# **Conclusion**

After all the data collection and the data analysis had been completed we believe that our research does not support the hypothesis that the reclaimed salt marshes cannot be returned to their original state. We found our research instead to support the null hypothesis that the reclaimed salt marshes can be restored to their original state. After comparing site one, our control site that was an established salt marsh unaffected by humans, to the rest of the sites we noticed that there seemed to be a trend, in many of the more recently reformed salt ponds, of non-native salt marsh plants that should not normally be found in the salt marsh. While those marshes that have been repossessed and have been involved in the restoration process for some time now, evidence supports them to be significantly close to being fully restored.

The chi-square results showed signifigant evidence that in the early parts of the restoration process the foxtails and shrubs were preventing the salt marshes from returning to their original state. These foxtails are normally found in “Grassy and bushy places” (Munz & Keck, 1508), however they are showing up in the salt marshes of the San Francisco Bay Area. In a chi- square test the lower the chi- variable, the less the probability of there being signifigant evidence against the null hypothesis that the restored salt marshes are stable. The chi-variable values for those sites that were older and had gotten a chance to re-establish themselves, were significantly lower than those sites that were newer. The chi- value showed that site 4 was the most stable, with a chi value of 37.53. This chi-value does not provide enough signifigant evidence for us to safely say that this site has not been fully restored. Probability shows that this site and its surrounding marsh have indeed been able to be fully restored.

Evidence shows that site 3 our second oldest salt marsh site shows follows the trend that the null hypothesis predicts. Its chi-value of 167.72 is significantly lower than those sites that have been more recently restored. Sites 5-7 & 10 reflected a large jump in the salt marsh restoration. While those sites have only been restored 2-3 years after the marshes reflected in site three. Their chi-values of 2327.093, 3585.71, and 10531.92 reflect that those 2-3 years are critical to the restoration process. It is in these sites that there were high levels of the non-native foxtails and other shrubs.

The shrubs that we counted were non-salt marsh plants that had established themselves within the marsh, but not in such numbers that we could create a separate category for them. These plants seem to establish themselves early on in the restoration process and then die out as the salt marshes mature in the restoration process. The site that was key to us in coming to this conclusion was site 9, our youngest site, this site showed a significant drop in the chi-value. Its chi-value of 273.08 seems to reflect a healthier salt marsh. However when you break it down and look and the individual sums that make up the chi-value you notice a complete absence of grasses and brass buttons. You would also notice a value for pickleweed that is relatively close to the expected value for it. The only value that is significantly different is the five-foxtail plants that were counted. This supports the idea that foxtails seem to set in and start to colonize the reclaimed salt ponds soon after the pickleweed does.

Wanting to be sure that each individual species of plants is surviving and re-colonizing at an expected rate we figured the chi- values for those plants that are native to the salt marshes. Pickleweed is one of the first plants to re-establish themselves in the reclaimed ponds; it also had a significantly low chi-value of 80.96. This shows that each site has pickleweed in stable populations. The grasses and brass buttons also had lower chi-values of 283 and 131.5. These lower Chi- values show that even though the non-native plants are coming into the salt marshes during the restoration process, those plants that we want to be present are establishing themselves in signifigant numbers. Another sign that the sites populations are establishing and growing in stable numbers are the bar graphs of plant percents for each site. You can see that there isn’t much variance between the plant populations from count to count within a site; this provides evidence that the surrounding marsh as a whole is growing.

The data that we have collected shows enough signifigant evidence to support the null hypothesis that the reclaimed salt marshes are being fully restored to their original states, however we also feel that some research should be done on whether or not eliminating the non-native plants could make the restoration process more efficient.