



The Otter Project

www.otterproject.org

2012 Sea Otter Status Report September 2012

A year-end report based on 2011 and 2012 population indicators

The status of the southern sea otter population at the end of 2011 was unknown due to inclement weather which hindered USGS from completing the annual spring survey. This was an unprecedented event as the population survey has been conducted annually since the 1980s to track the recovery trend of the population. **The 2012 Sea Otter Status Report utilizes 2011 mortality and strandings data and 2012 population survey data to provide an update on the population status.**

Determining the status of the sea otter population is a challenging task due to year to year environmental variability and other external factors that may provide conflicting information. By analyzing the data, we can assess the current status of the population, the population trend, and determine a proper course of action for improved management. Data used for this report was collected by the US Geological Survey (USGS), California Department of Fish and Game (DFG), Monterey Bay Aquarium, and other institutions to assess the health of the southern sea otter population.

In Summary

The Otter Project considers four factors when evaluating the southern sea otter population status. Our current determination of the status of the sea otter population for 2011 based on these four factors¹ is unknown. Utilizing data from 2011 and 2012, the factors indicated the following:

- **2012 Spring survey: Positive.** The 3-year running average² for 2011 and 2012 is up. USGS completed the 2012 survey and extrapolated the data over two years resulting in a 1.5% increase in 2011 and 2012 for the 3-year running average. The otter count for 2012 was up modestly from 2010 but still down from 2009. Even though 2012 saw an increase in the total number of otters counted in the spring survey, the trend in the 3-year average appears to be relatively flat since 2006;

¹ A positive or negative classification is describing the population impacts of this indicator (for example the number of dead strandings being low is deemed positive because it means less otters were found dead).

² The 3-year running average is the metric the U.S. Fish and Wildlife Service's Southern Sea Otter Recovery Plan recommends using to assess the sea otter population status, thus reducing the influence of anomalously high or low counts from any particular year (USFWS, 2003).

- 2011 Dead strandings: **Negative**. Through December 2011, the number of dead otters recovered was a new recorded high of 335 over the previous high of 305 in 2010;
- 2011 Mortality by age-class: **Negative**. An increase in mortality occurred in reproductive adult age classes this year. Mortality of pups and immature otters decreased slightly;
- 2012 Pup to independent ratio: **Positive**. The 2012 survey results showed a sizeable increase in the pup to independent ratio compared to 2010.

The Otter Project believes that the overall results for 2011 were mixed. Unfortunately, the data gap for 2011 has restrained rigorous interpretation and reporting of the population status. The 2011 mortality and strandings data did not provide a positive outlook for the population. The 2012 spring survey was an unexpected and positive result considering the difficult challenges that otters continue to regularly endure in the nearshore environment. The 3-year average is up and optimistically headed in a positive direction in spite of two years of high mortality. Management measures still need to be re-evaluated and other external factors considered to address improved recovery actions for the sea otter population. The most current Final Revised Recovery Plan for the Southern Sea Otter was completed 9 years ago and we encourage the US Fish and Wildlife Service to reengage the sea otter community to update the Plan.

Sea Otter Survey

The sea otter population is surveyed twice a year, spring and fall, by USGS, with support from CDFG and MBA, and a small number of other volunteers. The spring count is conducted from shore and by aerial survey within the established geographic range and used to assess current abundance and distribution. Only the spring survey is used in the annual population census report that is announced by the USGS Western Ecological Research Center each summer. As with any wildlife count, there is some amount of statistical uncertainty, and “the annual sea otter census is meant to be an index of abundance (the three-year average) rather than a true estimate of total abundance (USGS WERC Sacramento Headquarters, 2011).” According to USGS Western Ecological Research Center, fall surveys are intended as a compliment to the spring survey and are used to provide additional insight on reproduction trends -- basically, the ratio of pups to adults. USGS researchers have found this useful because the average pup dependency period is 6 months. So, by conducting 2 surveys 6 months apart, they are able to gain a fairly complete picture of annual pup production, even if the seasonal patterns of pup production change from year to year. During the fall 2009 survey, researchers modified their fall survey methodology, and determined that by switching to a sample of index areas (representing about 40% of the entire coastline); they were able to obtain an unbiased and reasonably precise estimate of range-wide pup production (USGS WERC Sacramento

Headquarters, 2011). This change in the fall pup survey methodology does not impact the 3-year running average but could lead to greater statistical accuracy in future sea otter counts.

Under the Revised Southern Sea Otter Recovery Plan, the 3-year running average is the number that is used to determine population status and taken into account when considering up-listing³ or de-listing the southern sea otter (USFWS, 2003). It is also the figure most widely used when considering appropriate management action.

The 3-year running average (Figure 1) for 2012 is 2792, an increase of 1.5% per year (2011, 2012) since 2010 (USGS WERC, 2012). USGS completed the count for 2012 and averaged the 3% annual percent change in the population from 2010 to 2012 over 2 years. This was done to compensate for the gap in the data for 2011 due to incompleteness of the spring survey count. The overall trend in the population is increasing but “the southern sea otter population continues its pattern of tepid recovery,” stated The US Geological Survey, the federal agency that coordinates the count (USGS WERC, 2012).

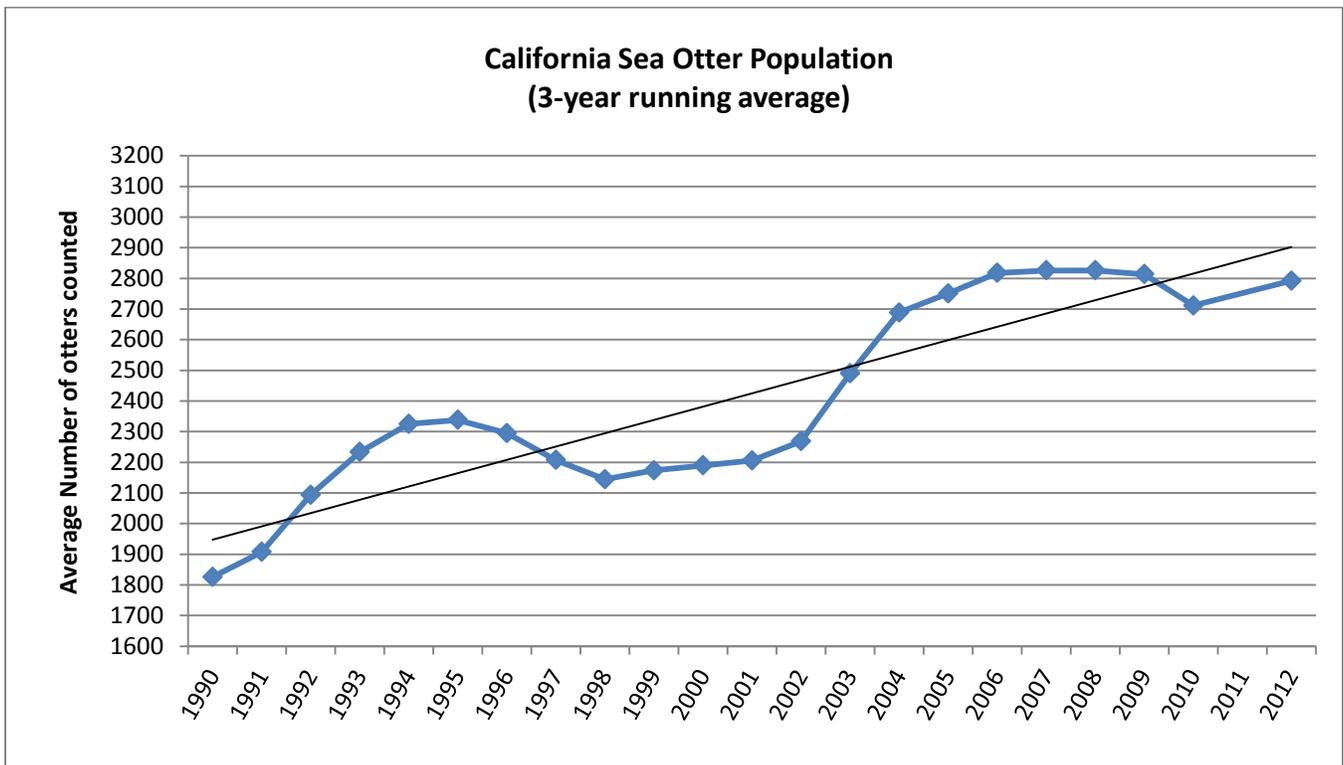


Figure 1: 3-year running average – Total number of otters counted averaged over 3 years. (2010 avg. - 2711)

³ Up-listing is defined as designating the population as “endangered” rather than “threatened” under the Endangered Species Act.

The 2012 spring survey (Figure 2) recorded 2,865 otters, 5% higher than the 2010 count (2719), but 5.3% lower than the record high in 2007(3026) (USGS WERC, 2012). Scientists have long noted that population growth for the southern sea otter is somewhat stagnant. The population has never experienced a growth rate increase of more than 5 percent (USFWS, 2003). The theoretical maximum is 17-20% and populations elsewhere, such as Washington, have seen average growth rates such as these (Estes, 1990).

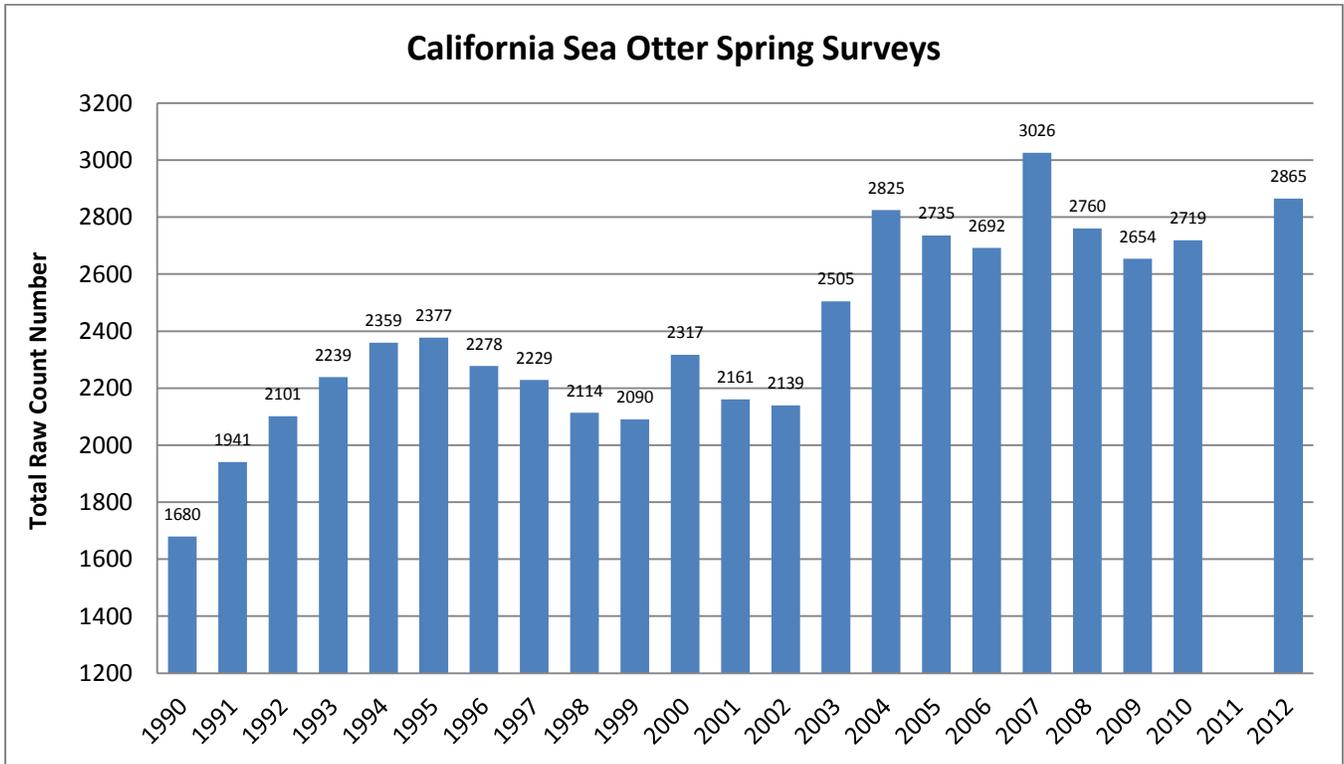


Figure 2: Spring Survey – Total raw count number of otters counted yearly.

Pup to Independent Ratio

Researchers believe that sea otter population growth is hindered by high levels of mortality rather than poor reproductive success. High levels of mortality in reproducing adults impact pup production and is cause for concern. Sea otter population recovery is impossible without successful pupping, which is why we track pup trends closely. The overall trend from 1990 to date of the pup to independent ratio (Figure 3) is currently flat to slightly increasing.

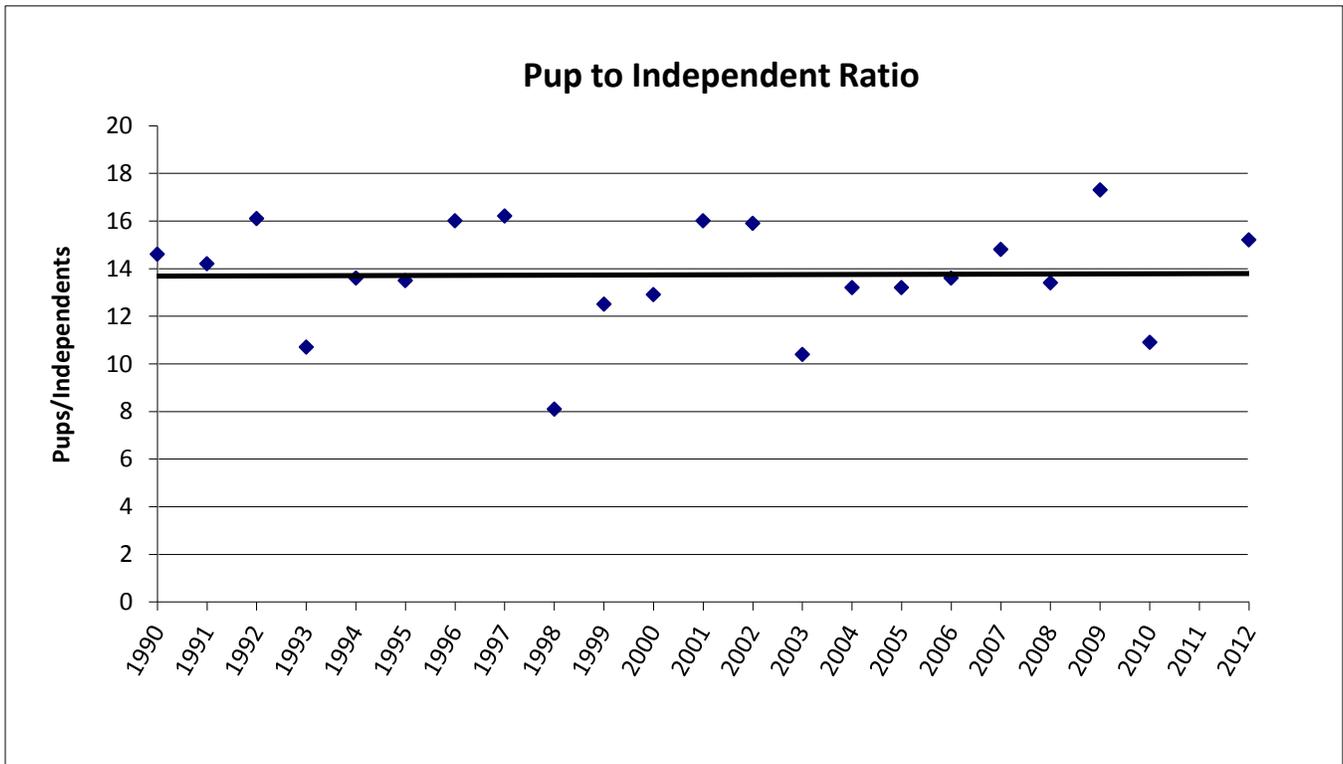


Figure 3: The ratio of the number of otter pups to independent otters

The 2012 pup to independent ratio increased to 15.2 pups for every 100 independents as compared to 2010 with 10.9 and but did not recover to 2009 level with 17.3 pups for every 100 independents. The 2012 spring pup count was 379, a 30 % increase from 2010's count of 267 pups. It should be noted that this increase occurred over a two year time span and averaged over two years (2011, 2012) is a 15% increase per year. According to USGS, "There were more pups counted (relative to the previous census) in 10 coastal segments, including all areas from Pigeon Point to Hazard Canyon and in the area southeast of Pt. Conception, where 10 pups were seen" (USGS WERC, 2012). There was also good news reported for pups south of Point Conception, where sea otters are currently prohibited. They also reported "the highest pup count on record and only the second time pups have been observed in this area during the spring census" (USGS WERC, 2012).

Dead Strandings

Dead otters found on beaches are collected throughout the year. Researchers perform necropsies on each fresh-dead otter to determine cause of death, which provides a greater understanding of what may be impacting the population. It is necessary to note that not all dead otters end up on public access beaches convenient for scientific research. Past research indicates that possibly less than 50% of sea otters that die in the wild end up on the beach, so the data presented here at best provide only an index of trends in population mortality (USGS WERC, 2012). Because of the unknown discrepancy between the actual numbers of otters that die and the number of otters that are recovered, this indicator can be misleading and should be considered in conjunction with other indicators.

There were 335 otters found dead (Figure 4) through December 2011 (USGS WERC, 2012). This year surpassed 2010 by 30 otters and is the highest number of strandings since recording of stranding data began in 1983. USGS researchers have determined that, “the record number of strandings observed this year can be partly attributed to more sea otters being bitten by white sharks, a cause of death that has been increasing steadily over the last decade” (USGS WERC, 2012).

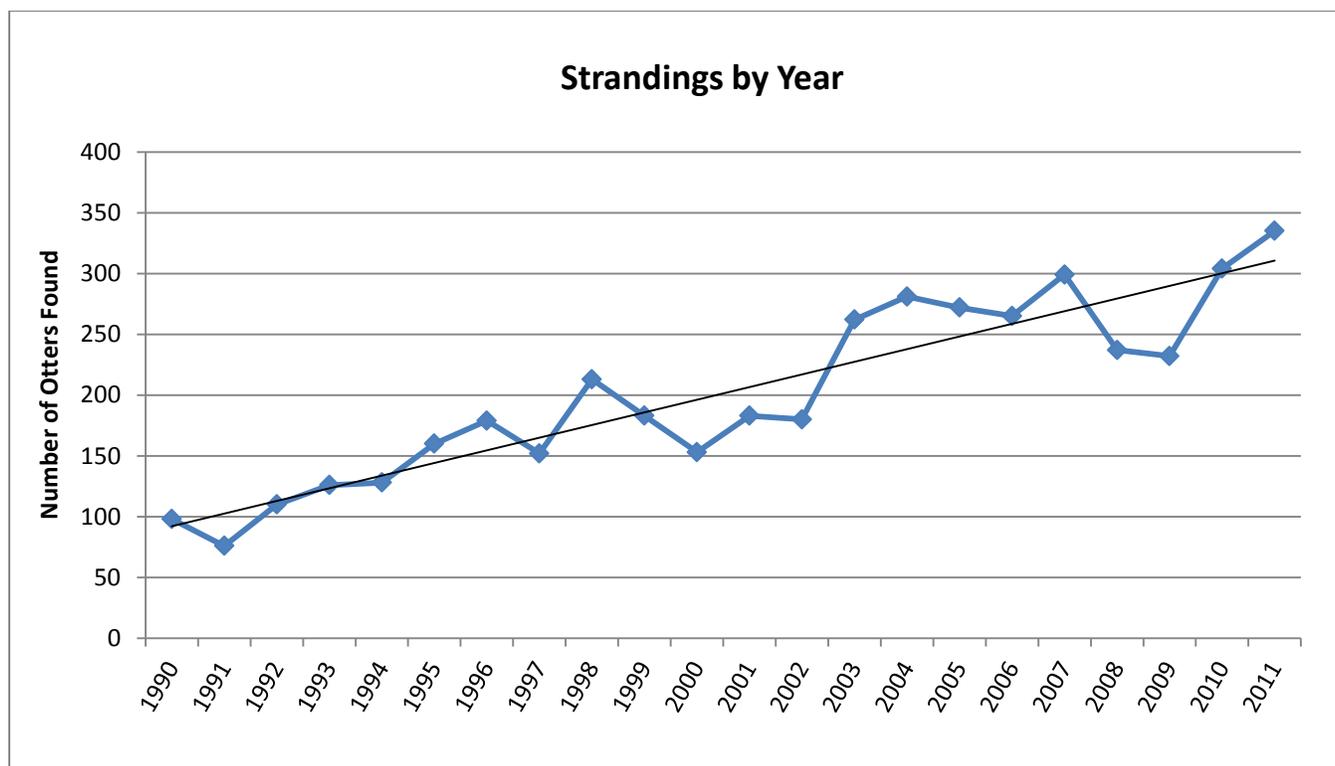


Figure 4: Count of otter strandings recovered yearly, 1990-2010.

As the sea otter population grows, we would expect the number of otter strandings to also increase. However, we might expect the percentage of the population dying to stabilize over time. From 2004 to 2007, the percentage of spring count found stranded stabilized around 9.9%. In 2008, strandings dropped to 8.6% and increased slightly to 8.7% in 2009. Although strandings appeared to stabilize from 2004 – 2009, the overall trend indicates an increase in the percentage of the population dying. In 2010, the percentage of the spring count found dead was an alarming 11.2% (Figure 5). This is the highest percentage on record (1983-2009) and 2.1% higher than the 10-year average (2000-2009) of 9.1% (USGS WERC, 2011). For 2011, we do not know the percentage stranded due to the lack of a spring count. We have this number in next year's report.

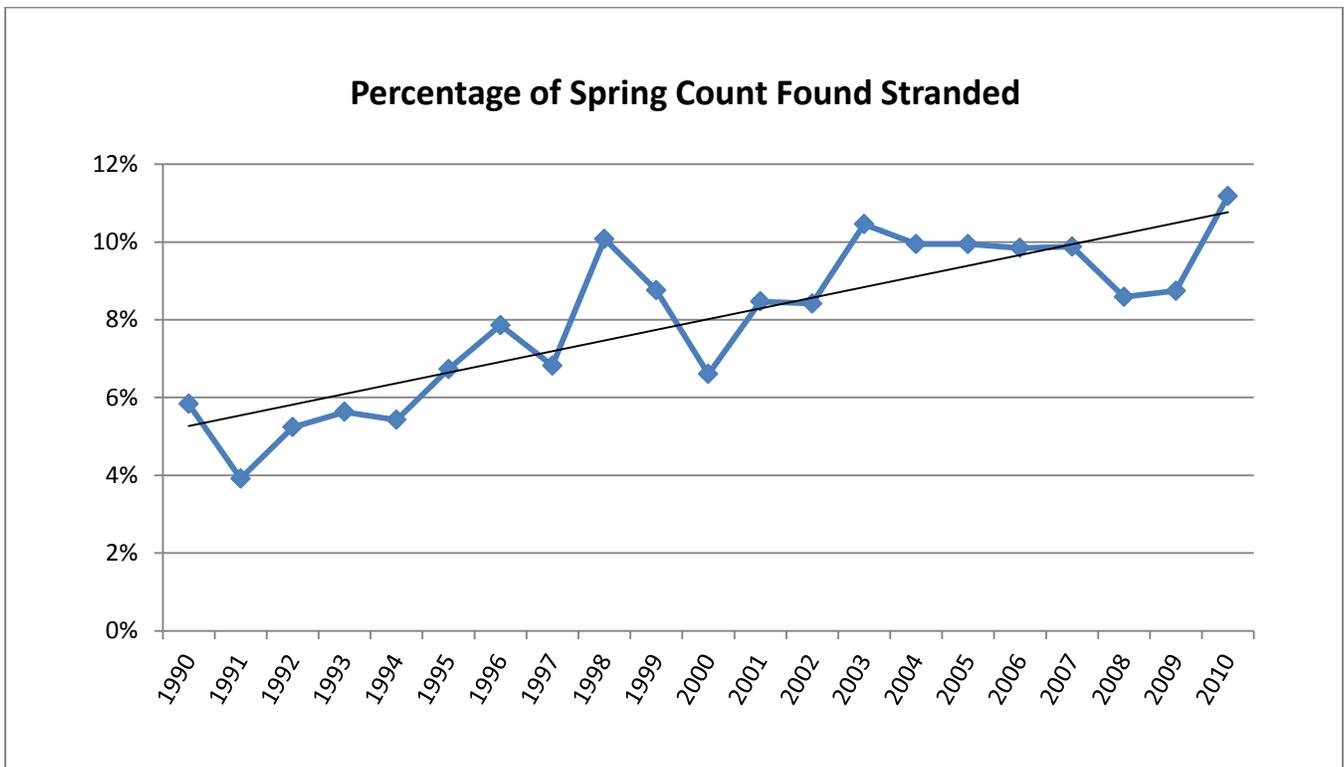


Figure 5: Number of otter strandings as a percentage of 2010 spring survey count

In 2011, there was a record number of strandings and a strongly correlated cause with the increase of sea otter mortality. In Figure 6 below, the record stranding totals in January, February, August, September and October for 2011 are attributed, in part, to an increase in the number of shark bitten otters (USGS WERC, 2012).

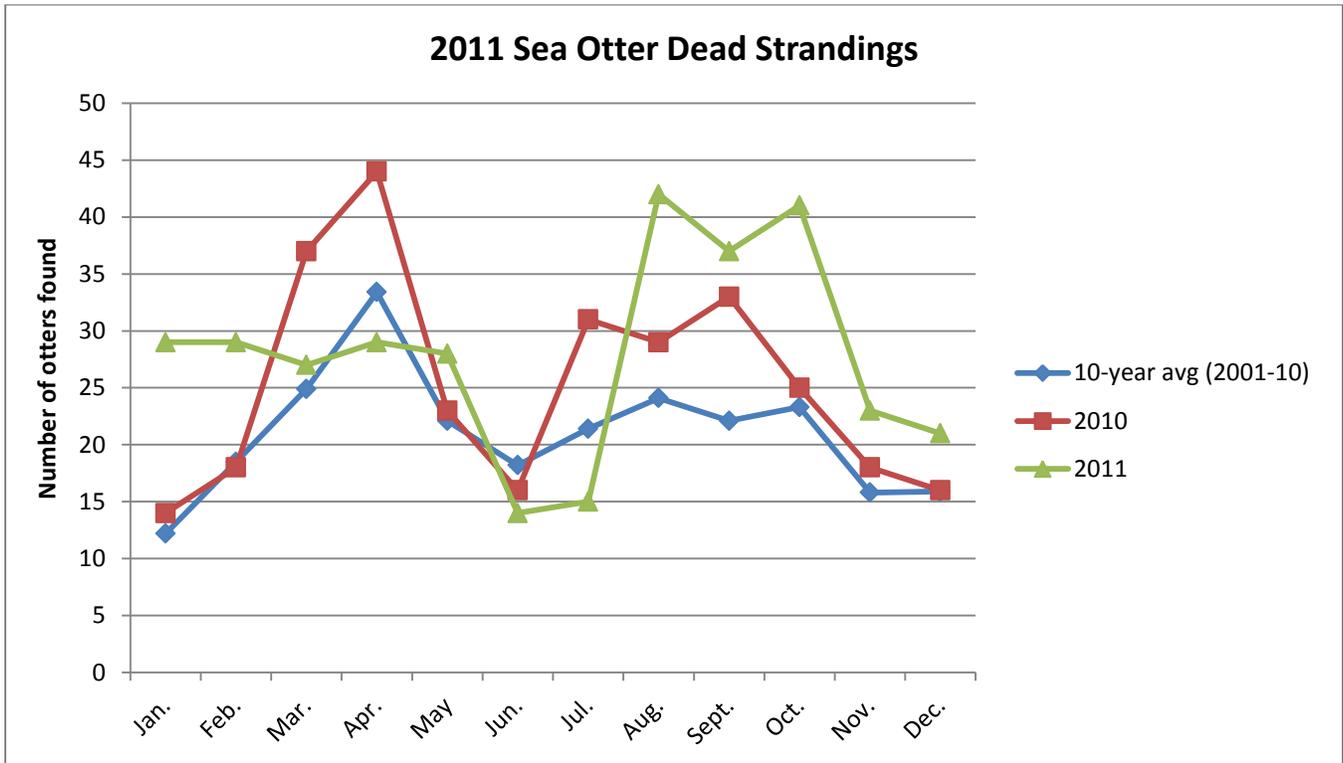


Figure 6: Monthly otter strandings for 2010 and 2011 compared to 10-year average

Mortality by Age Class

The Otter Project looks at the distribution of age and sex of otters stranded dead on the beach by averaging previous years (1990-2010) and comparing the current figures against that average (Figures 7, 8). In a healthy population, we would expect to see high levels of mortality for two key age groups—the very young and the very old. Mortality in aged adults should be the highest. Unfortunately, this rarely holds true for the southern sea otter population and this year the trend of high mortality in reproductive adults continues. The final count was 82 pup/immature otters, 43 sub-adults, 169 adults, 35 aged adults, and 6 unknowns.

In 2011, the number of pup and immature strandings decreased by 11% but there was an increase in mortality of adults by 8%, as compared to 2010. The USGS noted that “these differences in age and sex composition between these two years are well within the range of variability seen in most years” (USGS WERC, 2012). Mortality of all age classes is below the 10 year average except prime aged adults in which the trend continues to be higher.

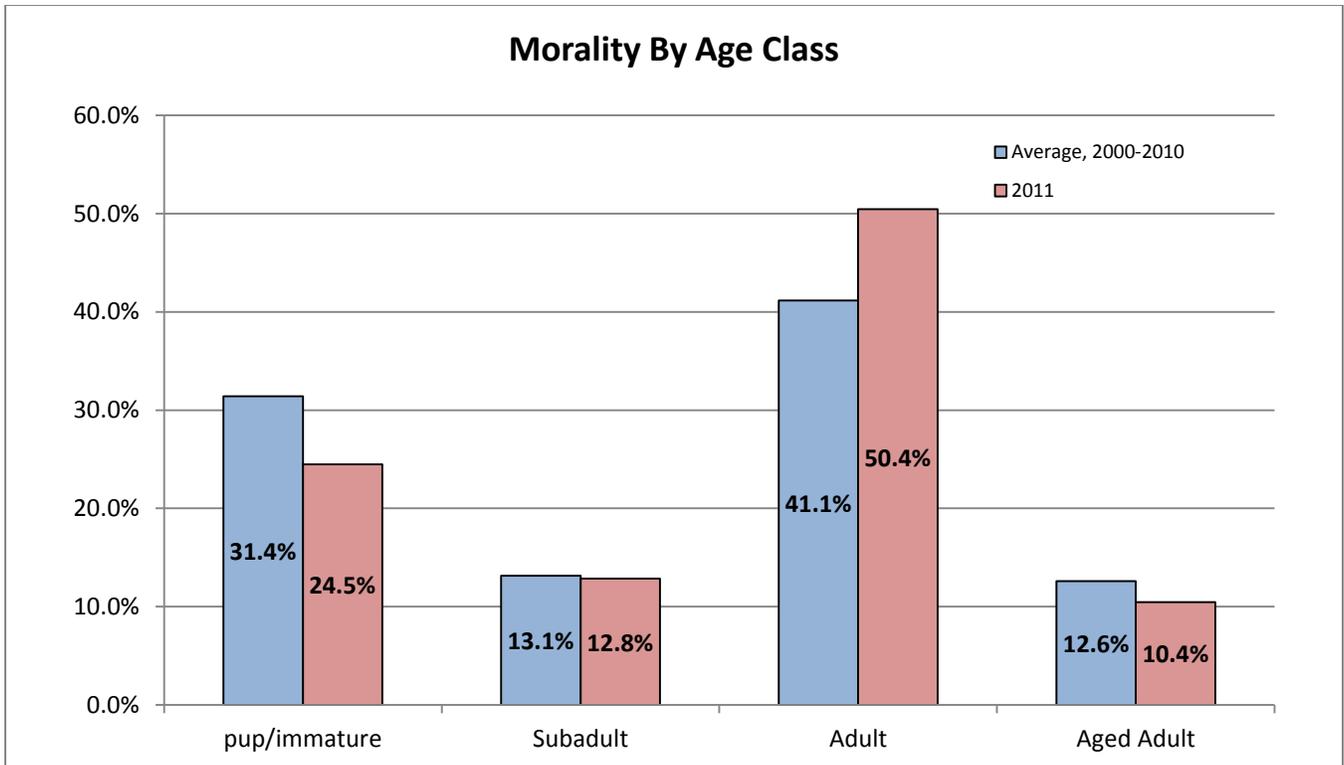


Figure 7: Percentage of Mortality by Age classification

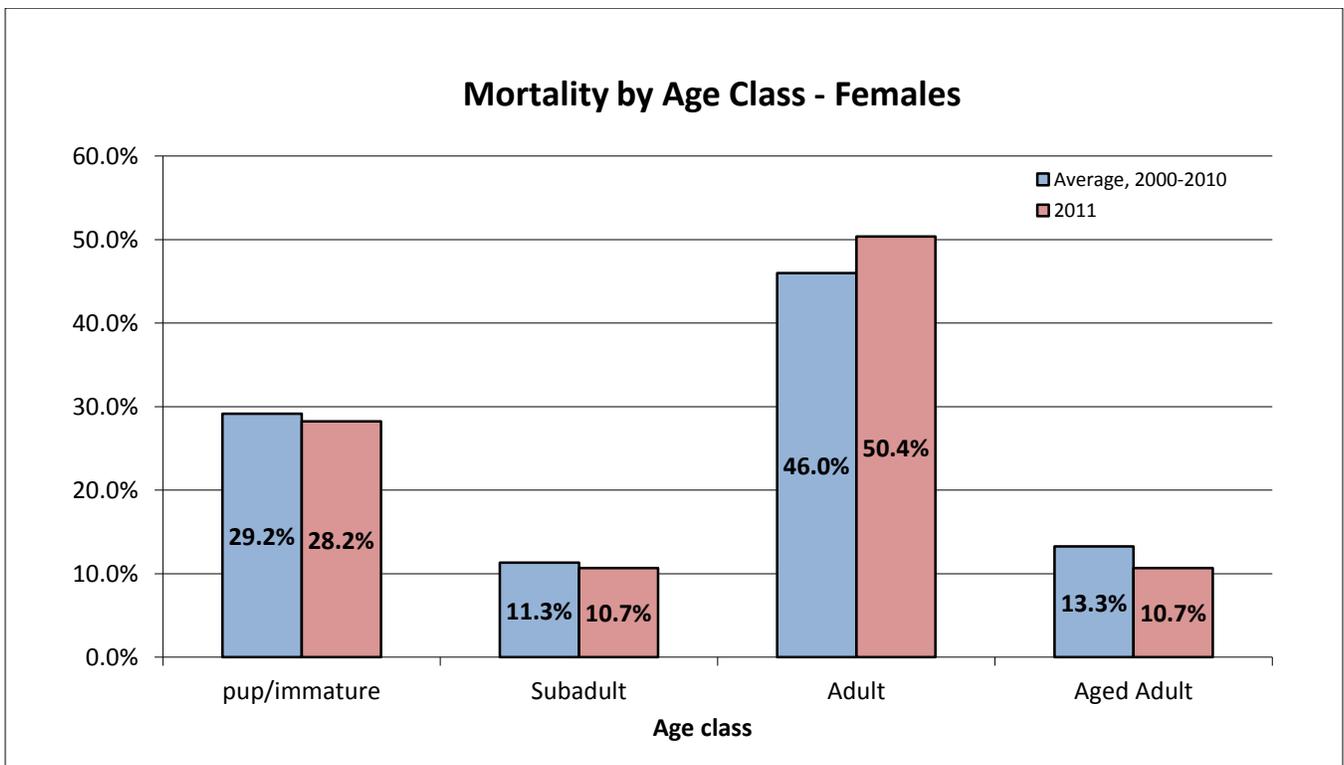


Figure 8: Percentage of Female Mortality by Age classification

Researchers believe that female otters are demographically the most important. Studies suggest the persistent high mortality of reproductive age female otters is a problematic trend with negative implications for recovery (Tinker, et. al., 2006). This year 131 females were counted out of 335 total stranded otters. There were 66 prime aged adult females, 37 pup/immature otters, 14 sub-adults, and 14 aged adults (USGS WERC, 2012). The mortality trend has typically shown higher levels amongst male sea otters for unknown reasons. From 2000 – 2010, males made up 49% of dead otters recovered, females were 45% and for 6% the sex was undetermined. This trend reversed from 2008 to 2010 when strandings consisted of slightly more females than males. This year the recent trend of high female mortality switched back 57% of dead otters recovered were males, 39% were females and in 4% the sex was undetermined (Figure 9).

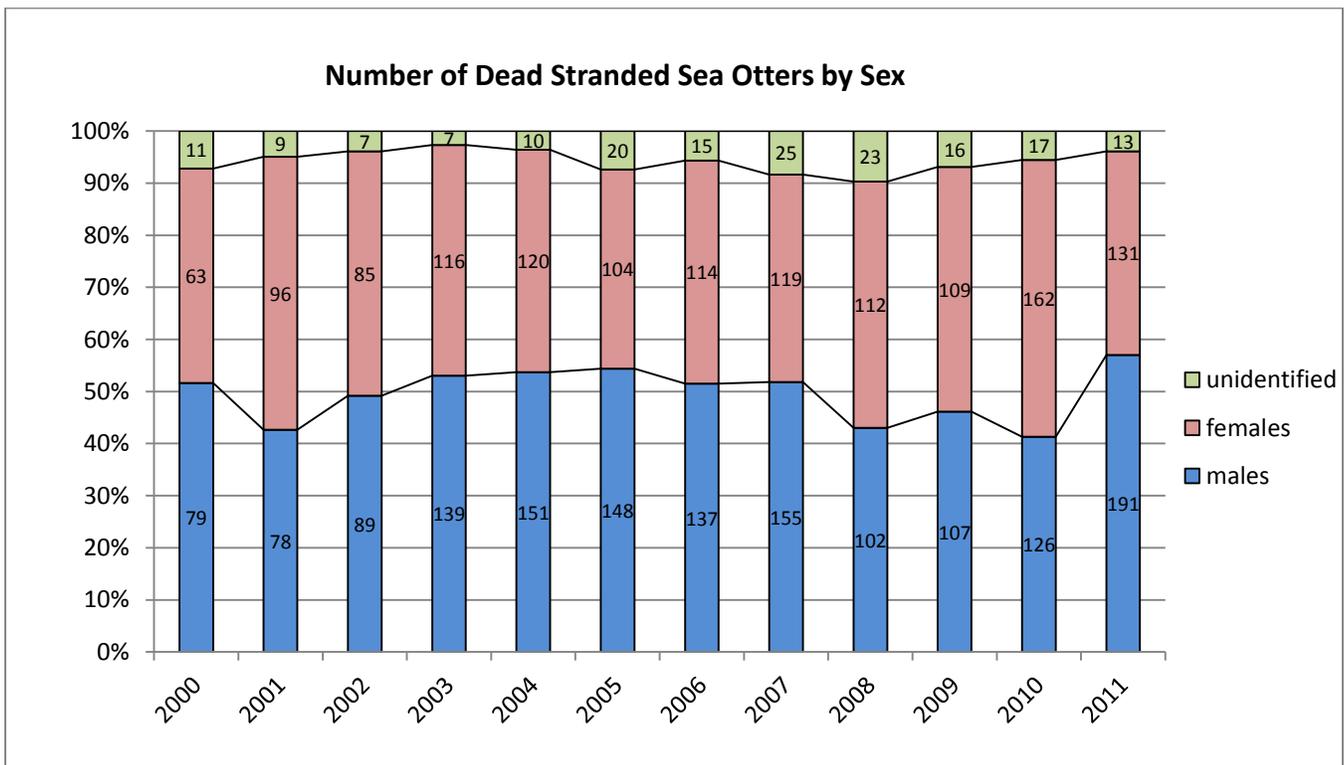


Figure 9: Percentage of Dead Stranded Sea Otters able to be identified by sex.

Our Interpretation: What The Otter Project thinks is happening



Based on the above analysis, the southern sea otter population has overcome two years of record high mortality and returned to population levels seen just a few years ago. Can this year's increase tell us where the population is headed? Not exactly but The Otter Project believes that it does tell us the population is doing better than we might have

thought given the recent spike in mortality we have seen. If you look at the long term trend of the sea otter population, you see consistent and steady growth of the population with periodic years of declines and increases. It may not be the expected growth rate that we would like to see but it is still positive growth overall. As for this year's results, for us to make any prediction as to where the population is headed based on one year, especially after having no survey data last year, would be inappropriate. What we can say is that the population data this year reversed the trajectory of the previous year's decline and this is definitely good news.

Consistently high levels of mortality in reproductive age adults and another record high count of otter strandings is discouraging but the decrease in strandings of pups and females is good news. If mortality of females decreases and pups continue survive to reproductive age and expand their current home range to take advantage of more productive habitat then there is an even greater chance for recovery of the species. The Otter Project is hopeful that further cooperation and coordination with researchers will result in information that will lead to a better understanding and a reversal in the trend of otter mortality. A focus on stronger science based policy decisions will also continue to provide increased protection and will result in a more rapid recovery of the sea otter population.

Why are sea otters dying?

Disease continues to be the leading cause of sea otter death. Thirty to fifty percent of necropsies (fresh recovered carcasses, approximately 20% of all dead otters) have infectious and other diseases as a primary or contributing cause of death including acanthocephalan peritonitis, protozoal encephalitis, bacterial, fungal, parasitism, gastrointestinal, heart, and

viruses. Recent research has shown that different diseases appear to be predominant in different geographical ranges and that the relationship between dietary specialization due to resource limitation and high levels of infection adds a new dimension to what we know about disease in sea otters (Johnson, et al, 2009).

Sea otters are recognized as an important indicator species for the health of nearshore ecosystems providing key insights into how human activity and shifts in ocean patterns are transforming the coastal environment. Researchers and sea otter managers agree that degradation of our coastal ecosystems and the impacts of human urban centers pose a significant threat to sea otters and efforts should be focused on reducing human-caused otter mortality. Addressing water quality and the conveyance of contaminants, toxins and pathogens continues to be one of The Otter Project's top priorities for sea otter recovery requiring resources focused on preventing pollution from a multitude of sources from entering the nearshore environment.

Range distribution

Since 1998, the sea otter habitat range had been from south of Half Moon Bay, near Tunitas Creek, to south of Point Conception at Gaviota State Beach, but unofficially as far as Coal Oil Point. The sea otter's range contracted slightly in 2010 but remains unchanged for this year. In 2010, the northern boundary moved from about Tunitas Creek to a point 2 km southeast of Pigeon Pt., and the southern boundary moved from approximately Coal Oil Point to Gaviota State Park (USGS WERC, 2010). Some otters have been sighted off Santa Monica and San Diego this past year. This is not an indication of range expansion. These were most likely male otters known for venturing long distances then returning to the home range. The center of the range has the highest density of sea otters with lower density found at the northern and southern edges of the range. A single otter was counted this year at the northern end of the range and 79 otters, including 10 pups, were counted at southern end of the range south of Point Conception (USGS WERC, 2012). The Otter Project is increasingly concerned about the status of sea otters at the southern end of the range, which includes the no otter zone. This year's results are encouraging and even though otters have been seen south east of Point Conception regularly for years, otters in southern California have fewer protections due to the existence of the no otter zone. Under Section 7 of the Endangered Species Act, each federal agency is required to insure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat. This has led to a variety of problems such as sea otters residing in the no otter zone not being considered in offshore project and local development plans.

What can we do about it?

While researchers are working to identify the predominant causes of sea otter deaths and stagnation of the sea otter population through the Pacific Nearshore Project, The Otter Project is focused on advocating for a healthier coast and ocean along the entire southern sea otter range. The Otter Project/Monterey Coastkeeper is engaged in activities to address the persistent trend of ecosystem degradation along the California coast. The Monterey Coastkeeper program is focused on improving water quality by stopping polluted sewage and runoff from urban and agricultural sources from reaching the ocean. This effort requires cities to maintain and update their sanitary sewer and storm water treatment systems and to update their municipal storm water plans to be more restrictive of pollutants entering the ocean. Irrigated agriculture should improve farm practices by reducing chemical use such as pesticides and herbicides and minimize the transport of these chemicals into the nearshore environment. Another important concern is legacy chemicals, such as butyltins, DDT, and PCBs, which should be cleaned up and transport into the coastal environment also minimized.

In addition to improving the health of the nearshore coastal and ocean environment, The Otter Project is focused on habitat protection and ensuring that sea otters are permitted to return to their natural range off southern California, which is essential to their recovery. Through legal action against the USFWS, the process to remove the No Otter Zone is already underway and USFWS will make a determination to discontinue the zone by December 2012. Providing a regulatory environment that is conducive to this expansion is paramount to recovery of the species and protecting otters off the southern California coast.

Although the focus of sea otter recovery has shifted from being primarily about oil spill prevention, this aspect of protection continues to be important. The U.S. Fish and Wildlife Service stated in the Final Revised Recovery Plan for the Southern Sea Otter that “minimizing oil related activity along the sea otter range should remain a priority for otter conservation” (USFWS, 2003). We must take aggressive action to reduce the possibility of a catastrophic oil spill from offshore oil development or a tanker collision. The sea otter’s current limited habitat range increases the vulnerability of the population to a catastrophic oil spill along the California coast and preventing this from occurring remains a priority for The Otter Project.

The Otter Project/Monterey Coastkeeper is exploring other ways of addressing the persistent trend of ecosystem degradation along the California coast by monitoring Marine Protected Areas through our MPA Watch program, coordinating outreach and training events on oil spill preparedness and response, addressing concerns about unknown fisheries interactions, and considering other policies and methods of habitat protection that could be useful for sea otter recovery in the future.

For more information about sea otters, how you can help or become a member, and what The Otter Project is doing to promote the recovery of the sea otter, please visit www.otterproject.org.

This report was prepared using public agency data and peer reviewed articles. All information is available upon request. Please contact: Brad Hunt @ 831-646-8837 or brad@otterproject.org.

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