Winter 1991 Vol. 14, No. 4

WILDLIFE JOURNAL

Journal of the International Wildlife Rehabilitation Council



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Guidelines for Authors for the *Wildlife Journal*

The *Wildlife Journal* is designed to provide useful information to wildlife rehabilitators and others involved in the care and treatment of native wild species with the purpose of returning them to the wild. All featured articles are subjected to a review process, and our staff and reviewers work with authors to produce the most accurate information possible in our ever-changing field.

The *Wildlife Journal* has various feature categories. We solicit submissions in the form of feature articles, rehabilitation notes, book reviews, news articles related to major events in the field, and selected case studies. Articles on veterinary medicine as it relates to wildlife rehabilitation are also welcome. We would like to expand the *Wildlife Journal* to include wildlife rehabilitation articles from countries outside the United States and welcome inquiries regarding such articles. We have two short features we use for basic information: "For The New Rehabber" and "Simple Things That Make a Difference." They are intended for basic information or new ideas that are easily demonstrated with a short text and photos. We pay authors a $25 honorarium for each article accepted for publication or provide a one year membership or renewal.

Submission Instructions

1. An original and two copies of the manuscript should be submitted to the Editor, IWRC, 4437 Central Place, Suite B-4, Suisun, California 94585, USA. The manuscript should include references, photo legends, and footnotes, and should be typewritten, double-spaced, if possible. The author's name, address, and phone number should be placed on at least the first page of the article so it can be readily identified and the author contacted.

2. The *Wildlife Journal* is prepared on a Macintosh personal computer with desktop publishing software. If papers are already on a personal computer disc, the submission cover letter should include that information, as well as what type of hardware and software systems were used. Obviously, being able to use the author's disc directly or translate by machine to Macintosh format prevents input errors and speeds up the process.

3. Manuscripts are received with the understanding that they have not been accepted for publication elsewhere. **It is the author's obligation to obtain permission or reprint rights if the submitted copy has been published elsewhere.** All accepted manuscripts are subject to editing. Unused manuscripts will be returned.

4. A separate page should be submitted with a short synopsis of information on the background of the author. Included should be the name, address, rehabilitation organization, and phone number of the author. Where appropriate, please list any academic degrees, special training, or experience that is relevant to the article (i.e., physical therapy—RPT, etc.)

5. Black and white photographs are preferred for use in the *Wildlife Journal*. When no other option is available, color slides and prints can be converted but this is costly and to be avoided when possible. Photo credits should be listed with the photographs.

6. Acknowledgments are limited to people who have contributed to the article in a major way.

7. References should be noted in the text with the last name of the author and the year published (i.e., Leighton, 1983) and listed at the end of the manuscript in alphabetical order in the following style:

LEIGHTON, FA; Peakall, DB; and Butler, RG. 1983. "Heinz-Body Hemolytic Anemia from the Ingestion of Crude Oil: A Primary Toxic Effect in Marine Birds." *Science* 20:871-873.

WILDLIFE JOURNAL

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Editorial . . .

Delegation in Wildlife Care Organizations

From the very beginning of the field of wildlife rehabilitation, some people have thought it was unique: different from other non-profit activities and certainly different from normal for- profit business operations. And in some ways it was. However, in looking today at those who have been successful in building strong wildlife care organizations—it is clear that the people who did it were successful managers, with many similarities between how they operate and how their counterparts in the business world operate.

In my constant quest for improvement of my management skills, I have reviewed a lot of business literature. I see much that is of use to the wildlife care manager. Several key management books have been reviewed in the *Wildlife Journal* over the years, and we have several more coming down our pipeline for future book reviews. Clearly, one of the key components to successful management of all organizations is the proper delegation of work assignments.

Delegation is giving people things to do. Management is the overall accomplishment of goals involving various people in the organization working together with their leaders. It is easy to see the connection and it is obvious that the manager that does not delegate is not managing.

One of the biggest management traps in wildlife rehabilitation is the feeling that your technical skills are so valuable to the animal care program that if *you* don't provide that care—no one else could do it as well, (and how many of us have had this thought?)- "In the time it takes to train someone, I could do it myself." But then what will happen to the animals when you can't be there because of illness, personal difficulties, or life changes (e.g., final and terminal burnout)? It may well be true that your skills are tops and no one can do it better. *No one ever will if you don't share what you know by teaching and training!* The animals are, after all, the bottom line in this business.

The most vulnerable and fragile organizations are those with very steep pyramids (essentially one person in control of all aspects) or the totally horizontal - everyone having a say in all aspects: micromanagement by a committee can be a nightmare! The strongest, most flexible organizations, whether non-profit or for-profit, have deep structures: a broad hierarchy of skilled people.

Levels of Management

Technical skills are the ones workers in any field learn on the first level of the organizational ladder. First line supervisors, often equipped with titles such as "day supervisor, shift supervisor, animal care supervisor, rehabilitation director" need to know good rehabilitation. However, to be effective in their jobs (whether voluntary or paid), they must communicate well with staff and volunteers, train new workers, and teach not only wildlife care but the organization's house rules as well. These require what are often called "people skills." For out-shelter organizations, the equivalent person is the species team leader who tutors others in the "speciality" and parcels out equipment and specialized food or formulas.

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The Ten Most Common Organizational Problems: Getting to Their Source

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Introduction

Most nonprofit organizations come to management consultants with the same basic complaints: too little money, a burned-out staff, a board that does nothing, no sense of direction. The first step to solving these organizational problems is diagnosing them correctly—often they are only superficial symptoms of less obvious maladies.

Too many organizations fall into the trap of treating the symptoms without looking into the underlying causes. When that happens, immediate pressures may be alleviated, but the real source of the condition remains. Therefore, difficulties will flare up again, perhaps in different forms.

Among the problems brought to management consultants from organizations both small and large, ten stand out as the most frequently heard. The "Top 10"—and the more fundamental bases from which they spring—are the subject of this article.

PROBLEM 1. Money

The number one lament of nonprofits is "We can't raise enough money." This usually is not the fault of those who are blamed most often—the funders. Rather, it may be a surface manifestation of a variety of ills: lack of clarity about the organization's mission or direction; a failure to reassess purposes and goals in light of changed political, social or economic realities; failure to confront issues of the organization's relevance; lack of a coherent strategy for realizing visions and programs; or plans that are unrealistic in light of the organization's resources or capabilities.

Even if the organization has sound goals and a solid capacity for implementing them, other barriers may block successful fundraising. The most typical is that the staff is so wrapped up in programs that it leaves little time for fundraising.

Contrary to widely-held belief, effective fundraising does not rest on inside information or mysterious technical know-how, but on the same kind of time-consuming research, planning, and care that a substantive program requires. The problem is that fundraising too often gets shunted to the bottom of the "to do" list, so the patient cultivation and long lead time needed to raise money are lost. The result is a funding crisis.

Some organizations think the answer is to hire a fundraiser. Although this can be useful, it is never a substitute for attention to fundraising by the organization's leadership. Only the leaders can conceive and develop the programs that merit funding. And only they can convey the two elements that form the most compelling case to funders—the vision of the organization as a whole and the societal needs it addresses.

The importance of knowing the right people and acquiring sophisticated know-how are also overrated as avenues to fundraising success. Certainly it helps to have friends to open doors and to learn basic fundraising techniques. But too often complaints about not having access or expertise are excuses for not facing the underlying facts that fundraising efforts are being overlooked or that the organization's programs are weak.

PROBLEM 2. Participation in Decision-Making

Leaders of nonprofits are particularly sensitive to staff complaints about "not having enough say in the organization's decision-making." Believing that their internal structure should be in keeping with their political and social values, nonprofit managers often rush into democratization and collective decision-making. Too often the results are endless staff meetings, proliferating committees, protracted consensus-reaching, postponed decisions and continued dissatisfaction.

The mistake lies in failing to look deeper to find out what the staff is really troubled about. When the staff says it wants to participate more, it is usually not asking to share in final authority for decision-making. Rather, staff members sim-

ply want to contribute to the decision-making process and, more importantly, to know that their views are being seriously considered and that their ideas are valued. What is often seen as a demand for more power in an organization is actually a desire for a greater sense of contribution and a need for more feedback and affirmation. People in organizations—particularly in nonprofits—want to feel that they make a difference. This is as true for the top program person as it is for the least paid clerical worker.

A staff can be given a heightened sense of worth even in the most traditionally-structured organization. Most people accept and even want some hierarchy; they understand that every team needs a captain and are content so long as the importance of every other member of the team is recognized. It is a foolish captain who doesn't realize that the questions, suggestions, and perspectives of the staff are indispensable to effective decision-making.

PROBLEM 3. Work Overload

Executive directors of nonprofits often complain that they "have to do too much," which usually means they are singlehandedly keeping the organization going—doing all the fundraising, decision-making, and worrying. Over-worked and overburdened, they think the answer is to hire and "executive secretary" or to enroll in a time-management course. Too often the real problem is either the director's unwillingness to share ownership of the organization or the staff's reluctance to assume responsibility for the organization as a whole.

When the director is the problem, he or she is usually a loner, has a weak board of directors, lacks an internal support group, and is convinced that no one else in the organization can get the job done as well as he or she can. The reward is a lot of power. The cost is an overwhelming burden of responsibility, a staff alienated by the lack of delegation and sharing, eventual burnout, and the crippling of the organization, which cannot grow within the confines of such exclusive leadership.

When the problem lies with staff members, they typically blame their lack of involvement on the director's "authoritarian" ways, not admitting that they are not really willing to take on the range of jobs and responsibilities that come with institutional ownership. Such a staff wants to be free to spend all of its time on program matters. It demands to be brought in on all important organizational decisions, but then wants to leave all of the fundraising and other vital maintenance tasks to the director.

PROBLEM 4. Organizational Drift

When an organization complains that it no longer knows what it is about or where it is going, the time has come to examine its growth. It is time to see whether it is too feverishly in pursuit of funding. Nothing leads faster to a loss of identity and direction than a program that has become shaped more by funding opportunities than by real needs and issues. This is the organization that has first asked, "What are funders interested in?" and then developed projects to fit those interests, regardless of how the projects fit in with the organization's true priorities.

Such organizations are often separated into projects that compete for funds, barely communicate, and have become more concerned about their own survival than about the central purpose of the organization. There is no team feeling, no excitement, and a waning sense of the organization's value. The irony is that the funding problems of these organizations never cease and new projects and schemes must continually be designed.

In order to restore the organization's vigor and vision, a process of tough program reassessment, some hard truth-telling, and consolidation or cutbacks in projects of questionable importance are essential. Sometimes such organizations are so enmeshed in thinking in terms of what they call "funding realities" that they must be pushed—frequently by the board—to dream and risk again.

PROBLEM 5. Burnout

An organization that is suffering from "burnout" and high staff turnover must look carefully to see whether it is stuck in any of the syndromes just described, because each of them can demoralize the staff. But burnout and high turnover can have a much simpler cause, namely, a lack of attention by the group's leadership to the care and nurturing of the staff.

Nonprofit organizations often make the mistake of believing that working for a worthy cause is reward enough for long hours and low pay. It is not, but that doesn't mean the only answer is higher pay scales or better benefit packages.

Sometimes all the staff needs is more feedback and recognition—a better sense that its commitment and efforts are known and appreciated. Sometimes more individual visibility or increased opportunities for training or professional growth are what the staff requires. And sometimes it can be as simple as making sure staff members know that their organization knows they

are human beings with birthdays, personal problems, and a need for healthy doses of time for themselves and their families.

One public policy research center reinfused energy in its staff merely by freeing them from the guilt they felt for not following the example unconsciously set by their executive director—a man who never took vacations, never left the office before 7:00 p.m., and never asked to be reimbursed for his out of pocket expenses.

PROBLEM 6. Staff Relations

Organizations that are suffering from communication breakdowns, under-currents of tension, and continual flare-ups among the staff often think the answer is a staff retreat where they can "clear the air" and get themselves back together. While a retreat can produce temporary rapprochement, the bickering and breakdowns often return and the organization finds itself laced with tension again. So they go on a second retreat, this time with a professional facilitator—only to have the stress reappear.

The problem, of course, is that the organization has not probed the source of the recurring anger. The most frequent cause is a lack of clarity about who is responsible and has authority for what. Ironically, what often underlies this ambiguity is avoidance of the real conflict: a basic struggle over power. The organization is unwilling to sit down and wrestle through fundamental questions of power and authority. It leaves things unclear, so the conflict never gets resolved. The result is constant skirmishing. The circumstances may change, but the basic issue persists.

This condition particularly afflicts organizations that have operated in a family style, where roles are informal and interchangeable. These groups have a hard time coming to grips with the fact that they have outgrown that mode of operating and need to define roles more clearly.

Such groups are also fearful of surfacing disagreements among the staff and hurting each other's feelings. One of the healthiest things they can discover is that they can have internal differences and successfully deal with them. What makes conflict insidious is the failure to acknowledge it and to confront the real issues.

PROBLEM 7. Reliance on Systems

A variation of the "all we need is a retreat" theme is the claim that "all we need is better systems and procedures." These organizations are trying to find easy answers to management problems. They are hoping that "management by objectives" or some other clever process or magical structure will remove all of the angst and snags. They want rules, systems, and carefully spelled-out procedures.

The trap is that they are concentrating on finding the right systems rather than on establishing the solid relationships, open communication, and clear lines of authority and responsibility that are the bedrock of any organizational structure—and for which there are no easy how-to's.

More systems mean more loopholes. Systems can never relieve one from being responsible for the tough judgement calls, risk-taking, and difficult decisions that are the inevitable burden of institutional leadership. It is also impossible to iron out the confusion, ambiguity, and conflict of organizational life with complex systems.

PROBLEM 8. Mystification of Management

Most nonprofits attract leaders whose hearts lie in programs and policy. Because of this, they often believe they "don't know how to manage." At the root of this complaint is a misguided mystification of management—a belief that management is a highly skilled task that depends on knowing techniques that one can only learn at business school. Nothing is further from the truth.

While some useful approaches and procedures can be learned, sound management depends principally on building good collaborative relationships with people and having clear roles, responsibilities, lines of communication, and purposes. That takes hard work, not arcane know-how.

Good management also depends on managers having a realistic understanding of their own limitations. It is a rare executive director who excels at all aspects of nonprofit leadership: vision, inspiration, supervision, program development, financial management, fundraising, and public relations.

Leaders become most effective when they know their strengths and weaknesses, and then hire people and build management teams that make up for their deficiencies.

PROBLEM 9. Idle Boards

Staffs of nonprofits frequently complain that their boards "do nothing." They think the answer is either to get new members or to "involve" the old ones by sending them more materials—which the board never reads.

But the problem may lie within the staff.

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Natural History & Rehabilitation of the Cliff Swallow *(Petrochelidon pyrrhonota) Part I*

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Introduction

This two-part paper is the result of three years of personal observations and work performed at the Suisun Marsh Natural History Association, Suisun, California, and The California Center for Wildlife in San Rafael, California.

The scope of the paper includes diet, captive care, rearing young, caging, diseases, foster parenting and release techniques.

Description

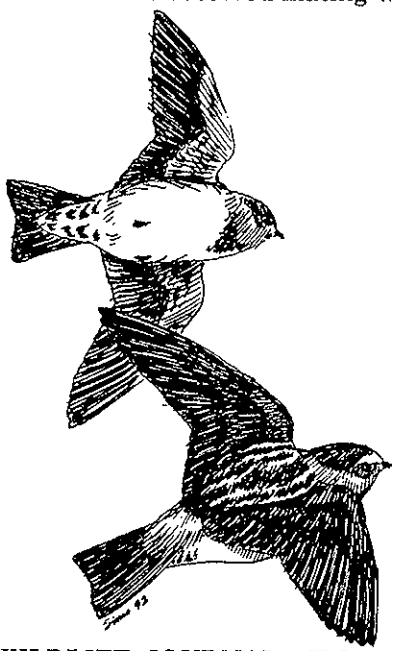
The Cliff Swallow is in the family *Hirundinidae* with Martins and other swallows. *Petrochelidon pyrrhonota* is Latin meaning redback (Terres, 1980). The body from head to tail is 5 to 6 inches long, with wing span of 12 to 13 inches (Terres, 1980). The bird has a dull white to buff forehead, compressed bill, and facial bristles. The crown, back, wings and tail are blue-black with a slight sheen. The rump is rusty to buff, the back is streaked with white, the throat and face are brownish red and the belly is white or slightly tan. The tail is almost square. There is very little sexual dimorphism, if any, due in part to the fact that the birds colonize and fly together throughout their lives. There does not appear to be competition for territory or females (Shaw, 1989). The juveniles look similar to adults but are paler in color.

Annual Arrival

The author was fortunate to live in an area in Yolo County for three years where a colony of 500+ Cliff Swallows would arrive on March 31st every year. The first group of birds to arrive numbered approximately 25. Of these, five were captured, surgically sexed, and found to be males. From this, the author suggests that the first arrivals are all male and that they act as scouts to search for suitable nesting areas, with good water sources and feeding areas. Possibly they are preparing for the onslaught that is to follow. Six days later the migration flock began to arrive.

On April 7th, at 6:43 a.m., the author was awakened by what looked like a scene from the movie "The Birds," with literally hundreds of swallows chattering and singing. The noise was quite deafening. This continued for several hours until about 11:30 a.m., when the birds left, only to return by 3:00 p.m. In the afternoon, when the birds seem to vanish, they can be found several miles away along the canal or near water holes situated in the foothills. On several occasions they were noticed flying high up in the sky looking like faint dark specks.

The arrival in early spring is when courtship begins. This occurs in the air and is marked with irregular tweeters and chatters. The males tumble and circle in loops around the females in an aerial dance. Copulation takes place in mid-air and one female was observed mating with several



different males. They land in the eaves for a few seconds and then continue on with the courtship. Courtship goes on for several weeks.

Feeding

Feeding is done on the wing and can occur through early morning well into the night as they fly through the air scooping up flying insects.

Food is 95% insect matter and 5% inert matter (plant particles, seed, dirt, etc.) (Terres, 1980). Feeding is a constant task; it requires a lot of energy to stay in flight and a lot of calories are burned up.

Swallows do not have a true crop but more of an enlargement of the esophagus for storing food or bringing food to their young. Checking crop contents of seven Cliff Swallows in Yolo county revealed mosquitos, the common house fly, and various beetles, and several specimens had a small quantity of dandelion seeds. A similar check on Cliff Swallows in Marin revealed a large amount of flying ants and spiders. Swallows from the Suisun Marsh area of Solano County revealed mosquitos, damsel flies and various amounts of midges. These crop checks, done on necropsy, revealed that food varies from region to region. There have been reports of swallows eating juniper berries (Gross, 1982). Other food includes weevils, chinch bugs, grasshoppers, aphids, wasps, bees, and white flies. Many of these insects are harmful to agriculture.

Nesting

After the weeks of feeding and courtship displays are over, the swallows begin the industrious task of building their nests. They are colonial and some of these colonies contain thousands of nests. On the author's house alone were some 260 nests built under the eaves. The traditional nesting sites of the Cliff Swallow include the faces of cliffs, canyon walls and bluffs, but they have also been observed using the upper part of large trees (Terres, 1980). Since the wide spread development in this state, these birds have learned to adapt to their changing environment and they take advantage of the eaves of bridges and many buildings. One of the oldest examples has been the adoption by Cliff Swallows of the mission at San Juan Capistrano. Their return to that site is marked with media coverage and thousands of people awaiting their return annually.

Nest building is a community event. They congregate around the area they are utilizing and douse it with saliva. After packing the initial area with saliva a pair goes off to various mud sources and starts building the nest. The Cliff Swallow takes small pellets of mud and works grass into these pellets. The pellets are then placed on top of one another much like adobe bricks are used to make a house. The swallows lay layer on top of layer until an upside down dome is created, somewhat resembling upside- down igloos. The nest is usually 8-10 inches (20.3 cm to 25.4 cm) across with a small opening that is 3 to 4 inches (7.6 cm to 10.2 cm) in diameter (Terres, 1980). The nests can be built on top of each other and there are some incidents where old nests are reinforced and used annually.

Perhaps a thousand years ago the Anastazi Indians of the Southwest observed swallows building nests on the cliff walls. Interestingly enough, these people adopted the same cliff dwelling lifestyle! Baskets made by these Native Americans have been found with images of swallows woven into them.

Once the bulk of the nest is completed the birds place a lining, consisting of downy white breast feathers, in the bottom for insulation. Other substances that are placed in the nest are various grasses and feathers of other birds. The author has found the primary feathers of an American Kestrel in several nests located near his home. Nest completion is done in 5 to 15 days. This depends on the distance between the mud source and the locality of the colony. The farther away the mud source is the longer it takes.

There are environmental and man-related conditions that affect nesting sites. Drought, such as the one California has experienced for the last five years, has had a drastic effect on nesting colonies. In normal years, a bridge over a canal near the author's home had some 500 or so nests built upon it. In 1990, the canal was dry and the nests were abandoned. Other natural factors that can affect a nesting colony include severe rain storms or windstorms during the breeding season.

Man-related factors such as pesticide spraying are another reason for nest site abandonment. In 1989, a nesting colony located in Solano County under a bridge near a corn field had an estimated 650 nesting birds. The nearby corn field was sprayed by aerial spray methods and within three days the colony was abandoned and many dead birds were found. It remained abandoned for two years and in 1991 only four nests were made there. Obviously, the destruction of nests and buildings can also have a devastating effect on nesting colonies. Fortunately, federal law protects these colonies once occupied and state or federal enforcement officers can and often will delay the destruction or renovation of bridges or buildings until the young have fledged, if the

enforcement agency is notified of the impending problem.

Egg Laying and Development of the Young

Eggs are laid several days after the nest is complete. The eggs are laid primarily in the early morning hours or in the evenings (Shaw, 1989). One egg is laid each day but incubation does not begin until all the eggs are laid. The eggs have the typical shape of passerine-type eggs; buff to light brownish with dark brown specks. The average number of eggs laid are four to six (Terres, 1980). There can be as few as three or as many as eight (Terres, 1980). It has been the author's observation that if more than six is laid, the first two normally do not hatch but are pushed out of the nest or just pushed aside. Incubation is done by both parents and usually takes 15 to 17 days (Terres, 1980) in northern California. In unusually warm summers the author has witnessed incubation periods of only 12 days. In southern California, the author found the incubation period to range from 12 to 14 days versus the northern part of the state where he observed incubation periods of up to 18 days.

In the southern part of the state there are normally two broods (Terres, 1980). The first eggs are laid in late May or early June, while the second clutch is laid in late July or early August. In northern California, there is one brood, laid in late June or July. The number of broods each year depends on the overall temperature and concurrent food supply.

Once the eggs are laid, the parents turn the eggs and take turns incubating them. On hot days where the temperatures reach 95 to 100° F, the parents will cover the eggs with the lining of the nest and leave it until the temperature is lower. The author has observed on such hot days that the parents are nowhere to be found in the vicinity of the nest and that when the parents leave, the eggs are situated so that they are not touching each other. Additionally, the author has observed parent birds flapping their wings vigorously in front of the entrance of the nest. This behavior may be an attempt at temperature regulation. A thermometer placed in the nest for several weeks while incubation was taking place and checked three times a day (8 am, mid-day, 9 pm) revealed that the average temperature ranged from 89 to 92° F.

Hatching takes place almost simultaneously. The time it takes for a chick to pip is six to twelve hours. For several days prior to hatching, clicking sounds are made by the chick. These clicking sounds act as a signal to the others of the clutch to accelerate or retard growth (Welty, 1975). These sounds can be heard with a stethoscope. Contact between the eggs helps these click vibrations be transmitted to each other.

After the emergence of the chicks, the egg shells are removed. It was the author's observations that egg shell fragments were discarded directly outside the nest when the colony was protected from predators and were carried some distance away when not so protected.

After emerging from their egg, the newly-hatched chicks lay almost motionless for approximately 12 hours. This is the time when the egg sac inside the bird is being utilized for nutrients and growth begins. The chick is about a half a gram in weight at hatch.

The young are completely bald, having only a few tufts of down on their head and back. They are totally blind (because their eyes are not open yet) with the eyes appearing as if they are barely developed. They are completely helpless and depend entirely on their parents for care.

After the first 12 hours, the parents take up the busy task of feeding the young. The young develop a feeding response and their parents start feeding right after the sun rises and continue until the sun goes down. The first few days, feeding is done all day long by both parents, with estimated visits to the nest being 135 in a 12 hour period (Shaw, 1989). During the first five days the weight doubles and from day five onward, an average weight gain of two to three grams per day is observed. After the fifth day, feeding slows down and there seems to be a period of relative in activity in the late afternoons. The average number of visits to the nest at this time is 55 to 65 in a 12 hour period. The parents present the young with a variety of flying insects and beetles and remove fecal pellets from the nest. Periodic repair is done and changing the nest lining appears to be one of the more constant parental tasks. This is, of course, to keep the nest clean and to prevent parasite infestation.

By the fifteenth day, the cliff swallow weighs 15 to 18 grams and is almost fully feathered. It is at this time the young may start to venture out of the nest and may be seen clinging to the sides of the nest for brief periods of time. By the 19th day, the birds spend more time outside the nest and they also may be seen flapping their wings vigorously. The young hover about the parents begging for food. Normally, the birds are flying by the 23rd day but they remain with the parents being fed by them for up to two weeks longer. When fully fledged, Cliff Swallows weigh

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Bobcat *(Felis rufus)*

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Introduction

The bobcat, *Felis rufus*, is a small-to-medium-sized felid found over most of the contiguous forty-eight states, southern Canada and northern Mexico. Solitary and shy by nature, it is seen rarely, and it is difficult to estimate actual population numbers in many areas except through trapping records. Trapping and human interference account for most bobcats, young and adult, presented to rehabilitators.

Natural History

Description

Bobcats are members of the order Carnivora, family Felidae, and have the following in common with all carnivores: elongated canine teeth, carnassial (shearing) teeth formed by a premolar/molar occlusion, no clavicle (allowing greater freedom of movement in the forelimb), a well-developed ulna, anal glands (used for scent-marking and identification), and the males all possess a baculum (os penis).

Bobcats have longer legs in relation to body size than most other carnivores, especially other felids. They have 28 teeth as adults (fewer than the domestic cat or the other North American wild cats such as the mountain lion), in a dental formula of incisors 3/3, canines 1/1, premolars 2/2, molars 1/1 (x 2). (Davis, 1974; Tumlinson and McDaniel, 1984) Incisors are vestigial and some may be missing in adult bobcats.

In Texas, average size for adult males is 34 inches (870 mm) overall, tail 5-6 inches (146 mm), hind foot 6-7 inches (171 mm). Females are considerably smaller at 30 inches (772 mm) overall, tail 5 inches (144 mm), hind foot 6 inches (158 mm). Average weight is 12-28 pounds (5-13 kg), females averaging 20-40% less than males. One very old animal taken from the wild in Texas was weighed at 36 pounds (Davis, 1974; Schmidley, 1988). Other states have reported animals over 50 pounds taken from the wild (Young, 1958; Rue, 1981).

The difference in size between males and females is a useful tool for sexing bobcats when close observation is not possible. Female kittens are smaller than their male counterparts, and this difference persists during development, barring illness or parasite load that might retard growth of males of the same age.

The bobcat is a lightly spotted cat, spots being darkest on younger cats, fading with age. The coat may be red-brown shading through yellow-buff to champagne, and albinistic and melanistic phases have been photographed. The belly and inside of the legs is white or light buff. The ears are slightly tufted with black hairs, and the backs of the ears are rimmed in black around distinct white spots. The short, bobbed tail usually has five or six incomplete black rings near the tip, and the tip and underside of the tail are white. Chin whiskers or a facial ruff is present on both males and females.

Habitat

In Texas, bobcats are most commonly found in areas with abundant rocky outcrops or canyons. In areas without rocks, bobcats will use dense thickets for den sites and protection. Pinon, oak, juniper and chaparral are preferred, and they are found only rarely in open pine thickets. Across the United States, bobcats prefer hardwood stands to softwood stands for den sites and cover. Bobcats have also adapted well to life in deserts, deep grass prairies and even the suburbs of large cities. Although they are seldom seen, their presence can be detected from tracks, scrapes, scat deposits on rocky prominences, and strong urine odors emanating from the den site.

Bobcats are excellent tree climbers, but trees serve merely as a refuge from pursuit, observation post and occasionally as a means of getting from one place to another. They do not den or sleep in trees, and rarely attack prey from a tree vantage point.

Natural Diet

Small mammals such as cottontails, jackrabbits and small rodents comprise the largest percentage of the bobcat diet. Seasonal variations may be seen in ecosystems where there are periodic fluctuations in certain species (Fritts and Sealander, 1978; Maehr and Brady, 1986; Litvaitis, Sherburne and Bissonette, 1986) such as the snowshoe hare in the bobcat's northern range, migrating birds, or opportunities for carrion of deer and hog during hunting seasons. Of the mammal species consumed by bobcats, 60-70% are harmful to man's interests, 20-30% beneficial or of importance as game animals, and the rest neutral (Davis, 1974). Rabbits, ground squirrels, woodrats and mice predominate in the Texas bobcat's diet. Birds form a very small portion. Depredation of poultry and livestock is usually not significant, but western states have reported significant losses of sheep and goats to bobcats. Adult bobcats also may take deer, especially in winter, killing weak or sick adults and fawns but also attacking and killing healthy adults whose mobility may be limited by snow.

All felids require very high protein levels and eat meat to satisfy this need. Since they cannot use provitamin A or carotenes from plant stock to fulfill their need for Vitamin A, organ meats such as heart, lungs, kidneys and adrenals are also important in their diet.

Grasses have been found in bobcat stomach contents, but most of this is attributed to food in the stomachs of prey species. Bobcats will occasionally ingest grass deliberately as a purgative. It is passed whole in the scats.

Reproduction, Gestation and Development

Estrus occurs in female bobcats once or twice a year, with the peak being in January-February. A second estrus may occur in August-September, especially for first year females that did not conceive earlier in the year or females who lost their first litters. It is possible for a female to bear two litters a year, and some captive females have even had three litters in a twelve-month period. Females are fertile for less than a week during estrus periods. Males are fecund year-round (Duke, 1954). Mating is polyandrous and promiscuous, a single male mating with several females with home ranges overlapping his. There is some competition for mates, but no serious encounters between competing males. This is probably due to the size of a male's home range, its lack of overlap with other males' ranges, and the fact that males are more susceptible to trapping than females (attributed to the larger home range and more intensive use of home range by the male).

Litters of 2-7 (average 3) are born after 60-63 days' gestation, the peak parturition period being April-May. Female fertility drops from May-November, with 100% infertility reported by November (Beeler, 1985). Kittens are born well-furred and spotted, with tightly sealed eyes and ears. Kittens are 6-8" in body length at birth and may weigh 6-10 ounces. The female takes sole responsibility for rearing the young. Males may kill or cannibalize young. The female leaves the den only long enough to forage and eliminate until the kittens' eyes open at 8-10 days. The kittens are fully mobile by two weeks of age, with functional lacteal dentition (milk teeth) at two months of age, when weaning is complete. First bites of meat may be brought by the female to her cubs as early as three weeks.

Cubs start hunting with the female around three months of age and stay with her until fall or until they are 6-9 months of age. By 12-14 months of age, they have dispersed completely out of her home range. At this time, she may already be traveling with another litter of kittens (Winegarner and Winegarner, 1982).

Sexual maturity is reached in the first year, but males may not mate until they are two years of age. Females may miss their first estrus/breeding.

Survivorship of wild bobcat cubs is less than 30% for the first year, trapping of young males accounting for a good percentage of the loss, followed by starvation (poor hunting skills, decrease in prey base), and depredation by other carnivores (mountain lion, eagle, great horned owl, occasionally coyotes and domestic animals).

Captive Management

Housing

Infants may be housed in an incubator, hospital box or small pet carrier with an external heat source. Ambient air temperature should be 85-90 degrees F (29-32°C) with a relative humidity of 50-60%. Too high an ambient temperature or hot spots under the bedding may cause hair loss and even burns on the lower extremities. Gradually reduce the temperature over 2-3 weeks until the infants are capable of self-thermoregulation. Once they are stabilized, their body temperature should be in the 100-102 degrees F (37.5-38.5 ° C) range.

Bedding should be soft and absorbent, without ravels or snags to catch claws. Infants may nurse or chew on bedding materials, ingesting fuzz and fibers. This should be avoided by using closely

woven bedding material such as flannel or sheeting.

Once the infants become mobile, around two weeks of age, they should be transferred to a larger carrier or pen, 2' x 2' x 2', with bedding, a separate nest box area and a small shallow pan of clay litter (the new sand/absorbent litters may have many advantages for ease of cleaning, but they generate a lot of dust when bobcats begin to play in them). A heat source such as a heating pad or heat lamp should be available to part of the pen. Keep wires and cords out of reach of kittens. They may bat at, disconnect or chew through them.

The cage should be designed with ease of access in mind. A wide top opening will enable one to capture kittens with a minimum of stress for feeding and will also prevent charges through a side-opening door, which can result in a lost kitten. Once their eyes open, kittens will not be particularly cooperative about coming to a hand and may strike at the hand that seeks to feed. They will also work to avoid capture.

As the kittens develop and grow, larger housing will be required. Wire mesh no larger than 1/2" x 1" is recommended for cage construction. Platforms, a nest box up on the side of the cage, and tree branches for climbing will require a cage 4' x 4' x 4' for a litter of bobcat kittens. Until they are completely weaned, the kittens must still be accessible for capture and bottle-feeding.

Once they are weaned, they can be moved outdoors into a kennel run or large cage (minimum 6' x 6' x 12') constructed of material they cannot get their heads through. Welded wire mesh 1" x 2" or 2" chain link is best. Do not use poultry mesh, hog wire or braided mesh or wire, and never use barbed wire in cage construction. The cage should have a secure top, a double door system to prevent escapes, and natural furnishings. A rock den, platforms at different heights, rock piles and secluded areas are recommended. Bobcats do not dig significantly, and will not dig out of a dirt-floored pen. If possible, the pen floor should be grassy, especially around the sides, for more privacy. Concrete floors are easier to clean but are hard on the cats' pads. Problems with parasite ova getting into the dirt and persisting in the environment are better avoided through testing and isolation of individuals during the early intake period and prophylactic treatment throughout the rehabilitation period.

A hunting chamber can be built inside the pen or the pen can have solid sides up to two feet for live-prey training. Start with a bare-floored chamber, then add obstacles and hiding places for the prey to sharpen the cats' hunting skills. Even before live prey is introduced, bobcats can practice in play maneuvers with knotted ropes suspended from the top of the cage, solid balls of a size that cannot be swallowed, and dangling strips of paper, feathers and pieces of meat. Bobcats, like domestic cats, are also fond of catnip, and a catnip-stuffed cloth ball can provide enjoyment and hunting practice as well.

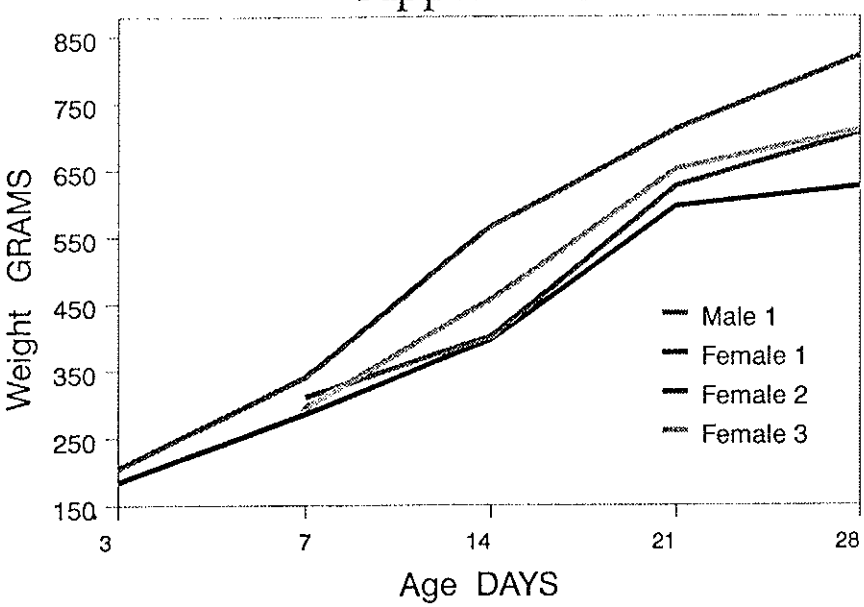
Isolation from human contact except for feeding is vital to the development of proper wild instincts. The animals should also be isolated from contact with domestic animals. In a rural setting, the pen can be built under or around a grove of trees to provide shelter and sense a of security. If this is not possible, shade cloth across the top will help.

Captive Diet and Feeding

Bobcat kittens can be raised on a diet of KMR™ (Pet-Ag) powder mixed 2 parts water to one part powder and post adequate weight gain and development. This formula falls a bit short in the comparative protein and fat content of natural bobcat milk, so supplementation with Multi-Milk™ (Pet-Ag), an adjustment in the KMR/water ratio or a combination of protein powder (cal-

Bobcat Growth Chart n=4

Appendix 5



cium caseinate, for example) and whipping cream added to a basic KMR mixture is recommended (Meier, 1986). Multi-Milk is readily available and can be mixed with KMR powder to raise fat levels and increase protein levels slightly. Higher protein levels can be obtained by adjusting the amount of water mixed with KMR powder. None of the suggested formulas is a perfect simulation of bobcat milk, but all work with bobcat young. If a kitten is not thriving on a particular formula or not posting expected weight gain (in the absence of other limiting factors such as illness or parasites), try one of the other mixtures. (See Comparison of Substitute Milk Formulas, Appendix I)

Use a human infant nursing bottle with a juice nipple or a formula nipple with holes large enough to pass the formula in response to the kitten's suckling. Feed the young bobcat in a ventrally recumbent position, not on its back. Sit with the kitten in your lap on the floor or set on a table on a pad, hold the head with the chin parallel to the floor and let the kitten nurse from a natural position. As the kitten's strength and coordination develop, it may brace its front end up on its forelegs. Later, it may sit back on its haunches or stand and take the bottle in its front paws. Once it starts eating from a dish, beware. Bobcats are very protective of their food and dishes, and removal of a dish without an immediate substitute may result in a slashed hand.

Upon intake, kittens should be warmed and stabilized before any feeding is attempted. First feedings should be of a warmed electrolyte solution such as Entrolyte™ (Beecham), one-half strength Lactated Ringers' Solution with 2.5% Dextrose, or similar osmotically balanced solution. Once the kittens are hydrated and sucking well, gradually introduce mixed formula with the electrolyte solution, 25% per day, until the kittens are taking full strength formula. Some kittens may not take well to the electrolyte solution, so the process of introducing formula may have to be accelerated. If diarrhea occurs, dilute the formula and work up gradually to full strength.

Kittens should be fed every 2 hours over a 16-hour day, or at least 8 times a day, for the first 10-14 days. Smaller feedings at a higher frequency may be needed to meet the caloric needs of the infants and to prevent bloating or diarrhea from overfeeding. Bobcat kittens should receive 35-40% of their body weight in daily feedings as a rule of thumb. (See Feeding Chart, Appendix II)

Reduce the number of daily feedings gradually, starting after the eyes open at 9-10 days. Strained baby meat, rice or high-protein baby cereal may be added to the formula in small amounts, keeping the mixture fluid enough to pass through the nipple without danger of aspiration to the kitten.

Small bites of cooked chicken or turkey may be offered after three weeks of age. Kittens should be encouraged to lap at four weeks and take solid foods from a dish starting at six weeks of age. Weaning should be complete at two months, when the lacteal dentition has fully erupted. Wean to a high quality diet such as Zu-Preem Canned Exotic Feline Diet™ for the best balance. Killed mice and chicks should be part of the diet by 2 1/2 months of age. Live prey training can be initiated at 2 1/2 months, but a balanced diet should continue to be offered during the entire captive period. The kittens should be hunting well and killing prey by four months of age. Depending on the season, release can take place anytime after four months.

A multi-vitamin supplement is recommended during the entire captive period. Special attention should be paid to providing sufficient Vitamin A. Calcium and phosphorus should be in the correct proportions as long as recommended commercially prepared diets are being fed. Significant deviations from these diets should be examined and the calcium/phosphorus ratios adjusted as needed.

Adults in rehabilitation will eat 1 1/2-2 pounds of food per day on average. They may not recognize commercial diets as food, so every effort should be made to provide natural prey items such as mice, rats and rabbits (occasionally chicks or quail). Vitamin-mineral supplementation with Vionate™ (Rich Health), at 1 tablespoon per 15 pounds body weight, is recommended.

Restraint

As the kitten grows and develops, it may become uncooperative about being handled regularly. This is good, except the kitten may decide to become unsociable during a period when daily hands-on care is still necessary. Therefore, it is wise to be prepared to utilize restraint techniques that allow the caregiver to do his or her job without unnecessarily traumatizing the kitten.

A good net, with a short handle, 12" diameter hoop and deep net, is an excellent restraint device. The cat may be scooped into the net, confined in the lower end by twisting the net around the hoop, and laid on a flat surface for examination or injections. Throw a towel over the cat's head to minimize external stimuli and to prevent it from biting.

A cat sack, either a commercial product with multiple zippers and Velcro fasteners, or a homemade one of heavy canvas, which will confine the body but leave the head free, may be used

for administering oral medications, cleaning ears or treating facial wounds. A nylon quick-release muzzle may also be used to prevent biting.

A squeeze cage is almost a must for handling medium to large carnivores of any type. The animal can be restrained against one side of the cage for administering injections, treating wounds, or force feeding. A commercial squeeze cage is expensive, but worth it for the rehabilitator or center working with large wild animals.

Chemical restraint or anaesthesia is necessary to treat broken bones or for suturing wounds, or for changing dressings and even evaluating the cat's condition upon intake, if it is an adult. The animal should be closely monitored during the period of sedation and protected against hypo- or hyperthermia, drying of the eyes due to lack of blink response and side effects of sedation or anaesthesia such as convulsions or choking. Chemical restraint should only be undertaken under the supervision of a vet or individual trained in the use of chemical restraint techniques.

Illness and Injury in Bobcats

Bobcats are susceptible to most of the same diseases as domestic cats, including feline panleukopenia (feline distemper), rabies, feline infectious peritonitis (FIP), feline upper respiratory disease (FURD), and possibly feline leukemia virus (FeLV) (Fowler, 1986b). Vaccines are available for some of these diseases, and prevention is much easier than attempting to cure an infected animal. In many cases, there is no effective treatment, and the animal dies.

Feline panleukopenia is primarily a disease of the gastrointestinal tract, characterized by vomiting, diarrhea and signs of fluid and electrolyte loss. Treatment is supportive in nature, with intravenous fluids and nourishment, until the animal dies or the disease runs its course. Animals that have survived the disease may still shed the virus for weeks after recovery. These should be housed separately or exposure should be limited to animals with a known immunity, either from recovery or vaccination.

Vaccination with a killed-virus vaccine is recommended for all new arrivals. Neonates which have not received colostrum from the mother should be inoculated at two weeks, four weeks, eight weeks, twelve weeks and 16 weeks with killed-virus vaccine. Modified-live virus vaccines may be used after one or two initial KV doses if killed is unavailable.

Neonates which are known to have received colostrum should receive KV at eight weeks, twelve weeks and 16 weeks. Those with an unknown immune status should receive the vaccines as recommended for colostrum-deprived neonates (Fowler, 1986a).

Adults should be isolated upon intake and vaccinated immediately with KV or MLV vaccine. Pregnant females should not receive MLV because it can cause cerebellar hypoplasia in the fetus, resulting in ataxia.

Rabies attacks the central nervous system and is always fatal. It also has significant zoonotic potential for human beings. Observe strict hygienic procedures - disposable gloves, mask, gown or long sleeves to protect the arms - when handling an animal displaying CNS disorder symptoms. Bobcats with rabies are reported in small numbers each year, and they have usually contracted the disease from encounters with skunks. Only *killed-virus* vaccines should be used if you routinely inoculate wildlife patients for rabies prior to release but be aware that the efficacy of killed virus vaccines is still in question when used in non-domestic animals. However, modified-live rabies vaccine should **NEVER** be used because it could cause rabies in non-domestic species.

Feline infectious peritonitis is caused by a coronavirus which affects the serous membranes, liver and kidney. It occurs in two forms, effusive (wet), characterized by accumulation of fluids in the body cavity and non-effusive (dry), which may involve the spinal cord, liver, lungs, eyes, kidney and brain. Clinical signs may include an acute depression, anorexia, fever, weight loss and abdominal distention. Analysis of sera from the effusive form will confirm the presence of FIP. Treatment is supportive in nature, but the disease is usually fatal. A vaccine for use in domestic cats is available, and there is a test for the presence of the virus in animals not exhibiting clinical signs of illness.

Feline upper respiratory disease covers a wide variety of calici- and rhinovirus-caused illnesses. Also, *Chlamydia psittaci,* a feline herpesvirus, and some reoviruses are found associated with feline respiratory disease. Symptoms are similar: nasal and ocular mucus discharge, sneezing, excess salivation, anorexia and fever (103-105 °F, 39.4-40.5 ° C). The animal will lose weight and dehydrate due to its reluctance to eat or drink. Pneumonia may proceed from virulent infections. Maintaining hydration and nourishment in a wild cat, especially one as unsocialized as a bobcat, may present the greatest obstacle to recovery.

If the cat is prostrate, intravenous support may be possible. A pharyngostomy tube may be inserted for gavage feeding, but the need for constant restraint and handling to accomplish this may be too difficult for the care-

giver and chronically stressful to the animal. This should only be undertaken under a veterinarian's supervision.

Isolation of animals exhibiting signs of respiratory distress is vital to prevent the spread of disease. Aerosols (sneezing, nasal discharge, salivation) and contaminated fomites (food dishes, bedding and the hands of the care-giver) are the major means of spreading disease. The virus may persist in carrier cats.

Again, preventative vaccination is better than attempting to cure the disease. MLV vaccines used in domestic cats may be administered at the same time as feline panleukopenia vaccines.

Feline leukemia virus may occur in wild felids, usually transmitted by feral domestic cats (or even a care-giver's own house pets). The virus itself is immunosuppressive in nature and generally results in the development of cancerous tumors or diseases from other infectious agents. Testing and vaccine are available. Animals that test positive for FeLV should be euthanized rather than returned to the wild, even if they display no symptoms of illness.

Bobcats carry the usual load of internal and external parasites: ascarids, tapeworms, whipworms, hookworms, mange mites (especially *Notoedres*), ear mites, fleas and ticks. Fecal samples from all animals should be checked upon intake and appropriate measures taken to eliminate existing internal parasites. Prophylactic treatment every two to three weeks during the rehabilitation period is recommended, for as long as possible. Anthelminthics that can be administered in food may work best. Before using any anthelminthic drug, consult a veterinarian or authoritative source for drugs suitable for use in wild felids.

Dust for fleas and ticks upon intake and keep the housing area dusted to prevent reinfestation. *Borrelia burgdorfferi*, the causative agent for Lyme disease, has been reported in ticks found on bobcats in Texas.

Ear mites in bobcats, especially adults, require several days or even weeks of treatment. The ears must be thoroughly cleansed with an otic cleaning solution daily and miticidal drops administered 2-3 times daily. The animal must be restrained tightly in order to provide treatment. (See Restraint). Sedation may be necessary in extreme cases. Consult a veterinarian before using any restraint chemicals on bobcats.

Coccidiosis, caused by protozoan parasites of the genus *Eimeria*, is a common problem in wild felids. Stress or unclean housing may be causative agents. Treatment is usually with Albon™ (sulfadimethoxine).

Injuries to bobcats that result in their being brought to rehabilitators are most often caused by human beings and their pets. An adult bobcat can usually elude or stand off dogs, kill cats foolish enough to challenge it and generally make itself scarce in times of threat. Their curiosity gets them into trouble. Quick movements catch the eye, and a piece of foil dangled over a trap lures a bobcat into a bad situation. Something across the road gleams in a car's headlights, and a bobcat may suffer anything from a glancing blow to serious injury, concussion or broken bones. Occasionally a hunter may wound a bobcat, but the cat is most likely to go to ground to try to heal on its own.

Bobcats injured badly enough to be taken in hand are in serious condition. In the case of head injuries, good supportive care, quiet, isolation and judicious use of steroids may be adequate treatment. A badly-concussed cat may be dazed for days or even a period of weeks, exhibiting a lack of concern with its surroundings and a deceptively passive nature. It may recover quite suddenly and revert to normal bobcat behavior, attempting to dismantle its enclosure and its care-giver. If this is the case, release it as soon as possible back into the area where it was found. Recovered adult bobcats need little backup support.

In most cases, injuries can be cleaned and treated with a long-acting antibiotic, and the cat can be released within 48-72 hours. Little is gained by confining a bobcat that is capable of surviving on its own. Extensive damage to a bobcat's hunting equipment, the paws, claws and teeth, may render it unreleasable. In such cases, consult a veterinarian and consider whether the cat could be maintained as an exhibit animal in captivity. Usually this is not a good choice for the animal, and euthanasia is a more humane solution.

In cities, bobcat "pets" which have been physically mutilated - declawed, defanged, neutered - are frequently dumped when their aggressive natures kick in. Most of these animals starve or are destroyed by city animal control officers. Some may find their way to a rehabilitator. Since these animals are unreleasable, there is little future for them. Some may retain sufficient charm to become display animals in a nature center, or one or two might be held by a rehabilitator as role models for imprinting cubs. They do not make good surrogates or foster parents in most cases.

Release

Captive-reared kittens should be able to hunt and kill prey efficiently, be wary of humans and domestic animals, and demonstrate a nasty disposition toward everything before they are released. Although the kittens

stay with the mother in the wild until they are 6-9 months old, they have been hunting with the mother since they were three months of age. Their first dispersal takes them to the edge of her home range. By 12-14 months, or when they reach sexual maturity, they have established territories and home ranges of their own, separate from their mother's.

Release can begin at four months of age for kittens demonstrating the necessary skills and attitude. Hacking out at a release site is better than a cold release into new territory, as it gives the young ones an opportunity to become acquainted with the site and have a backup source of food if times are hard. Unless you are able to carefully study and evaluate the suitability of a release site from a bobcat's point of view, avoid a cold release.

Set up a roomy cage and nest box at the release site and allow the young cats to become familiar with the smells and sights of the area for a few days. Open the cage door and fasten it open so the kittens can come and go at will. Leave food just outside the cage each afternoon, an hour or two before dusk. The kittens may come back for several days or even a week or two, or they may just bolt into the brush and not return. If one seems to be staying around the hack site and not venturing far away, it may need to be taken back into care and allowed to develop its instincts better.

Kittens four months of age or older and weighing 6-8 pounds (2.5-4 kg) are good candidates for release. You may want to see the back of them before that, if you have done a proper job rearing them, but their survival chances are poor enough under the best of circumstances. If there is any question about a cat's ability to survive in the wild, delay its release until a more propitious time. Some bobcats may develop more slowly than their litter mates and need more time to adjust to life on their own. Hold them at the hack site longer, select a more remote release site, or wait until a better time of year in terms of weather or prey abundance.

Conclusion

The North American bobcat is a very attractive, reclusive animal with a wide distribution and a low profile. Care of bobcats is challenging in the extreme, but the reward comes when a youngster is released back to its native wild, prepared to meet the challenges of its continued survival. That chance of survival would not have been possible were it not for wildlife rehabilitators and their efforts to preserve wild things.

Working with bobcats is a challenge. Rehabilitation of adult or young bobcats is best undertaken by the experienced rehabilitator with an understanding and tolerant veterinarian. Raising bobcat kittens is equivalent to raising hell.

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Appendix I
COMPARISON OF SUBSTITUTE MILK FORMULAS

	% solids	% protein	% carbohydrates	% fat	Kcals /gm
Bobcat Milk	21.70	10.20	4.50	6.20	
KMR-1	17.05	7.56	4.59	4.57	.92
KMR-2	21.48	9.52	5.78	5.76	1.13
KMR/Multi-Milk-3	21.09	8.93	4.84	6.58	1.15
Multi-Milk	97.00	22.50	0.00	41.25	6.15
KMR powder	97.00	43.00	26.10	26.0	5.12

KMR-1 is 1 part KMR powder mixed with 2 parts water
KMR-2 is 1 part KMR powder mixed with 1.5 parts water
KMR/Multi-Milk-3 is 1.25 parts KMR powder:.25 Multi-Milk powder mixed with 2.25 parts water (1.5 parts mixed powder:2.25 parts water). Formulas are based on values given in Pet-Ag publications "Mother's Milk is Nature's Most Perfect Food" and "Multi-Milk," promotional brochure. A Lotus 1-2-3 Spread Sheet program was used to extrapolate values and determine formulas. A "part" is any equal measure by volume: teaspoon, tablespoon, cup, etc. Approximate weights of various volume measurements are:

Product	**Multi-Milk**	**KMR**	**Water**
Spoon in product	4.6 g	5.6 g	14 g
Tablespoon measure	5.5 g	6.4 g	15 g
1/4 level measuring cup	20.0 g	23.0 g	60 g

Appendix III
TOOTH ERUPTION IN THE BOBCAT
Lacteal or Milk Dentition

The following is an approximation of times of tooth eruption in the bobcat, *Felis rufus*, based on Tumlinson and McDaniel, 1984 and "Dental Development - Eruption of the Teeth" in the Merck Veterinary Manual, 5th Edition, Otto Siegmund, editor, and personal observation.

Deciduous tooth	Age of cat at eruption
Incisor 1	2-3 weeks
Incisor 2 & 3	3-4 weeks
Canine	3-4 weeks
Premolar 1	none
Premolar 2	none
Premolar 3	4-5 weeks
Premolar 4	5-6 weeks

Deciduous teeth are fully erupted by 8 weeks of age. Replacement of lacteal dentition is complete by 5-6 months of age. Elements of both lacteal dentition and permanent dentition may be present in juvenile bobcats, as deciduous teeth are replaced from the lingual side and displaced anteriorly. Carnassial dentition in the lacteals is accomplished by Premolar 3 (upper) and Premolar 4 (lower). Adult carnassial dentition is formed by occlusion of the upper and lower combination of Premolar 4 and Molar 1 (present only in adult dentition).

Appendix II
BOBCAT FEEDING GUIDELINES
(Formula Feedings)

Weight (Approx)		5% max. per	BMR Kcal/day		#feedings/day # cc's/feedings			
Lb/Oz	Gm/Kg	feeding	1x	3x	4	6	8	10
6	170	8.5	18.533	55.6	*	9.7	7.2	5.8
8	225	11.3	23.020	69.1	*	12.0	9.0	7.2
10	285	14.2	27.232	81.7	*	14.2	10.6	8.5
12	340	17.0	31.168	93.5	*	16.2	12.2	9.7
14	400	19.8	35.010	105.0	*	18.2	13.7	10.9
16	454	22.7	38.716	116.1	*	20.2	15.1	12.1
1 lb 2 oz	510	25.5	42.245	126.7	*	22.0	16.5	13.2
1 lb 4 oz	570	28.5	45.739	137.2	*	23.8	17.9	14.3
1 lb 6 oz	625	31.2	49.146	147.4	*	25.6	19.2	15.4
1 lb 8 oz	680	34.0	52.418	157.3	*	27.3	20.5	16.4
1 lb 10 oz	740	36.9	55.680	167.0	*	29.0	21.8	17.4
1 lb 12 oz	795	39.7	58.879	176.6	*	30.7	23.0	18.4
1 lb 14 oz	850	42.5	62.022	186.1	*	32.3	24.2	19.4
2 lb	905	45.4	65.058	195.2	50.8	33.9	25.4	20.3
2 lb 3 oz	1 kg	50.0	70.000	210.0	54.7	36.5	27.3	21.9
2 lb 8 oz	1.1	56.7	76.923	230.8	60.1	40.1	30.0	24.0
3 lb	1.4	68.0	88.205	264.6	68.9	45.9	34.5	27.6
3 lb 8 oz	1.6	79.4	99.023	297.1	77.4	51.6	38.7	30.9
4 lb	1.8	90.7	109.415	328.2	85.5	57.0	42.7	34.2

Weight (Approx)		5% max. per	BMR Kcal/day		# feedings/day # cc's/feeding			
Lb/Oz	Gm/Kg	feeding	1x	4x	4	6	8	10
6	170	8.5	18.533	74.1	*	*	9.7	7.7
8	225	11.3	23.020	92.1	*	*	12.0	9.6
10	285	14.2	27.232	108.9	*	*	14.2	11.3
12	340	17.0	31.168	124.7	*	*	16.2	13.0
14	400	19.8	35.010	140.0	*	*	18.2	14.6
16	454	22.7	38.716	154.9	*	*	20.2	16.1
1 lb 2 oz	510	25.5	42.245	169.0	*	*	22.0	17.6
1 lb 4 oz	570	28.5	45.739	183.0	*	31.8	23.8	19.1
1 lb 6 oz	625	31.2	49.146	196.6	*	34.1	25.6	20.5
1 lb 8 oz	680	34.0	52.418	209.7	*	36.4	27.3	21.8
1 lb 10 oz	740	36.9	55.680	222.7	*	38.7	29.0	23.2
1 lb 12 oz	795	39.7	58.879	235.5	*	40.9	30.7	24.5
1 lb 14 oz	850	42.5	62.022	248.1	*	43.1	32.3	25.8
2 lb	905	45.4	65.058	260.2	*	45.2	33.9	27.1
2 lb 3 oz	1 kg	50.0	70.000	280.0	*	48.6	36.5	29.2
2 lb 8 oz	1.1	56.7	76.923	307.7	*	53.4	40.1	32.1
3 lb	1.4	68.0	88.205	352.8	*	61.3	45.9	36.8
3 lb 8 oz	1.6	79.4	99.023	396.1	*	68.8	51.6	41.3
4 lb	1.8	90.7	109.415	437.7	114.0	76.0	57.0	45.6

Appendix IV
PHYSICAL DEVELOPMENT IN THE BOBCAT

Age	*Description / Activity*
Birth	weight 6-10 ounces (170-285 g); fully furred with dark spots; eyes and ears tightly sealed; very low activity level
3-7 days	weight 12-16 ounces (340-454 g); using front legs to pull itself around the box
9-10 days	eyes open (blue, darkening to yellow/brown with age); ears beginning to open
2 weeks	weight 1-1/2 pounds (454-680 g); hind legs fully functional; standing
3 weeks	weight 1 1/4-1 3/4 pounds (570-795 g); beginning play behavior and grooming; offer small bits of cooked chicken or turkey
4 weeks	weight 1 1/2-2 pounds (680-908 g); eyesight and hearing fully functional; may start lapping from dish
5 weeks	eating soft and semi-solid foods
8 weeks	meat fully integrated into diet; lacteal dentition complete
9-10 weeks	juvenile pelage replaced; coat darker but still spotted
10 weeks	start live-prey training
16 weeks	prepare for release; weight in 6-8 pound (2.7-3.6 kg) range
8-10 months	reach adult weight*
1-2 years	sexual maturity*

*Females peak sooner than males in terms of adult weight and sexual maturity, but they are smaller than males on the average.

Continued from page 5 "Organizational Problems"

Nonprofit staffs often expect too much. They do not understand that board members—volunteers with full-time jobs of their own—are rarely willing to exercise initiative or take on extra tasks. Instead, boards usually want to be told what is needed and what they absolutely must do.

The staff's failure to provide board members with leadership and to suggest sparing but clear-cut expectations of performance, tied to each board member's own interests and abilities, is often why they end up doing nothing.

But providing that kind of guidance can backfire. Boards also end up doing nothing when the staff assumes too much leadership and is so powerful that board members feel they have no special contribution to make or role to play. If staff members want the board to participate in fundraising and other organizational maintenance tasks, they would be wise to engage the board in substantive policy discussions and program development as well. The hardest working board members are those who share the organization's vision and clearly recognize that they are helping in its realization.

PROBLEM 10. Overactive Boards

Then there's the opposite complaint—the board is viewed as meddlesome, mistrustful, and domineering. This is the board that seems to expect and demand too much, is never satisfied, and injects itself too deeply into the day-to-day affairs of the organization. It is often made up of people who founded the organization or who helped run its programs as volunteers. They have a clear picture of how things should be done (the way they did it) and can't seem to let go.

The staff tends to respond in one of two ways: either it resists, which generally leads to more mistrust and interference, or it submits, trying to do everything the board wants, only to become increasingly resentful, uncreative, and disaffected. The result in both cases is usually continual turnover of staff leadership.

Contrary to what most staffs believe, the problem here is generally neither a power-hungry board nor a board that is ignorant of its proper role. More often it is a board so deeply committed that it has a hard time finding a way to feel useful without getting overly involved.

The board's "interference" is thus actually a misdirected expression of its caring. The challenge for both the board and staff is to work together to find appropriate ways to channel that energy and dedication, not squelch it.

This does not mean it is all right for the interference to continue. An overbearing board can be costly to an organization's effectiveness.

Continued from page 18

No staff can perform well in an environment where it is being second-guessed, undercut, or feels that its competence and judgement are in question. Staffs need validation and support from their boards just as much as they need oversight and holding to account.

The value of boards lies in their ability to maintain a broad perspective and offer a fresh point of view, not to get caught up in organizational detail. Sometimes, indeed, the most important contribution a board can make is to keep alive a sense of vision and purpose for a staff that has become so overwhelmed by everyday demands that it has lost sight of what its job is really about.

Susan Gross is co-director of the Management Assistance Group, a nonprofit management counseling group that helps nonprofits diagnose and deal with their organizational problems. MAG has offices in Washington, D.C., and Santa Barbara, California. Reprinted from Exchange Summer 1991 with permission of the Land Trust Alliance in Washington, D.C..

Letters To the Editor

Dear Jan:

I am writing in response to your editorial in the summer 1991 *Wildlife Journal*. I have been involved with wildlife rehabilitation for over twenty years. By profession I am a high school science teacher and that pays the bills for my "kitchen table" rehabilitation operation which averages about two hundred animals a year. I have attended IWRC and NWRA conferences and enrolled in the basic and advanced rehab courses offered by the IWRC.

A "holier than thou" attitude on the part of some rehabilitators has no place in wildlife organizations. Rehabilitators I know spend most of their time feeding, cleaning, and housing the wildlife in their care. The public puts additional demands on our time. For one rehabilitator to make allegations against another is absurd and often self serving. We have all experienced times when our resources, time and efforts have been stretched beyond tolerable limits. Can an accuser honestly say that he or she never used practices now being condemned? If so then that person should receive an award as the worlds first perfect rehabilitator.

I do not believe volunteers serving on a national board should be removed due to allegations from another rehabilitator. In fact rehabilitators making such allegations should be investigated to determine motives. If the charges and motives are not legitimate then the accuser should be removed from any office he or she might hold.

Finally, if anyone in the wildlife rehab community has a problem with the way I operate I will gladly turn all two hundred of my annual referrals over to them and begin to enjoy something I haven't had for years - time I can call my own.

Sincerely,
David Taylor, Byfield, MA

Dear Jan:

As a Member of IWRC, I read with great interest your article on "Rehabilitation Notes: The Raccoon" (Volume 12, No. 4). It was excellent and very informational. I wanted to share something we have learned about nipple size for the raccoon. On the newborns 0-3 weeks, we discovered the orthodontic nipple (slow flow) works just great. The hole should be pointed to the roof of the mouth. This nipple does fill the mouth of these little ones, but we have found them to be quite successful. After 3 weeks of age, then transfer them to the preemie nipple for a couple of weeks, then the regular nipple if needed before learning to lap from a dish. Try this nipple next spring and see what you think. You might look for them in the months ahead, because sometimes they're hard to find. This is a "Playskool" nipple, but Gerber makes them too. (Maybe some others too.) Just be sure it's newborn and slow flow.

Best wishes,
Sharon Goff, Kansas City, MO

Dear Jan:

I thought the readers of the Journal would like to know that syringes with teflon O-rings like those mentioned in *Wildlife Journal* Vol. 14 No. 2 ("Simple Things That Make A Difference: Catac Nipples and O-Ring Syringes" by Emmy Reese) are available direct from a distributor. It may be cheaper to buy them direct from Baxa than from a pet store.

Baxa Corporation distributes the syringes which are called Exacta-Med dispensers and are made in Denmark. Their catalog lists them in 1ml, 3ml, 5ml, 10ml and 20ml sizes, perhaps if enough rehabbers like myself who tube larger birds ask them, they might market a 30ml size?

Baxa were nice enough to mail us some free samples when we first wrote to them, they also have an 800 number: Baxa Corporation, Denver, Colorado 80112. Tel 1-800-525-9567

I'm looking forward to future issues of the *Wildlife Journal*. Some of the mammal rehabbers in Project Wildlife here in San Diego would be interested in an article on the vaccination of native mammals such as raccoons, coyotes and gray foxes. We realize that few vaccines are licensed for the purpose, but are there any rehabilitators who are currently vaccinating these species? What do people do with animals kept for education or foster purposes? The last journal article on this topic was in 1983. Anyone out there with experiences - whether good or bad?

Sincerely,
Meryl A. Faulkner
Project Wildlife
La Jolla, CA

Dear Members: I received an anymonous letter for the editor. Like most publications, we do not print letters that no one is willing to sign. If the person wishes to send us a copy with a name and address, we would be happy to print the letter.

Considerations In Using Live Animals for Education

Susan Heckly
The Lindsay Museum
1901 First Ave
Walnut Creek, CA 94596

Introduction

Education is perhaps the most important part of wildlife rehabilitation. Unless we educate the public about wildlife and the environment, we will continue to see the number of injured, orphaned, and displaced animals increase. Using wild animals as educational tools is very effective; these animals can help people make a personal connection with nature.

When we make the decision to use a wild animal for education, that animal's life is in our hands. We must act reasonably and humanely.

How Do We Choose Appropriate Animals to Use?

Only non-releasable animals should be used for education and display. Animals that are potentially releasable should never be subjected to the additional handling and human exposure that educational use entails. This handling and exposure will give a releasable animal a disadvantage at release time, because it may not be wary enough of people. Unfortunately for the animals but fortunately for educators, there doesn't seem to be a shortage of non-releasable animals, allowing those groups who wish to use educational animals a ready supply.

The animal's condition must be considered in the decision to hold an animal for educational purposes. Some injuries, such as the loss of a leg in a bird, will preclude a life in captivity because of complications, either immediate or long-term. Education is often easier with a visibly handicapped animal, but that handicap must not interfere with the animal's basic functioning. The animal must be able to eat, defecate, urinate and move about in its enclosure without further damage to itself.

An animal's temperament also determines suitability for life in captivity. Overly aggressive animals or animals that do not accept captive life are not candidates for educational use. Safety of the handlers and keepers is important when dealing with aggressive animals or human-imprinted animals that can be unpredictable. To keep an animal that is so stressed by captivity that it is likely to injure itself or ultimately create a life-threatening stress-related illness is also not humane - nor does a visibly stressed animal provide a good model of caring to the public.

When we choose an animal to use for education, we take on the responsibility of that animal for its life. We must consider the animal's life span and its needs through the seasons and years when determining whether or not we can adequately care for the animal. Although euthanasia, because of non-releasability, is often the only alternative to educational use and life-long captivity, once we make the decision to use an animal for education, we are committed to its care, remembering that long-term animal care is very expensive.

Housing is a major consideration, both for the animal's well-being and its educational aspects - i.e., habitat design can help the animal feel comfortable while educating the public about its natural environs. This too, can be expensive - as the animal deserves, and the public often demands good, roomy housing.

How Do We Determine Appropriate Use of Educational/Display Animals?

The focus of the educational program must be determined before plunging into the responsibility of keeping non-releasable animals. What is

the message you want to spread, and what kind of programs can help you attain your goals are two questions that must be answered. Can such a program be just as effective using photos, prepared skins, or other models?

Once such a program is set up, the number of programs you will be giving will determine the number of animals that are kept (as well as any specific conditions of your permit). It is important not to overuse any one animal, but animals kept for education should be utilized in educational programs. Animals should *not* be kept just for the sake of keeping them: they must serve a purpose in order to justify a life in captivity.

Education with animals occurs in organized programs, such as classroom presentations, but non-releasable animals on display in a facility also educate, if the display is set up to emphasize education, *not* entertainment.

Handlers must receive special training, different from that required for rehabilitation care, that emphasizes education, not entertainment or pet qualities.

Conclusion

It is important to carefully consider all aspects of keeping animals for education prior to setting up such a program. Such programs must establish clear policies and procedures for the care and range of activities for the animals and people involved. Through these policies, educational consistency is maintained, providing the best care for and most effective use of the animals. Quality educational programs don't just happen—they are carefully considered, planned, executed and evaluated. Wildlife rehabilitators will find their rewards in wildlife education commensurate with the amount of effort they put into designing and implementing a quality program.

Errata:

In Vol. 14, No. 2, Rehabilitation Notes: Red & Gray Foxes, the chart labeled Appendix 2 should read as follows: Line two is KMR ***not*** *Esbilac. Under the line with KMR/Multimilk (3:1) powder a new entry has been made for Esbilac powder which is 97.0% Solids, 33.2% Protein, 43% Fat and 15.8% Carbohydrates based on dry weight. Our reprints have also been corrected.*

Additionally, Pet-Ag has added the amino acids arginine and methionine to Esbilac. Hence they have corrected the deficiency that was suspected to have caused several nutritional cataracts in the 1970's which were mentioned in the article.

Continued from Page 8 "Cliff Swallows"

19-24 grams and may lose weight when they become more active and independent.

In late September, sudden temperature changes trigger hormonal responses in the birds (Terres, 1980). Feeding picks up and insects with high fat concentrations are consumed along with some vegetable matter (Gross, 1982). The birds band together with other colonies and form huge flocks. The young and a few stragglers stay around the nesting area. In the fields the birds all congregate together. The author has observed thousands congregating in the Suisun Marsh.

Other birds such as Brewers Blackbirds, Red-wing Blackbirds, and House Finches have been witnessed congregating with Cliff Swallows. Then one night in the fall (around October 13th), they disappear as suddenly as they arrived in the spring. The Cliff Swallows migrate south to southern Mexico, Central America, and some South American countries. Argentina is one of the primary wintering grounds for this species (Terres, 1980).

Editor's Note: This is part I of two parts. The rehabilitation section will appear in Vol. 15, No. 1.

References

GROSS, A.O. 1982. *Northern Cliff Swallow*. National Museum Bulletin 179 Washington, D.C.

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TERRES, John K. 1980. *Audubon Society Encyclopedia of North American Birds*. New York: Alfred A. Knopf, Inc. pp. 866.

Errata:

In Vol. 14, No. 3, "Wildlife Response on the North Slope," we should have acknowledged David Thraen for his hand drawings that were used by Alaska Clean Seas to produce computer graphics for the article. Thanks, David!

Continued from Editorial Page 2

The second level of supervision is more management than animal care. It involves more of the leadership roles for the organization (e.g., executive director, administrator, volunteer coordinator, development directors, etc.). While knowing animal care skills is valued—what is also required is a good working knowledge of the complexities of the organization. For example, these managers need to know the important issues of the first line supervisors (worker safety issues, necessity for organizational support such as having a good system to provide efficiently for veterinary services, food supplies, or the necessity of screening out work referral community service volunteers with a history of drug abuse in a center with a pharmacy, etc.). However, they really don't need to know how many meal worms a swallow will eat in a day as long as they understand the first line supervisor or team leader will be ordering what is necessary. These second level supervisors need to have good people skills and good conceptual abilities to see where everyone fits in the mosaic that makes up the total organization. They need a good working knowledge of the interrelatedness of the technical tasks of the group—not the specifics of the technical knowledge.

Problems in Managing

In my experience, what often happens is that one of the prime movers and shakers (or founders) gets pushed up away from animal care because "no one else wants to do the managing or has the same grasp of the big picture for the organization." This often includes fundraising, board organization and interactions, public relations, and many other things that take one away from rehabilitation activities. Some people rise to the challenge—others find themselves in a place they want to leave. Most do not know how to delegate tasks and all must learn it to be successful. Learning by experience can be painful—to us and those around us.

Symptoms of poor delegation include the following: 1) some employees or board members are much busier than others; 2) the supervisor is usually too busy to talk to the workers; 3) workers are unsure of their authority; 4) employee decisions are often overruled; 5) no one ever does the job well enough to meet your standards or to get promoted; 6) no one is ever sure just who is responsible for a project; 7) the organization is plagued by slow decision making; 8) changes in plan or objectives are not passed to workers on a timely basis or, as frequently happens in our field, interested potential volunteers call but never get contacted or brought on board to help because the need for them is so great that no one has the time to train them; 9) employees are thrown into tasks without training or assigned tasks that are too difficult for their skills; 10) the supervisor intervenes in the delegated project without informing the delegatee; 11) the supervisor chronically takes work home and may even postpone or reschedule vacations because of workload.

Other problems encountered in shifting to a management role include one's need for approval and the fear of being disliked. Some new managers will not delegate for fear that the receiver of the work assignment will resent them for the particular project or the volume of work. My pet peeve is the rehabilitation director that spends a good part of their day cleaning cages to show the volunteers that even they are not above the "dirty" work. Meanwhile, work only they are trained to do remains undone—or they take it home at night. In fact, when properly briefed, volunteers and staff members will encourage the supervisor back to those tasks because they can understand the value of the work—sometimes better than the new supervisor! Interestingly, employees rate supervisors who make full use of delegation high and give low ratings to supervisors who do not delegate.

Some wildlife rehabilitation managers lack confidence in their staff and volunteers. The word is—if there *is* reason to lack confidence, then the supervisor needs to look inward for the answers. If volunteers or staff cannot handle their work assignments then the manager has hired the wrong people, assigned volunteers to inappropriate tasks, failed to provide them with appropriate training, or has not evaluated their capabilities well. The answer is to evaluate the tasks and delegatees, train or replace those who can still not meet acceptable, defined standards.

Decide What to Delegate

The purpose of delegation is to make the organization more efficient and effective. Any time the supervisor accepts a work task that can be done by the worker/volunteer, he/she can't perform work that only he/she can do. Okay, so what kind of decisions should be delegated? Functions that are in your technical or functional specialty. If you had the technical skills of rehabilitation before you became a manager, odds are that the person now in the spot you left either has or is learning those technical skills. These are often operating tasks rather than management functions. You can train them and delegate. Another type of task to delegate is one which involves decisions that you make frequently.

Minor decisions and repetitive routines

can take up a large part of the day and most, if not all can be delegated by teaching the staff or assigned volunteer the policies and procedures that apply. Another reason to delegate has to do with what work experience the task will provide for the delegatee. This is an important way of keeping people challenged and with the organization on a long-term basis. Assignments that will add to the variety of routine work assignments is also important for preventing staff/volunteer burnout. A typical example in rehabilitation is having volunteers working only intake and husbandry and not getting to go out on releases or follow-up procedures.

Another management factor to consider is the importance of cross-training. The organizational goal is to increase the number of people who can perform critical assignments. This is very important in a field with a number of unrecovered adult children of alcoholics who often try to control the organization by not allowing others to learn critical tasks—thus attempting to make the organization dependent on them. There is power in being the only one who can perform certain key tasks and it is often used as emotional blackmail. It is a pitfall that can be avoided.

On the other side, delegating tasks to people with various skills can be a way to reinforce creative talents. The good manager stimulates those under him/her with difficult problems/projects (no problem in rehab work!) and rewards creative solutions.

Decide to Whom to Delegate

Some of the key questions to ask in this task are: 1) does the task belong to a certain position or job description? 2) who in the organization has the ability or interest? 3) who would be challenged by this task? 4) who has been overlooked in the past but should be considered now? 5) who has the time to do it? 6) who is being prepared for promotion?

The Act of Delegating

This is important! When one delegates, a face-to-face, two-way discussion is central to the process. Remember, when you are delegating, you are not just pushing work down on someone else, you are consulting and helping to develop the work project or task. When the communication at this point is poor or there is a lack of trust—the result is often a lack of understanding, motivation, and a lack-luster or sabotaged effort.

When delegating the assignment make sure that these steps are included: 1)adequately describe the task/project, 2) agree on standards of performance and timetables, 3) determine if training is needed and if so—arrange for it, 4) define what is needed (resources, budget, scope of work, 5) state the frequency of feedback required, 6) define the amount of authority (read on for details) being delegated, and 7) communicate to others who is in charge of the task/project.

Assignment of a Level of Authority

In any task, various levels of authority can be assigned. An example of low authority is to assign a worker to look into a situation and report back (problem identification). Higher authority involves having the worker come up with alternative solutions complete with the pros and cons of each. Going higher, a more experienced or trusted worker might be told to make a decision and consult with the manager; higher yet is the command to handle the problem and later report the results to the manager.

The level of authority assigned depends on the confidence that the manager has in the worker. This confidence should be based on the proven ability of the worker in past tasks—not on the insecurity of a manager who feels threatened by a subordinate with good skills. If a worker handles tasks well and yet gets no higher authority over time, the manager needs to again look inward for the reason. Remember, job satisfaction comes from the appropriate delegation of both responsibility *and* authority.

Conclusion

There is a lot of good, applicable material available to assist wildlife rehabilitators become better managers. It may not be specifically written for this field, but none the less should be required reading for those who are in charge of wildlife care programs.

The more we know, the better we can become and the more professional our programs will be. Learning the basics of delegation is an essential step for those who manage wildlife care programs—whether in a home care network or in a center. The more we focus on overall organizational goals—the more we realize how important good managerial skills are to people on all rungs of the group. Let's make this the decade that wildlife rehabilitation jumps to new heights in professionalism!

-Jan White, DVM-

Book Review

Atlas of Avian Radiographic Anatomy

Stephen and Bonnie Smith
W.B. Saunders Company
Independence Square West
Philadelphia, PA 19106
Price $65.00, 226 pgs.

Few veterinary medical books even mention wildlife rehabilitators, so it stands to reason that when one does, it deserves our special attention. *The Atlas of Avian Radiographic Anatomy* by Stephen A. Smith DVM, PhD. and Bonnie J. Smith, DVM, Ph.D. is one such extraordinary book whose stated goal is to provide a reference of normal radiographic anatomy for selected species bred by avian fanciers, as well as "avian wildlife species that are presented to veterinarians and wildlife rehabilitators." This book is a tremendous achievement in comparative avian radiographic anatomy and is sure to be an important resource for the wildlife rehabilitator.

To accomplish their considerable objective, the authors have included chapters on the red-tailed hawk, the great horned owl, the mallard duck, and the ring-billed gull along with the species of "companion birds" such as the budgerigar, amazon parrot, etc. Additional views of other wildlife species are included, such as the osprey, barn owl and trumpeter swan, to demonstrate unique anatomical features of these species. Of course, not all species are represented and some may desire studies on cranes or pelicans, for instance. However, the reader can quickly gain confidence in radiographic evaluation of different avian species by using the radiographs and xeroradiographs included for comparative purposes.

Xeroradiographs are high resolution images produced by a massive amount of x-rays striking electrically charged metal plates. A special type of xerox machine then directly produces a paper copy of the plate. Although the technique is not generally available outside of research institutions due to radiation concerns, comparing a subject's xeroradiographs to conventional radiographs provides a wealth of explicit detail.

Xeroradiography must be very similar to the way things appear to Superman using his x-ray vision. Not only is every bone visible, but the soft tissue detail is complete right down to the slightest feather plume. By including xeroradiographs, the authors have effectively overcome the usual shortcomings of printing shades of grey otherwise obvious on the original radiograph film. Furthermore, the detail of a xeroradiograph remains excellent even though the image size may be reduced for printing purposes.

The authors also demonstrate great attention to detail in other ways. For instance, readers will appreciate the additional examination given to wings, including ventrodorsal, and cranio-caudal views of the shoulder, elbow, and carpus. Also, each species' chapter contains a helpful summary of typical problems diagnosed with radiographs. This can serve as a quick primer on pathology, although all the studies in the book are of normal anatomy. Indeed, the only area in which this superior attention to detail is somewhat lacking, is in the medical illustration. The reader will have to rely on other text's drawings to understand the boundaries of air sacs, or the individual bones associated with the carpus for instance. However, I suspect it is too much to ask that one book contain all the answers on avian anatomy.

If you have ever wanted to clearly see the radiographic image of the raptor humeroscapular bone, or an egg within a bobwhite quail, then you need this book. Once you have seen in beautiful detail the elongated trachea of the trumpeter swan, you too will trumpet with delight. This text is a wonderful resource of normal avian anatomy that will eliminate much of the radiographic guesswork from the lives of wildlife rehabilitators and veterinarians. It deserves a special place on your bookshelf and would be a terrific gift of appreciation to any veterinarian that works with avian wildlife.

The author wished to acknowledge the kind technical assistance of Richard Kay, Radiology Technician, Oregon State University, College of Veterinary Medicine.

-Joanne Richards D.V.M.-

Come to Naples and See What's New in Wildlife Rehabilitation!

October 1-4th, 1992

This is our 15th Annual Conference and will be the best ever! We have been assembling an exciting program for our members and along with all the learning will be offering some of our best field trips ever. The conference site is just a short drive away from the Everglades National Park, Ding Darling National Reserve and the Audubon Corkscrew Sanctuary. Our hosts, The Conservancy, have offered the assistance of their interpretive staff to take participants out to see the natural beauty of the area. They also have a wildlife care facility nestled on their expansive property along with education facilities and a great nature/book store that you will want to visit. This is our best site ever and must be seen to be truely appreciated! We have an incredible room rate of $75 per night from the Naples Beach Hotel and Golf Club and we plan to fill the hotel. Some of these rooms have kitchen efficiencies which are available upon request—while still available! For hotel reservations and information call (813) 261-2222. Imagine eating dinner in a restaurant overlooking the Gulf of Mexico, golfing, swimming, windsurfing or taking a hike along the beach! This hotel has it all!

As become our custom, we will be offering skills seminars in advance of the conference for serious rehabilitators wanting to hone their skills. We hope to offer both basic and advanced topics this year (depending on facilities).

Early confirmed program topics include workshops on bandaging, educational use of wildlife, computers in wildlife rehabilitation, fundraising for the 1990's and avian emaciation. We have lots of papers on topics ranging from volunteer management to wildlife care and veterinary care! More program information will be mailed to members in June!

Scheduled Topics

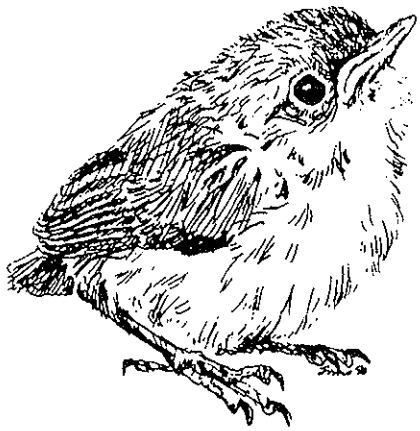
The Effects of Plastic and Latex Ingestion in Sea Turtles--Dr. Peter Lutz and Alexis Alfaro-Schulman
Public Speaking—Cheryl Millham
Choosing Education Animals Workshop—Marge Gibson
Volunteer Coordination—Leslie McCracken
Video—An Effective Tool for Fundraising—Hope Douglas
Bulletin Boards and E Mail Services—Bill Marshall
Fundraising Made Easy and Other Fantasies--Douglas Dunn
WR and State Wildlife Agencies: Uneasy Allies or Fast Friends—Marnie Allbritten
Computers for Wildlife Rehabilitation (Workshop)—Tom Millham
Designing a Fundraising Program for the '90's—Dianne Pearce (Workshop)
The Slit-Wrap: An Alternative to the Figure 8 Wrap—Joan Priest
Burrowing Owl Rescue and Rehabilitation in Silicon Valley—Joan Priest
Avian Emaciation Wkshop: Unraveling the Mysteries of Recovery-Jan White, DVM/Louise Shimmel
Rehabilitation of Bobcats—P.C. Hanes
Burn Tx in Raccoons in the 1991 Oakland Fire Storm-Susan Heckley
Emergency Care for Stranded Cetaceans—Dawn Smith, Michael Stone, Kenneth Lee
Rehabilitation of Collared Peccaries/Javelinas—Nancy Umphres and Dina Saldana
Pododermititis in Cormorants—Chris Harvey Clark, DVM
New Advances in the Treatment of Fractures—Flo Tseng, DVM
Isoflurane Anesthesia In Critical Wildlife Patients—Magdalena Menchaca-Martin, DVM
Isoflurane: A Safe and Effective Anesthetic for Sea Turtles--S. Shaw, S. Leone-Kabler, A. Schulman, and P. Lutz
Emergency Treatment of Migrating Wood Warblers—Magdalena Menchaca-Martin, DVM
Intraosseous Fluid Administration in Birds—Janna Wynne, DVM
Bandaging Workshop—Jennifer Ramelmeier, DVM
Euthanasia—Joey Richards, DVM

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Papers covering the following topics: How to Make Your Wildlife Education Programs More Effective by Marge Gibson; Home Care and Wildlife Rehabilitation by Marnie Allbritten; Squirrel Rehabilitation Project by Carol McIntyre; Handling and Restraint of Wildlife Species by Florina S. Tseng, DVM; Seal Pup Rehabilitation Program by Laurence Braun, DVM; Rehabilitation of Orphaned Sea Otter Pups by Julie Hymer; Rehabilitation of the Beaver and Muskrat by Cheryl Millham; Rehabilitation of the Coyote (*Canis latrans*) by Jeanne Wasserman; Study of 129 Coracoidal traumas, Successes Without Intervention by Kit Chubb; Radial and/or Ulnar Fractures: In Support of No Support by Kit Chubb; Current Protocol for the Rehabilitation of Oil Affected Waterbirds by Jan White, DVM; Care of Coots, Rails, Plovers and Sandpipers by Meryl Faulkner; Aspergillosis in a Rufous Hummingbird Colony by Chris Harvey-Clark, DVM; Avian Hematology: An Overview of Specimen Processing, Sample Evaluation, and Interpretation by Victoria Joseph, DVM; Basic Public Speaking for the Rehabber by Alyssa A. Ottomeier; Raising More Money in Hard Times by Bill Marshall; Hand-rearing Techniques for Raptors by Claire H. Hager and Walter C. Crawford, Jr.; Rehabilitation of Orphaned Raptors: The Fostering Alternative by Brian Woodbridge, An Investigation into the Health Status of Bald Eagles of British Columbia by Ken Langelier.

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