Barking News Story:
Media Perceptions of the California Sea Lion

MAS-MBC Capstone Report
June 11th, 2015

Canon Purdy
Center for Marine Biodiversity and Conservation
Scripps Institution of Oceanography
University of California, San Diego

Committee Members:
1. Dr. Sarah Mesnick, Southwest Fisheries Science Center, National Marine Fisheries Service, NOAA
2. Dr. Stuart Sandin, Scripps Institution of Oceanography, University of California, San Diego
3. Zachary Schakner, PhD Candidate, University of California, Los Angeles
Abstract
A growing California sea lion (Zalophus californianus) population close to a large human population in southern California has lead to increasing human/sea lion interactions. These interactions range widely from positive impacts on people (e.g. tourism benefits, increased education) and on sea lions (e.g. marine protected areas, rescue efforts) to negative impacts on people (e.g. depredation, attacks, nuisances) and negative impacts on sea lions (e.g. entanglement in fishing gear, intentional killing). How the general public perceives these interactions is an important area of study to inform managers and scientists of the public context for management decisions. This capstone surveyed 5 southern California newspapers from January 1st 2005 to April 30th 2015 to investigate the topics and tone of news stories about sea lions. Results show that topic coverage was greatest for tourism/entertainment, general risks to sea lions, and general biology/information, totaling 444 articles of the 792 read. Results also showed that the overall tone of news stories was positive and compassionate (240 articles with sympathetic tones towards sea lions, 176 with positive tones towards sea lions), as compared to 132 with negative tones towards sea lions, despite the full range of both positive and negative interactions occurring in the region. These results suggest that public perception in southern California is overall positive and sympathetic toward sea lions which may foster support for conservation initiatives and hamper the introduction of management actions designed to curtail the growing sea lion population size and the increasing number of potentially negative human-sea lion interactions.

Introduction
On March 18th 2015, the La Jolla Light newspaper published an article entitled “La Jolla Cove ‘Stench’ Calendar: Weekly updates about the foul odor caused by sea lions and marine life” (Lew, 2015). The article expressed just how pungent the sea lions and sea birds of La Jolla Cove were considered to be each day of the week, highlighting a major thorn in the side of retailers and residents. Yet on that same day, the Orange County Register published “Warmer waters are starving sea lions” (Ritchie, 2015), listing biological influences on the record-breaking number of stranded pups showing up starved or dead on local beaches. What factors go into such disparate news articles and are these mixed messages common? In southern California, an area with over 16 million people living in coastal counties (U.S. Census, 2015) and a growing California sea lion population (Carretta et al, 2013), what topics are covered, and what is the tone of articles about sea lions and human interactions as presented to the public? In the discussion I consider how public perception can potentially affect management options for the future.

The California Sea Lion
California sea lions, Zalophus californianus, belong to the Otariidae family, the “eared” family of pinnipeds (seals, sea lions, and walruses). Long pectoral flippers and ability to rotate their hips under them make otaraiids decidedly more agile than their phocid cousins, such as harbor seals. Due to their mobility, sea lions can access the terrestrial habitat and are often found on docks, anchored
boats, buoys and rocky coasts. They forage in nearshore waters on a variety of squid and fish species and thus also come into contact with fishers and their gear. In close proximity to humans both on land and in the water, it is not surprising that interactions are increasing.

California sea lions are distributed from British Columbia to the tip of Baja California and throughout the Gulf of California (Carretta et al, 2013). The total population is an estimated 400,000 for the United States and Mexican populations (Carretta et al 2013, Lowry et al 2005, Szteren et al 2006). Sea lions mate, give birth, and nurse their young on rookeries found primarily on islands in southern California, along the west coast of Mexico and in the Gulf of California. Along the U.S. west coast, there are rookeries on five of the Channel Islands in southern California (Lowry et al, 2005), with the rookeries on San Nicholas and San Miguel islands of the Channel Islands making up over 90% of the pup production (Carretta et al, 2013). This puts the bulk of the US breeding population very close to the highly populated southern California coast.

Sea lions spend time hauled out on land outside rookeries as well, usually to rest (Peterson, 1967). The vast majority of sea lions found north of southern California rookeries in the U.S. and Canada are male. After breeding, males are free to roam wherever they can find food and are known to follow baitfish or salmon runs north (Stansell, 2014). Females are tied to the rookeries and pups; they nurse pups for an average of 10 months, spending several days at sea between nursing to forage for food (Ono, 1987). Pups can spend an average of one year (sometimes more in El Niño years) with their mothers (Peterson, 1967). Juveniles are seen on the mainland beaches after weaning, except for years with high stranding rates, wherein pups might leave the rookeries early, perhaps because of premature weaning or in search of food (NOAA FAQ, 2015).

Sea lions were not always abundant, however. Hunted for oil and blubber as well as to make room for settlers and explorers, the populations of several pinniped species along the U.S. west coast were dramatically altered in the 1800 and early 1900s (Cass, 1985). While species identification is not always clear in the literature, there were an estimated 15,000 ‘sea lions’ (most likely Steller and California sea lions) killed from 1960 to 1970, and a reported 180 California sea lions were killed each day for pet food in commercial hunting operations in the 1930s (Cass, 1985). The hunting was so extreme that Steller sea lions were essentially expatriated from southern California rookeries and now only occupy rookery habitat north of Año Nuevo (Meadows, 2007). Along with commercial hunting, fishers and hobbyists were able to take sea lions without limits, sometimes targeting males or pups, but often indiscriminately taking all age and sex classes (Cass 1985). In the late 1950s, surveys of pinniped populations counted a little over 13,000 California sea lions on the Channel Islands (Bartholomew, 1960). Since then, some pinniped species have rebounded, such as California sea lions or northern elephant seals (124,000 individuals), while the Steller sea lion numbers have remained low for some of the populations of the
stock, with an estimated 45,000 in the west U.S. population and 78,000 in the east U.S. population (Carretta et al, 2013).

Protecting Marine Mammals
The rate of population decline changed with the passage of the Marine Mammal Protection Act (MMPA) in 1972. Born from increased knowledge and growing public interest in marine mammals, as well as concern over the stocks of many species, the MMPA provides equal protection to species living fully in the marine environment (cetaceans) to land-based mammals that rely heavily on oceans to survive (polar bears) (Twiss, 1999). The MMPA operates on the precautionary principle, erring on the side of conservation when protecting marine mammals due to the considerable lack of information about many species, especially at the time of the Act’s creation in the early 1970s (Twiss, 1999). As for California sea lions, population monitoring began in earnest after passage of the Act, as all marine mammal populations are required to be routinely monitored (MMPA, 16 U.S.C. 1386 Sec. 117. (a)). The current process of monitoring sea lions involves aerial surveys of all rookeries on the Channel Islands (Lowry, 1999). From those surveys, newborn pups are counted each season and an estimation of total population size for the U.S. stock is estimated from that number (Carretta, 2000).

According to the 2011 stock assessment, pup counts have been increasing at an average rate of 5.4% except for El Niño years, which show a large decrease in pup numbers (Carretta, 2011). The population has rebounded from El Niño events to varying degrees; pup counts have been shown to rebound within a couple of years, but if the El Niño affects breeding female survival, then the numbers will not rebound as quickly. In any case, low pup survivorship will affect the population for many years, as the affected cohort enters the breeding population at lower numbers than other years (Carretta, 2011).

The MMPA not only protects marine mammals from harassment and direct killing by humans, but also requires commercial fishing operations and other programs to create plans to reduced their overall take to zero (MMPA, 16 U.S.C. 1371, Sec. 101 (a)(2)). The 2011 stock assessment report estimates an annual average of at least 431 animals taken in commercial fishery operations. This is likely an under-estimate as it is based on counts of individuals washed up on shore. However, this estimate of take is still well below the calculated Potential Biological Removal number of 9,200 animals (Carretta, 2013). The definition of Potential Biological Removal (PBR) aims to quantify the highest numbers possible that could be taken from the stock without limiting it from reaching its optimum sustainable population size (OSP). OSP is defined as: “... the number of animals which will result in the maximum productivity of the population or the species, keeping in mind the carrying capacity of the habitat and the health of the ecosystem of which they form a constituent element.” (MMPA, 16 U.S.C. 1362 Sec. 3. (9)). The number of fishery-related mortalities has also been decreasing. The recent 2013 assessment found the human-related mortality to be below 10% of the PBR for the first time since stock assessments started, and thus “is
considered to be insignificant and approaching a zero mortality and serious injury rate.” (Carretta, 2013) This suggests fishing operations are becoming less of a threat to sea lions or are at least remaining constant as the population grows. These numbers also do not take into account stranding center efforts, which could have an effect on lowering the amount of mortalities as injured or entangled animals are rehabilitated and released.

The network of stranding and rehabilitation centers up and down the U.S. west coast seeks to save individual marine mammals from injury and death, and return recovered animals to their natural habitat. The Marine Mammal Center (TMMC) has a stranding network spanning from Santa Barbara to Mendocino counties, and has rescued and released 284 animals in 2013, mostly pinnipeds including 2 Steller sea lions, which at that time were still listed as endangered (TMMC, 2013). Since its founding in 1975, TMMC has rescued 18,449 animals, with that number increasing greatly due to the record-breaking stranding season of 2015. Since January 1st of 2015, 1,800 sea lion pups stranded on California beaches, as reported on March 17th (Flaccus, 2015). While only recently officially in a weak El Niño (National Weather Service, 2015), NOAA scientists have speculated the warming waters to be a likely cause, pushing high-nutrient fish to cooler waters in the north and causing mothers to be unable to gather enough energy to feed their young (Flaccus, 2015). This event follows on the heels of the 2013 Unusual Mortality Event for sea lions, which saw elevated standings as well. The California sea lion population is still considered healthy, and both events are not thought to seriously affect the overall population (NOAA Fisheries FAQ, May 2015). However, the causes and implications of these events, as well as the likelihood of them repeating into the future, it still being investigated (NOAA Fisheries, 2015).

Despite fishing-related mortality and stranding events, the 2013 stock assessment report puts the U.S. population numbers at an estimated 296,750 individuals (Carretta, 2013). They are listed as Least Concern under the IUCN Redlist (Aurioles, 2014) and currently are not and have never been listed under the Endangered Species Act (US DF&W, 2015). If their growth rate of 5.4% continues (Carretta, 2013), it is expected we will have a wealth of sea lions and sea lion interactions well into the future.

Wildlife and Us: Human-Sea Lion Interactions
While firmly in the category of ‘charming megafauna’ and made famous by circus and SeaWorld acts, human-sea lion interactions are variable and complex. Sea lions can be aggressive and bites can transmit a variety of diseases harmful to humans as well as pets (NOAA FAQ 2015). They can also be abundant where people are present, as well as frustrate fishermen by stealing their bait and catch. Sea lions’ tendency to haul out in groups on boats, docks, and beaches has resulted in sunken boats (Connelly, 2008) as well as turned them into perceived nuisances due to crowding docks or creating unpleasant pungent odors (Sherman, 2015). Positive interactions, such as meaningful contact with wildlife, are abundant as well. Marine mammal tourism can bring revenue to coastal
areas, and charming species such as sea lions can be used as representatives to increase education and conservation support for the greater environment (Mittermeier, 1988). Sea lions can also act as a vector for broader knowledge about the California ecosystem and nature as a whole. The full range of positive, negative, dangerous, or simply bothersome interactions makes management a challenge, and increasing populations of sea lions, and pinnipeds in general, are one of the biggest issues facing marine mammal managers today. If both sea lion and human populations continue growing, the frequency and intensity of these interactions will also most likely increase. A few examples of the more frequent or contentious interactions follow.

**Depredation**

With productive, nutrient-rich waters, mild weather, and a wealth of dockside restaurants and bars, southern California is a sports fisher’s paradise. In 2013, a reported 253 Commercial Passenger Fishing Vessels (CPFVs) hit the water carrying over 400,000 fishers and carrying back over 2 million fish (DF&W CPFV Reports, 2013). For sea lions cruising coastal waters, this often means a free lunch of either baitfish, or the larger sports fish taken directly off of hooks (depredation) (Strege, 2008). In the early 1980s, depredation was estimated to cost fishers (commercial and recreational) roughly $600,000. Impacts on sports fishing was considered low, at 2.5% of total catch, taken primarily by sea lions (Miller, 1981, as sourced by DeMaster et al 1981). Depredation understandably leaves fishers frustrated, especially as fishers claim interactions and depredation have been rising steeply in the past decades (pers. convers.). For fishers old enough to have lived through different management changes, the transition to being unable to “protect their catch” due to the passage of the MMPA could still be a difficult shift. It can also put sea lions between the crosshairs; stranding centers routinely report sea lions with gunshot wounds each year (TMMC, 2013). When two hunters compete for the same resource, there is bound to be conflict, but the sea lion issue has added complexity. Fishermen can sometimes feel sea lions are overprotected and operating with unnatural behavior (pers. convers.). An argument that the sea lions have the initial property rights to the ocean and are having difficulty finding prey this year could also be made. Regardless of which side of the argument is right (or louder), the issue is a hot and contentious topic for California managers, fishers, and the public.

**Bonneville**

The Columbia River is home to a network of dams, several species of culturally and economically important salmonids (some endangered), and within the past decade, several species of pinnipeds (Stansell, 2010). These pinnipeds (California and Steller sea lions, and harbor seals) have figured out that the fish ladders cause salmon to congregate while waiting to swim up stream, creating a veritable open buffet (2010). Chinook Salmon, the Steller and California sea lions’ meal of choice, are federally listed under the Endangered Species Act (Stansell, 2014) as well as being an important part of the local recreational fishery and Native American culture (ODFW, 2014). For wildlife managers, this situation looked eerily familiar; in the early 1980s, California sea lions found
their way to the Ballard Locks in Washington and began preying on the steelhead trout run (Cheng, 2011). Local managers responded to the predation threat with attempted deterrence and relocation of the offending sea lions. Neither worked, as deterrents went unnoticed and sea lions that had been relocated eventually found their way back to the locks (2011). The MMPA did allow for lethal take of marine mammals, but only in the context of public health (MMPA, Sec 1379). Wildlife managers needed a solution before the steelhead numbers declined further and thus Section 120 of the MMPA was born.

Section 120 was amended to the MMPA in 1994 in order to allow a state to apply for a lethal take of pinnipeds, contingent that pinnipeds are “individually identifiable” and are having “a significant negative impact on the decline or recovery of salmonid fishery stocks” that are endangered, approaching endangered status, or part of the Ballard Locks migration (MMPA, 16 U. S. C. 1389, Section 120). Oregon applied for Section 120 in 2007 (Cheng, 2011), and this year alone, 30 sea lions have been lethally removed, with over a hundred trapped, branded, and released (Oregon Department of Fish and Wildlife, 2015). The issue is still highly controversial (Marshall, 2012, Humane Society et al. vs Secretary of Commerce et al, 2008) and cannot yet be considered a success; sea lions still gather at the fish ladders, and while predation rates are dramatically lower than both the dam (NMFS, 2008) and fisher removal (The Daily News, 2014), predation remains a large issue, with 1.6% of the Chinook run taken by sea lions last year (Stansell, 2014).

Tourism
Human-sea lion interactions are not all negative, however. For sunny California, tourism is a way of life, and for coastal cities boasting charming wildlife, groups of sea lions can be a big boon. The most famous example might be Pier 39 in San Francisco. Sea lions started to haul out on the boating pier in 1989 and eventually became accepted residents (Pier39, 2014). As Pier 39 is a tourist hub, the sea lions quickly became an attraction in their own right and now feature prominently in the Pier 39 branding; they are clear on the website’s main page and major marketing material. The pier boasts 14 million annual visitors (Picture, 2010), and while it is unclear if all those visitors come to see the sea lions, it is likely that some do, as well as others having learned about the sea lions through their visit. Pier 39 also establishes a portal for education; the newly opened Sea Lion Center increases education about the sea lions and ongoing conservation issues. It is clear that Pier 39 finds the sea lions to be an important part of their business and invests in fostering the public’s interest in them.

For Southern California, the tourism potential of sea lions is apparent. In a 1991 study on Worldwide Whale Watching, it was found that “More than 65 operators using 140+ boats offer whale watch tours along the California coast” (Hoyt, 2001) and sea lions are almost always part of tours. As many boats have onboard educators or naturalists, tens of thousands of people are exposed to ocean education and conservation issues (Hoyt 1992). California also celebrates whale watching from land, with 5 of the 9 land-based whale-themed festivals taking
place in Southern California (Hoyt 2001). While whale watching and sea lion watching are not the same, they often occur simultaneously and some whale watching operators have capitalized on the availability of sea lions in local waters. Hornblower cruises offers “Harbor Cruise & Sea Lion Adventures” (Hornblower, 2015), and the San Diego SEAL Tours company is built entirely on short harbor tours to see sea lions (SD SEAL Tours, 2015). More reliable and accessible than other marine mammal favorites like dolphins or whales, sea lions and seals offer brushes with wildlife without much effort or cost; Hornblower’s three hour blue whale watching tour costs $75, as compared to the two hour harbor cruise for $29 (Hornblower, 2015). For locals or tourists visiting coastal communities, sea lion watching can take practically no effort at all. In La Jolla, you can watch and listen to sea lions while enjoying brunch. And for those with limited access to wildlife, sea lion interactions can be deeply moving experiences; “When you see the looks on kids' faces when they see a seal or sea lion -- or Southern California kids who have never seen ocean -- it’s pretty amazing.” (Woodall, 2008).

**Wildlife and the Media**

While the need to study human and pinniped interactions is becoming apparent, the how is much more difficult. Surveys, interviews, and economic analyses may be effective but are also time and resource consuming. One way to look at opinion, perception, and knowledge at a large scale is to look at news representations of the subject. Media has played a large role in educating the public on conservation and wildlife issues, from endangered bird populations due to feather fashion to DDT threats in the environment (Corbett, 1995). Studies have compared the difference between online and print news stories, on how readers choose what stories to read, and how different formats might dictate editorial choices (Schönbach et al 2005, Carlson 2007).

Whether or not news media increases the public’s knowledge about a subject is susceptible to such issues as selection bias (people with some knowledge about a subject tend to seek out more) as well as outside socioeconomic factors in people’s lives (Takashi and Edson, 2015). There are a number of studies dedicated to how people learn and just what they absorb (Atkin et al. 1976, Eveland et al. 2000, Carlson 2007), but to what extent is difficult to measure concretely. Studies do suggest that exposure to news media does increase knowledge on a subject in some capacity (Jensen, 2003). The availability of information and media focused on threatened animal species helped give rise to the MMPA and Endangered Species Act (Twiss, 1999) as well as fostering public outcry against perceived threats to the environment or specific (usually charming) species (Jensen, 2003). How a subject is presented will have considerable influence on feelings and knowledge held by the public. The 2003 study by Jensen et al on the disposal of a defunct oil platform shows that public outcry and the sense of great controversy did not gain traction until the news began dramatically reporting on protests from Greenpeace. Perhaps this was in part because of increased, widespread knowledge, but it is also apparent that dramatic coverage fosters dramatic reactions. Editors have some control over this by making choices about what is considered newsworthy. “Particular values
and worldviews are produced, reproduced and transformed in media discourses” (Carvalho, 2007). News editors know what “sells”, especially in the digital age where user activities and “clicks” are easily counted, and a news conglomerate is ultimately in the business to make money. Therefore, while media perceptions cannot be said to accurately reflect people’s opinion, there is some give and take between what is reported on, what is responded to, and then what is again delivered to the public. (Takashi and Edson, 2015).

Studying media is also important for scientists and managers to discover if their communication and outreach efforts are filtering out into the public. If this exposure ultimately inspires conservation or management action, such as voting or changes in purchasing behavior, is one question, but first scientists may want to know if the public is being given the basic facts or understands new trends (e.g. the magnitude and causes of the recent stranding crisis). Managers would benefit from knowing public sentiment before taking management actions so that information can be disseminated effectively. Media studies therefore give scientists and managers a view into the success of their outreach programs, the public context in which management actions might be introduced in the future, and can document which media relationships are the most fruitful, as well as what information is the most often consumed.

Several recent studies have investigated media representations of animals, including many looking at large carnivores, which often suffer unfair discrimination and conservation challenges due to perceived risk (Corbett 1995, Wolch et al 1997, Kellert et al 1996, Jacques 2010, Jacobson et al 2012, or in the case of Muter et al, 2009, risks attributed to cormorants). For example, the Muter et al 2009 study found that public perception of cormorants in the Great Lakes Basin has shifted from perceiving them as victims, due to their low numbers in the 1970s, to one viewing them more as nuisances due to their recent abundance. The paper also considered that media coverage of recent disease outbreaks in the cormorant population could possibly shift the perception back towards a more sympathetic frame.

As of yet, no formal study has been undertaken to look at the media perceptions of sea lions. This study aims to ascertain what topics are covered and to determine the tone of the articles as a proxy for the public’s perception of sea lions. Specifically, this capstone addressed four main questions:
1. Have the media topics regarding sea lions changed over time?
2. Do topics vary geographically?
3. Is the media sourcing scientists or marine mammal professionals for sea lion information?
4. What is the overall tone of sea lions stories in the media?

Methods
This study analyzed articles concerning sea lions from 5 newspapers in the southern California area, chosen based on highest circulation numbers as well as location to get the most coverage south of Point Conception, including 1
newspaper specializing in boating & fishing news across California. The time frame was 10.5 years, from January 1st 2005 to April 30th, 2015 to capture the current perceptions and any recent changes. It was conducted by searching for the term “sea lion” or “sealion” to gather any and all articles mentioning the pinniped, regardless of the main topic. This approach is based off of a similar review of media portrayals concerning sharks by Muter et. al. (Australian and U.S. News Media Portrayal of Sharks and Their Conservation, 2013). A Lexis-Nexis search was conducted for articles from the Orange County Register, which was the only newspaper available in the database. For the San Diego Union-Tribune, the Los Angeles Times, the La Jolla Light and The Log (the fishing newspaper), internet searches were conducted on each of the newspaper’s websites.

As of March 2013, the LA times (950,010 subscribers), the San Diego Union-Tribune (409,796 subscribers) and the Orange County Register (376,674 subscribers) represent a large part of the news landscape in southern California and all three are in the top 25 newspapers in the country (Alliance for Audited Media, 2013). La Jolla Light has a distribution to 17,985 subscribers (U-T Community Press, 2014) and The Log boasts a readership in Southern California of over 52,000 (The Log, 2015).

The articles were coded into a **primary topic** (risks to humans, risks to sea lions, general biological information, nuisances or losses of property, aggressive (lethal) management, fishery interactions, stranding crisis, tourism and entertainment, personal interest story, multiple), **primary tone** (negative effects of sea lions, negative effects on sea lions, positive effects of sea lions, positive effects on sea lions, multiple, neither), as well as the **primary voice** for the article (scientist, conservationist, politician, stranding expert, general public, fisher, navy, police, retailer, article author). ‘Stranding experts’ represent veterinarians or stranding center staff/volunteers, while ‘scientists’ are anything from a pure biologist to NOAA representatives. “Primary tone” can be broken into costs/benefits *to us* from sea lions (selfish tones), or costs/benefits *to sea lions* from us (more selfless, sympathetic tones). See Appendix 1 for more detail. Other animals mentioned in the article were recorded, as well as any interesting quotes or anecdotes. Duplicates, sports teams, police blotter reports, and letters to the editor have not been included in the data set. Articles mentioning sea lions in Canada or Alaska without mention of species were assumed to be referring to Steller sea lions and thus disregarded. News stories focusing solely on sea lions in aquariums/zoos outside of southern California with no connection to the region were disregarded as well.
Results

A total of 792 articles were coded, with the Orange County Register representing the most at 301 (38.0%), followed by the San Diego Union-Tribune with 266 (33.6%), the Los Angeles Times with 123 (15.5%), La Jolla Light at 78 (9.8%) and The Log with 24 articles (3.0%). The year 2013 had the highest number of articles about sea lions, with 127, with 2014 coming in second with 101 articles. 2006 had the least amount of articles with 30 (Figure 1).

Across the 10.5 years, the highest coverage was given to the topics of tourism and entertainment (Table 1), followed very closely behind by general risks to sea lions. The mostly actively covered interaction considered negative toward humans, nuisances and losses of property, took up 10.45% (n=82) of the media coverage. Articles about physical risks to humans from sea lions only represent 1.52% (n=12) of all coverage, despite the fact that two people were bitten in 2015. Balanced articles were also not very common at less than 1% (n=4), while personal interest stories (subjects focused on people with only passing mentions of sea lions) were more common (n=102, 12.88%).
### Table 1: Total count of Primary Tones and Topics of newspapers over the 11 years.

<table>
<thead>
<tr>
<th>Primary Article Topic</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>risks to humans</td>
<td>12</td>
<td>1.52%</td>
</tr>
<tr>
<td>nuisance/loss of property</td>
<td>82</td>
<td>10.35%</td>
</tr>
<tr>
<td>aggressive management</td>
<td>18</td>
<td>2.27%</td>
</tr>
<tr>
<td>fishery interaction</td>
<td>58</td>
<td>7.32%</td>
</tr>
<tr>
<td>general risks to sea lions</td>
<td>152</td>
<td>19.19%</td>
</tr>
<tr>
<td>stranding crisis</td>
<td>71</td>
<td>8.96%</td>
</tr>
<tr>
<td>general biology/information</td>
<td>138</td>
<td>17.42%</td>
</tr>
<tr>
<td>tourism/entertainment</td>
<td>154</td>
<td>19.44%</td>
</tr>
<tr>
<td>personal interest story</td>
<td>102</td>
<td>12.88%</td>
</tr>
<tr>
<td>multiple</td>
<td>4</td>
<td>0.51%</td>
</tr>
<tr>
<td><strong>Primary Article Tone</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>negative effects of sea lions</td>
<td>132</td>
<td>16.67%</td>
</tr>
<tr>
<td>negative effects on sea lions</td>
<td>240</td>
<td>30.30%</td>
</tr>
<tr>
<td>positive effects of sea lions</td>
<td>176</td>
<td>22.22%</td>
</tr>
<tr>
<td>positive effects on sea lions</td>
<td>55</td>
<td>6.94%</td>
</tr>
<tr>
<td>multiple</td>
<td>17</td>
<td>2.15%</td>
</tr>
<tr>
<td>neither</td>
<td>172</td>
<td>21.72%</td>
</tr>
</tbody>
</table>

Q1. Has there been a change in topics over time? (Fig. 2). Consistent across all years are three main topics; personal interest stories, general biology/information, and tourism/entertainment. Coverage on nuisances/loss of property also remained somewhat consistent with a small increase in more recent years. The largest difference is in the years 2012-2015, where articles mentioning extreme stranding events (“stranding crisis”) grew considerably.

![Figure 2: Total Primary topic for all newspapers across 3 sets of years](image)

Q2. Do topics differ geographically? Specific actions were reported in specific areas. For example, Newport was reported on often for sea lion nuisances in the harbor, as well as La Jolla having infamous troubles with the smell from sea lions.
and cormorants. 80.49% (n=66) of articles coded as nuisance/loss of property (82 in total) come from these two locations alone, as reported in the Orange County Register and La Jolla Light respectively. Conversely, articles concerning San Diego and Dana Point had the highest rates of tourism/entertainment coverage at 27.27% (n=42) of all tourism articles (n=154). Specific newspapers reported on these location differences (Fig. 3) as well. Again, the three main topics (general biology/information, tourism/entertainment, personal interest story) are generally covered at a similar abundance over the three largest newspapers, the Los Angeles Times, the Orange County Register, and the San Diego Union-Tribune. Here, articles about general risks to sea lions also take up similar amounts of coverage. In contrast, both La Jolla Light and The Log report on nuisances/loss of property topics with more frequency.

Figure 3: Total topic coverage by newspaper

Q3. Are scientists heard in the media? The majority of the articles are divided amongst four main voices; the article authors themselves (n=298, 37.63%), stranding experts (n=125, 15.78%), scientists (n=115, 14.52%) and the general public (n=107, 13.51%). As “scientists” and “stranding experts” could be considered voices of animal experts, this shows nearly 30% of the articles feature the voice of someone with increased knowledge about sea lions.

Q4. What is the tone of media coverage of sea lions? While tourism and risks to sea lions were equally represented in topics, “benefits to us” (n=170, 22.22%) was second behind “costs to sea lions” (n=240, 30.30%) (Fig. 4). Despite California’s booming tourism industry, the dramatic stranding over thousands of pups seems to have captured the attention of editors. Coverage on “benefits to sea lions” was
also low (n=55, 6.94%). Selfish and negative toned articles, “costs to us from sea lions,” only took up 17% (n=132) of all news coverage, less than neutral tones, which were present in 172 articles (21.72%).

Specific topics also had a diverse makeup of tones. Articles discussing stranding crises (n=71) were most often sympathetic in tone, with “costs to sea lions” at 90.14% (n=64). Fishery interactions (58 articles) such as entanglement or depredation, which could be generally considered negative for both parties, had a similar breakdown. While articles expressing selfish tones, “costs to us,” numbered at 14 (24.14%), sympathetic tones were more common, comprising 70.69% (n=41) of the articles. The other 5.71% was split between “positive effects on sea lions” and “multiple” tones.

**Discussion**

**Biases, Caveats, and News Skews**

As mentioned above, news and the media are not a perfect proxy for public opinion. There are general biases in what is reported on due to editorial choices or dramatic event and thus do not accurately reflect the breadth or frequency what is happening in reality. This inaccuracy can create false senses of the world in the public. For example, chains of articles that focused on a single sea lion rescued followed a dramatic narrative; sea lion found, sea lion recovering under the care of dedicated volunteers, sea lion released with tears and well wishes. Happy endings do occur, and can foster a lot of support for rehabilitation, however successful rescue and rehabilitation is not always the case. Stranding centers, overrun by patients, also have to make hard choices over which animals
to treat, and hundreds of pups do not survive (pers. convers.), yet these stories are apparently far less likely to make the news.

Articles about wounded or stranded sea lions also inconsistently put these events into perspective of the overall species’ population. Shorter articles, and more dramatic articles detailing the rescue of specific individuals did not give stranding numbers in the larger context of the population count, focusing only on the tragic nature of stranding sea lions. Without the context of the population size and health, readers cannot begin to evaluate the impact of strandings and perhaps allow for readers to believe the sea lion population may be in danger. Longer, more detailed articles and those sourcing scientists and NOAA representatives, however, shared this information when looking at the stranding issues as a broader part of environmental conservation or scientific study (Sahagun, 2015). During dramatic events like mass strandings, media studies would do well to be paired with surveys to understand the public’s comprehension of these events.

Location was a factor in media coverage of sea lions. The La Jolla Light published 31 articles (nearly 40% of their total article count) about the La Jolla Cove issue in the past four years alone. Compare this to the Orange County Register that, despite covering a larger area with harbors prone to the presence of sea lions, published only 25 articles concerning sea lion nuisances in the 11-year span of this study. The Union-Tribune, which is also a large area and covers La Jolla in its distribution, only published 14 articles on nuisances in total over 11 years. While focusing on local, high-impact events is no doubt part of any newspaper’s strategy, there may be selection bias. In La Jolla, the editors of the newspaper may be more concerned with the feelings of long-term shop owners and residents, as opposed to short-term visiting tourists who may feel more positively toward sea lions. However, this could also be this researcher’s perception of perceptions; just like La Jolla Light editors, a large amount of hype about an issue could lead one to believe that it is an important issue for everyone. Media studies should be paired with stakeholder surveys to help clear up perception bias.

The high number of tourism/entertainment articles in Dana Point could present contrasting editorial interest or an overall difference in perception for that location. Perhaps certain wildlife viewing companies have garnered specific support from the editors or public. A considerable amount of wildlife tours from Dana Point seem to be for students or disenfranchised groups, funded by locals or hosted for free by the boat operators themselves (Shimura, “St. John's sponsors educational cruise for Santa Ana students”, January 24, 2014). This philanthropy could be considered more newsworthy than general commerce happening out on the water.

This study focused solely on media topics and tone in southern California. It can potentially be a model for broader studies and investigations outside of the area that would be needed in order to capture the perceptions of the species across the entire range. For example, as noted above, in Oregon the situation is different.
Sea lions are taking endangered salmon in the Columbia River and the state is authorized to conduct lethal removal of sea lions and has been conducting harassment long before any lethal action was taken (Stansell, 2014). Thus it would be important to compare media coverage and public perceptions in the Pacific Northwest, which might be very different, considering the cultural and economic importance of protected salmon, as well as the difference in importance of tourism to that region.

**Carnivores in the News**
The study of sea lions also offers a unique perspective on carnivores in the news. While sea lions do pose some physical risks to us, they are very different predators than wolves or sharks, who have been investigated in other media studies. Coverage on risks to us only represents 1.52% (n=12) of all articles, reflecting the rarity and lack of severity of these events. However, there still could be a difference in reality versus coverage. A 1996 study by Kellert et al showed that despite similar risks to people and livestock, wolves were reported on with much higher and more polarized frequency, while mountain lions only garnered a lukewarm response in the media. In speaking to fishermen, they claim to routinely have antagonistic and potentially dangerous interactions with aggressive sea lions on bait docks and the harbors. It could be that, like the mountain lion, these hostile events just do not spark the media’s attention. There are no records of the frequency of human-sea lion interactions, thus we cannot say if the article count of incidents like bites or attacks is representative of actual events. As the sea lion population increases, it is important to monitor these interactions to see if they are increasing, both in actual frequency as well as media attention.

Sea lions occupy a culturally different space than many wild animals; intelligent, social, comfortable with humans, able to learn and easy to train, sea lions are staples at aquariums and in circus acts. The quintessential image of a sea lion with a ball balanced on its nose is pervasive in our cultural consciousness, despite controversy over the morality of keeping intelligent animals in captivity. Consider, for example, the SeaWorld/orca controversy. In several letters to the editor for the Union-Tribune, people responded to the SeaWorld backlash by praising them for their rescue of stranded sea lions. No one, it seemed, had an issue with the sea lions in captivity, just the orcas. While bears and lions similarly have a place in our circus history, the image there is of a chained beast and man’s dominance over their dangerous disposition. For killer whales and dolphins, the controversy comes from man’s dominance over animals considered to be too intelligent and
too wild to be held in captivity for people’s enjoyment. In contrast, the slapstick routine of Seamore and Clyde at SeaWorld’s Sea Lion and Otter show (Image 1) paints the human-sea lion relationship in a more friendly and pet-like manner. Seamore and Clyde are equal partners to their human companions, and are portrayed working together to overcome obstacles, seemingly both enjoying the relationship and partnership more than had the sea lions been left to the wild.

Sea lions, unlike the reclusive mountain lion or iconic grizzly bear, also gather in large numbers in often crowded, urbanized beach towns, offering consistent and intimate connection with nature for many people who would otherwise not have the chance to see wild animals. Conversely, this persistent interaction also sets the stage for localized conflicts. Visitors to an area can delight at wildlife, while residents have to deal with the reality of wild animals on their doorsteps. This is similar to several other media studies (Kellert et al 1996, Gusset 2009) that show how proximity to the animals and frequency of interactions are important factors in perceptions.

An August, 2010 article profiling a local swimming champ starts out “Chloe Sutton dives into the churn of Marine Stadium in Long Beach on Sunday morning, in temperatures that would make a sea lion scream for a toque (and maybe a toke)” (Whicker, OCR, 2010). This illustrates another way in which sea lions fit differently in our lives. There is something relatable in the way sea lions move from land to water like us, especially for coastal communities where a connection to the ocean is strong. Sea lions are also often nicknamed “dogs” by fishers, and their faces and “four-legged” appearance also suggest this comparison. Curious and social, with the ability to mimic and learn quickly, they can interact with us in and out of the water in ways similar to domestic dogs, and these similarities can make them more familiar and endearing to us than other marine animals.

**Scene Setters**
Regardless of how much, or in comparison to whom, it is clear that taken together, southern Californians love sea lions (Figure 4). Why do sea lions get such positive feedback, despite loud objections from frustrated harbor communities and fishers?

Part of it may simply be access. Many of the tourism/personal interest stories included other animals with sea lions, but plenty did not. Sea lions were mentioned alone in 264 articles (33.46%), often in relation to their iconic bark. We might adore whales but they make considerably less noise, and that echoing sound is practically a cultural staple (just ask any 10 year old to mimic a sea lion). Sea lions are also seen as decidedly Californian: TV host Jeff Corwin states “I can't think of a creature more symbolic of California then the California sea lion... It's laced its way into the fabric of the culture and into the economy and tourism.” (Ritchie, OCR, 2013). Many articles used sea lions as a ‘scene setter’; in a 2012 article about a local marriage coordinator, one of the defining elements of the article states: “At a dawn wedding held at Malibu's Point Dume beach, a sea lion...
started walking toward the wedding party. ‘I loudly asked the sea lion 'Is it OK if we do a wedding here?’ When the sea lion roared back, Katz says he ‘took that as a 'yes.’”' (Gopman, OCR, 2012). Sea lions are mentioned again and again to give context to a misty morning at a dock, or to highlight the wild and majestic coastlines.

**Putting the News to Work**

The future of sea lions in the news will be an interesting to track. If ocean conditions persist, this high number of strandings might be the new normal. For public perceptions, this increased perceived risk to sea lions could push the tide even further in the sea lions’ favor (Muter, 2009). This could lend support to conservation, but it also might leave retailers and fishers feeling that no one is listening to their concerns, which could increase frustration and perhaps illegal activities. The conflicts surrounding sea lions are already rather heated, so care should be taken by managers to bring all stakeholders to the table, especially when the focus is perceived to exclusively be on protecting sea lions.

As noted, nearly 30% of news articles source some sort of animal expert, which seems to say that stranding centers and NOAA (the most oft cited scientists were from NOAA) have established positive relationships with the media. While no qualitative breakdown of the accuracy of information in these articles was completed, many articles included some natural history about sea lions. There were even a few articles discussing the mistakes of the past. One article details the inaccuracy of the sea lion sculpture installed as the icon of Seal Beach, which is supposed to be, as the name suggests, a seal. Says one resident: “Our founding fathers weren’t very good marine biologists” (Kopetman, 2010). It is very encouraging to see that efforts are paying off in getting scientific voices in the news, especially considering many articles were about tourism and do not particularly need a scientific voice. More study should be done to quantify the accuracy of information, as well as the impact added knowledge and outreach has on the public’s potential actions.

**Going Forward**

Media perceptions can be helpful in guiding managers to know what is important to citizens and voters, as well as helping show specific points of contention. However, making predictions on how people will act based solely on media or even self-reporting is ill advised. The relationship between what people say and what people do is highly changing and unpredictable. Just as fishers rage against sea lions stealing their bait, on the same trip they will be seen feeding small starving pups on the docks (Zac Schackner, pers. conversation), thus reinforcing the behavior that inspires such frustration. The situation of being out on a boat and having yellowtail stolen by a large sea lion is apparently different enough from the large-eyed stare of an adorable and seemingly tame pup in order to inspire different actions, despite internal knowledge deeming those actions illogical.
Media studies can still give managers and scientists a grasp on the social environment any proposed management action will need to operate within. Through this study, we have found that perceptions of sea lions are predominantly positive and sympathetic, and have not changed much over the past decade in southern California, except in the event of dramatic events such as mass strandings. Location is also important to the public when considering nuisances or tourism; a delicate balance is maintained in popular towns such as La Jolla, which boasts tourism due to the same sea lions that cause strife for business owners. Managers and scientists should feel confident that their voices are making it out into the public with some consistency, which lends legitimacy to the articles and shows good communication between stakeholders. Overall, despite a variety of possible interactions, sea lion conservation and protection seems to generally be favorable. Managers will have to take into account the apparent desire to see sea lions protected, as well as how much sea lions seem to matter to the local identity and economy. Expanding this study to the entirety of the species’ range would create the complete picture, giving managers more understanding of where particularly solutions may work better than others.

It is important to maintain perspective when looking at media firestorms. Media studies should be pared with stakeholder communication, as well as other studies such as economic analyses of key player’s industries, and the importance of environmental and non-market value should always be kept in mind. As factors such as climate change and increased human populations begin to alter the environmental landscape, our relationships with wildlife will also change; continued interest in media perceptions will benefit managers and policy makers. How the sea lion population will react to these changing oceans will not be fully understood for years to come, but it is apparent that southern California will continue to delight in their charm.
Appendix 1  
**News source information recorded:**
- Date
- Source Category: Lexis-Nexis Newspaper, online newspaper
- Region: Newspaper region
- Topic Location: Location of incident or topic, as specific as possible (West coast, Southern California, Dana Point, etc)
- Title
- Author name
- Summary: Brief summary of main points
- Interesting anecdotes: quotes that highlight mention of sea lions or particularly noteworthy/unique details

**Primary Topic classifications:** This classification should be based on the majority of the article; many articles will offer several points, but the main point should be clear. For newspaper articles, often the main point will be in the title or the first few paragraphs (in order to not burry the lead), so when in doubt stick within the first paragraphs.

<table>
<thead>
<tr>
<th>Risks to humans</th>
<th>Any physical risk or danger; bites, attacks or direct threat of infection. Annoyances, nuisances, or undefined low risks should not go in this bucket.</th>
</tr>
</thead>
<tbody>
<tr>
<td>General risks to sea lions</td>
<td>Any threat or mortality that doesn’t have a clear cause or a direct link to fisheries. Stranding cases that are normal and not displayed in a “crisis” situation. Human harassment, sonar testing, environmental changes, coastal construction, etc.</td>
</tr>
<tr>
<td>Aggressive management</td>
<td>Discussion of lethal management or physical harm harassment to discourage nuisance or aggressive sea lions. General “scaring away” sea lions without explicit mention of painful deterrents or specific harassment by fisheries should go in Fishery interactions.</td>
</tr>
<tr>
<td>Tourism/entertainment</td>
<td>Aquarium animals, wildlife tours, education, etc. Any mention of sea lions in a context to bring visitors to a certain space. Charm of sea lions on docks, swimming with sea lions as part of California experience, etc.</td>
</tr>
<tr>
<td>Fishery interaction</td>
<td>Interaction between sea lions and fisheries. Sea lions stealing bait, sea lions wounded from gaffes, fishermen’s complaints, etc. Dock nuisances should not be put in this unless mentioned in relation to fishing trips.</td>
</tr>
<tr>
<td>Stranding crisis</td>
<td>Unusually dramatic stranding events, record-breaking stranding numbers, stranding centers “overwhelmed” or at capacity.</td>
</tr>
<tr>
<td>General biology/information</td>
<td>Mention of sea lions in relation to food web of other animals or coastal ecosystem information.</td>
</tr>
<tr>
<td>Nuisance/loss of property</td>
<td>Sea lions taking over public spaces, pungent smells, damage of property such as docks. Any fishing-related</td>
</tr>
<tr>
<td>Classification</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Personal interest story</td>
<td>Stories focused on people or other events with casual mention of sea lions as “scene setters” but not in tourist context. Sea lions mentioned in the context of California environment but without significant biological information can go here.</td>
</tr>
<tr>
<td>Multiple</td>
<td>It is near impossible to find a focus. Longer, well-balanced articles on a complicated issue might fall in this bucket.</td>
</tr>
<tr>
<td>Other</td>
<td>A topic that impossible to classify into any of the above.</td>
</tr>
</tbody>
</table>

**Primary Tone classifications:** This classification is for the main point or frame intended by the article author. While an article may mention different points of an issue, the main tone should be the lasting effect the author is intending. For example, an article about a stranding rescue may mention a sea lion trying to bite the rescuer, but if the primary tone of the article illicit sympathy and details threats facing sea lions, it is more appropriate to label it “negative effects on sea lions”.

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative effects on sea lions</td>
<td>Lack of prey, stranding events, entanglement, threats from humans, changing environmental factors due to human activities (coastal changes, prey competition), natural predators in unusual contexts (increase of shark predation, etc).</td>
</tr>
<tr>
<td>Negative effects of sea lions</td>
<td>Threats to humans, attacks, nuisances, depredation, sea lions disrupting other species.</td>
</tr>
<tr>
<td>Positive effects on sea lions</td>
<td>Conservation efforts, protective legislation, stranding articles focusing significantly on the stranding center itself as opposed to threats facing sea lions.</td>
</tr>
<tr>
<td>Positive effects of sea lions</td>
<td>Tourism, entertainment, education programs, importance of sea lions in the ecosystem, sea lions as charming parts of an experience.</td>
</tr>
<tr>
<td>Multiple</td>
<td>Well-balanced articles that cannot be narrowed down to one tone or the other. If an article mainly highlights one tone but presents only one “counterpoint”, it should not be labeled with this category.</td>
</tr>
<tr>
<td>Neither</td>
<td>Articles without emotional connection to sea lions, like personal interest stories or archeological finds.</td>
</tr>
</tbody>
</table>

**Primary Reporter:** The primary person being interviews or as a point of authority.
- Scientist, stranding expert, conservationist, general public, politician, fisher, Navy, police, retailer, article author, multiple.

**Animals included with sea lions:** Any mention of other animals included with sea lions as specific as mentioned in the article, unless it is only a very brief mention of fish in relation to sea lions as prey without species or type specific.
References


California Department of Fish and Wildlife. Commercial Passenger Fishing Vessel Fleet Reported Catches for 2013.


Connelly, Laylan “Newport aims to tame unruly sea lions Did you know?; Unwanted harbor guests wreak havoc on boats, drive residents to distraction.” The Orange Country Register. September 14, 2005.
Connelly, Laylan. “Sinking of boat in Newport is latest sea lion aggravation; Incident comes soon after several of the animals used a trimaran as a sun deck.” The Orange County Register. August 30, 2008

Connelly, Laylan “Sea lions spark debate; Their barking and jumping on boats in an area harbor have residents seeking a solution.” The Orange County Register. September 3, 2008.

Connelly, Laylan “Sea lions again go boating in Newport Harbor” The Orange County Register. March 25, 2015.


Flaccus, Gillian “Things to Know about California’s sea lion crisis” San Diego Union-Tribune, March 17th, 2015.


Gropman, Adam. “Untitled” The Orange County Register. December 22, 2012


HUMANE SOCIETY OF THE UNITED STATES; WILD FISH CONSERVANCY; BETHANIE O’DRISCOLL; ANDREA KOZIL v. CARLOS M. GUTIERREZ, Secretary of Commerce; JAMESWBALSIGER; JAMES LECKY, WASHINGTON STATE DEPARTMENT OF FISH AND WILDLIFE; STATE OF OREGON DEPARTMENT OF FISH AND WILDLIFE, No. 08-35305 UNITED STATES COURT OF APPEALS FOR THE NINTH CIRCUIT 523 F.3d 990; 2008 U.S. App. LEXIS 28052, April, 2008.


Kopetman, Roxana “Seal beach mastic actually a sea lion” Orange County Register, October 16, 2010


Mackie, Ashley “Mayor declares first round of La Jolla Cove stench cleanup a success” The La Jolla Light. June 28, 2013.


McKechnie, Iain; Wigen, Rebecca J. “Toward a Historical Ecology of Pinniped and Sea Otter Hunting Traditions on the Coast of Southern British Columbia,” Human Impacts on Seals, Sea lions, and Sea Otters. Ed. Todd Braje 2011


NOAA Fisheries, West Coast Region. “Deterring Problem Seals & Sea Lions (Pinnipeds)”, August 2014.


NOAA Fisheries, West Coast Region. “2015 Elevated California Sea Lions Strandings in California: FAQs” May 20, 2015

NOAA Fisheries, West Coast Region. “FAQs on the California Sea Lion UME in California” March 23, 2015

Ocean Biogeographic Information System (OBIS-SEAMAP) “California Sea Lion Species Profile” 2015


Oregon Department of Fish and Wildlife. California Sea Lion Management. 2013. www.dfw.state.or.us/fish/sealion/index.asp

Oregon Department of Fish and Wildlife. “California Sea Lion Management” May, 2015.

Oregon Department of Fish and Wildlife. Sport Fishing Regulation Updates – Columbia Zone. 2014. www.dfw.state.or.us/resources/fishing/reg_changes/columbia.asp

Perry, Tony “To cut sea lion and bird stink, city puts gate in La Jolla Cove fence” The Los Angeles Times, December 31, 2013.


Ritchie, Erika I. “Warmer waters are starving sea lions.” The Orange County Register. March 18, 2015

Ritchie, Erika I. “TV host focuses on local sea lions.” The Orange County Register, May 23, 2013

Sahagun, Louis. “Scat may contain clues to marine mammals' Southern California deaths” The Los Angeles Times. April 13, 2015


Sforza, Teri “A LOST PUP GROWS UP; Stranded sea lion Tommy won the hearts of the Pacific Marine Mammal Center. But now he’s too old to stay.” The Orange County Register, April 24, 2005.

Sherman, Pat “As Children’s Pool rope comes down, seal advocates continue push for year-round barrier” La Jolla Light. May 16, 2012.

Sherman, Pat, “New collaborative effort to tackle La Jolla Cove stench in the works” La Jolla Light. April 15, 2015.


Strege, Dave. “Resorts load up on ‘real’ snow” The Orange County Register, January 25, 2008.


The Log, “About The Log Newspaper” May 2015 mediakit.thelog.com/pages/about.php


U.S. Census Bureau: State and County QuickFacts, San Diego County, Los Angeles County, Orange County, California. April 22, 2015


Whicker, Mark. "Untitled" The Orange County Register, August 19, 2010.


Woodall, Christa. “Tour company offers an eco-friendly ride; O.C. Wildlife and Beach Tours encourages environmental stewardship while taking tourists around Laguna.” The Orange County Register, March 20, 2008.