

Section 1.5: Browse Collection

- **Our examination of the Zoo’s workers’ compensation claim data over the past four years found that a significant portion of claims were for injuries incurred by animal keepers while collecting fresh plant and tree cuttings for animal food and enrichment, known as “browse.” From July of 1995 through June of 1998, there were ten browse related workers’ compensation claims at an estimated total cost to the City’s General Fund of \$270,389. These injuries resulted in the loss of 477 workdays, representing 14.3 percent of all claims submitted by animal keepers who are City employees and over 40 percent of the workers’ compensation benefits paid for injuries incurred during that four-year period.**
- **The San Francisco Zoological Society has taken effective steps to address the rate of employee injury such as contracting with the Recreation and Park Department for browse collecting and assigning responsibility for a greater portion of the Zoo’s browse collection to professional in-house horticultural staff. These efforts have recently resulted in a drop in the number of browse-related injuries to City and Zoological Society staff. The Zoological Society’s long-term plans also include meeting a portion of the Zoo’s browse needs by planting trees and bushes within the Zoo to be used for browse.**
- **However, such solutions do not adequately address all of the Zoo’s browse collection issues. The SFZS should establish a browse farm for the Zoo’s ongoing browse needs, which could result in long term cost savings and would provide other important benefits, such as eliminating potential exposure of the animals to toxins and ensuring an ongoing adequate supply of food and enrichment materials for the Zoo’s animals.**

As part of this management audit, the Budget Analyst reviewed and analyzed the San Francisco Zoological Society’s (SFZS) and the City and County of San Francisco’s workers’ compensation claims and expenditures. In order to assess workers’ compensation claims and expenditures for workers at the Zoo, we:

- Obtained and reviewed documents from the SFZS and the City’s Department of Human Resources, including:
 - OSHA Form 200, “Lot and Summary of Occupational Injuries and Illnesses,” which reports information such as the injury date, the number of lost days and number of days of restricted duty for each claim filed by an employee;

- The City Workers' Compensation "Loss Summary Report", which shows all costs incurred by the City for each claim filed by a City employee assigned to the Zoo;
 - The SFZS's Workers' Compensation "Risk Management Report", provided by the SFZS's insurance carrier, The Zenith, which shows all costs incurred by the SFZS for each claim filed by a SFZS employee.
- Interviewed animal keeper staff, managers, and other SFZS personnel;
 - Interviewed Recreation and Park Department personnel;
 - Reviewed Recreation and Park Department work order documentation related to browse collection; and
 - Interviewed and reviewed documents from personnel at other animal facilities with dedicated browse farms.

A Significant Portion of Workers' Compensation Costs Incurred at the Zoo are Due to Browse Collection Injuries

An examination of workers' compensation claims over the past four years found that a significant portion were for injuries incurred by animal keepers while collecting fresh plant and tree cuttings for animal food and enrichment, known as "browse." From July 1995 through March of 1999, there were ten browse related workers' compensation claims filed by City animal keepers which resulted in the loss of 477 work days at a total current and future cost to the City of \$270,389.

The San Francisco Zoo has a variety of animal species which require fresh plant and tree cuttings, or browse, to meet part or all of their dietary needs. Browse is also used by the Zoo for animal enrichment. For example, tree limbs are placed in many of the Zoo's animal enclosures to provide a more natural environment and stimulation for the animals. Browse collection needs at the Zoo have increased steadily in recent years as the Zoo has striven to provide more "naturalistic" settings for its animals, has recognized the importance of animal enrichment, and has acquired animals, such as the koalas, who require large amounts of specific plant species in their diet. Unlike some other zoos and animal facilities, the San Francisco Zoo does not have a dedicated area set aside for browse production and harvesting. Instead, browse for the Zoo's animals is collected weekly by animal keepers and other personnel from public and private properties in the City and the surrounding areas.

As of March of 1999, 28 of the Zoo's animal keepers were SFZS employees and 31 were City employees. Under the 1993 Lease Agreement between the City and the SFZS, all City employees salaries are paid by the SFZS, however, all workers' compensation payments for claims filed by City employees at the Zoo are paid by the City and not the SFZS. An examination of the City's workers' compensation data showed that there were ten browse related workers' compensation claims submitted from July of 1995 through March of 1999, an approximately four-year period. As shown in the table below, injuries to animal keepers employed by the City incurred while collecting browse resulted in estimated total costs of \$270,389 to the City and lost work time of 477 days over the four-year period. Injuries incurred during the collection of browse represented 14 percent of all claims submitted by animal keepers who are City employees and over 40 percent of the workers' compensation benefits paid and the future liability incurred by the City.

Table 1.5.1
Workers' Compensation Claims Related to Browse Collection
Animal Keepers Employed by the City
July 1, 1995 through March 14, 1999

<u>Fiscal Year</u>	<u>Number of claims</u>	<u>Number of work days missed</u>	<u>Amount paid</u>	<u>Estimated future liability</u>	<u>Total</u>
1995-96	3	288	\$ 89,207	\$ 95,893	\$ 185,100
1996-97	3	145	24,865	35,976	60,841
1997-98	4	44	9,539	14,906	24,445
1998-3/14/99	0	0	0	0	0
1995-99 Total	10	477	\$123,611	\$146,775	\$270,386
All claims*	70	1,788	\$306,748	\$335,430	\$642,178
% of all claims	14.3%	26.7%	40.3%	43.8%	42.1%

* All claims submitted by City employees assigned to the Zoo.

As shown in Table 1.5.1 above, no browse related workers' compensation claims were submitted by City employees from July 1998 through March 1999. This appears to be attributable in great part to the SFZS's success in shifting responsibility for a large portion of browse collection from animal keeper staff to professional tree cutting staff, which is discussed in more detail below.

In addition to workers' compensation claims for City employees at the Zoo, we also reviewed workers' compensation data for SFZS employees during the same period. As noted above, 28 or approximately half of the Zoo's animal keepers are SFZS employees. A review of the SFZS's workers' compensation claims data found that three browse related claims had been submitted by animal keepers employed by the SFZS between July of 1995 and March of 1999. Such claims were for relatively minor injuries and represented a total of \$2,095 in workers' compensation payments and no lost work days.

The types of browse related injuries sustained by City and SFZS animal keepers include contusions from falling equipment and branches, repetitive strain injuries from using long pole cutters to cut overhead, poison oak contracted while locating or cutting browse, and muscle sprains from uneven terrain. The two species of browse that are most commonly collected are acacia and eucalyptus. We found that while injuries were incurred while collecting all types of browse, the most serious injuries were attributable to the use of extension pole pruners used to collect eucalyptus browse from high up locations. Acacia browse collection resulted in fewer and more minor injuries, most likely because the branches suitable for browse can be cut at ground level.

Browse Collection Background

The San Francisco Zoo does not have a dedicated area set aside for browse production and harvesting. Instead, browse for the Zoo's animals is collected from public and private properties throughout the City and the surrounding areas. Zoo staff advise that the volume of browse required by the Zoo has steadily increased as the Zoo has worked to provide more "naturalistic" settings for its animals, has recognized the importance of animal enrichment, and has acquired animals, such as the koalas, who require large amounts of specific plant species in their diet.

Collection of eucalyptus browse for the koalas was the cause of the most serious injuries among the claims we examined and presents the greatest ongoing browse collection challenge to the Zoo. The sole source of food for koalas is eucalyptus which is plentiful in the San Francisco area. However, according to animal keeper staff, the collection of eucalyptus browse for the koalas is much more difficult than it may first appear due to the specificity of what the koalas will consume and the large volume of browse that they require.

Koalas require a large volume of fresh eucalyptus browse. Keeper staff advise that each koala consumes the leaves contained on 12 to 15 branches of eucalyptus every day. With the Zoo's current collection of eight koalas, this means that 672 to 840 eucalyptus branches must be supplied per week. Second, staff report that it is desirable to supply three to four different species of eucalyptus per day in order to

keep the koalas' appetites stimulated in captivity. This means that browse collectors must travel to various locations to collect the right mix of eucalyptus species for the koalas' weekly food supply. In addition, once a suitable browse location is located, it cannot simply be returned to and re-harvested week after week. Instead, it takes several months for trees to regenerate branches suitable for subsequent harvesting. Browse collectors must take care not to overharvest since constant cutting of new growth may be detrimental to the trees.

Further complicating matters is that browse collection must be done several times per week since the koalas will eat only from very freshly cut branches which must be placed in buckets of water almost immediately after cutting. This precludes cutting and storing more than a short-term supply of eucalyptus. Also, koalas will consume only the tender new growth shoots of the eucalyptus which grow at the very top of the trees. To reach these branches, keepers used long overhead extension pole pruners which were responsible for the most serious workers' compensation claims during the period we examined, including injuries resulting from falling branches, wounds from falling poles, and repetitive strain injuries.

Zoo staff advise that the collection of browse consumes a significant portion of their time. Staff must travel all over the City and surrounding areas to harvest enough browse throughout the year to meet their animals' needs and depend on personal relationships and negotiations on a case by case basis with property owners for permission to collect browse at various properties. Zoo staff report encountering unsafe conditions when having to enter public and private lands to collect browse, such as disturbing homeless encampments, negotiating difficult terrain, and hostile property owners. In addition, it is often unknown if the trees or bushes in a browse collection site have been contaminated by toxins which may then be passed on to the animals.

Steps Taken by the Zoo to Address Browse Collection

Browse collection has been an ongoing challenge for Zoo animal keeper staff and SFZS management. To its credit, the SFZS has successfully taken steps to address the problem of worker injuries resulting from browse collection activities as reflected by the drop in browse related workers' compensation claims beginning in FY 1998-99.

In 1996, the SFZS entered into a work order agreement with the Recreation and Park Department (RPD) for tree cutting services. Under the agreement, RPD tree toppers, using an aerial lift truck, spend three days per week, four to five hours per day, cutting various eucalyptus species at sites specified each week by animal keeper staff and transporting it to the Zoo. The average cost to the SFZS for this service was approximately \$6,600 per month from July 1998 through March 1999 or

\$79,200 annually. Collection of all other types of browse continued to be performed by Zoo animal keeper staff and other Zoo personnel.

The RPD contract has relieved koala keeper staff of the bulk of browse collection activities. However, Zoo staff report that the quality and quantity of the eucalyptus collected by the RPD has been inconsistent and the koala animal keepers must continue to cut some eucalyptus as a supplement when the quality or quantity collected by the RPD is insufficient or the RPD crew is unavailable. For example, for a one month period in early 1999, the RPD's aerial extension truck was out of service, thereby necessitating collection of eucalyptus browse by the Zoo's animal keeper staff. Also, because RPD staff must be directed to the sites where the various desired species of eucalyptus can be found, a portion of a Zoo animal keeper's time still must be devoted to tracking and surveying areas for cutting. This requires travel throughout San Francisco and surrounding areas on "reconnaissance missions" in search of suitable browse and in order to secure permission to harvest browse from property owners.

Currently, the SFZS is working toward bringing all browse collection activity under the Zoo's in-house horticultural staff and terminating the RPD work order agreement. In early 1999, the SFZS hired two horticultural staff to be trained in the collection of browse who will be responsible for the collection of browse, thus relieving the Zoo's animal keepers from the bulk of this duty and freeing their time to devote to animal care, public interaction, environmental enrichment, and other projects. The SFZS is also outfitting a donated truck with an aerial lift which it believes will enable these two new horticultural staff eventually to harvest all of the eucalyptus required for the koalas. The SFZS reports that once the truck is ready, the contract with RPD for such services will eventually be discontinued. The SFZS also plans to transfer two of its eight koalas to the San Diego Zoo in order to decrease the San Francisco Zoo's browse needs.

Finally, the SFZS advises that it plans to meet some or all of its future browse needs by including plantings of species used for browse in the new Zoo design. Under current plans, trees and shrubs commonly used for browse will be planted throughout the Zoo.

Long Term Solution – Establishment of a Browse Farm

The changes being implemented by the SFZS will address some of the concerns regarding worker safety and the collection of browse, by assigning this task to trained personnel and including browse in its new Zoo plans. However, these measures do not adequately address all of the issues surrounding browse collection.

Although two additional Zoo horticultural staff have been assigned to browse collection, they are intended to replace eight to nine animal keepers who performed this work as well as a particularly dedicated and recently retired Zoo truck driver who regularly collected browse in addition to his normal duties. In addition to browse collection, the two horticultural staff are also assigned to perform regular tree work within the Zoo, such as pruning and removal of trees. Horticultural staff will also take on the added responsibility of locating suitable sites for browse collection and keeping up ongoing relationships with public and private property owners to ensure permission prior to harvesting browse. This will continue to be extremely time consuming and inefficient as staff must travel sometimes long distances to find suitable browse.

It is unclear as to whether the two Zoo horticultural staff who will be dedicated only part time to browse collection will be adequate to meet the Zoo's browse needs, particularly since it is the RPD's experience that it requires a crew of three tree toppers four to five hours per day, three days per week, just to meet the Zoo's eucalyptus browse needs. Also, browse collection will be dependent upon the reliable operation of a single aerial lift truck. Finally, it can not be assured that browse collected from properties outside of the control of the Zoo are free of toxins which may affect the Zoo's animals.

The SFZS advises that, in the future, all or a large portion of the Zoo's browse needs will be met by on-site plantings contained in the new Zoo plan. Zoo staff advise that the planting of 3,000 to 6,000 browse trees and shrubs along the perimeter of the Zoo is being considered. However, we question whether the Zoo's browse requirements and the new Zoo plans are compatible. The ideal trees for browse should be at or close to ground level and would be frequently cut. Such trees are not particularly aesthetically pleasing and may not be suitable for areas in public view. Second, due to the windy conditions at the Zoo, the perimeter landscaping should consist of dense shrubs and tall trees that are better suited to serving as windbreaks.

The best long term solution for browse collection at the Zoo is the establishment of a browse farm, particularly to meet the Zoo's eucalyptus requirements. Other zoos and animal facilities such as the San Diego Zoo and Six Flags/Marine World have established browse farms where needed species of plants are planted and harvested in one location. Eucalyptus grown on a browse farm is kept at a dwarfed size where new growth is regularly harvested so that cutting takes place at ground level, exposing employees to a significantly reduced likelihood of injury. A browse farm permits harvesting without the use of pruning poles and exposures to unfamiliar terrain, driving hazards, and the general public.

A farm would eliminate the need for staff to travel various distances daily and visit unfamiliar locations to harvest browse. Ideally, the site would be in a controlled area to ensure that no dumping of toxins or vandalism would occur at the site. In order to obtain information on the size and cost of establishing a browse farm we examined documents and conferred with staff at the San Diego Zoo, Six Flags/Marine World, and San Francisco Zoo.

Koalas consume the tender shoots contained on 12 to 15 six-foot eucalyptus branches per day. An established eucalyptus plant yields approximately eight to ten suitable branches per year. Therefore, to establish a browse farm, 438 to 684 trees per koala should be planted. In order to feed six koalas, the requirements for a eucalyptus browse farm for the Zoo are three to five acres of land suitable for growing 14 to 17 different varieties of eucalyptus. The site must have water for irrigation nearby and be accessible to equipment. Such a browse farm could be established on Zoo grounds or in another location.

Initial costs to establish a browse farm are highly dependent upon the location selected. Factors such as availability of irrigation and whether or not the Zoo must purchase or pay to lease land would have a great impact on the price. A browse farm which would address the Zoo's most pressing need for eucalyptus is estimated to range from \$76,000 to \$213,000, assuming the Zoo would not incur any costs to lease or purchase land. Ongoing costs are estimated from \$61,000 to \$68,000 per year, including staff. It is estimated that it would take three to four years for a eucalyptus browse plantation to reach sufficient size and maturity to begin harvesting. An expansion of the browse farm to include other species of plants would add approximately \$20,000 for the initial installment and materials.

In 1996, the SFZS entered into discussions with the San Francisco Sheriff's Department about establishing a browse farm on property adjacent to the San Bruno Jail facility and developed a preliminary plan. Under that plan, it was proposed that the Sheriff's Department would work with the Zoo to establish a browse farm which would also serve as a horticultural work training program for inmates. Due to changes in SFZS staffing, talks between the Zoo and the Sheriff's Department were discontinued.

Given the benefits outlined above, the SFZS should renew efforts to establish a browse farm at the San Bruno Jail site or form a similar partnership with another agency. In December of 1999, the Sheriff's Department reported to the Budget Analyst that it is still willing to consider the establishment of a browse farm at the San Bruno Jail site. The Zoo Director has advised the Budget Analyst that the Zoo will contact the Sheriff's Department in the very near future to discuss establishing a browse farm at the San Bruno Jail site.

CONCLUSIONS

An examination of workers' compensation claims over the past four years found that a significant portion of claims were for injuries incurred by animal keepers while collecting browse. From July of 1995 through June of 1998, there were ten browse related workers' compensation claims at an estimated total cost to the City of \$270,389, the loss of 477 work days, and representing 42 percent of all claims filed during that period.

The SFZS has taken effective steps to address the rate of employee injury such as contracting with Recreation and Park Department for browse collecting and assigning responsibility for a greater portion of the Zoo's browse collection to professional in-house horticultural staff. These efforts have recently resulted in a drop in the number of browse-related injuries to City and SFZS staff. The SFZS's long-term plans also the planting of trees and bushes at the Zoo to be used for browse.

However, such solutions do not adequately address all of the Zoo's ongoing browse collection needs. The SFZS should instead plan to establish a browse farm, which would provide a more efficient, safe, and stable supply of browse for the Zoo's animals.

RECOMMENDATION

The Zoological Society should:

- 1.5.1 Include an on-site or off-site dedicated browse farm in its new Zoo planning and establish such a farm as soon as possible.

COSTS/BENEFITS

Implementation of the recommendation in this section would result in estimated one time costs from \$76,000 through \$213,000, not including any costs to lease or purchase land if necessary. Annual ongoing costs are estimated to be from \$61,000 through \$68,000. Potential long term cost savings could result from averted workers' compensation claims and a reduction in Zoo staff hours required for browse collection and would provide other important benefits, such as eliminating potential exposure of the animals to toxins and ensuring an ongoing adequate supply of food and enrichment materials for the Zoo's animals.