

**CITIZEN SCIENCE PELAGIC CORMORANT MONITORING IN MENDOCINO AND NORTHERN SONOMA COUNTY, CALIFORNIA – 2009-2018 SEASONS.** Ron LeValley, P.O. Box 332, Little River, CA 95456, USA, [ron@levalleyphoto.com](mailto:ron@levalleyphoto.com)

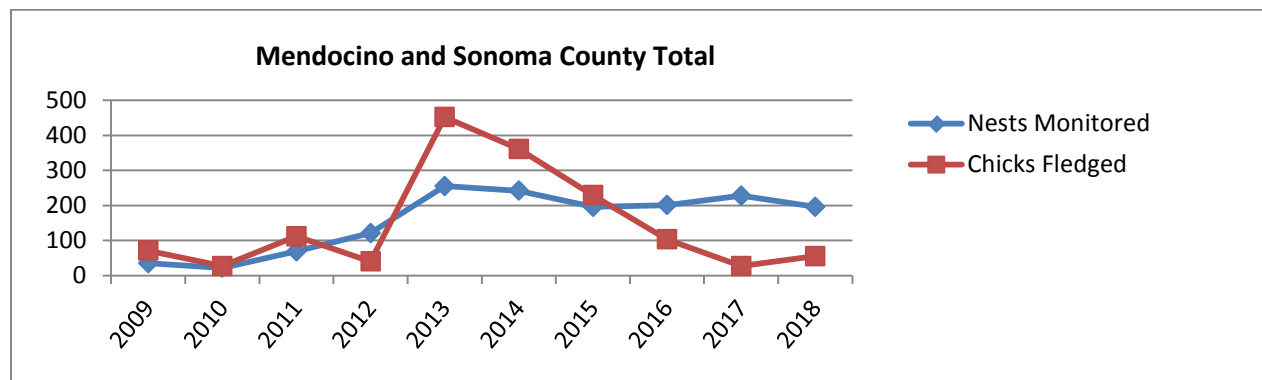
**Summary**

In 2018 volunteers from Mendocino Audubon Society conducted the tenth year of monitoring Pelagic Cormorant colonies in central coastal Mendocino County. As was done in 2009, surveys were conducted on Point Cabrillo and at the entrance to Noyo Harbor. In addition, Pelagic Cormorant colonies in Fort Bragg, Mendocino Headlands, Navarro Point, Iverson Cove and The Sea Ranch islands were added to this effort. Monitoring performed primarily by local volunteers and high resolution photography have provided valuable data on the reproductive success of these cormorants that further aids in understanding of ocean conditions and its relation to seabird nesting in Northern California. Reproductive success of these cormorants in 2018 was very poor at the Mendocino colonies, and the pattern of nesting was novel.

**Introduction**

Volunteers monitored seventeen Pelagic Cormorant colonies on the Mendocino County coast and the northern Sonoma Coast: five along the Fort Bragg coastline, one near the mouth of Noyo Harbor, two near Point Cabrillo, two on the Mendocino Headlands, three near Iverson Cove and four at The Sea Ranch. Photos were taken of the nesting sites approximately weekly and volunteers used these photos with numbered nests to check on the status of nests regularly. Nesting success of Pelagic Cormorants in northern California has been poor for the past decade (Warzybok et al. 2014, R. LeValley, pers. obs.). Data from this study are showing that the colonies did fairly well during the past seven years in northern Sonoma and Mendocino counties but the past three years had particularly low reproduction success, although this year was a little better.

In 2009-10 we monitored only the colonies at the mouth of Noyo Harbor and at Point Cabrillo. Only 35 nests were monitored in 2009 and 22 in 2010. In 2011 we added two colonies along the waterfront in the town of Fort Bragg and monitored 69 nests. In 2012 we added two more colonies along the Fort Bragg waterfront and colonies on islands off the Mendocino Headlands in the town of Mendocino, raising our monitored nests for all years to 1217. In the years 2013-2015 we added another colony along the Fort Bragg waterfront, a single colony on Navarro Bluff, two colonies near Iverson Point in southern Mendocino County and colonies along The Sea Ranch in northern Sonoma County. This allowed us to monitor 255 nests in 2013, 242 nests in 2014, and 196 nests in 2015. In 2016 we monitored 201 nests. In 2017 we expanded the sites in Iverson Point and Sea Ranch. Despite the expansion of sites, the total nests monitored did not go up much. In 2017 we monitored 228 nests. In 2018 we monitored 196 nests. The overall totals are summarized in Figure 1.

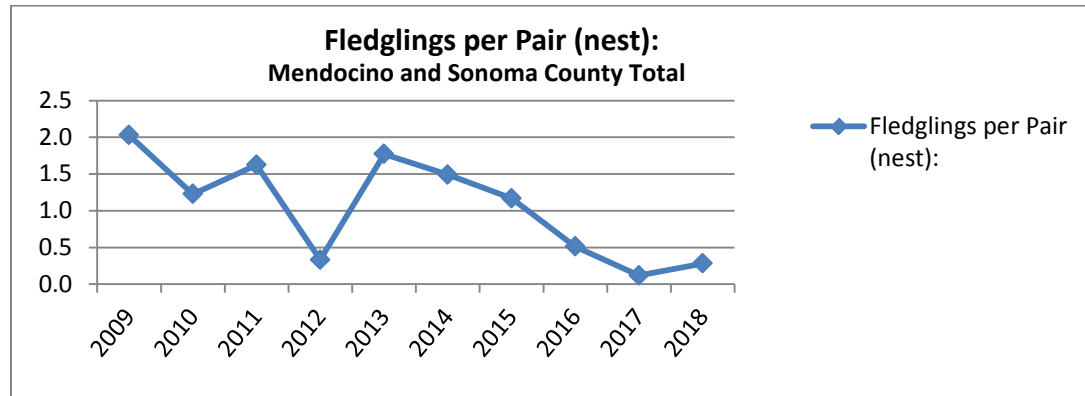


**Figure 1. Number of nests monitored and number of chicks fledged per year.**

## Results

### **Overall Results**

The overall results for the eight years have varied (Figure 2). The worst year was 2017. Much of the reason for the poor year was probably because there was a lack of food in the near shore area. Beginning in 2015 the warmer waters caused by the offshore warm patch known as “The Blob” and coincident warming due to El Niño and Global Warming led to years of poor productivity. In 2017 there was upwelling only early in the season and then we suspect that local currents carried the nutrients away and caused an acute shortage of food for cormorants. In 2018 there was upwelling and nutrients in the ocean late in the season. The number of fledglings per nest has ranged from 0.1 to 2.0 during our study, averaging 1.1 fledged chicks per nest.



**Figure 2. Fledglings per nest total for all colonies studied.**

### **Fort Bragg Waterfront Pelagic Cormorants:**

There were five active colonies along the Fort Bragg waterfront (Map 1), one historical one was not active, but a new colony was found and monitored.. These colonies used to be on private property owned by the Georgia Pacific Lumber Company, but in 2015 they became accessible publicly on the new Noyo Headlands trails that the City of Fort Bragg has developed. One colony had no birds in 2018, and two other colonies had only a few birds. Most of the colonies did not do well.

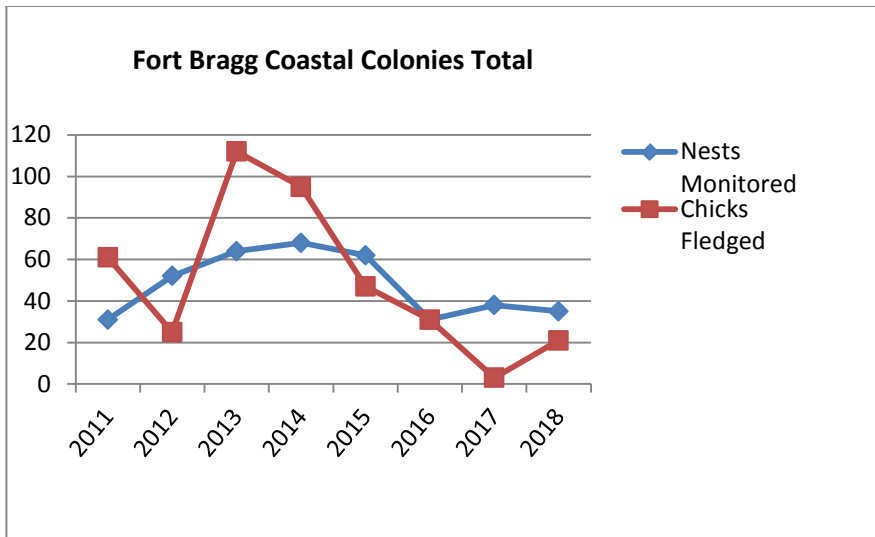


Figure 3. Number of nests and fledglings along the Fort Bragg Waterfront

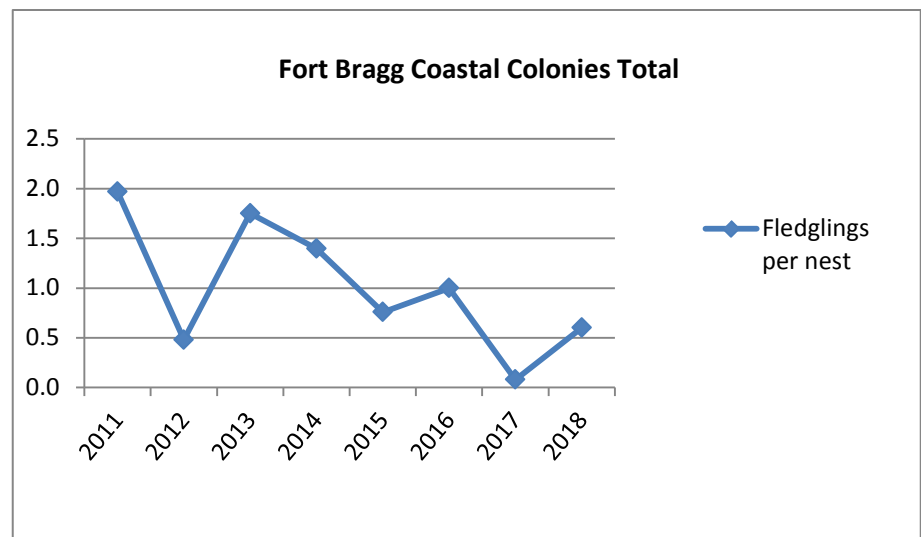


Figure 4. Fledglings per nest on the Fort Bragg Waterfront.

### Fort Bragg Waterfront Pelagic Cormorants: Individual Sites

#### Fort Bragg North Colony

The colony at the northern end of the Fort Bragg Waterfront has done had fairly normal reproductive rates until last year. When the public trail opened prior to the nesting season in 2015, the number of nests appeared to be slightly higher than in previous years. Unfortunately, during one visit all of the nests in the main portion of the colony except one were destroyed. Last year the North Colony was located slightly farther away from the beach and some on a farther offshore rock. This year only one nest was active, but no chicks fledged.

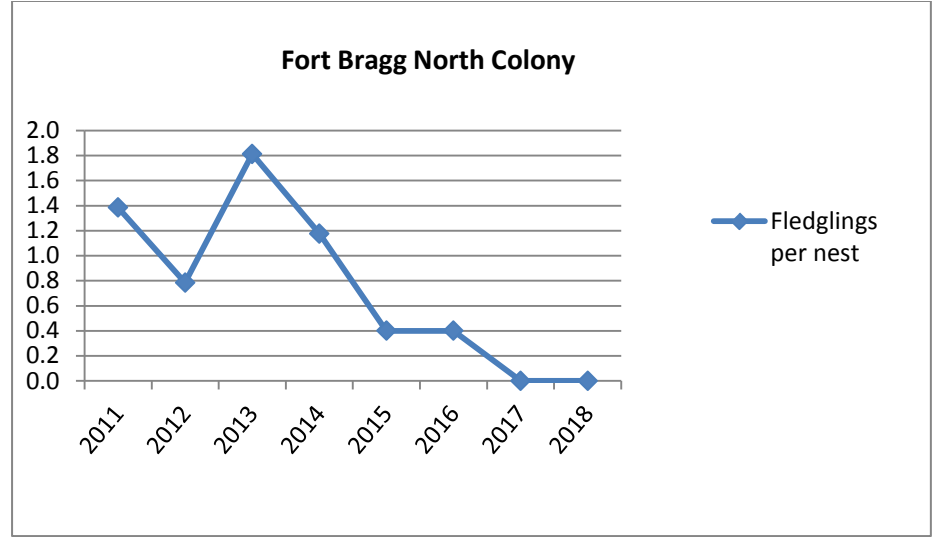
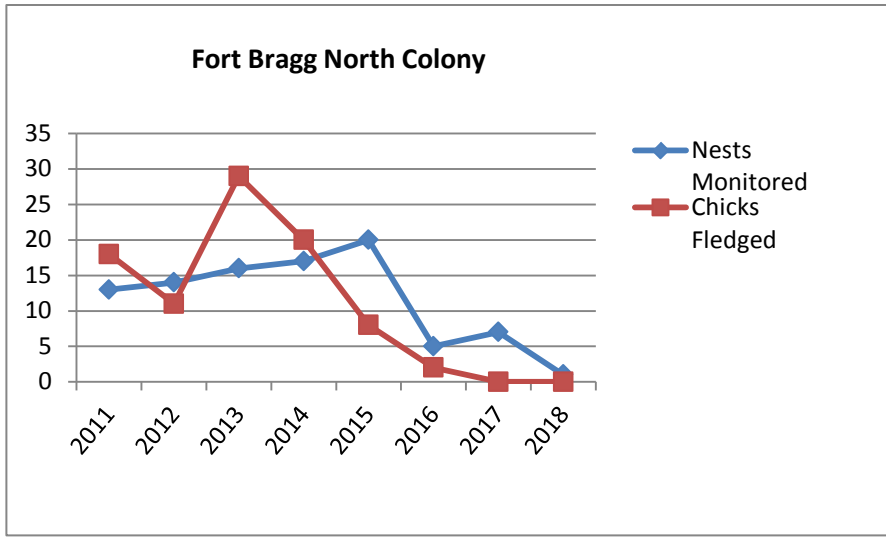
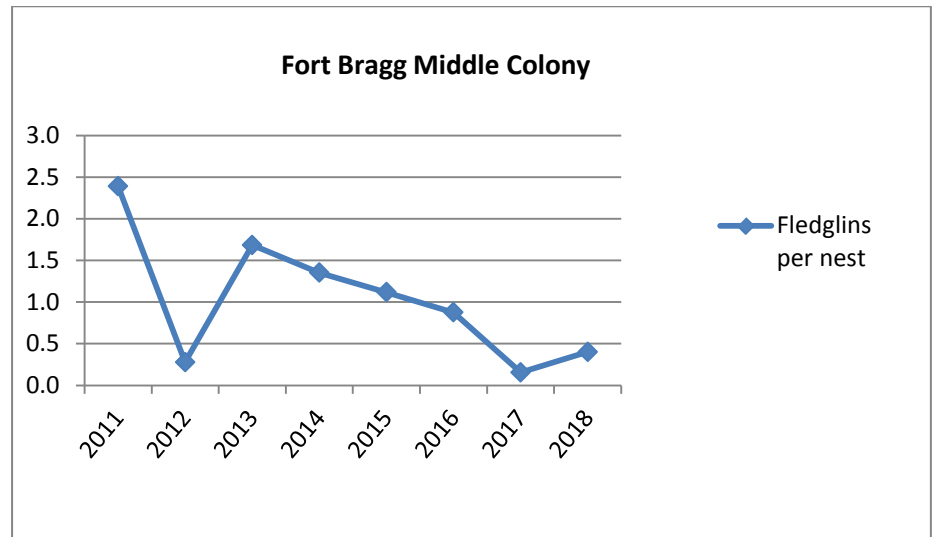
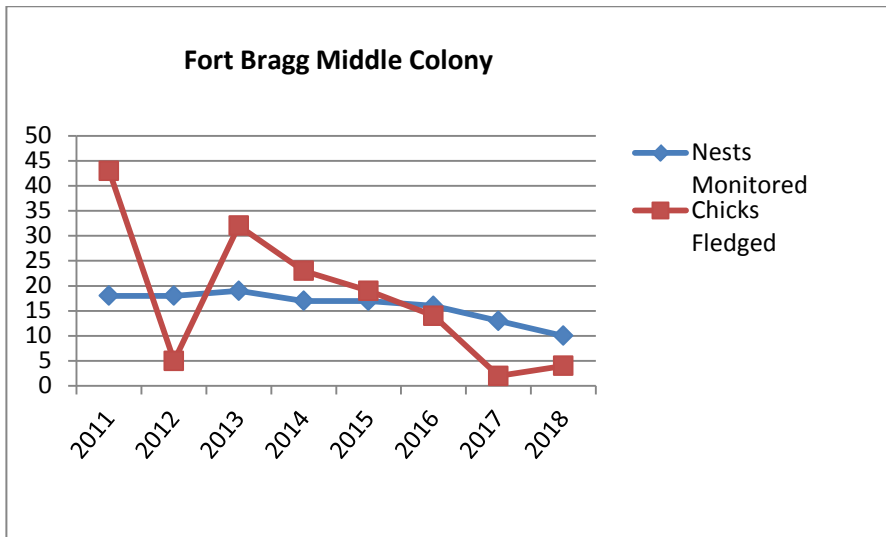


Figure 5. Number of nests and fledglings -- Fort Bragg North Colony

Figure 6. Fledglings per nest -- Fort Bragg North Colony.

**Fort Bragg Middle Colony**

The colony further south of Glass Beach seemed near normal over the past three years with slightly lower chick fledging success last year and slightly better fledging success this year.

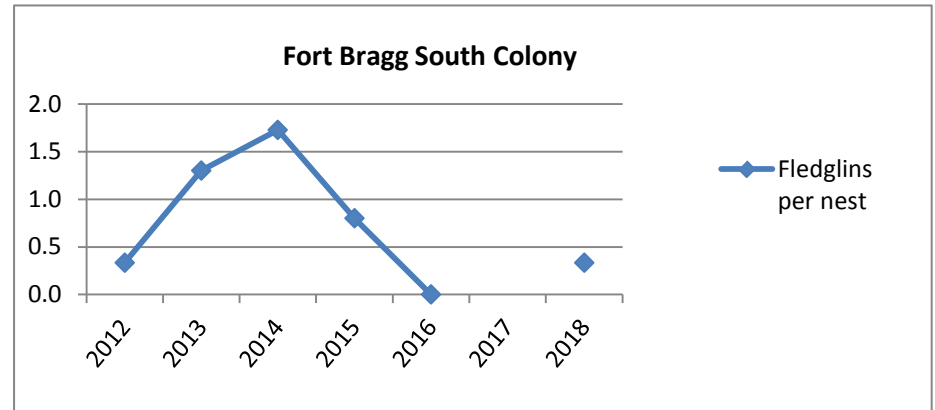
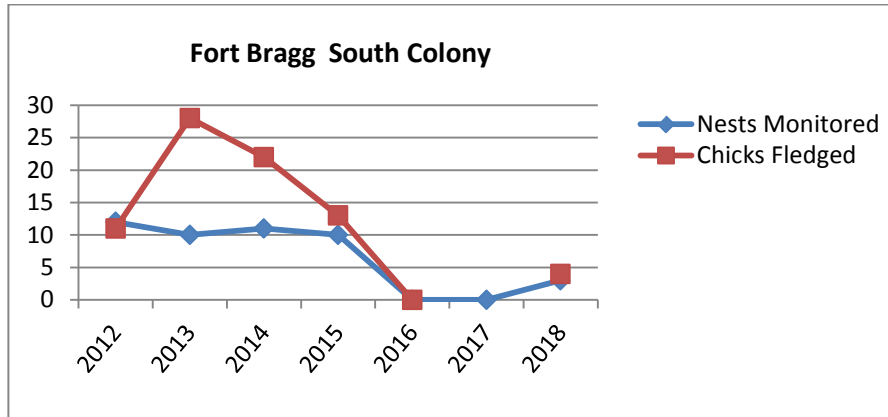


**Figure 7. Number of nests and fledglings -- Fort Bragg Middle Colony**

**Figure 8. Fledglings per nest -- Fort Bragg Middle Colony.**

**Fort Bragg South Colony**

The South Colony did not have any birds appear in the colony in 2016 or 2017. This year three nests were started and only two were active. Only one chick fledged.

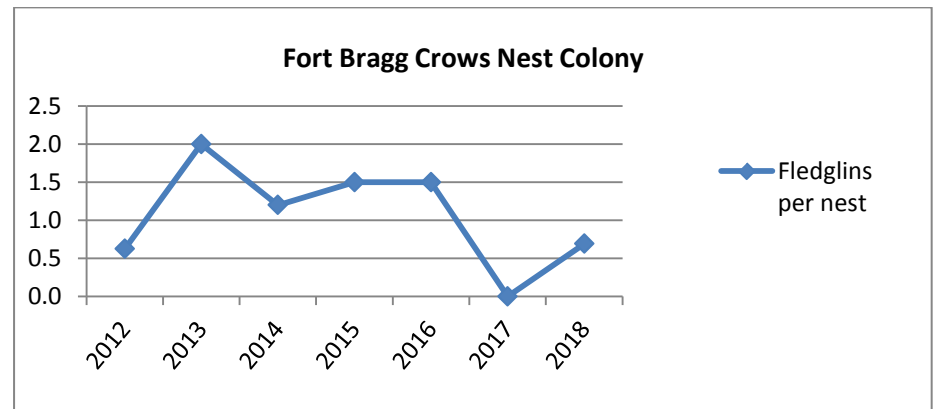
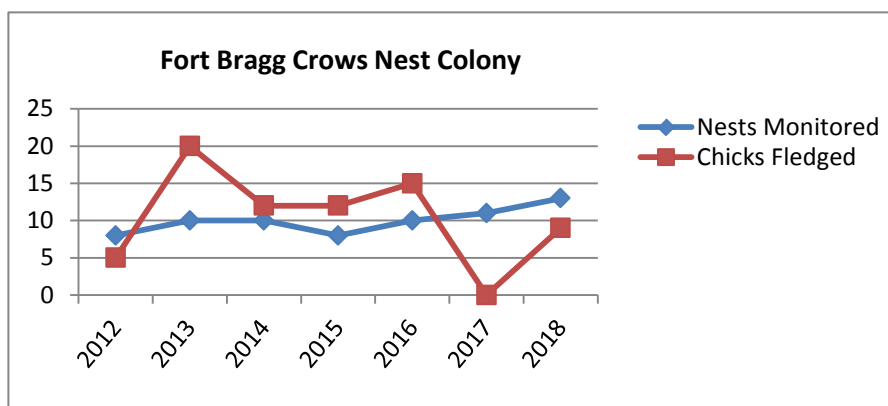


**Figure 9. Number of nests and fledglings -- Fort Bragg South Colony**

**Figure 10. Fledglings per nest -- Fort Bragg South Colony.**

**Fort Bragg Crows Nest Colony (formerly the Sewage Treatment Colony)**

The Crows Nest Colony did better this year with eleven chick fledging.. .



**Figure 11. Number of nests and fledglings -- Fort Bragg Crows Nest Colony**  
Mendocino and Sonoma Coast Pelagic Cormorant Monitoring 2009-2017

**Figure 12. Fledglings per nest -- Fort Bragg Crows Nest Colony.**

### Noyo Harbor Mouth Colony

The colony at the mouth of the Noyo Harbor has been monitored for the full 8 years. The best year was in 2013. In 2011 two of the nests were abandoned due to the 4<sup>th</sup> of July fireworks when people set off fireworks during the day on the adjacent beach. We have worked to keep that from happening, and the colony has not been affected by the fireworks during the past few years. Of course, there were fewer nests and chicks fledged last year than in any other year. This year was a slight improvement.

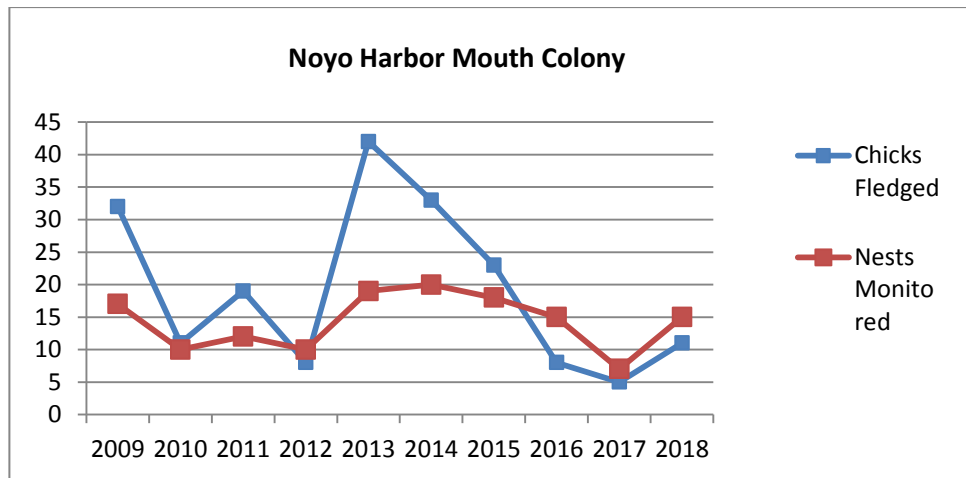


Figure 13. Number of nests and fledglings – Noyo Harbor Mouth Colony

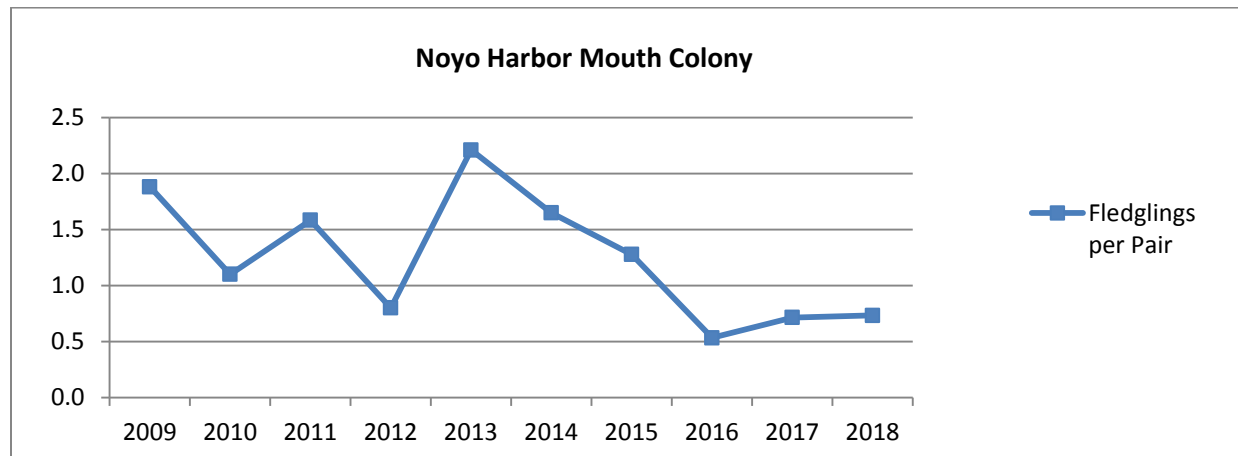


Figure 14 Fledglings per nest – Noyo Harbor Mouth Colony.



**Map 1. Fort Bragg and Noyo Harbor Colony Locations**

### Point Cabrillo Lighthouse Cove Colony

It often has one pair that nests very early in the season. In 2018 the number of nests was way lower than the previous years, and the number of chicks fledged was zero. Again, the worst year in our study period.

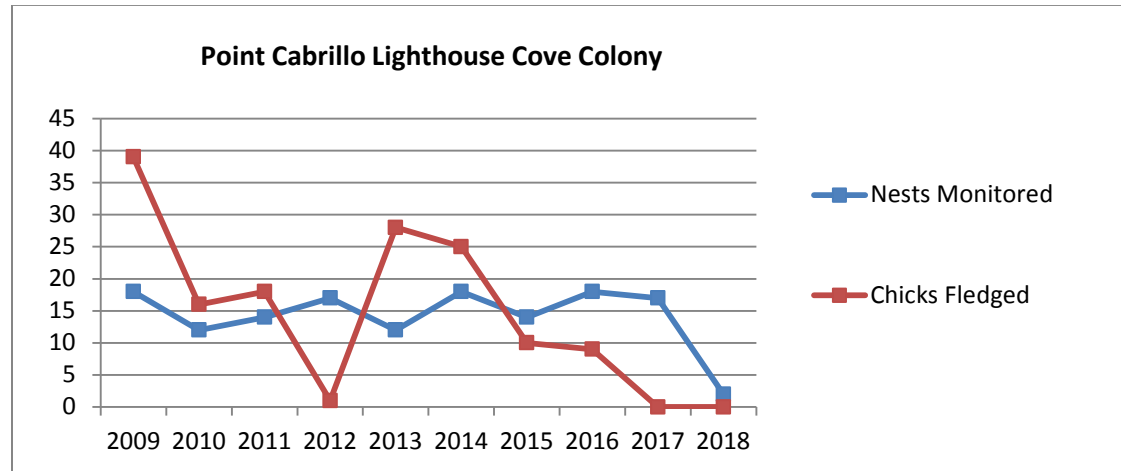


Figure 15. Number of nests and fledglings – Lighthouse Cove Colony

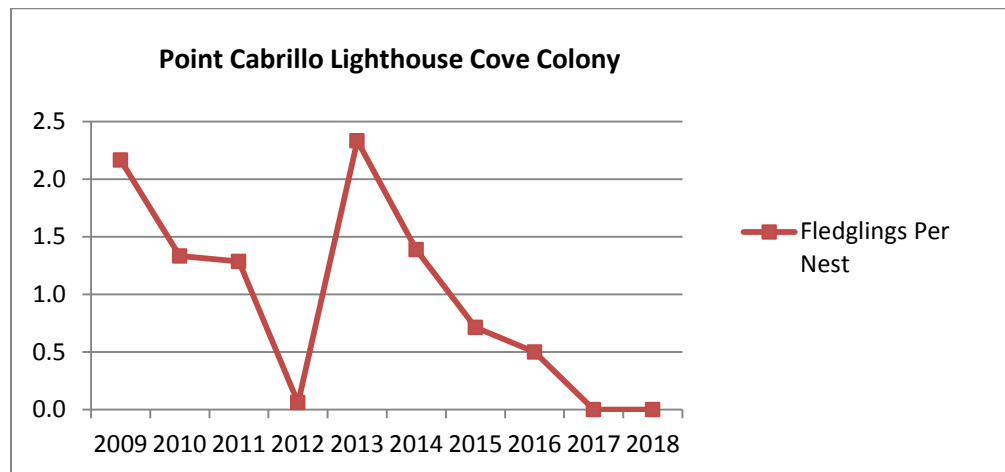


Figure 16. Fledglings per nest – Lighthouse Cove Colony.



**Point Cabrillo South Cove Colony**

The Point Cabrillo South Cove Colony is not active every year, in 2018 there was 1 nest, but no chicks fledged.

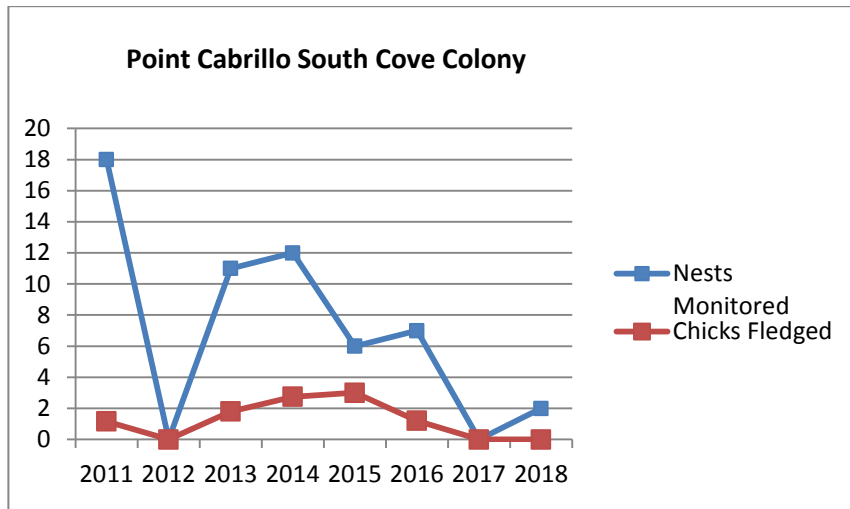


Figure 17. Number of nests and fledglings – South Cove Colony

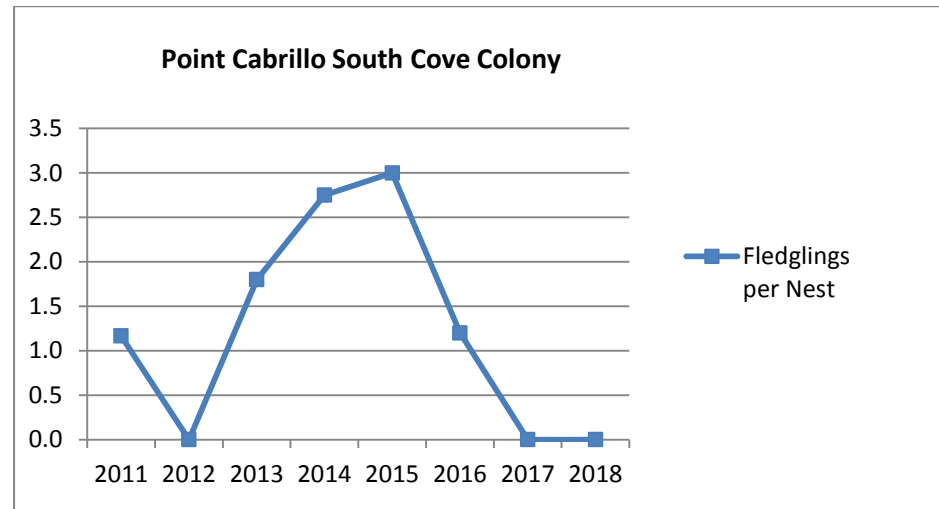


Figure 18. Fledglings per nest – South Cove Colony.



Map 2. Point Cabrillo Colony Locations

**Mendocino Headlands Pelagic Cormorants:**

The Mendocino Headlands colonies have been fascinating. We have been following them for six years now and the location of each small colony is annually changing. This variability was not expected. We do not know whether the same birds are shifting nest sites each year, or whether some colonies take a year off from nesting. Data from more years will clarify this question. As elsewhere in 2018, the productivity was very poor. The number of nests was way down, and only two sites were active. The number of fledged chicks was one.

**Mendocino Headlands Colony Totals**

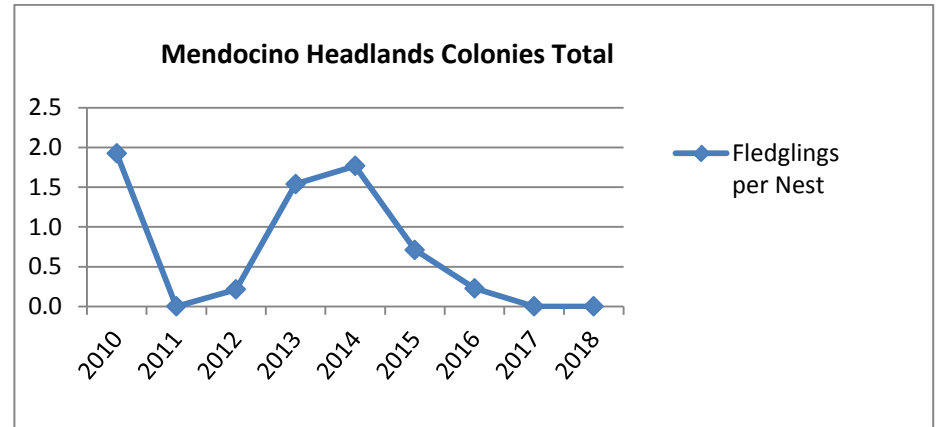
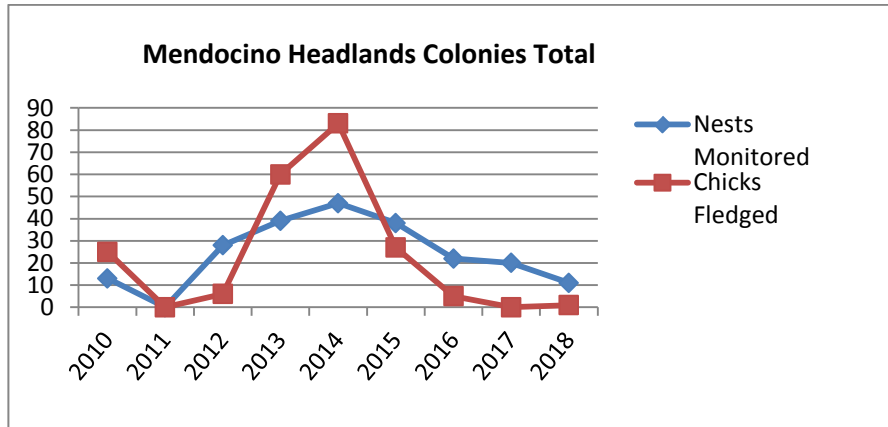


Figure 19. Number of nests and fledglings – Mendocino Headlands Colonies

Figure 20. Fledglings per nest – Mendocino Headlands Colonies.



Map 3. Mendocino Headlands Colony Locations

### Navarro Bluff Colony

The Navarro Bluff Colony was discovered in 2013 and was active in 2014 but no birds appeared in 2015 or 2016. No nests were present this year.

### Iverson Point Colonies

We started monitoring two colonies at Iverson Point in the southern portion of Mendocino County in 2013. This year Doug Forsell monitored 4 colonies. They had been fairly active, and their fledging rates were not great. In 2018 8 birds fledged in the 64 nests that were monitored.



Map 5. Iverson Point Colony Sites

### Iverson Point South Colony

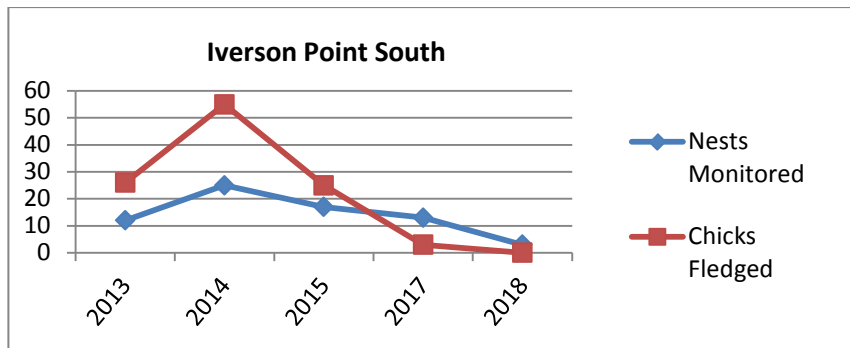


Figure 21. Number of nests and fledglings – Iverson Point South

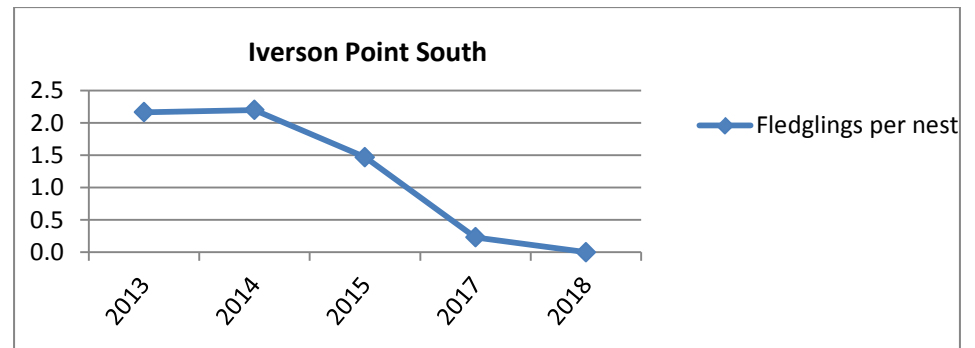


Figure 22. Fledglings per nest – Iverson Point South.

### Iverson Point North Island Cove

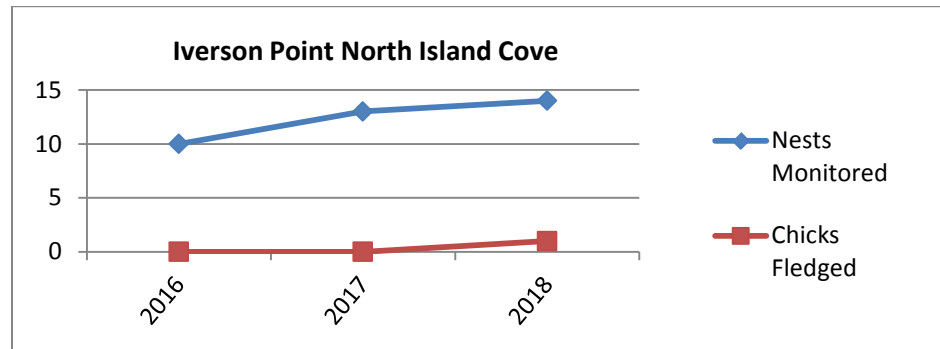


Figure 23. Number of nests and fledglings – Iverson Point North Island Cove

### Iverson Point North Colony

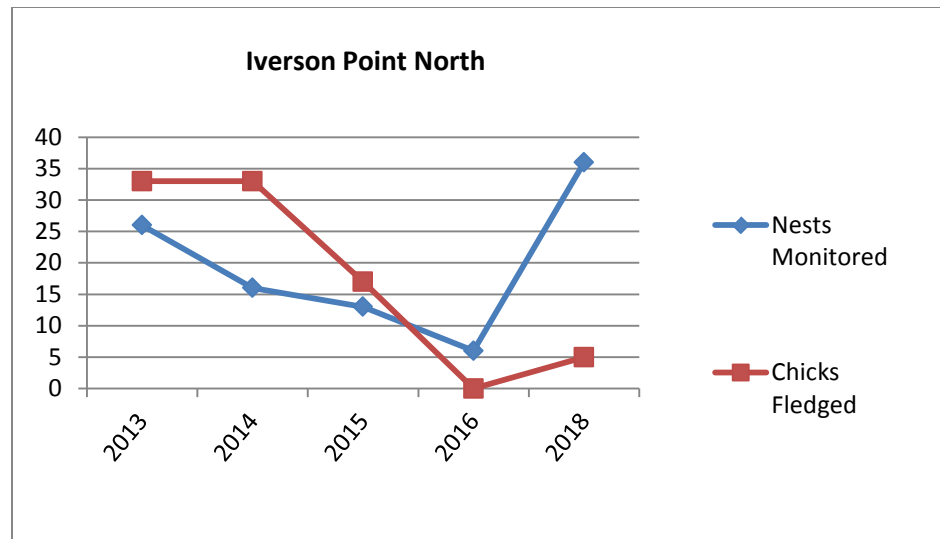


Figure 24 Number of nests and fledglings – Iverson Point North Colony

**Iverson Point New Colonies**

	Number of Nests Monitored	Number of chicks hatched	Total Fledged	Fledglings per nest
Hearn Gulch	0	0	0	0.0
Iverson Point Big Island	11	4	4	1.3
Iverson Point Total (includes all sites)	64	17	8	0.7

**Sea Ranch Pelagic Cormorants**

Volunteers at The Sea Ranch have been monitoring Brandt’s Cormorants for many years. For the last four years they have joined us in monitoring Pelagic Cormorants as well. The number of nests monitored in 2018 was lower than in the first 3 years but the number of fledglings per nest was also low. Future data will help us compare the ocean conditions between the two areas.

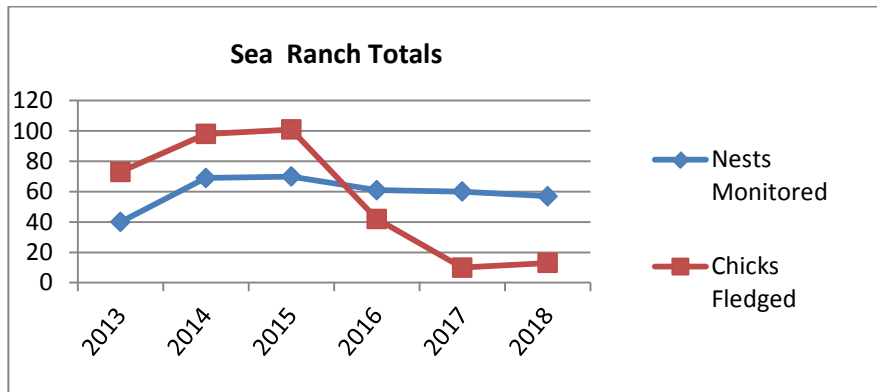


Figure 25. Number of nests and fledglings – Sea Ranch Totals

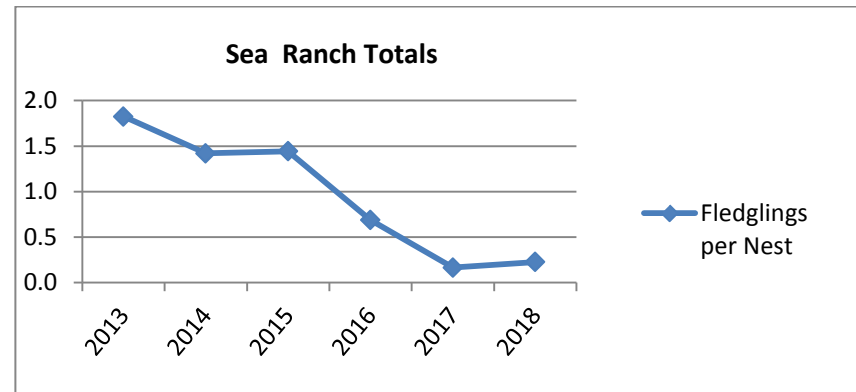


Figure 26. Fledglings per nest –Sea Ranch Totals.

### The Sea Ranch Breakers Reach

The number of chicks fledged per nest was slightly higher than last year, it was about the same as most colonies in northern Mendocino County.

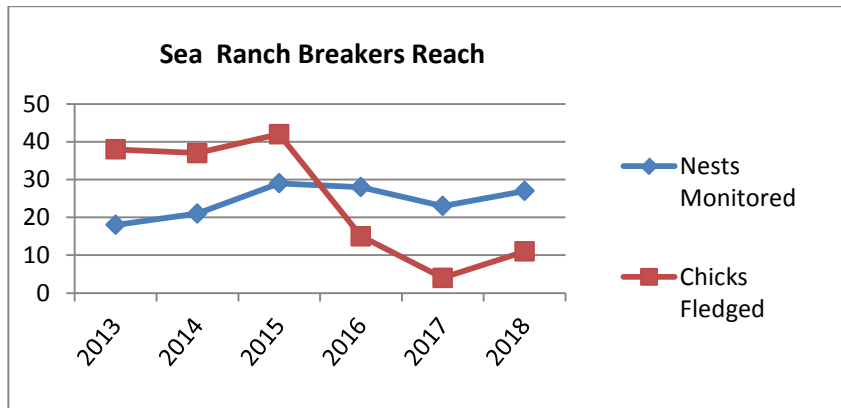


Figure 27. Number of nests and fledglings – Breakers Reach.

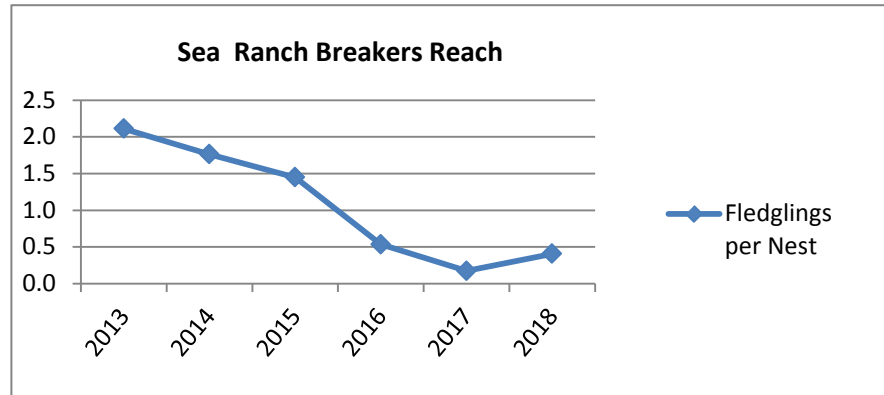


Figure 28. Fledglings per nest – Breakers Reach.

### Sea Ranch Del Mar Point Colony

This site had about the same number of nests in 2018 than in 2017 but the fledging rate actually went down in 2018.

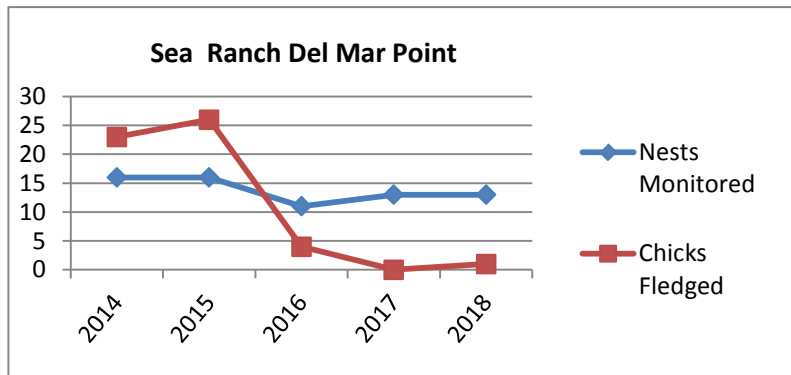


Figure 29. Number of nests and fledglings – Del Mar Point.

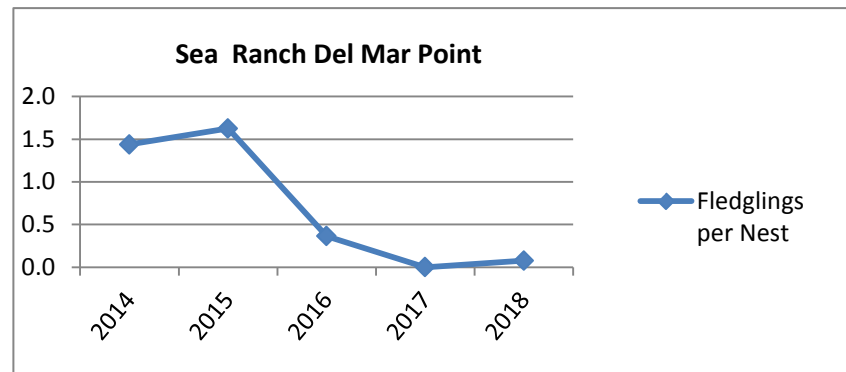


Figure 30. Fledglings per nest – Del Mar Point.

### Sea Ranch Galleons Colony

This site had slightly lower number of nests in 2018 than in 2017, and the fledging rate was lower again.

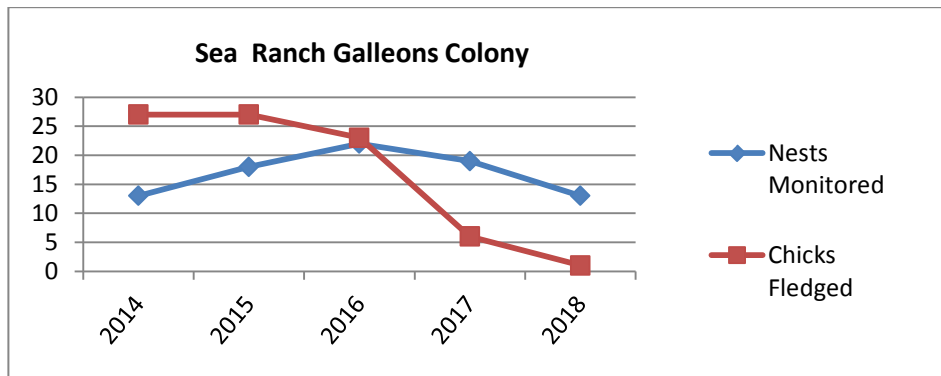


Figure 31. Number of nests and fledglings – Galleons.

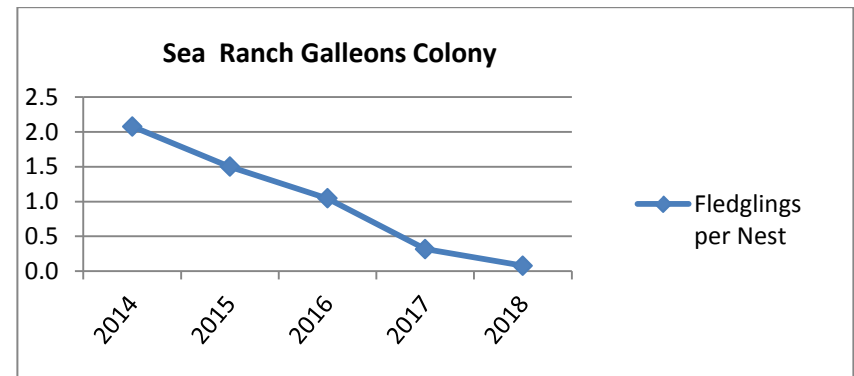


Figure 32. Fledglings per nest – Galleons.



**Map 6. Sea Ranch Colony Locations**



## Discussion

In 2018 volunteers participated in monitoring of cormorant colonies for the tenth year at various sites in Mendocino County and northern Sonoma County. The data that were gathered were valuable, and the participants in the study enjoyed their involvement. The outreach that resulted from the project complements the scientific value. We recommend that this monitoring project continue into the future so that aspects of the local breeding efforts, such as the timing of breeding, the numbers of attempted nests, and the fledging success can be compared as ocean conditions vary annually. Understanding the network of environmental drivers that affect Pelagic Cormorant productivity will enable resource managers to implement timely measures to protect and increase reproductive success under diverse conditions.

## Acknowledgements

This study succeeds with the participation of many volunteers. Many thanks to the following for their time and efforts:

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