THE MAMMALIAN RESOURCES

HISTORICAL ACCOUNT

Under primeval conditions, California was endowed with a varied and bountiful supply of wild game, among them the most precious furbearers in the world. It was the early fur trade more than any other single factor that opened up the West, and the Bay Area in particular, to world trade. The Spanish, French, English, Russians and Americans engaged in the California fur trade before 1825. American ships sailed around the Horn and across the Pacific to China to engage in this trade. Prodigious quantities of the most valuable kinds of furbearers were taken—beaver, river otter, marten, fisher, mink, fox, weasel, harbor and fur seals and sea otter. The Bay Area contributed most valuable kinds of furbearers were taken—beaver, river otter, marten, fisher, mink, fox, weasel, harbor and fur seals and sea otter. The Bay Area contributed most of these species to the industry as well as many of the lesser varieties such as raccoon, badger, skunk, and others. Common mammals of the region are listed in Appendix H-1.

A great deal has been written of the early California fur industry and a considerable amount of research spent on its history. The Bancroft Library, San Francisco, and Scammon’s Marine Mammals of California are particularly excellent sources on the early history of the fur and whaling industries in California.

The Marine Mammals

The Sea Otter. The first trade began as early as 1784 when a Spanish expedition headed by Senor Vicente Vasadre y Vega traded abalone shells, beads, and various metal articles to the Indians for pelts of the sea otter (Enhydra lutris nereis). In 1785 Senor Vega organized and expanded the sea otter trade. The furs obtained were sent to Mexico for tanning and thence to China in exchange for quicksilver which was badly needed in the Mexican mines. Between 1786 and 1790, 9,729 sea otter pelts and an unknown number of seal skins were shipped to Manila, which according to Senor Vega brought $3,120,000 ($321 each).

In 1786 France sent Conte de La Perouse to investigate the fur trade possibilities. Between Alaska and California he obtained about a thousand sea otter pelts which he sold in China for $10,000. In view of the contrast in values cited above it is amusing to note the following comment by La Perouse. “Antecedent to this year an otter’s skin bore no higher value than two hare’s skins; the Spanish never suspected that they would be much sought after; they had never sent them to Europe and Mexico was too hot a climate to suppose there would be any sale for them there.” (The Pacific Science Congress of 1940 proclaimed: “The sea otter is the rarest as well as the most valuable of all the furbearing mammals ever known.”)

Between 1727 and 1742 single sea otter pelts (from the Asiatic Pacific) sold for $80 to $100 in China where it was the royal fur. Between 1775 and 1777 England sold 29,932 pelts to Russia for $90 to $100 each. After that the price declined until the middle 1800’s when the scarcity of the animal again encouraged good prices.

In 1812, Kuskof, a Russian engaged in the sea otter trade founded the “Russian American Company” at Fort Ross, Sonoma County. His party also set up a station on the Farallon Islands.

The following paragraphs from Scofield (1954) reflect the situation during this period:

“The Spanish explorations along the west coast claimed the land for the Crown of Spain but little was done toward occupying the country. Trappers invaded the Central Valley of California, selling their beaver pelts to the English traders at Fort Astoria near the mouth of the Columbia River (1811) and Russians established settlements in California, primarily to gather the furs of ‘sea beavers’ and secondarily to grow grain to feed their nationals in Alaska. Spain, fearing that Alta California might be lost to the Crown, decided to hold the new land by occupying it. Military forts (presidios), civilian towns (pueblos) and church settlements (missions) were established. Trade with foreign ships was prohibited and a little later, under Mexican rule, the killing of sea otter was outlawed. But smuggling flourished, and the hunting of otter and sea lions was carried on by ships of several nations. The most persistent hunting was conducted by the Russians and as early as 1804 they brought about 100 Aleutian Indians to the California coast to hunt otter from skin canoes.

“Sea otter were abundant all along the coast but were especially plentiful around the Channel Islands and the Farallons. The mild climate and abundance of food from the ocean led to a dense population of native Indians along the shore, especially in the Santa Barbara region and on several of the Channel Islands, particularly Santa Catalina and San Nicolas. The peaceful natives of the islands were friendly but the Aleuts played too rough. When not hunting otter they killed as many men as they could find and carried off the native women. They were so efficient that in eight years (1812) the otter of the Channel Islands were becoming scarce and the population of native Indians on the islands had been greatly reduced. Scourges of measles contributed to the wiping out of the natives
but a few survived and those remaining at San Nicolas Island were transported in 1835 to the mainland where they promptly died of measles.

"In this chronicle of killing, the sea otter were the stake. The furs were very valuable and fantastically high prices were paid for them by Chinese Mandarins. These prices attracted the greedy. The otter helped to settle California but they were reduced almost to the point of extinction till a belated state law of 1913 protected the remnant that was left along the San Simeon coast south of Monterey Bay."

Although the Russians are credited with taking large numbers of these animals, the Americans had already siphoned off the cream in the fur bonanza. Several ships out of Boston were engaged in the fur seal and sea otter trade, making regular trips around the Horn to San Francisco and other ports. Bancroft (1884) states that 16 ships were engaged in the fur trade as early as 1801, 15 American and one English. Upwards of 18,000 otter skins were collected for the Chinese market by the American vessels alone. In 1802 "more than 15,000 sea otter skins were collected and carried to China".

Sea otter were particularly abundant about the Farallons and in San Francisco Bay. It is reported that the Russians took 1,200 skins from San Francisco Bay alone in 1811. There is some disagreement on the numbers taken thereafter, but one source states the Russians took 700 to 800 pelts in a single week in 1812. They are reported to have taken 50,000 skins within five years after first settling here and about 5,000 annually thereafter until 1831. Grinnell et al (1937) recorded at least 13,600 skins to them although they point out that valuable furs of other kinds were also taken in considerable quantities. A perhaps exaggerated statement from a manuscript of General Vallejo referring to the abundance of sea otter in the Bay states: "They were so abundant in 1812 that they were killed by boatmen with their oars in passing through the kelp."

Over-hunting imposed a decline on this valuable species which was felt initially about 1820, but even after this they were found in fairly good numbers. In 1830, 30 of a herd of about 100 near Point San Quentin were lassoed by a Senor Amador and three or four Indians. At the entrance to Sonoma Creek a herd existed under the protection of General Vallejo. In 1847, 42 of them were shot by hunters who received $60 each for the pelts in San Francisco. After 1850 sea otters were extremely rare in the Bay Area.

Fisher (1941) has done considerable research on the sea otter trade and is the source of most of the data for Appendix H-2 on prices of sea otter pelts.

**The Fur Seals.** Although the sea otter was by far the most valuable of the Bay’s furbearers, it was but a single item in the overall fur industry. The Pribilof and Guadalupe fur seals were also hunted keenly and their importance heightened as sea otters declined.

Bryant (1915) reported that a Captain Wm. Smith, about 1808, took 130,000 seal skins to China in two years for which he received about $2.50 each. The same source states the Russians took as many as 80,000 a year at the Farallons. The records are not clear as to whether these were Guadalupe or Pribilof seals but both were probably taken up to 1833.

The Pribilof fur seal (*Callorhinus ursinus cynocephalus*) is a migratory animal which circumnavigates the North Pacific Ocean. It annually appears off the California coast between December and April but rarely comes ashore. They are usually observed off the Farallon Islands as they move northward.

The Guadalupe fur seal (*Arctocephalus townsendi*) is primarily a southern species which formerly inhabited and bred on the Farallon Islands. Records indicate that 73,402 were killed between 1810 and 1812 by the Russians. From 1812 to 1824, 1,200 to 1,500 were taken annually. After that only 200 to 300 per year were caught although, over 1,000 were reported taken in 1824. The catch continued to diminish until only 54 were secured in 1833. According to Starks (1922) Guadalupe fur seals bred on the Farallons until 1833.

The small harbor seal was also hunted until about 1890. This species was common about the bays, with "extensive" rookeries at the southern end of San Francisco Bay near Alviso, according to Bonnot (1928) They also were eventually depleted by fur hunters.

**The Sea Lions.** There are two species of sea lions common to the California Coast and which are represented in the Bay Area fauna. These are the Stellar’s sea lion (*Eumetopias jubata*) and the California sea lion (*Zalophus californicus*).

Bonnot (op. cit.) states: "Before 1860 sea lions were extremely numerous along the California Coast. During the sixties they were commercially valuable and their numbers therefor steadily decreased until the late seventies, when the products gained from them (oil and hides) were bringing such a low price that it was unprofitable to hunt them." Quoting Scammon (1874), Bonnot continues, "A few years ago great numbers of sea lions were taken along the coast of upper and lower California, and thousands of barrels of oil were obtained. The number of seals slain exclusively for their oil would appear fabulous when we realize that it requires, on the average, throughout the season, the blubber of three or four sea lions to produce a barrel of oil. Their thick, coarse-grained skins were not considered worth preparing for market in a country where manual labor was so highly valued. At the present time, however, they are valuable for glue stock, and the seal hunter now realizes more comparative profit from the hides than from the oil."

The Chinese killed them frequently for the "trimmings" (testes and penis). In the past sea lions evinced considerable comment from commercial fishermen who claim they consume large numbers of salmon. Although this contro-
versy is still going on, it is doubtful that they cause near the destruction with which they are charged.

Currently, their principle value probably is their attraction to tourists. The animals congregate in large numbers around the Seal Rocks off the Golden Gate where they are observed by thousands of spectators annually.

**The Cetaceans.** The whales, porpoises and dolphins might be mentioned since they have been important mammals in the past. Historically, most of the Pacific species were found along the California Coast, and several species were very common, seasonally, off the Bay counties. As a matter of fact, the Bay porpoise was common in San Francisco Bay. There is a reported instance of a killer whale being taken as far inland as Benicia. All are scarce at the present time, but may be observed occasionally in the ocean just off the coast of the Bay counties. Whales were the basis of an important industry which existed for many years in California (see Commercial Fisheries).

**The Inland Fur Bearers**

About the time the coastal and oceanic fur industry began to decline, the Hudson Bay Company began to exploit California's inland fur resources. Between 1826 and 1845 the British sent parties out annually from Fort Astoria and Fort Vancouver into the Sacramento and the San Joaquin valleys as far south as French Camp on the San Joaquin River.

These trapping expeditions must have been extremely profitable to justify the long overland trip each year. It appears that the golden beaver was one of the most valued of the animals taken, and apparently was found in great abundance. McKay of Hudson Bay is reported to have taken 4,000 beaver skins on the shores of San Francisco Bay. At the time, these pelts sold for $2.50 a pound or about $4 each.

Thomas Farnham in 1840 stated beaver were very numerous near the mouths of the Sacramento and San Joaquin rivers and on the hundreds of small "rush-covered" islands. Of them he said: "There is probably no spot of equal extent in the whole continent of America which contains so many of these much-sought animals." This area incidentally, is probably where McKay was so successful, rather than the Bay itself.

Little can be said of other varieties of furbearers and game animals during the early years because they have not been individually or specifically treated in the early literature to any extent. Many of them, however, are given frequent mention in the many treatises on the California fur trade. After 1850 they undoubtedly comprised the bulk of the trade.

**Economic Value.** It is difficult to provide an accurate estimate of the economic value of the fur trade prior to 1922, but between 1800 and 1850 it apparently amounted to two or three million dollars annually. From 1800 to 1825 the sea otter and fur seals supported the trade and the available evidence indicates that an estimate of 20 to 30 thousand sea otter annually is probably not too high. The price per pelt during this period averaged from $30 to $50, making the total value at the primary level $750,000 to $1,-250,000 per year for sea otter alone.

After 1825 the number of sea otter were fewer but the trapping of inland furbearers took up the slack and in all probability the total value exceeded that of the 1800 to 1825 era. Fur trapping continued as a major occupation in California until after 1900, and as a matter of fact, as late as 1928 amounted to almost $470,000 at the primary level (raw furs).

Although much more information exists in the literature on the early fur industry of California and the Northwest generally, the preceding account indicates the general magnitude and importance of the fur resources during those early years. California, and San Francisco specifically, was the center of this industry. Originally, the Bay Area was a major source of the animals themselves.

Even as the seal and sea otter resources diminished locally, San Francisco continued as a center of trade and principal port for fur expeditions to the Aleutian and Kurile Islands of the north and west Pacific. Eventually, even those areas became seriously depleted and about 1903 international agreements between the United States, Canada, Russia, and Japan were drawn up to protect these valuable fur resources.

**Big Game Animals**

Other important mammals prominent in the early history of the Bay Area include the Roosevelt elk, tule elk, black-tailed deer, pronghorn antelope, and the grizzly and black bears. These are considered big game animals. The puma or mountain lion is also in this class but generally has been relegated to the category of predator.

**Roosevelt and Tule Elk.** Elk are large members of the deer family, the males of which possess ponderous antlers. Historically, Roosevelt elk (Cervus canadensis roosevelti) extended along the Coast Range from the Marin Peninsula northward. These magnificent animals were once plentiful in Marin and Sonoma counties. An article describing an elk hunt in Marin County in 1846, by Joseph Warren Revere, "A Tour of Duty in California", was published in New York in 1849. The hunt took place on Point Reyes where a herd of not less than 400 animals were reported observed. The encroachment of civilization and hunting drove them from the Bay Area about 1870.

Tule elk (Cervus canadensis nannodes) primarily inhabitants of the Central Valley, were only found in those Bay Area Counties bordering the Valley and Delta. Elk provided a source of excellent food as well as fine hides. They were hunted heavily and greatly reduced by 1850 in the Bay Area.
Grizzly Bears. The grizzly bears, of which two species (*Ursus californicus* and *Ursus mendocinensis*) were represented in the Bay Area, were distributed throughout California, except along the crest and eastern slope of the Sierra Nevada. After the American occupation about 1850, the livestock industry which had been given a good start by the Spanish and Mexicans, became very prominent and ranchers slaughtered the grizzly at every opportunity. They were extremely scarce by 1900. The last one reported in the State was shot August, 1922 at Horse Corral Meadows, Tulare County. Grizzly Peak, east of Berkeley, is a reminder of this animal's presence there.

Black or cinnamon bears (*Euarctos americanus*) are still found within the confines of the area covered by this report but they are very scarce.

Black-Tailed Deer. Black-tailed deer (*Odocoileus hemionus columbianus*) were an important source of food and clothing to the Indians and early settlers. The hides were also used for a number of domestic purposes. Concerning their early presence (1768-1800) Longhurst, et al, (1952) state: “Deer are mentioned by Juan Batiste de Anza as being common in the San Francisco Bay Area . . . .”

Pronghorn Antelope. The American or pronghorn antelope (*Antilocapra americana*) was a member of the native fauna of the Bay Area, inhabiting the valleys and eastern portions of the coastal range. Grinnell (1933) indicates their original range included the open hills of Contra Costa County. Presumably, similar habitat in Alameda, Santa Clara, Napa, Sonoma and Solano counties also were antelope range. Information on the early status of this animal is lacking, although it is known that there was a flourishing trade in Stockton and San Francisco for their meat and hides.

Mountain Lion. Mountain lions (*Felis concolor californica*) were apparently quite common throughout the State, particularly in the brushy and lightly forested areas inhabited by their principal prey, the deer. In the Bay counties they were most common in Santa Clara, Alameda, and Sonoma counties, just as they are today. This animal has always been severely hunted because of its depredations on deer and livestock. In recent years game managers and biologists have concluded that the widespread killing of these animals may not be commensurate with sound game management principles.

A legislative act of 1906 provided for the payment of a bounty on them and the practice has continued to the present even though actual depredations on livestock are rare.

The livestock industry has had a profound affect on the entire native fauna. The wild animals were hunted to eliminate depredation, trapped for their fur, used as food, or lost grazing range to the large herds of domestic stock. The latter is illustrated by a quotation from Longhurst, et al, (op. cit.). “The Spanish settlers although few in number and restricted in the area they occupied, nevertheless brought about many changes in the land, particularly as a result of their introduction of domestic cattle, sheep, horses and goats. The domestic herds were large, and much spread out. In 1825 it is estimated that there were 1,003,970 head of sheep at the Spanish missions, and about as many more kept by ranchers outside the missions (Miller, 1942)”.

1870 TO 1915

By 1870 the local fur seal and sea otter resources were insignificant, and although the Bay remained the center of the fur trade, the animals were hunted elsewhere. The grizzly bear, Roosevelt elk, and tule elk were extremely rare by this time due to excessive hunting and the ever increasing encroachment of civilization. The smaller furbears were trapped heavily and the local game resources were exploited for both home and market.

Lumbering, agriculture and livestock practices were responsible for game habitat destruction and the eventual diminution of some species, while over-hunting and the gradual settling of the Bay Area were primary causes of reductions in other species.

Between 1870 and 1915, the public and the newly created Fish and Game Commission, aware of the loss of these resources, initiated a number of legislative movements to protect the wildlife resources of the State. More of these were directed at the fauna of the Bay Area than any other area of the State. Restrictive and protective legislation was enacted to benefit sea otter, fur seals, waterfowl, shore birds, deer, elk and other species.

For the most part, however, legislation was too late, or there was a direct conflict between man and the animal resources which eventually resulted in the loss of the latter. Man's activities often are not compatible with the wild creatures he wishes to preserve. Such was the case of the grizzly bear, antelope and elk. The sea otter was simply over-hunted, almost to the point of extinction, and their recovery was inhibited by poaching, a relatively poor reproductive rate, high mortality of the young, and perhaps also the loss of habitat areas like San Francisco Bay, which appears to have been particularly favorable.

1915 TO PRESENT

Systematic quantitative game records commenced when the Fish and Game Commission licensed trappers and polled them as to the kind and quantity of furbears taken each season. The first year for which this information was available was 1922. It has been continued each year since. In 1927 accurate deer kill figures became available when the “deer tag” system was inaugurated. Deer hunters have since been required to purchase tags which successful hunters
must attach to the deer in the field and return to the Department of Fish and Game.

Since 1948 the department has conducted annual postal surveys to obtain hunting statistics.

**The Trapping Industry**

Trapping is now of minor economic importance, although approximately $100,000 worth of furs are taken annually (31 year average of $122,971) of which the Bay Area contributes about seven percent (see Appendix H-4). The number of licensed trappers has declined from over 6,000 in the 1928-29 season to about 600 annually at the present time. The number operating in the Bay Area is somewhat less than ten percent of the state-wide total. The number of trapping licenses issued in California each year since 1917 is listed in Appendix I-3.

The fur market is now influenced strongly by fashion, and economic conditions. Furs which formerly were used to provide warm clothing are no longer required. As a result, only the dark, short haired pelts are currently in sufficient demand to interest trappers.

According to George Seymour, a Department of Fish and Game specialist in this field, the present abundance of a number of the more desirable furbearing species probably compares favorably with that of 50 to 100 years ago. However, because of the lack of demand and price for these furs the animals are not trapped.

Of the twenty or more species of furbearers trapped in California in recent years, the Bay Area consistently contributes about fourteen. Some of these, like the coyote, are not trapped for their fur, but rather as predators.
The number of furbearers taken annually in California since the 1921-22 season is shown in Appendix H-3. The Bay Area catch is also shown; however, the figures shown prior to the 1937-38 season are estimates based on the percentage of each species contributed by the Bay Area to the state-wide total between 1938 and 1956. It has only been possible to obtain separate data on the Bay Area catch since 1938. About 4,000 or 5.6 percent of the total annual number of pelts came from the Bay Area between 1938 and 1956.

Four of the 14 species under discussion are strictly aquatic animals and the raccoon is generally associated with aquatic environments. The Bay Area, as might be expected, accounts for a proportionally greater percentage of the State total of these aquatic species. This group includes the river otter, mink, beaver, muskrat, and raccoon. Otter, mink and muskrat are among the most valuable of the wild furbearers.

The 14 species and the mean percentage contribution of the Bay Area to the total State catch of each is listed in Table 53. The annual value of the fur catch for 1922-1956 is given in Appendix H-4 and illustrated in Figure 49.

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1 Based on data for the years 1938-1956.

The Marine Mammals

Sea Otters. Sea otters, which were on the verge of extinction about the turn of the century, are now completely protected, and are making a slow but definite recovery. It is interesting to note the following comment by Grinnell et al. (1937) concerning their future. "All these facts together with the records showing that within the last century and a half there have been at least two periods of profitable hunting of this animal, give basis for the belief that the sea otter might again become a rather important part of the coastal fauna of California. The conditions for subsistence of the species probably remain about as favorable as ever except for the presence of the human hunter, and his activities could be regulated."

An estimate by D. D. McLean, of the Game Management Branch of the Department of Fish and Game, places the current number along the California coast at about 1,000 individuals. They are located off Monterey and San Luis Obispo counties. Stragglers may appear off the Bay counties but this is unusual. Their future appearance in the Bay Area can only be speculated upon, but it is logical to assume that any large increase in the population would move them northward to the Bay Area, provided of course, suitable habitat and conditions prevail.

Sea otters are apparently limited to the offshore kelp beds and rocky shorelines. The reproductive rate is low, one pup per female every other year. The young are born in the kelp beds. The food of sea otters consists of long-spined urchins, sea mussels, abalones, kelp crabs and occasional fish.

As an indication of the value of their pelts under present market conditions, 100 pelts from Alaska were sold in April of 1957 by the federal government for an average of about $100 each. These were a miscellaneous collection of pelts from wounded or dead animals, as well as some that were confiscated from poachers and of which few were considered as prime pelts.

Fur Seals. Pribilof fur seals are strictly migratory animals which each season move northward some distance off the California Coast. They may be observed off the Farallon Islands, but rarely come ashore either there or on the mainland. Under the protection of international agreements the number of these animals has increased to the point that more than 50,000 pelts were permitted to be taken off the Pribilof Islands in 1956. The U.S. Government at its semi-annual sales sold 27,819 skins in April 1957 for $2,547,182, for an average of $91.56 per skin. Sales in October 1956 brought $2,714,852 for 26,890 skins or $100.96 per skin. Since the international convention of 1911 which set up the machinery to protect them, more than a million seals have been harvested. The population, meanwhile, has increased steadily. In 1941 it was estimated at 1,600,000 animals, just 400,000 below the estimated population of 1860.

Guadalupe fur seals are no longer found in the Bay Area, but they are increasing slowly, under complete protection, off Southern California and Mexico. Neither of the above species are likely to become an important part of the Bay Area fauna.

Sea Lions. Both the California and Steller's sea lions are quite numerous along the shores outside the Golden Gate, and are commonly observed within the Bay itself. Their continued presence seems assured. They are given adequate protection by law, and there is no reason to believe that other factors, including pollution, will affect their abundance to any great extent.

Harbor Seals. Harbor seals, unlike the preceding three species, are common residents of the Bay and have been observed by the writer as far inland as Grizzly Bay. A rookery still exists in the south end of San Francisco Bay. These curious little animals are a prominent part of the local fauna and should be preserved. Legal protection from hunters, however,
not alone sufficient to preserve them. Pollution could be a serious threat to their existence by destroying the shellfish and bottom fauna upon which they feed, or in the case of oil pollution causing direct physical injury.

Their future in the Bay is therefore dependent to some extent upon the quality of the Bay water. Without the threat of pollution there is every reason to believe they will become even more abundant.

Rookeries and Hauling Grounds in the Bay Area. The locally important areas for seals and sea lions are listed below. Bonnot (1928) is the source of most of the information.

**Point Reyes**: Formerly, an extensive rookery was located here, but after the herd was exterminated in 1899-1900 the area has been used primarily as a fishing ground for Stellar sea lions.

**Tomales Bay**: This bay is the hauling grounds for a small resident herd of harbor seals which in 1927 and 1928 numbered forty.

**Farallon Islands**: At one time these islands supported the largest rookery along the coast. The valuable Guadalupe fur seal occurred here in vast numbers. Both Stellar and California sea lions currently have rookeries here.

**Seal Rocks**: These are the rocks just off Golden Gate Park, San Francisco. They are primarily hauling grounds for Stellar sea lions.

**The Sisters**: This is a group of rocks located in San Francisco Bay near Point San Pedro. They are used as hauling grounds by harbor seals.

**Calaveras Point**: Harbor seals use the area only as a hauling ground according to Bonnot. This area formerly (1890) was an extensive rookery and according to Mr. McLean of the Department of Fish and Game, a number of pups are still born in that vicinity each year. It is located in the south end of San Francisco Bay near Mowry Slough.

**Purissima**: This area just south of Half Moon Bay, San Mateo County, has supported a moderate number of Stellar sea lions (150 in 1927). According to the U. S. Commissioner of Fisheries report of 1902, 3,583 were killed in the last six months of 1901 at this location. It is a hauling ground.

**Ano Nuevo**: This island just south of Pigeon Point was the largest sea lion rookery on the California Coast in 1929. It is used chiefly by Stellar sea lions.

The Inland Furbearers

River otter and mink populations have probably remained at a near constant level since the early 1900's. Raccoon and the non-native muskrat on the other hand have unquestionably undergone significant increases. The golden beaver, despite intermittent closed seasons and other protective measures, seems to have suffered a steady decline.

**Mink and River Otter**. According to Grinnell et al. (1937), the center of abundance of the California river otter (*Lutra canadensis brevipilosis*) appears always to have been along the lower Sacramento River, particularly in the extensive tule marshes and in the region about Suisun Bay. Similarly, mink (*Mustela vison*) are most abundant on the marshy lands along the lower courses of the Sacramento and San Joaquin rivers and the upper parts of San Francisco Bay.

These are the two most valuable individual fur bearers currently taken in California. The market for their fur is quite steady, especially for mink, which generally ranks second behind muskrat in terms of the total value of furs taken. Individual mink pelts, at present market prices, vary from $10 to $25, with those in the Bay Area closer to the former figure. Otter pelts may bring as much as $20 or more but generally $15.

Neither can be considered as being particularly abundant in the Bay Area, but populations are holding their own, while providing upwards of 20 percent of the state's supply of pelts.

Reclamation is perhaps the most serious threat to these two species. Their future abundance will probably be influenced less by pollution than reclamation. Although they are primarily aquatic mammals it probably would require severe pollution conditions to affect the population adversely. Destruction of their food supply by pollution, however, could reduce them.

Grinnell et al. (*op. cit.*) states: "The river otter in California can never be expected to figure importantly as a fur animal. Fresh water habitat of a sort to provide proper food and shelter for otters is becoming more and more restricted".

**Muskrat**. The muskrat (*Ondatra zibethica*), in the last twenty years has risen to the status of the most important fur bearer in the state, in terms of number of animals and total value of the raw furs. The animal which now comprises the bulk of the market furs is an exotic species. Originally introduced into the northeastern counties, they have moved down the Sacramento and into the San Joaquin system since 1943. It has only been since 1950 that they have been trapped in profitable numbers in the Bay Area counties. The catch has increased from less than 100 in 1950 to between 6,000 and 9,000 annually at the present time. This species can be expected to increase significantly in the Bay Area in the future and in all probability will become the most important fur bearer in the region. Many freshwater streams and sloughs in which it is not now found are likely to provide habitat for them. As in the case of the previous two species, reclamation is the most serious threat to their existence. Unlike the two previous species, muskrats are principally vegetarians and their food supply would not be similarly affected by pollution.
Beaver. The golden beaver (*Castor canadensis subauratus*), it was pointed out earlier, was apparently very abundant in the freshwater areas of the Sacramento and San Joaquin Delta. Evidence exists to show that they were also found along the Napa River, and in Coyote and Sonoma creeks in small numbers at least. The beaver is adapted to freshwater and its presence about the bays is inhibited by saline conditions. Some of the greatest local concentrations of beaver in the state are found within the Bay counties. The delta area of Contra Costa County and the Cache Slough area of Solano County are particularly favorable locations. These areas however, are outside the geographic area encompassed by this report and the absence of suitable habitat and other conditions precludes any serious consideration regarding the future of beaver in the Bay Area.

Due to its habit of burrowing in banks and levees, beaver were classified as an undesirable rodent within prescribed areas of the Sacramento and San Joaquin valleys in 1950. There is no closed season on them within that area, which aids in limiting the abundance and extension of the species. Alameda, Contra Costa and Solano counties are included in this area.

Raccoon. One of the most consistently important furbearers of the Bay Area has been the raccoon (*Procyon lotor*). This native has always been prominent in the fur trade. Individual pelts are not especially valuable, but they are taken in sufficient quantity each year to remain among the top five furbearers in total value. The price per pelt was about five dollars in the 1920's. During the 1927-28 season raccoon pelts brought $105,000. This was more than any other kind, and comprised about one-fourth of the total value of all furs.

Raccoons are abundant in the area surrounding the Bay and Delta, and when the demand for this fur exists they are trapped heavily in Napa, San Mateo, Santa Clara, Alameda, Contra Costa, Sonoma, and Solano counties.

According to Grinnell et al. (*op. cit.*), “It is safe to consider as the chief requirement for the presence of coons in a locality, ready access to water, whether in running streams, ponds, or marshes. Even though the animal can and does go far from water it seems to be so adjusted that it must make regular and frequent visits to the stream side or marsh.”

Populations are not likely to be affected by water quality except as it might affect their food supply. Their diet usually consists of a high percentage of aquatic organisms; frogs, crayfish, aquatic invertebrates and quite often fish. They will, however, turn to rodents, insects, plants, and berries.

The raccoon is considered by some people to be a choice article of food, and is captured specifically for this purpose.

Prospects for this species are encouraging. There are extensive areas of favorable raccoon habitat in the Bay Area and as long as a water supply is available they can be expected to remain plentiful.

The Lesser Furbearers. Some of the lesser varieties of furbearers collectively constitute an important segment of the Bay Area fur resources. Generally speaking, their individual pelts are not as valuable as the preceding species and there is not a steady demand for them. Skunk are something of an exception in that pelts are consistently worth $0.50 to $1.00, and are obtained in good quantity. There are two species of skunk. The striped skunk (*Mephitis mephitis*), is the most important, although the spotted skunk or civet (*Spilogale gracilis*), is also taken in fair numbers. In terms of value, skunks have been the most important furbearers of a group which includes foxes, badgers, ringtail cats, opossums, weasels, coyotes and wildcats. Several of these species provide food and/or recreation in the form of hunting or trapping.

These furbearers are not primarily aquatic, nor do they depend upon water other than an adequate supply for drinking purposes. Their contribution to the Bay Area fur production can be obtained from Appendix H-3.

A few species are increasing in numbers as a result of present land use practices. Generally speaking, however, this group has probably reached a rather stationary level under prevailing conditions. Some, like the coyote, fox, and skunk are considered predators and excess animals are cropped by ranchers and trappers. Their numbers are unlikely to change unless particular factors such as demand for their fur, radically changed land use practices, or disease affects them.

Small Game Animals

The Bay counties provide a varied assortment of small game animals which furnish a considerable amount of hunting for local residents. This category includes several species of squirrels, rabbits, and varmints. Some of the minor furbearers are also in this category.

Jack rabbits (*Lepus californica*) provide the greatest amount of hunting in this group. In 1956 the bag for the Bay counties totaled 75,800 jackrabbits or about 8.3 percent of the state-wide total. Solano County was the largest single producer. About 3.1 percent or 11,000 brush rabbits (* Sylvilagus bachmani *) and cottontail rabbits (* Sylvilagus auduboni *) combined were taken in the Bay Area against a total of 356,000 for the State. As a group, rabbits are the fourth most important game animal in California.

Only 3,200 tree squirrels were taken for 7.7 percent of the state-wide total of 41,700. Those represented in the Bay fauna are the western gray squirrel (*Sciurus griseus*), eastern gray squirrel (*Sciurus carolinensis*) and the fox squirrel (*Sciurus niger*).
Precluding disease or some other catastrophic event they should continue in good abundance. The western gray squirrel is just recovering from an outbreak of scabies which occurred in the early part of this century.

**Big Game Animals**

The black-tailed deer, the black or cinnamon bear and the mountain lion are the only big game animals remaining in the Bay Counties. Bears are extremely scarce and are known to be present only in Sonoma and Napa counties although evidence indicates they may also be present in Marin and Solano Counties. Department game kill records were not designed to obtain the county of kill for bears until 1957; since that time only two have been reported and these were taken in Sonoma County.

Black-tailed deer are found in moderate abundance at the present time in most Bay counties. The number taken by hunters from 1927 to 1952 has averaged about 8.6 percent of the annual state-wide total. The kill by county for 1953-56 is given in Table 54. Deer kill records for the state and the Bay counties for the 34-year period 1927-1960 are compared in Appendix H-5. The recent status of deer and deer habitat in the Bay Area is summarized in Tables 55 and 56.

It is an established fact that deer thrive through partial removal of forests when replaced by favorable forms of agriculture, and it is entirely possible that deer are more numerous now than under primeval conditions as the following paragraphs from Longhurst, et al. (op. cit.) indicate. "Ralph S. Roy, who spent all of his 68 years on a 2,000 acre dairy ranch near Lagunitas, Marin County, was 14 years old (1894) when he saw his first deer and it was several years before he
saw another. As he grew to maturity, however, deer became increasingly common and by 1920 several legal bucks were killed each year on the ranch. In 1947 members of the family and their friends killed 30 bucks on the same area, and Mr. Roy was in our office to report acute deer damage to his crops and orchards."

The mountain lion or puma is rarely encountered except by experienced hunters and trappers. The statewide kill ranges from 150 to 250 animals per year. In the Bay counties they are mostly found in the Mount Hamilton Range of Santa Clara County, from which over 65 percent of this area's total has been taken. The Department of Fish and Game has maintained records on mountain lion bounties since 1906. Since that time 284 lions have been taken from the nine Bay counties, for which bounties were paid. Santa Clara County alone produced 186. Alameda and Sonoma are the only other Bay Area counties which consistently produce lions but these have contributed only 49 and 36, respectively, for an annual average of about one each. These figures are

**TABLE 54**

<table>
<thead>
<tr>
<th>County</th>
<th>1927-1952</th>
<th>1953</th>
<th>1954</th>
<th>1955</th>
<th>1956</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sonoma</td>
<td>932</td>
<td>1,679</td>
<td>1,979</td>
<td>1,586</td>
<td>1,303</td>
</tr>
<tr>
<td>Napa</td>
<td>706</td>
<td>1,161</td>
<td>1,386</td>
<td>1,329</td>
<td>1,144</td>
</tr>
<tr>
<td>Santa Clara</td>
<td>629</td>
<td>1,172</td>
<td>1,695</td>
<td>1,434</td>
<td>1,239</td>
</tr>
<tr>
<td>Marin</td>
<td>499</td>
<td>885</td>
<td>1,048</td>
<td>901</td>
<td>707</td>
</tr>
<tr>
<td>Alameda</td>
<td>360</td>
<td>763</td>
<td>911</td>
<td>639</td>
<td>538</td>
</tr>
<tr>
<td>San Mateo</td>
<td>113</td>
<td>139</td>
<td>140</td>
<td>157</td>
<td>134</td>
</tr>
<tr>
<td>Solano</td>
<td>71</td>
<td>113</td>
<td>139</td>
<td>143</td>
<td>147</td>
</tr>
<tr>
<td>Contra Costa</td>
<td>65</td>
<td>232</td>
<td>311</td>
<td>175</td>
<td>187</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td>3,045</td>
<td>6,144</td>
<td>7,609</td>
<td>6,364</td>
<td>5,399</td>
</tr>
<tr>
<td>State Total</td>
<td>35,330</td>
<td>58,992</td>
<td>75,602</td>
<td>71,126</td>
<td>79,371</td>
</tr>
<tr>
<td>Bay Area bag as percentage of the state total</td>
<td>8.6</td>
<td>10.4</td>
<td>10.1</td>
<td>8.9</td>
<td>7.7</td>
</tr>
</tbody>
</table>

**TABLE 55**

<table>
<thead>
<tr>
<th>Range Condition for Deer</th>
<th>Range Trend</th>
<th>Deer in Relation to Range Capacity</th>
<th>Livestock in Relation to Range Capacity</th>
<th>Deer Population Trend</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Bay</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monticello</td>
<td>F</td>
<td>S</td>
<td>O</td>
<td>S</td>
</tr>
<tr>
<td>Santa Rosa</td>
<td>F</td>
<td>S</td>
<td>C</td>
<td>S</td>
</tr>
<tr>
<td>Petaluma</td>
<td>F</td>
<td>S</td>
<td>C</td>
<td>S</td>
</tr>
<tr>
<td>South Bay</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Santa Cruz</td>
<td>F</td>
<td>S</td>
<td>C-O</td>
<td>C</td>
</tr>
<tr>
<td>Mt. Diablo</td>
<td>P</td>
<td>O</td>
<td>O</td>
<td>Dec.</td>
</tr>
<tr>
<td>Mt. Hamilton</td>
<td>P</td>
<td>D</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TABLE 56**

<table>
<thead>
<tr>
<th>North Bay</th>
<th>South Bay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monticello</td>
<td>Santa Rosa</td>
</tr>
<tr>
<td>1. Summer Deer Range Area (square miles)</td>
<td>1,100</td>
</tr>
<tr>
<td>2. Winter Deer Range Area (square miles)</td>
<td>1,100</td>
</tr>
<tr>
<td>3. Area closed to hunting by public agencies (square miles)</td>
<td></td>
</tr>
<tr>
<td>4. Area: Kill ratio for 1947 (bucks killed per square mile of hunted range)</td>
<td>1.20</td>
</tr>
<tr>
<td>5. Estimated Summer deer density (deer per square mile) (1947-1949)</td>
<td>24</td>
</tr>
<tr>
<td>6. Estimated Winter deer density (deer per square mile) (1947-1949)</td>
<td>24</td>
</tr>
<tr>
<td>7. Estimated total deer numbers (1947-1949)</td>
<td>26,000</td>
</tr>
</tbody>
</table>
presented in more detail in Table 57. The population of these animals has remained rather static in the State since 1931 or so judging from the bounty records. McLean (1954) has placed the total population of the State at close to 600.

Bears and mountain lions are extremely rare and each will probably continue in their present low abundance. Deer on the other hand, have unquestionably increased in numbers since the 1800's. The population is now maintained at a relatively constant level by hunters. When they become so numerous as to cause damage to agricultural crops special hunts may be held.

<table>
<thead>
<tr>
<th>TABLE 57</th>
<th>NUMBER OF MOUNTAIN LIONS BOUNTIED 1906-1955</th>
</tr>
</thead>
<tbody>
<tr>
<td>County</td>
<td>1953</td>
</tr>
<tr>
<td>Alameda</td>
<td>2</td>
</tr>
<tr>
<td>Contra Costa</td>
<td>1</td>
</tr>
<tr>
<td>Marin</td>
<td>1</td>
</tr>
<tr>
<td>Napa</td>
<td>-</td>
</tr>
<tr>
<td>San Mateo</td>
<td>-</td>
</tr>
<tr>
<td>Santa Clara</td>
<td>7</td>
</tr>
<tr>
<td>Solano</td>
<td>-</td>
</tr>
<tr>
<td>Sonoma</td>
<td>-</td>
</tr>
<tr>
<td>Totals</td>
<td>10</td>
</tr>
<tr>
<td>State-wide Totals</td>
<td>181</td>
</tr>
<tr>
<td>Percentage from Bay Area</td>
<td>5.5</td>
</tr>
</tbody>
</table>

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