8 ± 63.1	308.8 ± 133.4	929.5 ± 638.5	175.9 ± 45.1
	Reference	Ridges North	—	17.6 ± 10.7	79.1 ± 44.7	4.2 ± 2.7	85.5 ± 17.9	44.3 ± 20.8	11.3 ± 11.3	8.9 ± 4.6
		Rocky Point North	154.2 ± 136	—	99.9 ± 55.4	35 ± 35	188.3 ± 43.9	52.6 ± 26.8	473.9 ± 179.3	82.5 ± 40.1
		Point Vicente West	35 ± 35	—	35 ± 35	—	37.2 ± 13.3	163.1 ± 54.6	105 ± 35	93.2 ± 38.4
<i>Hermosilla azurea</i>	Control	Abalone Cove Kelp West	—	—	—	—	—	—	—	—
		Christmas Tree Cove	—	—	—	—	—	—	—	—
		Hawthorne Control	—	—	—	—	—	—	—	—
	Restoration	Underwater Arch Cove	—	—	—	—	—	—	73.1 ± 73.1	—
		Honeymoon Cove	—	—	—	—	—	—	—	—
		Hawthorne Restoration	—	—	—	—	—	—	—	—
	Reference	Ridges North	—	—	—	—	—	—	—	—
		Rocky Point North	—	—	—	—	—	—	—	—
		Point Vicente West	—	—	—	—	149.6 ± 149.6	208.9 ± 143.9	1114.4 ± 671.4	—

<i>Sebastes camatus</i>	Control	Abalone Cove Kelp West	—	—	—	—	—	—	—	—
		Christmas Tree Cove	—	—	—	—	—	—	—	—
		Hawthorne Control	—	—	—	—	—	—	—	—
	Restoration	Underwater Arch Cove	—	—	—	—	—	—	—	—
		Honeymoon Cove	—	—	—	—	—	—	—	—
		Hawthorne Restoration	—	—	—	—	—	—	—	—
	Reference	Ridges North	—	—	—	—	—	—	—	—
		Rocky Point North	—	—	—	—	—	—	—	—
		Point Vicente West	—	—	—	64.6 ± 64.6	—	—	—	—
<i>Sebastes chrysomelas</i>	Control	Abalone Cove Kelp West	—	—	—	—	—	13.9 ± 13.9	—	—
		Christmas Tree Cove	—	—	—	—	—	—	—	—
		Hawthorne Control	—	—	—	—	—	—	—	—
	Restoration	Underwater Arch Cove	—	—	—	—	—	—	—	—
		Honeymoon Cove	—	—	—	—	—	—	—	—
		Hawthorne Restoration	—	—	—	—	—	—	—	—
	Reference	Ridges North	—	—	—	—	—	—	—	—
		Rocky Point North	—	—	—	—	—	—	—	—
		Point Vicente West	—	—	—	273.7 ± 158	—	—	—	—
<i>Sebastes mystinus</i>	Control	Abalone Cove Kelp West	—	—	9.3 ± 3.1	—	—	—	—	—
		Christmas Tree Cove	—	—	—	—	—	—	—	—
		Hawthorne Control	—	—	3.1 ± 3.1	—	—	—	—	—
	Restoration	Underwater Arch Cove	—	—	—	—	—	—	—	—
		Honeymoon Cove	—	—	2.8 ± 2.8	—	—	—	—	—
		Hawthorne Restoration	—	—	3.3 ± 3.3	2 ± 2	—	—	—	—
	Reference	Ridges North	—	—	—	—	—	—	—	—
		Rocky Point North	—	—	—	—	—	—	—	—
		Point Vicente West	—	—	—	—	—	—	—	—
<i>Sebastes rastrelliger</i>	Control	Abalone Cove Kelp West	—	—	—	—	—	—	—	—
		Christmas Tree Cove	—	—	—	—	—	—	—	—
		Hawthorne Control	76.5 ± 76.5	—	—	—	—	—	—	—
	Restoration	Underwater Arch Cove	—	—	—	77.4 ± 77.4	—	—	—	—
		Honeymoon Cove	—	—	—	—	—	—	—	—
		Hawthorne Restoration	—	—	—	—	—	—	—	—
	Reference	Ridges North	—	—	—	—	—	—	—	—
		Rocky Point North	—	—	38.7 ± 38.7	—	—	—	—	—
		Point Vicente West	—	—	38.7 ± 38.7	—	—	—	—	—
<i>Sebastes serranoides</i>	Control	Abalone Cove Kelp West	—	—	—	—	—	4.4 ± 4.4	—	—
		Christmas Tree Cove	—	—	—	—	—	—	—	—
		Hawthorne Control	—	—	—	—	—	—	—	—
	Restoration	Underwater Arch Cove	—	—	—	—	—	—	—	—
		Honeymoon Cove	—	—	—	—	—	—	—	—
		Hawthorne Restoration	—	—	—	—	—	—	—	—
	Reference	Ridges North	—	—	0.3 ± 0.3	—	—	—	—	—
		Rocky Point North	—	—	—	—	—	—	0.6 ± 0.6	21.6 ± 21.6
		Point Vicente West	—	—	—	—	—	—	—	—
<i>Semicossyphus pulcher</i>	Control	Abalone Cove Kelp West	—	173.3 ± 173.3	56.6 ± 56.6	—	122.1 ± 100.2	59.7 ± 56.2	347.9 ± 347.9	280.5 ± 138.8
		Christmas Tree Cove	—	—	—	—	—	—	—	12.9 ± 12.9
		Hawthorne Control	347.1 ± 185.7	104.7 ± 104.7	266 ± 160.4	104.7 ± 104.7	199 ± 166.5	17.4 ± 17.4	312.2 ± 242.7	169.9 ± 83.7
	Restoration	Underwater Arch Cove	25.7 ± 25.7	235.1 ± 108.1	—	104.7 ± 104.7	—	258.2 ± 151	370.6 ± 370.6	431.5 ± 138.1
		Honeymoon Cove	—	—	—	—	56.6 ± 56.6	71.8 ± 52.3	—	301.3 ± 216.1
		Hawthorne Restoration	160.3 ± 68.5	—	—	—	25.7 ± 25.7	280 ± 98.2	442.6 ± 158	171.6 ± 81.3
	Reference	Ridges North	25.7 ± 25.7	82.3 ± 82.3	286.5 ± 217.6	104.7 ± 104.7	173.3 ± 173.3	25.7 ± 25.7	25.7 ± 25.7	38.6 ± 18.8
		Rocky Point North	130.4 ± 130.4	312.2 ± 144.4	866.5 ± 95.8	173.3 ± 173.3	56.6 ± 56.6	144.9 ± 114.6	—	28.3 ± 28.3
		Point Vicente West	25.7 ± 25.7	—	—	880.1 ± 530.6	209.4 ± 120.9	235.7 ± 126.9	56.6 ± 56.6	860.9 ± 612

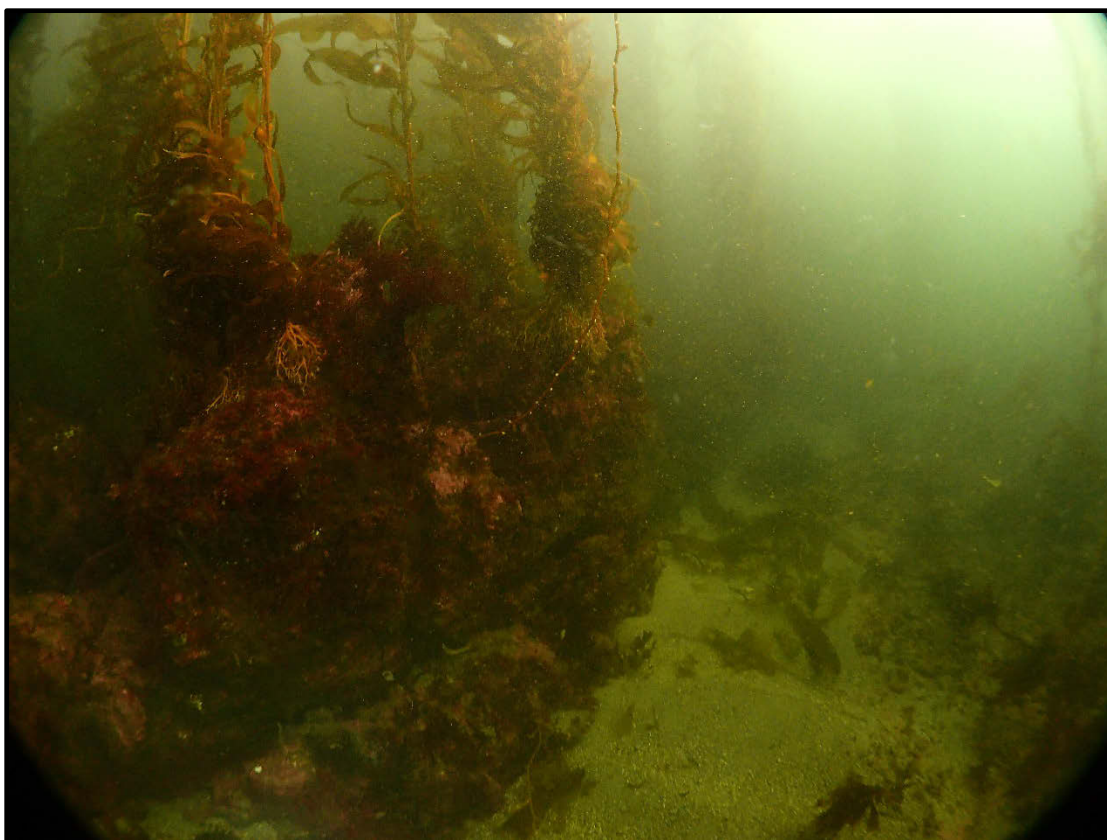
Honeymoon Cove



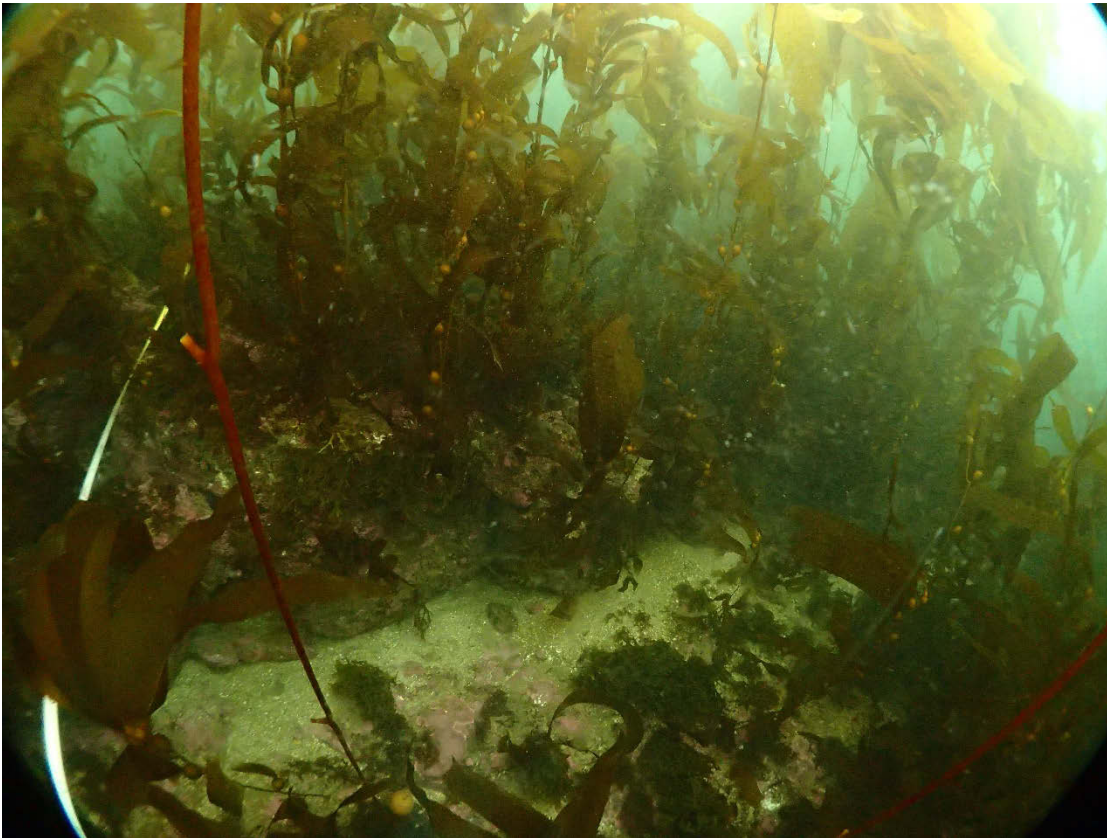
Honeymoon Cove Block T2 (HMC T2) east-west running ridge is a large distinguishable feature easily found by divers. This block was restored in March 2014. GPS: 33.764260, -118.423734



HMC T2 07/29/16



HMC T2 08/3/17



HMC T2 07/18/18

Honeymoon Cove Block R5 (HMC R5) is the site of another TBF project with ongoing monitoring. Divers visit this area quarterly to conduct subtidal surveys allowing the opportunity to collect photos over time. This block was restored in November 2014. GPS: 33.765297, -118.424221



HMC R5 06/22/15



HMC R5 09/24/15



HMC R5 11/12/15



HMC R5 02/10/16



HMC R5 08/3/17

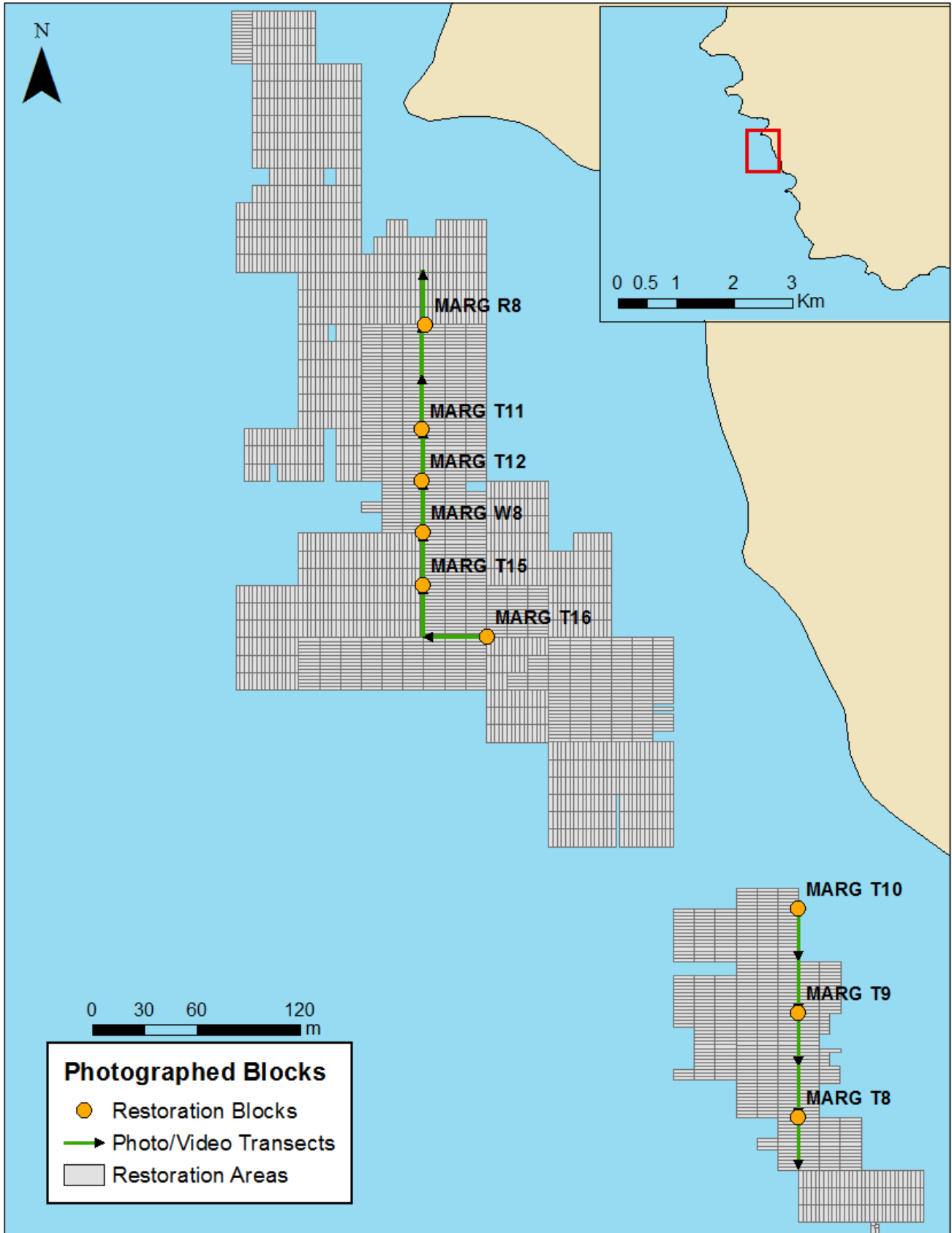


HMC R5 07/3/18



HMC R5 7/3/18

Marguerite



Marguerite Block T16 (MARG T16) will be monitored monthly by TBF divers over the next 2 years for a wave attenuation study. This block was restored in September 2016. Photos and video will be taken during these surveys.

GPS: 33.757561, -118.41782



MARG T16 08/10/16

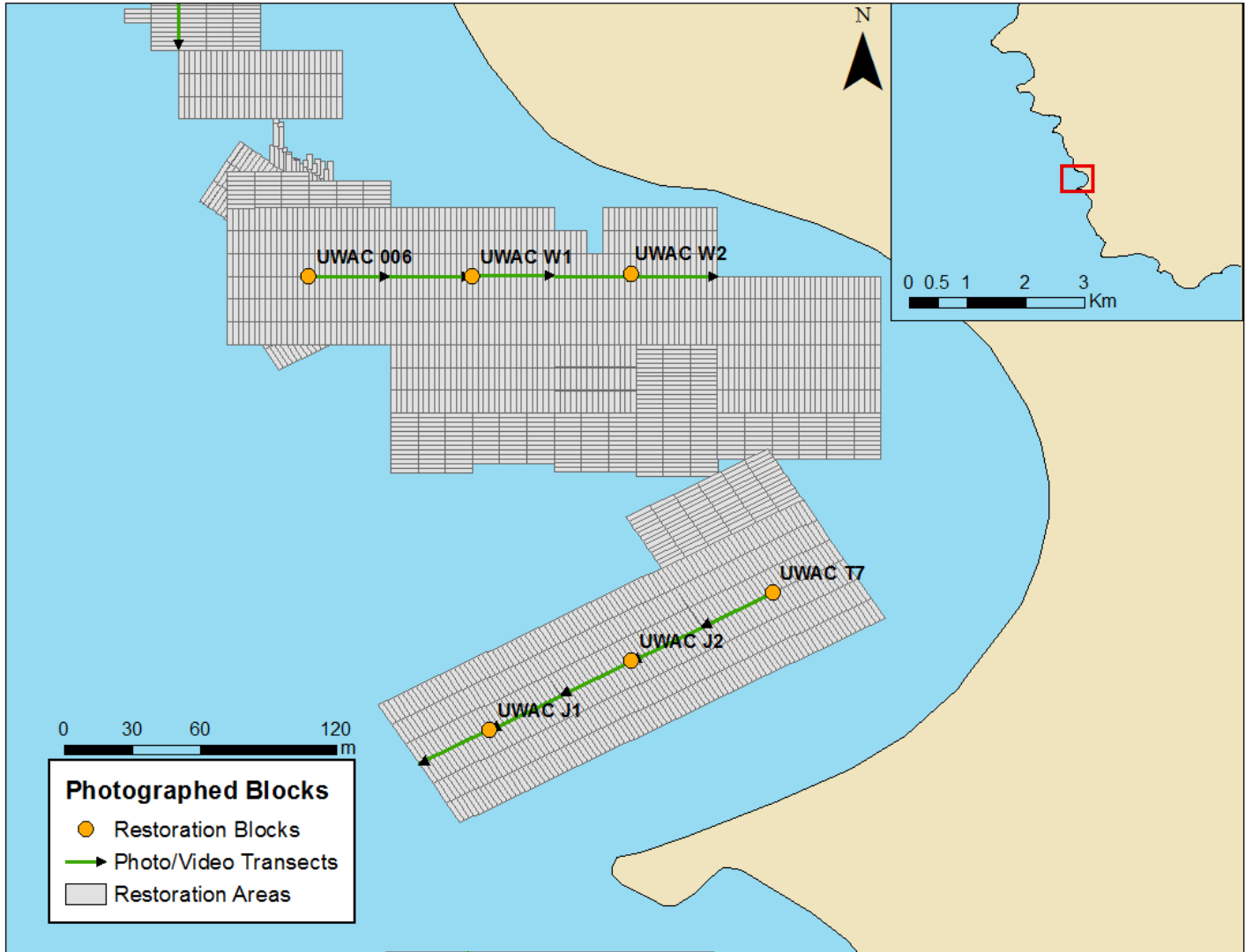


MARG T16 08/3/17



MARG T16 07/20/18

Underwater Arch Cove

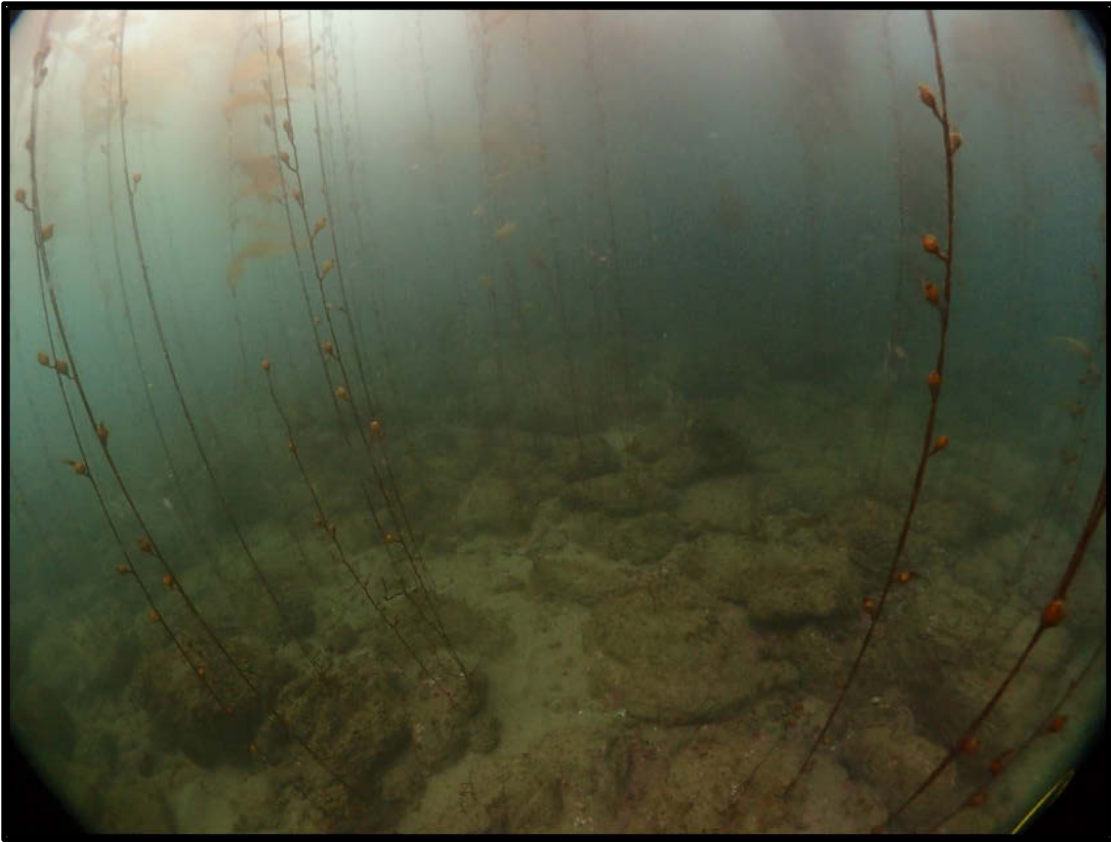


Underwater Arch Cove Blocks (UWAC) J1, J2 and T7 were the locations of our first transect video shot in 2014. In 2016 and 2017, this video transect was recorded again and photos from both dates have been archived. Divers will continue to revisit this area at least annually for video and photography.

UWAC J1 restoration was complete in November 2013. GPS: 33.75205979, -118.4156861



UWAC J1 08/14/14



UWAC J1 07/07/16



UWAC J1 07/27/17



UWAC J1 07/18/18

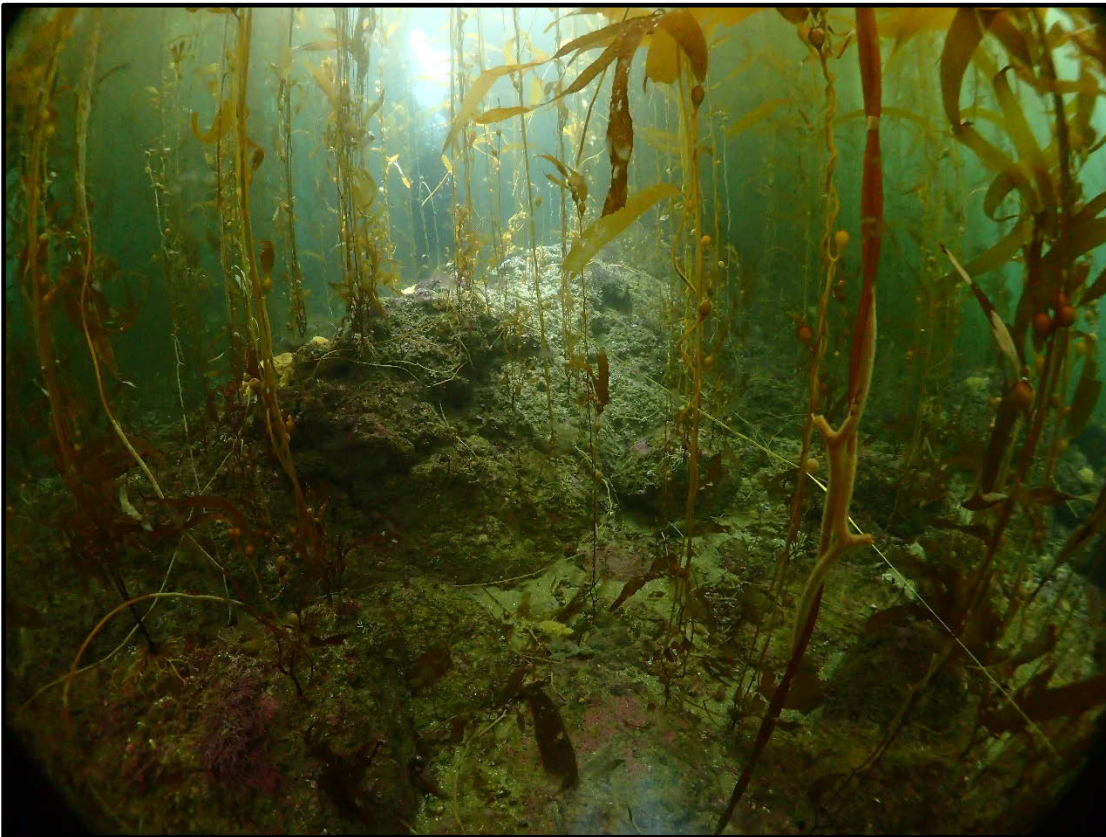
UWAC J2 was restored in July 2014. GPS: 33.7523302, -118.4151245



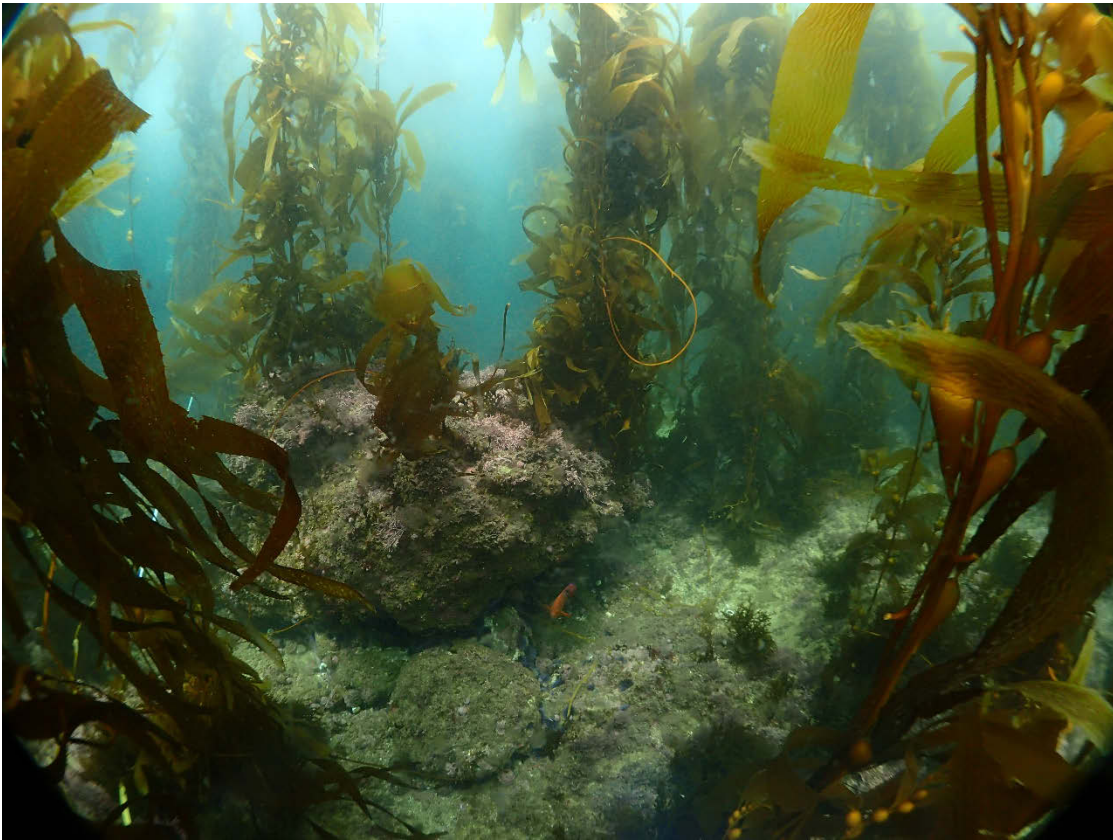
UWAC J2 PRE-RESTORATION 07/12/14



UWAC J2 08/14/14



UWAC J2 07/27/17



UWAC J2 07/18/18

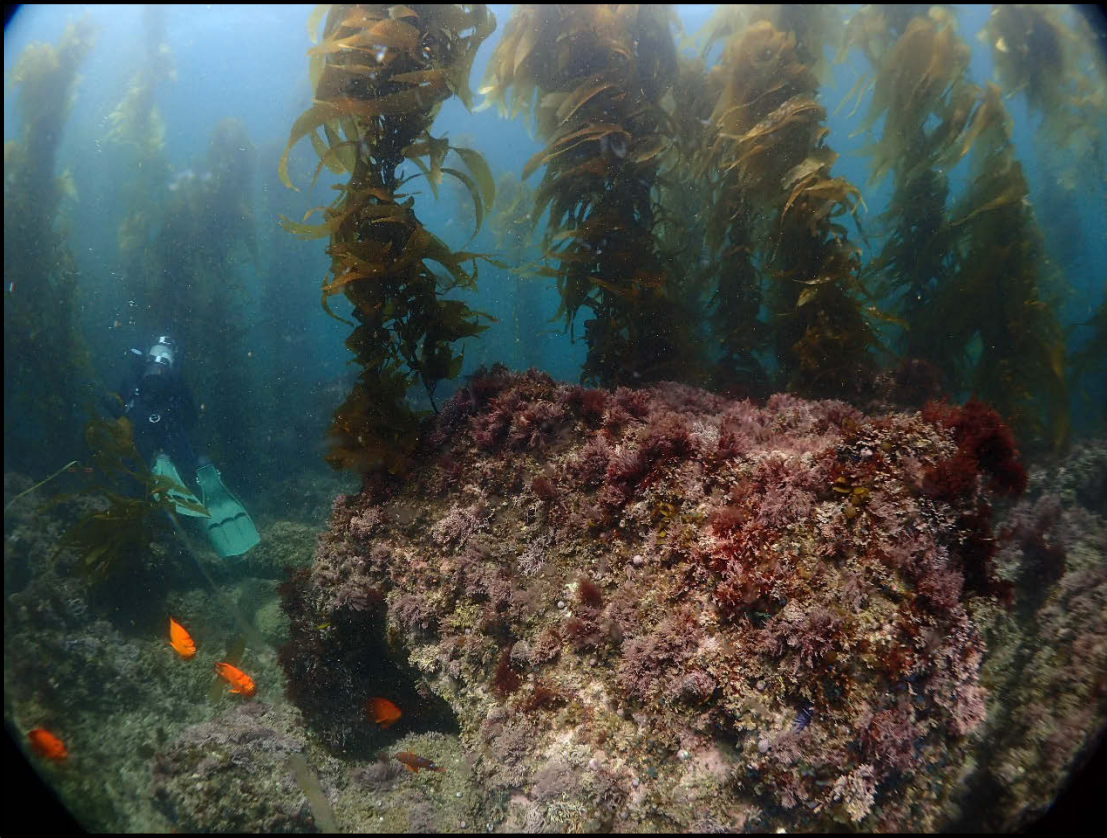
UWAC T7 was restored in September 2014. GPS: 33.7526, -118.414563



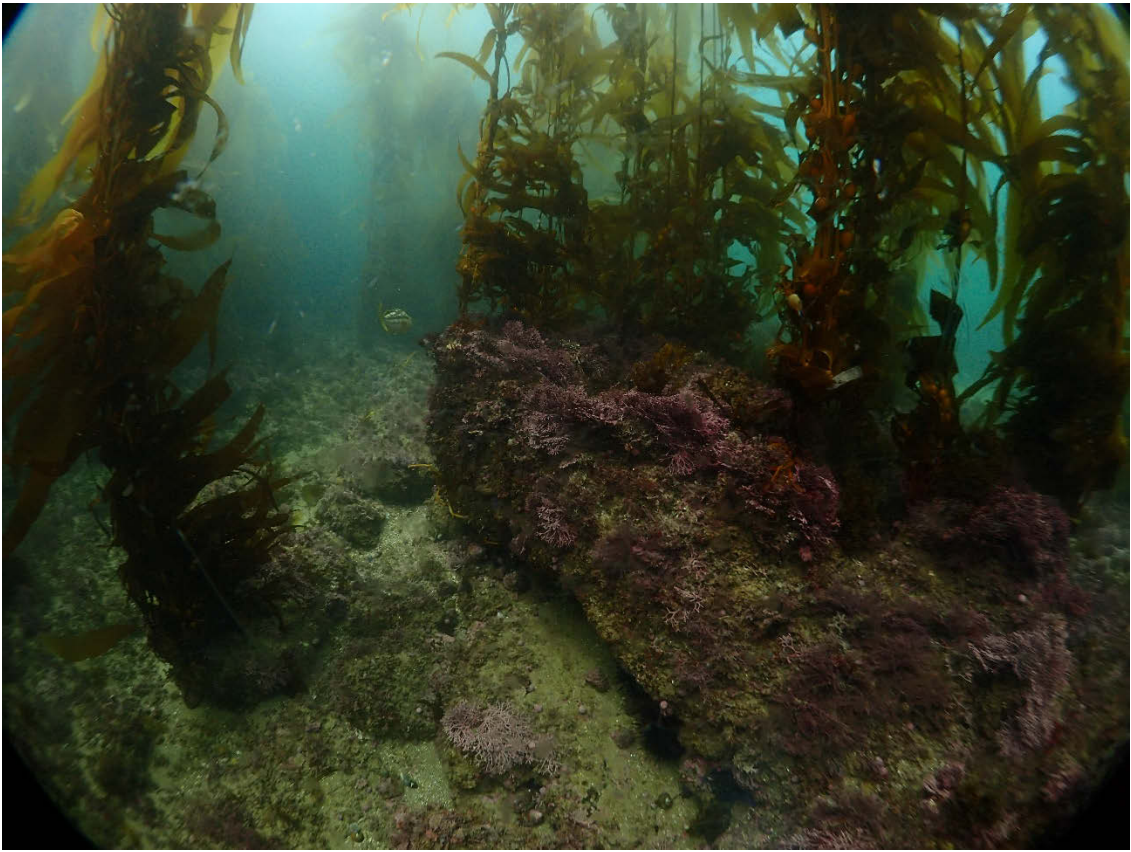
UWAC T7 PRE-RESTORATION 08/14/14



UWAC T7 07/07/16

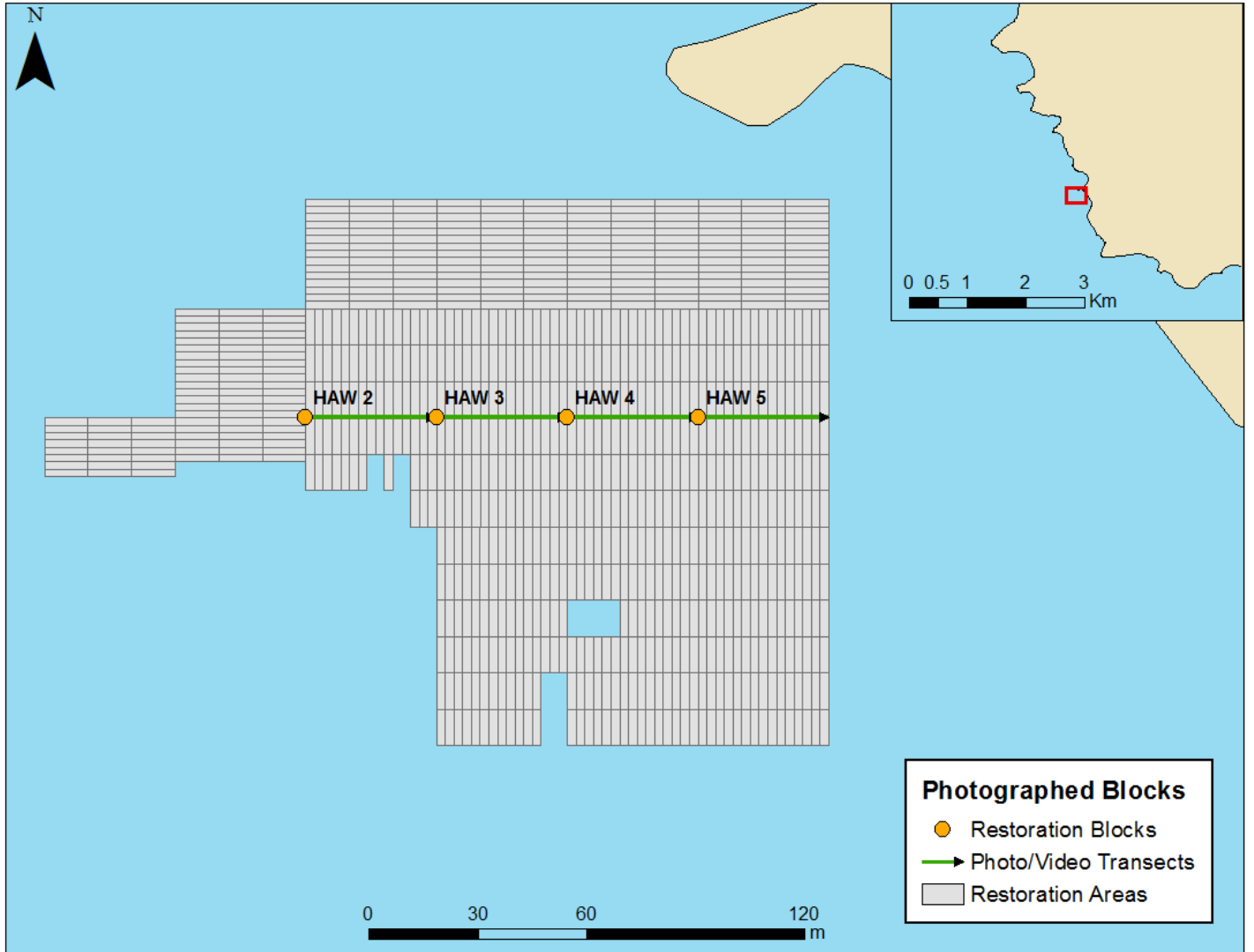


UWAC T7 07/27/17



UWAC T7 07/18/18

Hawthorne

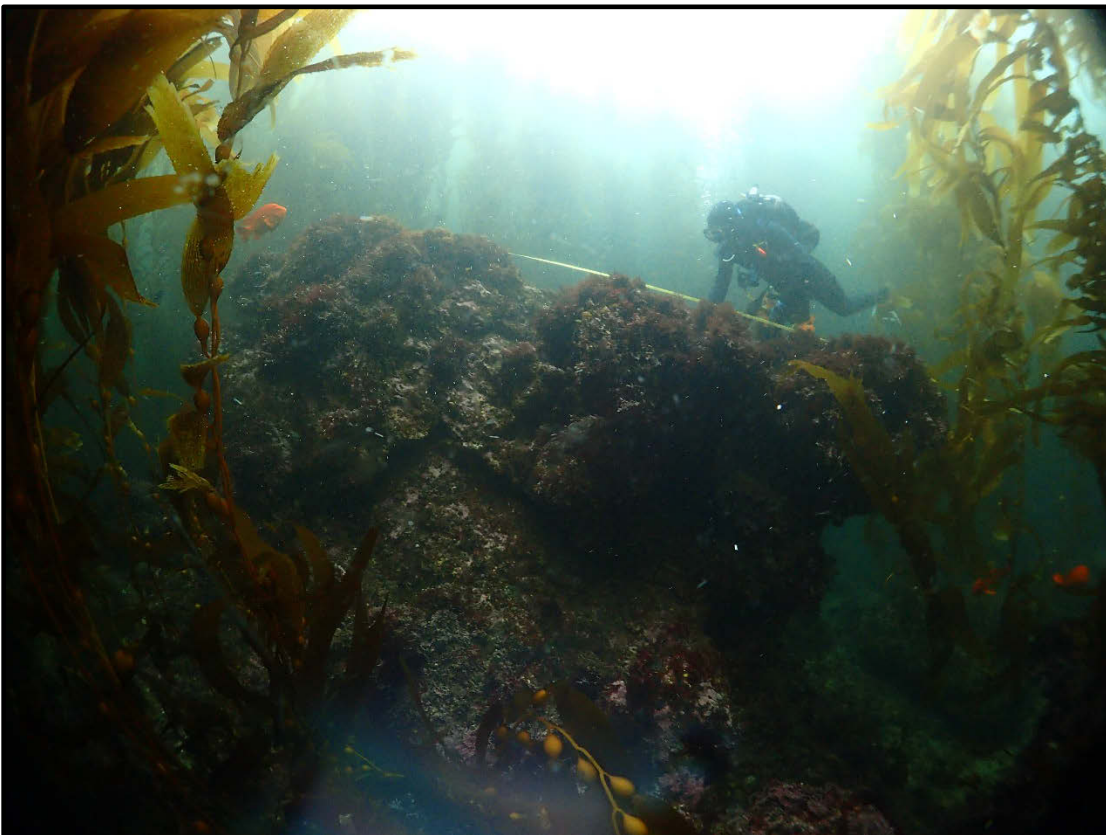


Hawthorne 2 this large pinnacle within Block 2 is easily found by divers and will serve as the starting point for video transects and photos of the site. The photos below show the pinnacle at heading 180 degrees and 90 degrees.

GPS: 33.75064, -118.416097



HAW 2 Heading 180 08/10/16



HAW 2 Heading 180 08/25/17



HAW 2 Heading 180 07/20/18



HAW 2 Heading 90 08/10/16

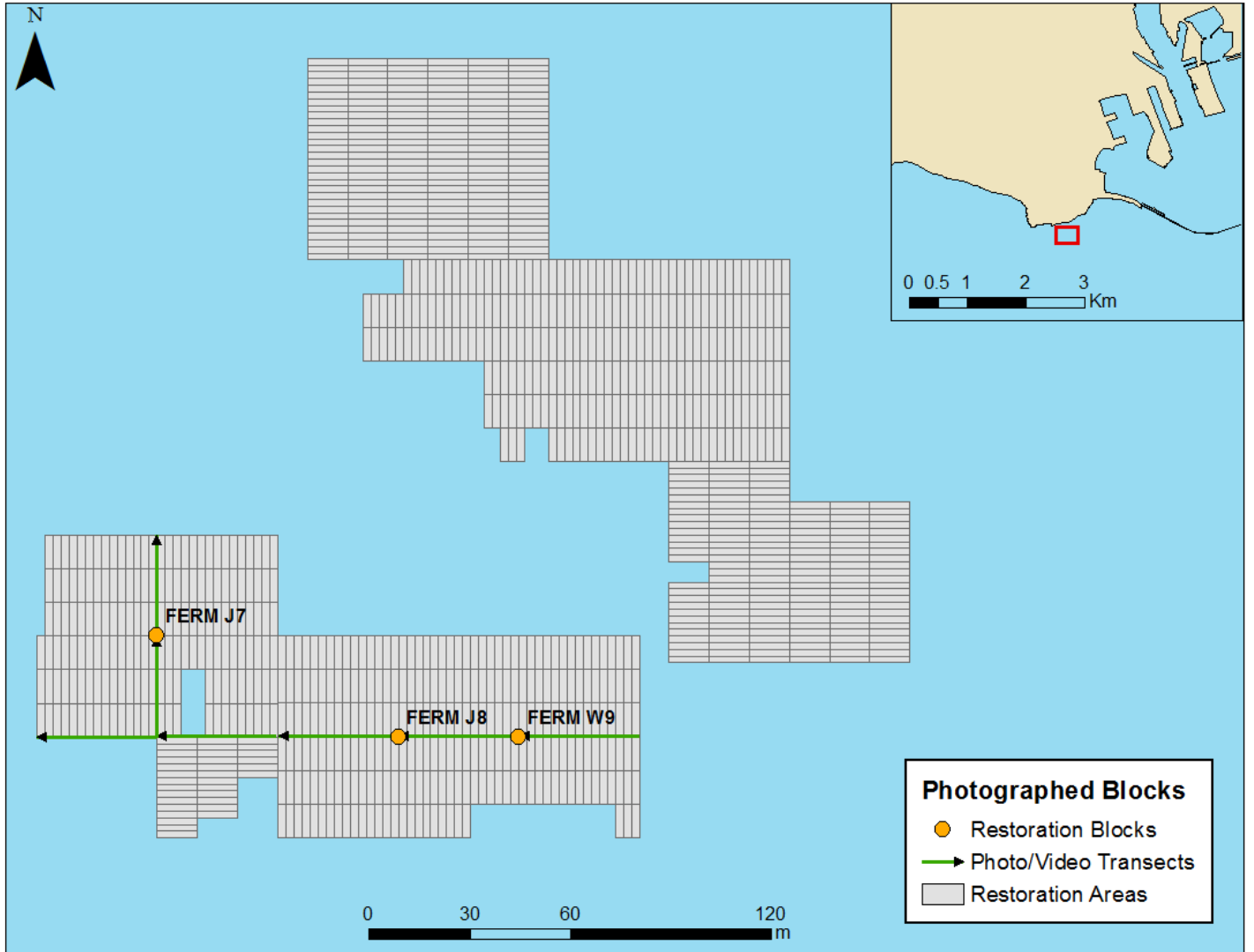


HAW 2 Heading 90 08/25/17

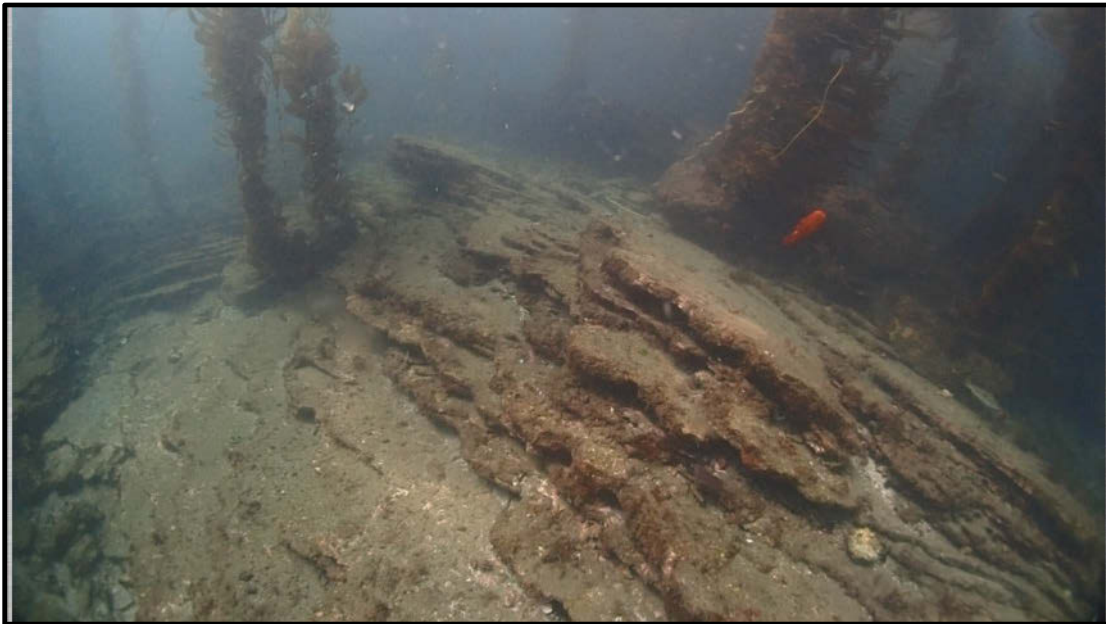


HAW 2 Heading 90 07/20/18

Point Fermin



Point Fermin, Block J7 (FERM J7) north-south running ridge has been well documented with video footage pre and post restoration. GPS: 33.703028, -118.290167



FERM J7 9/25/15



FERM J7 7/7/17



FERM J7 7/17/18



FERM J7 8/10/16



FERM J7 7/7/17



FERM J7 7/17/18

2018 Video Transects (video files available by request)

Video transects are recorded annually at specific GPS points per site. Transect lines are drawn on the maps above for each site.

Files

Honeymoon Cove:

1_HoneymoonCove_Videotransect_2018

Underwater Arch Cove:

2_UnderwaterArch_006_Videotransect_2018

3_UnderwaterArch_T7_Videotransect_2018

Marguerite:

4_Marguerite_T16_Videotransect_2018

5_Marguerite_T10_Videotransect_2018

Hawthorne:

6_Hawthorne_Videotransect_2018

Point Fermin:

7_PointFermin_Videotransect_2018

Timelapse Videos of Sites (video files available by request)

Videos were taken at set blocks per site pre and post restoration. Each video consists of the same transect defined by GPS coordinates during summer months in different years.

Files

Honeymoon Cove:

1_Timelapse_HoneymoonCove_Videotransect_2018

Underwater Arch:

2_Timelapse_UnderwaterArch_Videotransect_2018

Marguerite:

3_Timelapse_Marguerite_Videotransect_2018

Hawthorne:

4_Timelapse_Hawthorne_Videotransect_2018

Point Fermin:

5_Timelapse_PointFermin_Videotransect_2018