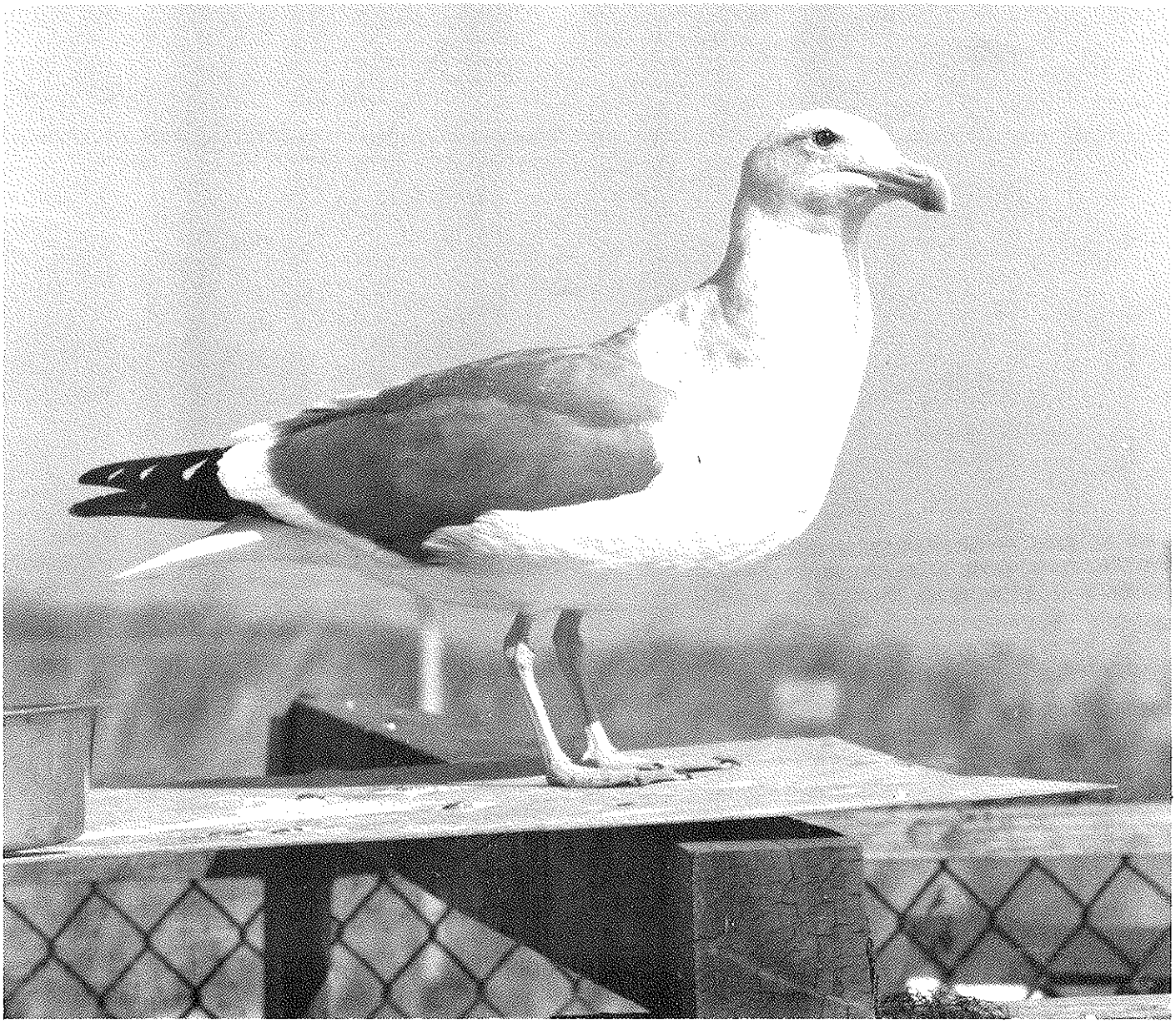
Vol. 9, No. 4

WILDLIFE JOURNAL

Journal of the International Wildlife Rehabilitation Council



Western Gulls . . . Page 3

WILDLIFE HOTLINE! A Little Help From Your Friends!

Wildlife emergencies usually happen at the most inconvenient times — leaving many rehabilitators feeling isolated and helpless. Are you a rehabilitator who can't reach your veterinarian? Are you a veterinarian who can't reach your rehabilitator? The WILDLIFE HOTLINE was designed to help people in such instances by offering advice, or referring you to an expert who can. Whether it's a "strange" animal you've never seen before...or a "problem" you've never dealt with...the WILDLIFE HOTLINE is open 24 hours a day — manned by experts who care. (And the WILDLIFE HOTLINE is not limited to emergencies. It is also available for questions regarding any kind of wildlife care. Non-emergency calls should be made during regular hours; Pacific Time.)

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Another service of the International Wildlife Rehabilitation Council.

Need Some Help?



GUIDELINES FOR AUTHORS

The following is a guideline for articles to be submitted to the WRC Journal. All manuscripts submitted to the Journal are subject to review and revision by our editors.

1. Submissions should be typed and double-spaced, with 1 inch margins.
2. Full length articles run between 1500 and 2500 words.
3. Fillers and short articles run between 500 and 1500 words.
4. The writer's name and address and organization should be typed on the first page, and name and page number should appear on all consecutive pages.
5. It is the writer's obligation to obtain permission or reprint rights if submitted copy has been published elsewhere.
6. Provide a stamped, self-addressed envelope if you wish manuscript and/or photos returned.
7. We accept black and white glossy photos only, preferably 8 × 10.
8. We pay $25 for any feature article accepted; $5 for any fillers and "Handy Hints" under 500 words.

Articles should be mailed to: Editor, WRC Journal, P.O. Box 3007, Walnut Creek, California 94598.

WILDLIFE JOURNAL

Vol. 9, No. 4

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MARKETING & ADVERTISING
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Jan White
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● The IWRC Journal is designed so you can use a 3-hole punch and store back issues in a binder for easy reference.

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President's Message

Share the knowledge, a noble goal, don't you agree? What is sharing? According to the American Heritage Dictionary, to share is "to have, use, or experience in common, to participate." Knowledge is defined as "understanding gained through experience or study . . . the range of what has been perceived, discovered, or inferred." These are broad definitions. Participating in understanding is fine, but who is to share the knowledge and with whom? What knowledge should be shared? Why even bother to share it?

Everyone involved with wildlife rehabilitation has information of use (or at least of interest) to, the active wildlife rehabilitator. Often we forget that there are others in our community, state, or country on whom we can call upon for assistance and guidance. The wildlife biologist can discuss behavior; the botanist, habitat; the veterinarian, medicine; the nutritionist, diet; the carpenter, caging; the accountant, taxes. Our questions never end, and not all questions are directly concerned with wildlife care.

Questions regarding wildlife rehabilitation can be directed to other rehabilitators. How do we find them? Both the International Wildlife Rehabilitation Council (IWRC) and the National Wildlife Rehabilitators Association (NWRA) publish membership resource directories listing members, their addresses and phone numbers. Generally, rehabilitators are friendly people willing to help others. We are not in competition with one another and have the same goal (i.e., to do our best in rehabilitating wildlife). Don't be afraid to call someone for advice.

Many times when talking to rehabilitators, I hear the disclaimer, "But I don't know anything special." Of course you do. It may be a tip on how you were able to get a poorwill to self-feed, where to get used incubators, or the name of a copy shop that offers discount rates. You have a wealth of knowledge.

What other information should we be sharing? For starters, how to care for animals: which diets are working the best, what medications are currently available for wildlife problems, what forms of exercise are yielding the best results? Methods used to recruit and train volunteers are of interest to many. If you have a successful volunteer program share it with other rehabilitators. If your records are clear, concise, and complete show others how you do it. If your fundraising and grant writing are generally successful teach others your techniques. Share the knowledge you have, and others will share their knowledge in return.

But why bother? Why should you share what you have worked so hard to learn? Why did you learn it? If the needless, and sometimes tragic, repetition of errors that you have experienced can be stopped, the treatment given to the wildlife under our supervision can be improved, and our own knowledge and understanding of wildlife rehabilitation can be broadened, you will have made a contribution. The more we learn, the more success we will have rehabilitating wildlife.

How can this transfer of knowledge and information take place? One way it can be accomplished is through a publication like the *Wildlife Journal.* Contribute your experience by sending in tips that you use. Write an article on the rehabilitation of a particular species or a case report. Write up a new technique for the person just entering the field. The article does not need to be perfect; the editors will help you.

Use the IWRC Wildlife Hotline listed on the front page of the *Wildlife Journal.* This number makes available to you expert wildlife information. You can receive timely advice, general information and referrals to others active in this field.

Participate in the IWRC Skills Seminars. These classes are now offered in many areas of the United States. Classes can be scheduled upon request for your locale. These classes teach basic wildlife rehabilitation techniques, fluid therapy, wound management, wildlife clinical pathology, and basic necropsy skills. Learn the skills that make you a better rehabilitator.

Attend conferences such as those sponsored by IWRC and NWRA. It is at these meetings that you can meet rehabilitators from around the world, listen to speakers who are experts in their fields and share your knowledge as well.

Sharing the knowledge is not only a noble goal, but also something you and I can work to attain together.

Kirstine Thorne, President

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NATURAL HISTORY NOTEBOOK:

The Western Gull

Barbara McKnight
Wildlife Care Center,
Peninsula Humane Society, San Mateo, California

INTRODUCTION

The Western Gull, *Larus occidentalis*, because of the variety of its feeding habitats, is one of the most common gulls found along the Californian coast. These gulls search for food by following fishing vessels, scavenging beaches and dumps, school playgrounds, and parking lots. They will pursue fish at sea and have been known to steal baby sea birds from their nests. Haley (1982) described them appropriately by saying "Gulls personify a tough, resourceful, aggressive philosophy of life".

DESCRIPTION

Adult Western Gulls weigh between 1000-2000 g and have a wing span of 132-142 cm (51.9-55.9") with a body length of 61-68 cm (24.0-26.7"). The adult plumage consists of a white head and rump, with body underparts, mantle, and upperwing slate-gray. Wing underparts are white. These gulls have a yellow beak with a red dot near the tip of the lower mandible, and pink legs and feet.

The average lifespan of Western Gulls in the wild is ten years although some have been known to live for 30 or more years.

RANGE

Western Gulls are found in the coastal areas from British Columbia through Baja California, Mexico. They are primarily maritime and rarely venture inland. However, after their breeding season, they may move up rivers where salmon are running (Terres, 1980). Their range overlaps that of the Glaucous-winged Gull, *Larus glaucescens*, and the two species will interbreed and produce fertile offspring.

NATURAL DIET

The Western Gull feeds on fish, clams, worms, shrimp or other invertebrates. Invertebrates such as sea urchins are dropped by the gulls as they fly to break their shells. Small mammals are caught, and the eggs and young of cormorants and murres are also eaten (Terres, 1980).

NESTING, BIRTH AND YOUNG

Western Gulls nest from May through July on off-shore islands, rocky ledges, or grassy slopes above beaches. The nests are constructed of grass and weeds to shelter the spotted buff-olive colored eggs, usually three to a clutch. The eggs are incubated for 25-29 days. Studies have shown that chicks still in the egg call out to the parents just prior to hatching (Haley, 1982). The newly hatched chick is covered with gray down spotted with black. It has solid black legs, a black beak with a white tip, and should weigh between 60-80 g (Schreiber, 1970).

In the first few hours after hatching, the chick begins to peck at the adult's beak, aiming for the red spot near the tip. This pecking may set off a complex set of behavior in the parent birds including brooding, feeding, and learning to identify their chicks (Tinbergen, 1953).

Western Gull chicks develop quickly. By the end of the first week, the wings have developed pin feathers showing dark tips, although the body is still covered with black spotted gray down. Their weights climb to 110-170 g (Schreiber, 1970). As the days pass, the chick begins to walk around the nest, pick up twigs, and generally becomes more mobile and coordinated. If it strays away from its nest and out of its parents' territory, it is attacked by other adults. By the end of the second week, the young chicks begin to answer their parents' with a high pitched



Western Gull chicks approximately 21 days old.

call and an "up and down" head movement associated with begging. In this early stage, they recognize the alarm call of their parents and freeze, hide, or run away depending on the type of cry. At three weeks, most of their tail and back feathers have appeared while the head is still fluffy with down. They weigh between 400-600 g (Schreiber, 1970). During this stage of their development, they are no longer being brooded by their parents, and may succumb as a result of adverse environmental conditions such as heavy rains or extreme winds.

By the seventh week, they are fully feathered. Their weights have reached a plateau and they are strong enough to peck at and chase intruding gulls from their territories. It is at this time that the first attempts at flight are made. They begin by running across the ground, frequently picking up twigs as they go, flying up a few feet, landing abruptly and starting over again. Within a few days, they leave their parents' territories, gather with other gulls their age, and make progressively longer flights.

Parental feeding gradually tapers off once the juveniles have joined a group of their peers. At the end of the seventh week, most of the chicks have fledged, but still need some food from their parents. The "humble posture", heads held low, keeps hostile encounters to a minimum as they approach adult gulls for food. Their begging continues through autumn, since they are still inefficient at finding food. The mortality rate among first year gulls is high, about 20% of the young die between mid-August and September, and another 20% die between September and January.

During the first year of life, the young gull spends most of its time in search of food. Plumage during the first year is speckled brown with a tan body which changes to a dark gray as the months pass into the second year. It is at this time that the legs are fading from black to light gray. The mortality rate during the second year is between 15% and 25%.

As the Western Gull progresses into its third year, the mortality rate has dropped to about 12-15%. The feathers have become much lighter in color - the mantle is gray, but the neck and body are white.

By the fourth year, Western Gulls are seen in breeding groups with complete adult plumage except for a little brown near the red spot on the beak. White spots on the wing tips (called mirrors) do occur, with a few dark spots near the tip of the tail feathers.

A critical stage in the gull's life is the establishment of a breeding territory. By this time, it has survived some migration flights, several winters and competed for a limited food supply. Most Western Gulls reproduce in their fourth summer; however, some females reproduce in their third summer.

The interactions between a pair of breeding Western Gulls is very complex. The pair must have been together for several years in order to create a bond strong enough to gain and defend a territory, and corrdinate efforts in incubation, food gathering, and nest guarding (Haley, 1982). When one considers that approximately 80% of young gulls die by their fourth year, and that the adult pair must have a lengthy association prior to successful nesting, it is a wonder we see so many of these handsome birds.

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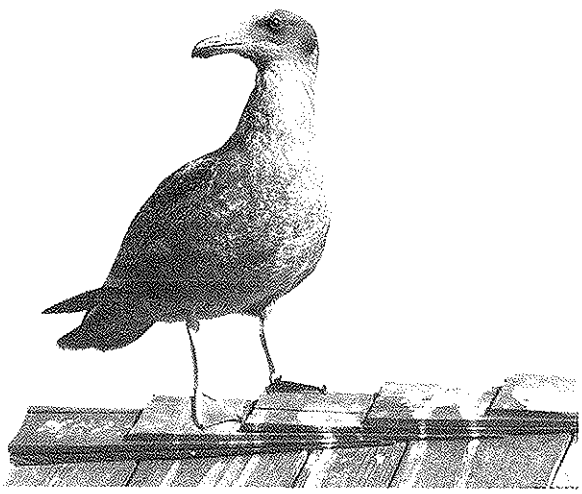
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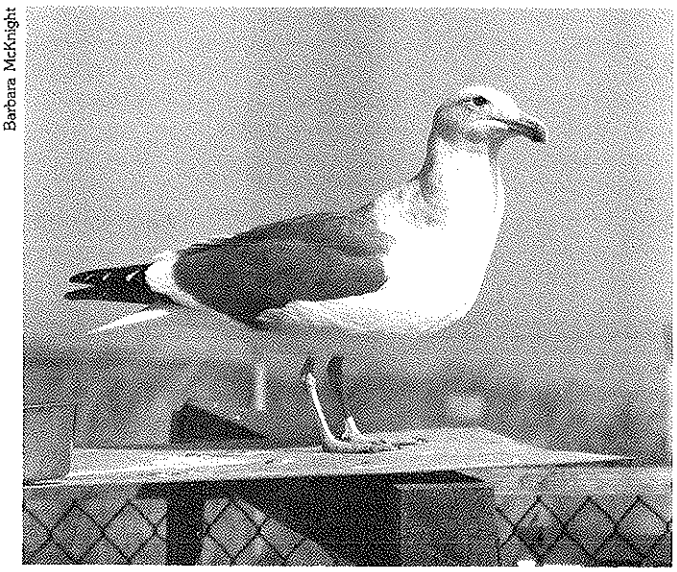
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Barbara McKnight



Immature Western Gull.

Barbara McKnight



Adult Western Gull.

For the New Rehabber:

Feather Imping: History and Technique

Lisa Hoefler
Monterey County SPCA, Monterey, California

Imping, a very useful tool for anyone practicing wildlife rehabilitation, is a method of feather repair originally developed and practiced by falconers. Falconry is a centuries old sport that can be traced back as far as 400 B.C.

When a rehabilitator encounters a bird with one or more damaged feathers which might preclude release he or she has four choices. The bird can be held until the feather is moulted naturally. This can take up to a year depending on when the feather is broken. The bird can be induced to moult artificially by the administration of a thyroid hormone or by alteration of the photoperiod (day to night length). The use of thyroid hormone is undesirable as it causes an increase in the metabolic rate and can make the bird more susceptible to infection. Altering the photoperiod is done gradually and takes long enough to make the method impractical. The rehabilitator can also pull the damaged feather out so a new one can grow in its place. This method has potential to cause permanent damage to the feather follicle and proper replacement may not ever occur. The fourth, and the generally preferred method, is imping.

The technique for feather imping is inexpensive, fast, and the required skill can be mastered with little practice. However, where chemical restraint is utilized, skills beyond the scope of the new rehabilitator will be required. Some calm individuals can be imped without the use of chemical restraint. This is not a procedure that causes pain to the bird. Others, especially species known for their inability to handle human stress (i.e., accipiters, some falcon species), or those needing multiple feathers imped generally require sedation to reduce the stress to them. The new rehabilitator with a bird needing sedation should arrange to take it to a veterinarian and do the work while hospital staff maintain the bird under sedation.

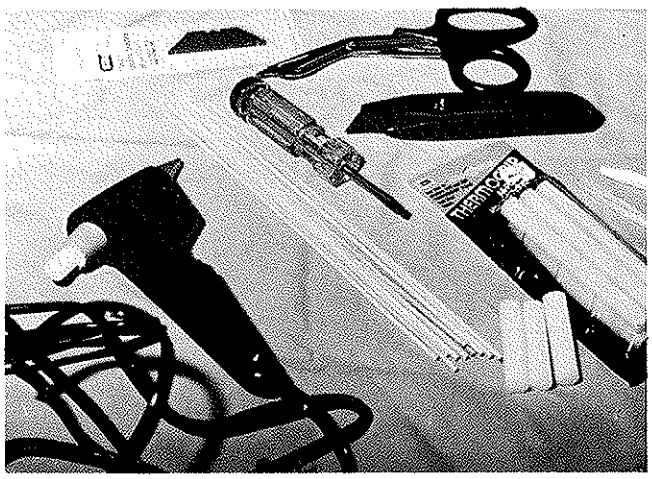
To gain experience and proficiency in this procedure, new rehabilitators should consider the advantage of one or more trial runs using dead birds or feathers alone. This will reduce the amount of time that a live bird must be handled and subsequently reduce the amount of stress encountered by that bird.

Originally the practice of feather imping was accomplished through the use of an "imping needle," whereby the broken end of the feather was replaced and a new feather was grafted in its place. The imping needle, made of iron or steel, was filed so it would fit into the shaft of the existing feather quill at one end, and into the new feather at the other. Prior to joining the two feathers, the imping needle was dipped into a vinegar or brine solution. Once the two ends of the feathers were joined together by the imping needle, the vinegar or brine solution caused the imping needle to rust. After about twelve hours, the imping needle would permanently adhere at both ends.

The state of the art today in feather imping is actually quite similar to the method summarized above. The rehabilitator can use this method either to repair feathers broken by cage wire, or to replace feathers weakened by stress marks. Instead of relying on a rusty imping needle to hold the two parts of the repaired feather in place, a bamboo skewer or wooden dowel and a glue gun are used.

MATERIALS NEEDED

The following is a list of recommended materials for putting together a feather imping kit: 1. electric glue gun, 2. "hot-glue" sticks, 3. bamboo skewers or appropriately sized wooden dowels, 4. utility knife and blades, 5. utility scissors, 6. raptor hoods in assorted sizes (optional as vision may be blocked by using towels). In addition, the rehabilitator should maintain his or her own "feather bank". The feather bank will provide feathers to be used at a future date. Feathers should be removed from deceased birds, labeled, wrapped in plastic and filed by species. Labeling consists of a small piece of tape placed on the quill of each feather which indicates the feather



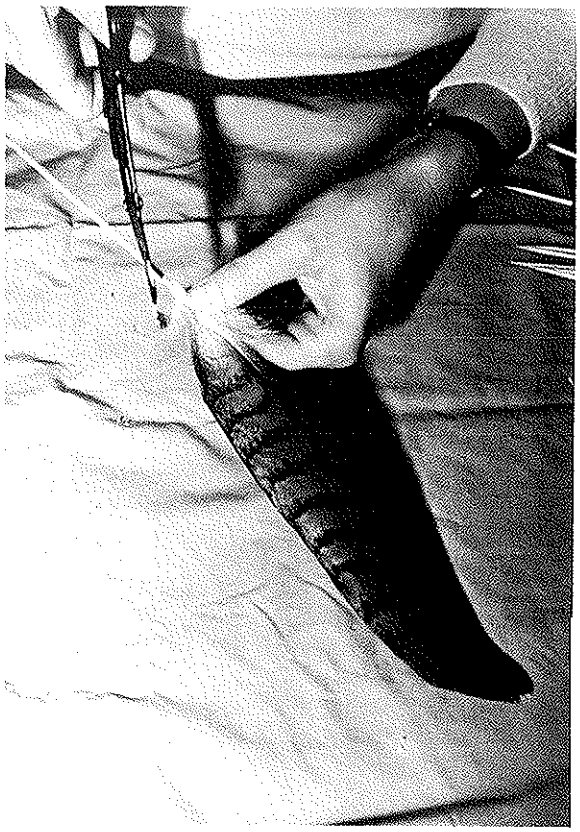
Equipment needed for imping feathers.

1



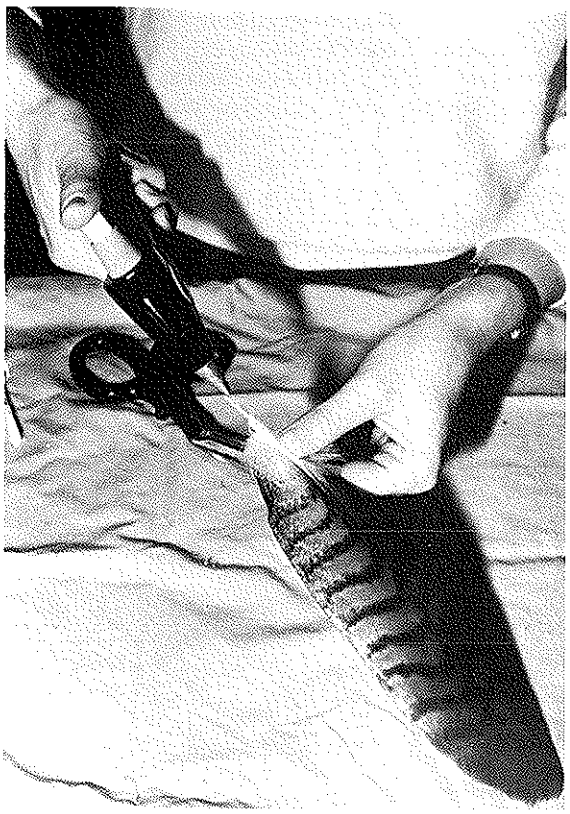
Bamboo skewer being placed into the replacement feather.

2



Once measured to fit shaft left on bird cut excess skewer off.

3



Applying hot glue to skewer.

4



Attaching replacement feather to shaft

position. Primary feathers are labeled downward from the number ten, starting from the leading edge of the wing. The numbers decline to one approaching the body. The label should also indicate whether the feather was from the left or right wing. The plastic bag containing the feathers should indicate the species. It is advisable to "dust" the feather with lice powder prior to storing.

PREPARING THE FEATHER

To prepare the feather, the proper feather should be selected from the feather bank. The quill should be cut off the feather at an angle, just below the vane. The pointed end of the bamboo skewer is then inserted into the feather to check for fit. These skewers are ideal for Coopers' Hawks, Sharp-shinned Hawks and Red-tailed Hawks. American Kestrels, Merlins, smaller owls and birds of similar size may require the shaving of the bamboo stick to achieve a proper fit. Conversely, Bald Eagles, Golden Eagles, and vultures may require a small wooden dowel. Hot melted glue from the transparent glue sticks is applied inside the cut feather, and the bamboo skewer is placed approximately ½ to 1" inside the feather.

IMPING THE BIRD

As with any restraint procedure, the rehabilitator should have all equipment assembled and ready to go *prior* to obtaining the bird. The feathers from the feather bank should also be prepared by this time.

The bird is then obtained and hooded (or otherwise covered so as to block its vision). Unnecessary loud sounds should also be avoided while the bird is being handled. At this point, some species may require sedation. Drugs commonly used for this procedure generally must be done at the direction and under the supervision of a licensed veterinarian. Ketamine is given IV at a rate of 0.01 mg/100 g and valium is given IV at a rate of 0.01 mg/100 g. Dopram, equal to the amount of administered ketamine should be drawn up and ready to administer IV, if necessary. Note: Valium is a Schedule II drug and its use is further restricted by law. Veterinarians may have other regimens or routes of administration that they prefer. The general idea is to sedate the bird for about 10-15 minutes so the procedure can be performed.

With the bird properly restrained, the broken or damaged feather should be cut in the same manner as previously described and at the same angle as the new feather. The glue gun is used again to place hot glue into the quill of the feather. The bamboo stick now attached to the new feather is then inserted into the existing quill. The glue will take 30 to 60 seconds to harden, allowing a little time to manipulate the newly placed feather for a better fit.

Finally, the bird should be maintained for another day or so to ensure that the newly imped feather is firmly attached. If possible, it is recommended that the bird be placed in a flight cage, or flown on a line or in a harness to make sure that the newly imped feather will remain functional.

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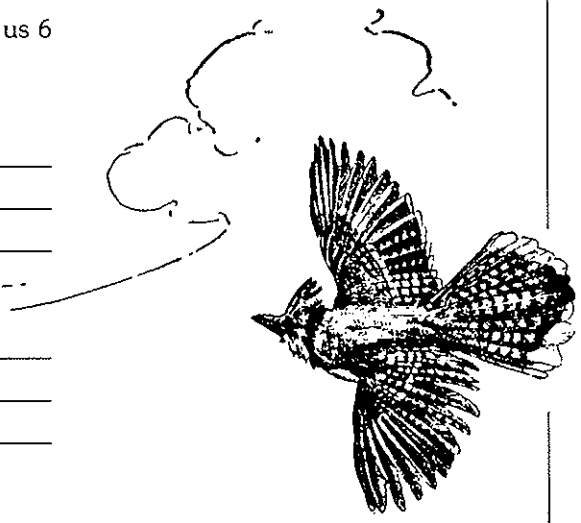
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WILDLIFE STATISTICS AND THEIR IMPORTANCE

Marty Johnson
Wildlife Rescue, Inc.
Palo Alto, California

I never set out to be a statistician. Gathering data, analyzing it, and drawing conclusions were not activities with which I had any expertise nor ones in which I was particularly interested. I wanted to raise robins. However, when I became the robin team leader for Wildlife Rescue, I felt obliged to gather as much information about the species as I could so that we might improve our release rate. Already I was involved in the first step of the statistical process — data collection.

At least in rehabilitation work the data comes to us — in shoe boxes and paper bags, baskets and the palms of little hands. At Wildlife Rescue, as each animal arrives at our shelter, the information about that animal and the person who brought him is handwritten in the registration log (Figure 1). Unfortunately, if I wanted, say, to find out how many cat-caught robins were released, I had to sift through over 450 handwritten, loose-leaf binder pages looking for robin entries and making hashmarks on a separate sheet of paper. This discouragingly tedious process prompted my offering to enter all the data from the log into my home computer on the theory that there had to be a better way to get AT all that information.

The creation of an "electronic log" was a turning point for our organization. The "great computer experiment" was begun. I soon became aware of just how valuable the computer would be in simplifying masses of data so that it could be analyzed to provide valid interpretations and useful guidelines for animal management. I became the statistician for Wildlife Rescue simply because the data had become so easy to assemble and analyze.

The third step of the statistical process, presentation of results, was the final hurdle. How could I communicate what I had learned in palatable form? I emphasize the word "palatable" because endless columns of percentage figures are NOT palatable. Charts and graphs ARE, because they present information in more understandable form. Pie charts and bar or line graphs have all proven to be effective ways of presenting some of the wildlife statistics the computerized log has unearthed for our organization.

At Wildlife Rescue we receive approximately nine birds for every one mammal (Figure 2). Among the feathered population 61% are songbirds represented in 1985 by 45 different species. About one in four of the birds we register will be in the dove and pigeon order, doves being the most numerous single species. Only about 2% of our birds are raptors.

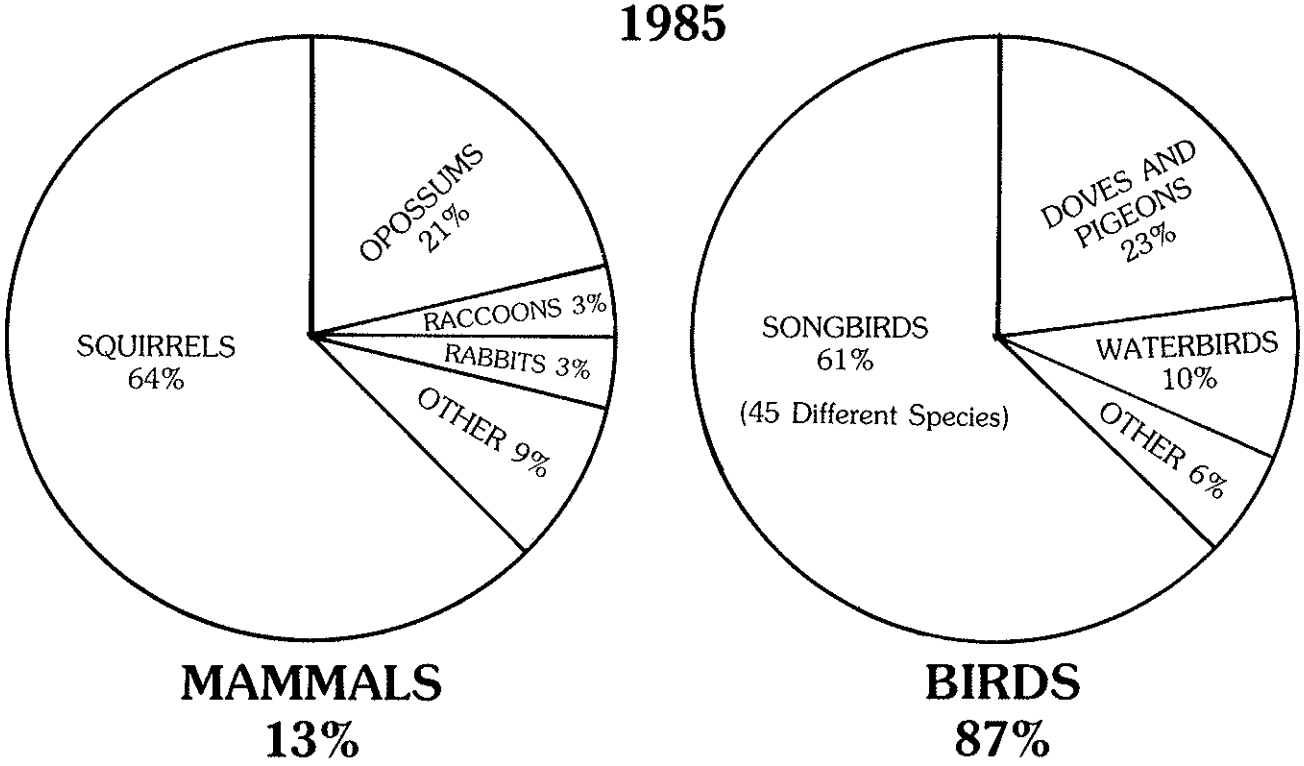
On the mammal side of the coin, squirrels account for over 60% of the population. Information such as this is valuable, of course, for volunteer management and development. Our opossums can be adequately handled by a team of 2 or 3 volunteers, while the squirrel team numbers nearly 20, every one of them VERY busy.

The proportion of birds to mammals received by any center varies greatly depending on where that center is located. The makeup of our Palo Alto wildlife population definitely reflects our existence in suburbia. At Project Wildlife in Alpine, California, however, one out of every four creatures registered is an opossum — over 760 in the first six months of 1985! Even more startling is the fact that with over 3000 animals registered, only

Figure 1. **SAMPLE LOG PAGE** WRI 2/83

DATE 19__	ACQ. NO.	SOURCE	WHERE FOUND	SPECIES	AGE	REASON FOR PROB./DIAG.	RESCUE CAUSE	VOLUNTEER/ PHONE	DISP.	DATE
7/15	2318	Name Sara Str City Menlo Park Zip 94025 Phone	on porch 7/14	Mourning Dove	A	®wing fx at joint	Cat caught	WRT	EXP EUTH X DOA REL TRAN TO	7/15
7/15	2319	Name Margit Str City Saratoga Zip 95070 Phone	Stanford campus 7/14	White-throated Swift	A	swollen eye concussion	hit window	Courtenay D-R	EXP X EUTH DOA REL TRAN TO	7/21

Figure 2.



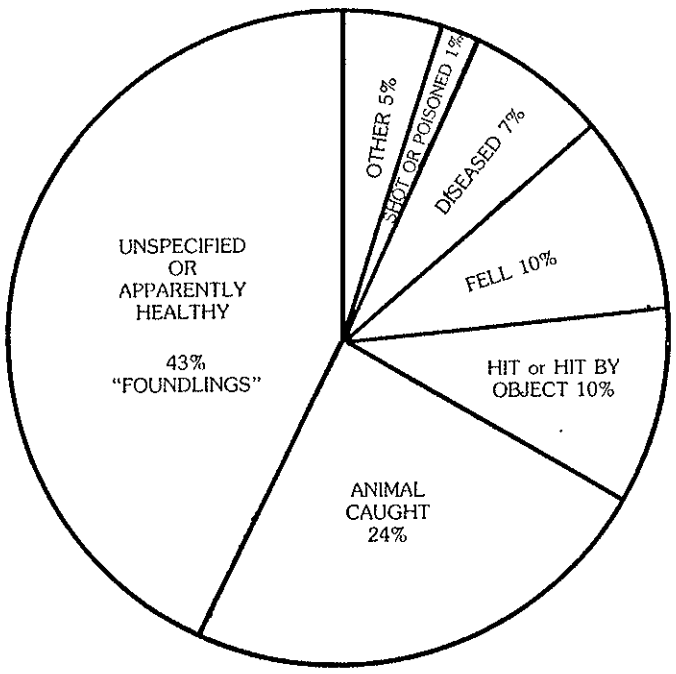
two were robins. Clearly the wildlife population in Alpine is very different from the population in Palo Alto. And, furthermore, the robins are either scarcer or smarter!

In addition to WHAT animals we receive each year, we also find it useful to track WHY we received them in the first place — what, in other words, is their reason for rescue (Figure 3). The proportion of "Rescue factors" does not change much from year to year. About 1% are shot or poisoned, some are sick, 10% have fallen, and another 10% hit windows or have been struck by things like stones and cars. About one in four are caught or attacked by some other animal — mostly cats. Clearly human-related factors account for a large proportion of distressed wildlife.

The biggest single percentage of animals we receive, however, have unspecified problems or are apparently healthy foundlings. A large number of creatures in this part of the pie have been "overrescued" by members of the public a little too anxious to do a good deed. In their haste, these well-meaning people essentially rescue many creatures from their parents who are, after all, far better equipped to raise them than we are. Undoubtedly some public education about such things as returning nests to trees, placing fledglings on low branches, and bringing in the family cat for a few hours might significantly reduce the number of "foundlings" we get.

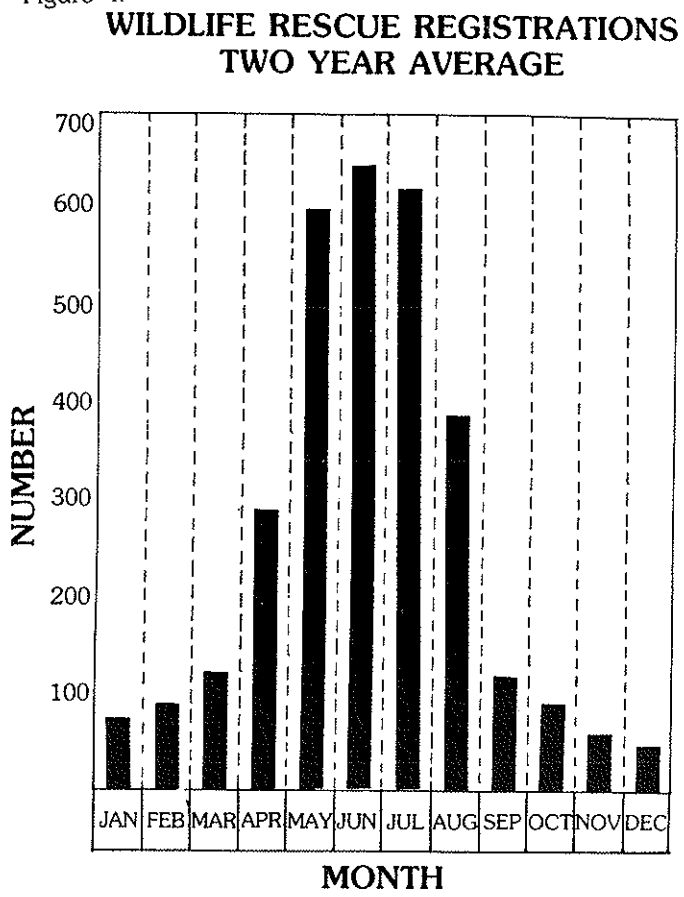
Having examined WHAT we receive and WHY they have been brought to us, we next can look at WHEN they arrive. Arrival statistics are particularly useful because they help us prepare for the onslaught. We can predict with some accuracy when each species will ar-

Figure 3.



rive in the greatest numbers and can, therefore, be armed and ready with volunteers and adequate supplies. In Figure 4 the overall arrivals of all animals are charted as a two year average. The graph defines a classic bell curve with the peak in June. Our shelther is open from April through August which is appropriate

Figure 4.



All charts courtesy of Marty Johnson.

since 82% of the year's business will be done in that five month period. May, June, and July are primarily "baby bird" months, with young mammals accounting for the numbers in April and August.

Each individual species, however, has its own particular rhythm. Some do conform to the overall bell curve of arrival. Robins, sparrows, and finches (Figure 5,6,and 7) typically arrive in the greatest numbers in June. Comparing the line graphs below, however, reveals the interesting DIFFERENCES in the statistical "fingerprint" of each species. Robins and finches have a more definite peak in June, while the sparrows seem to peak, and peak, and then peak some more in June and July.

While many species follow the average bell curve arrival shown in Figure 4, others most definitely do not. There are,for instance the "early birds" — thrashers, bushtits, blackbirds, starlings, and Scrub Jays who arrive in raucous style in May. In Figure 8 below, it is very obvious that if the Scrub Jay team is waiting for June to come they're going to miss most of the action. Clearly, for them, a July or August vacation is a possibility. The Mockingbird team, however, had better plan vacations earlier in the year, since the arrival of their species builds through the summer peaking in July (Figure 9). These two arrival charts provide almost mirror images of each other.

Some species seem to defy any kind of bell curve at all. The pigeons (Figure 10) "do their thing" all summer long in more or less the same numbers. The squirrel team, on the other hand, is very busy when the shelter opens in April and busier still when we close in August. The squirrel arrivals (Figure 11) define two bell curves rather than one. Obviously the rhythm of squirrel reproduction in California is different from that of birds, with distinct peaks in late spring and early fall.

The one statistic we all generate is our release rate. We must, by law, report the most basic information —

Figure 5. **ROBIN ARRIVALS**
Two Year Average

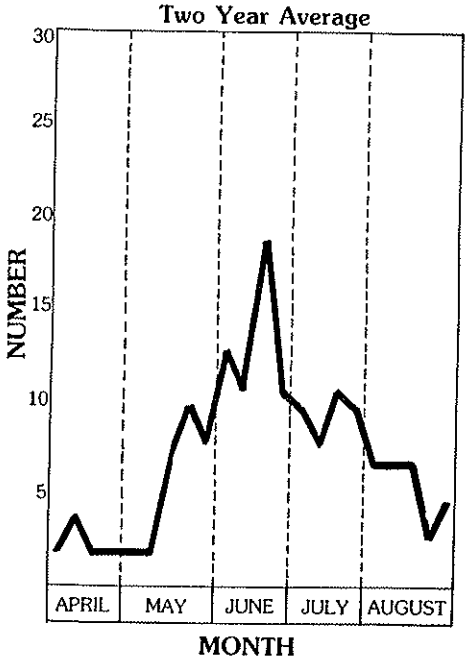


Figure 6. **SPARROW ARRIVALS**
Two Year Average

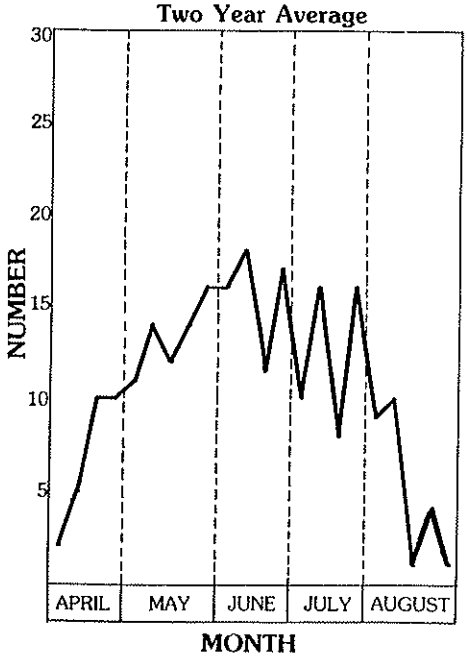


Figure 7. **FINCH ARRIVALS**
Two Year Average

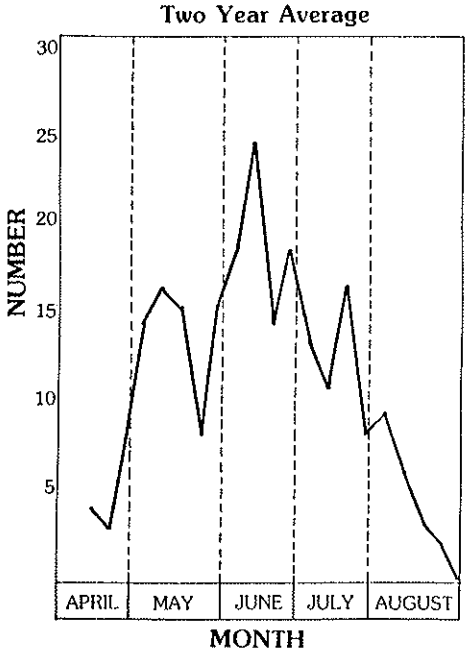


Figure 8.

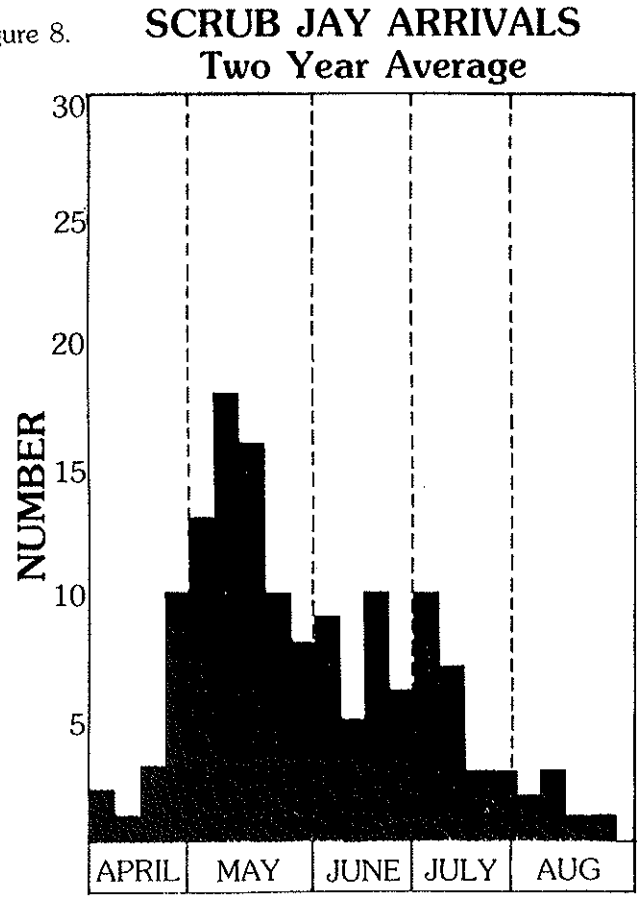


Figure 9.

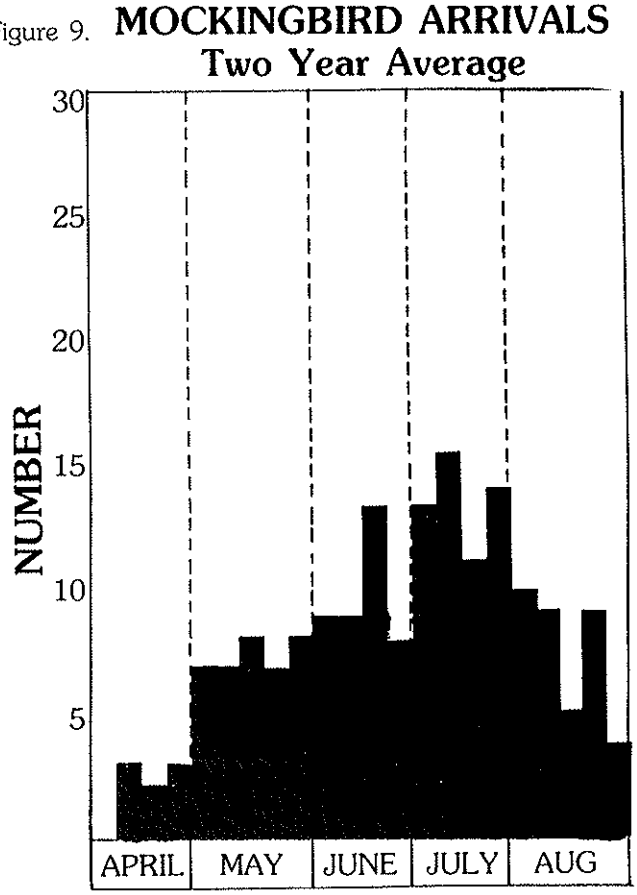


Figure 10.

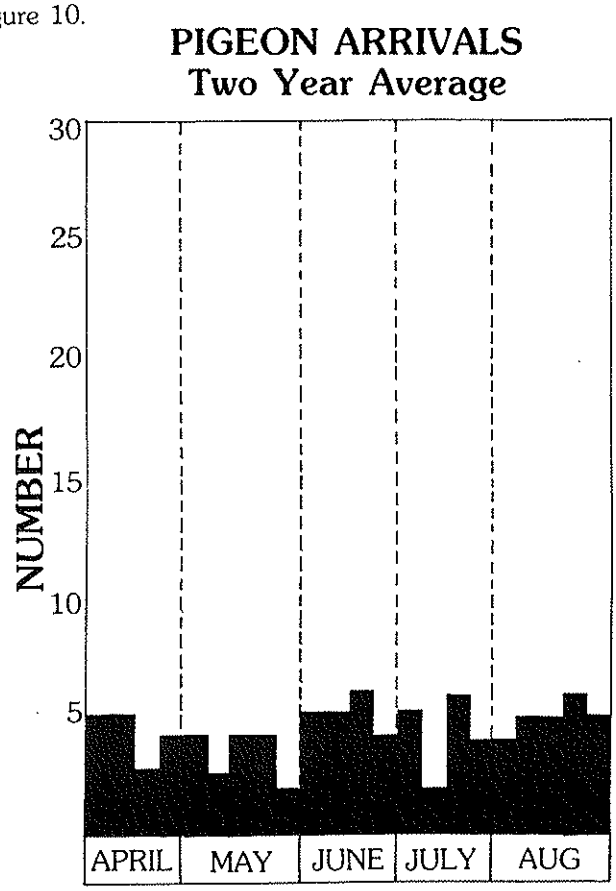
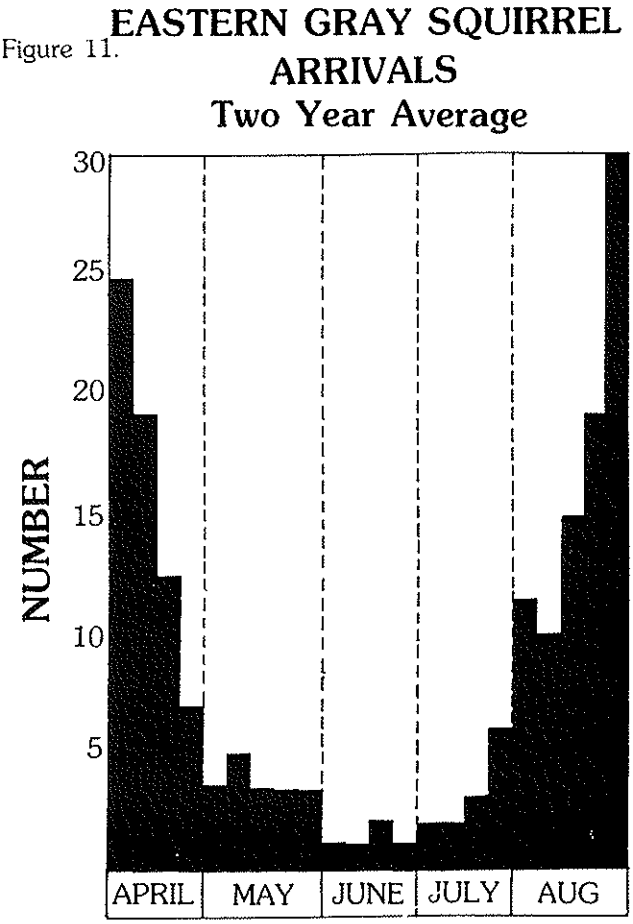


Figure 11.



what animals we received and how they fared. Disposition percentages for all creatures received by Wildlife Rescue in the past five years appear in Figure 12.

Unfortunately even though all organizations process some kind of release statistics, the way we arrive at those figures is a matter of some difference. At Wildlife Rescue we define release rate in the purest sense — that is, those creatures released back into the wild. Other organizations view release more as a matter of survival, in other words, who is alive as of December 31st. Some groups lump expired and euthanized together as "non-survivors." Carried to the extreme, euthanized animals might be considered as having been "released" from pain and suffering.

Clearly some standardization in this area would be most helpful. I could find no two organizations who computed their release statistics using the same definitions and guidelines. Standardization is important because we all have a strong urge to compare our release rates. Comparisons are simply not valid unless the definition of each category of disposition is the same.

Another problem in comparing OVERALL release statistics is that the wildlife population in various areas is not comprised of the same percentage of birds to mammals. The mammal release rate is 25 percent points higher than that of birds (approximately 65% vs. 40%). The higher percentage of mammals an organization receives, the higher overall (birds and mammals) release rate it will have. Species to species comparisons are certainly much more valid.

In addition to similarly defined categories of disposition, and similar ratios of birds to mammals, a third factor is important when making release rate comparisons — what is the number in the sample? How many animals are we talking about? Some rehabilitation groups register hundreds of creatures, others receive thousands! Numbers make a difference. I could tell you, for example, that last year we released 100% of the blue-gray gnatcatchers we received. It would be irresponsible of me, however, not to also tell you that we only registered ONE. As a rule of thumb, the larger the sample, the more reliable the conclusion.

Since no two of us figure our release rates the same way, nor have the same wildlife populations, nor the same total number in our sample. I, personally, am very leery of release rate comparisons.

What happens, though, when release rates are compared not to each other, but to some other factor — say total number of animals registered? An interesting correlation is revealed in Figure 13.

The top of the graph charts the overall Wildlife Rescue release rates for the past five years. As you can see, we've had our ups and downs. A comparison of those release rates to the total numbers of animals registered for those same years brings new meaning to the term inversely proportional. As the number of animals increases, the release rate decreases. It's possible volunteer exhaustion is a factor. Generally, though, an increased number of animals means something unfortunate has happened to them and their chance of survi-

Figure 12.

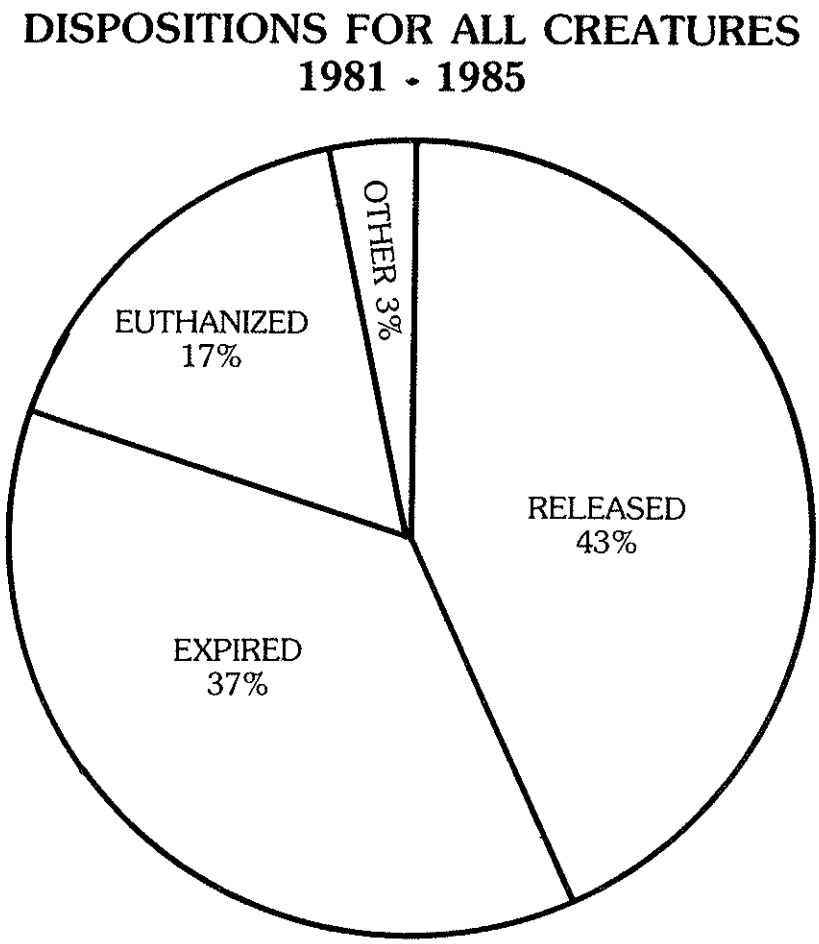
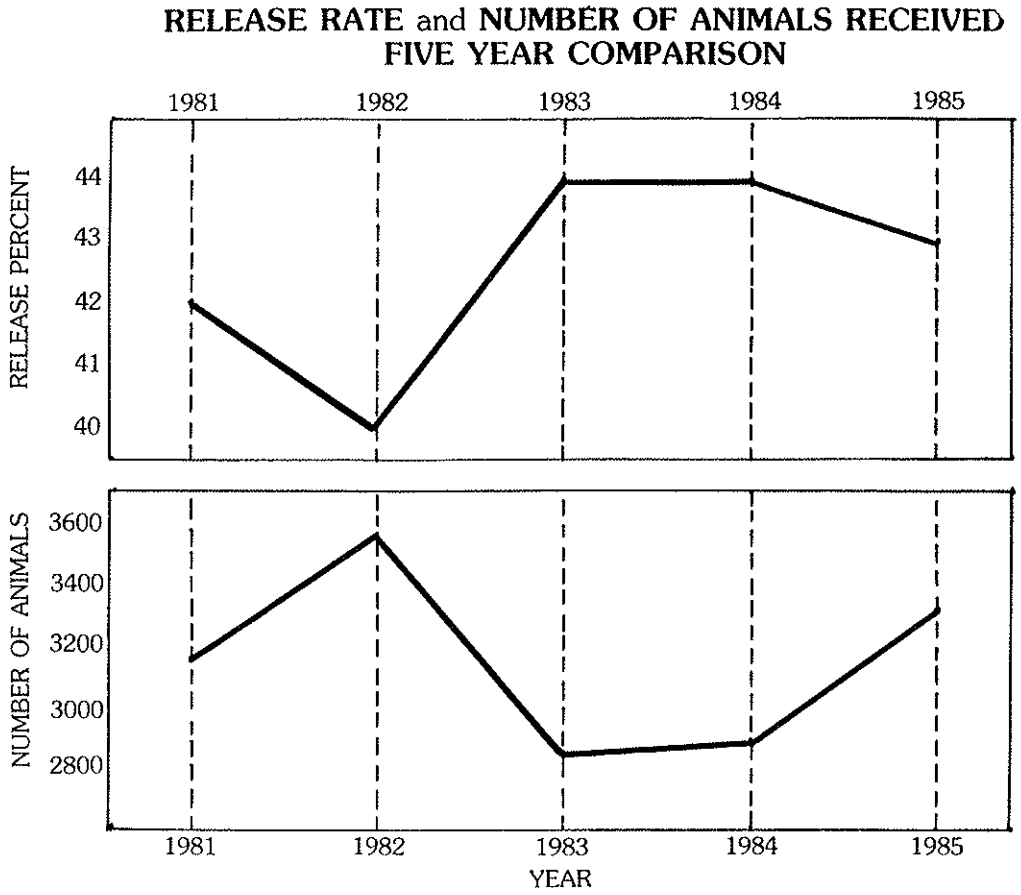


Figure 13.



val is diminished. Perhaps a city decides to trim its street trees during squirrel season, or the state sprays malathion over residential areas in a effort to control the Mediterranean fruit fly. In 1985, weather was undoubtedly a factor in our slightly lowered release rate. In July we had a record heat wave in California. fires raged all over the state; and in the South San Francisco Bay botulism was "brewing." Shortly after the heat wave we received over 150 very sick waterbirds. Certainly this influx of critically ill birds was at least one factor in our overall release rate. The fact that other possibilities remain largely a mystery certainly prompts us to do a little detective work in exploring this correlation further.

Surely one goal of statistics should be to prepare us for the future - to give us some guidelines for animal management and volunteer education. Arrival statistics do that - they help us prepare. Other kinds of information can also be useful for future planning. Knowing how long it takes to rear an average nestling/fledgling (n/fl) bird could be VERY useful. The Days in Captivity graph below (Figure 14) shows how many days Wildlife Rescue volunteers took, on the average, to raise eight different species of birds last year. I chose these eight because they come to us in the most sizeable numbers. The precise age of the birds when received influences the total number of days in captivity - a young nestling requiring more time than an older fledgling. It took longer to raise a towhee or a scrub jay than it did a robin or a mockingbird. Since volunteers have varying amounts of time to devote to raising birds, and have vacations to arrange, in a facility like ours where most raising is done "at-home", this chart can provide beneficial guidelines. Newer volunteers can also get an idea of whether they are rushing or extending the raising process beyond the "norm."

Just for fun I multiplied the average days in captivity for each of these species times the number released, added them together and came up with an astounding 56 YEARS of volunteer days just to raise these eight species!

Figure 15 shows a comparison of n/fl release rates. The solid bar indicates the OVERALL release rate for the same eight commonly received species as in Figure 14. The striped bar indicates the release rate for those birds surviving more than three days.

Imagine if you will, that each bar is represented by a basket full of that particular species. All baskets contain the same number of birds and all have just arrived for care. If the birds are placed with volunteers on Day 1, as so often happens, less than 40% of the towhees are ever going to be released. This information would tend to make towhees hard to "sell." All of us thrive on success, and no one is more devastated by death than a new and inexperienced volunteer. We want to minimize discouragement, so let us hypothesize that the team leaders are going to try an experiment. Each of us is going to take our basket of birds home for three days. Most birds who are going to expire will do so in three days, more typically in 24 hours.

Figure 14.

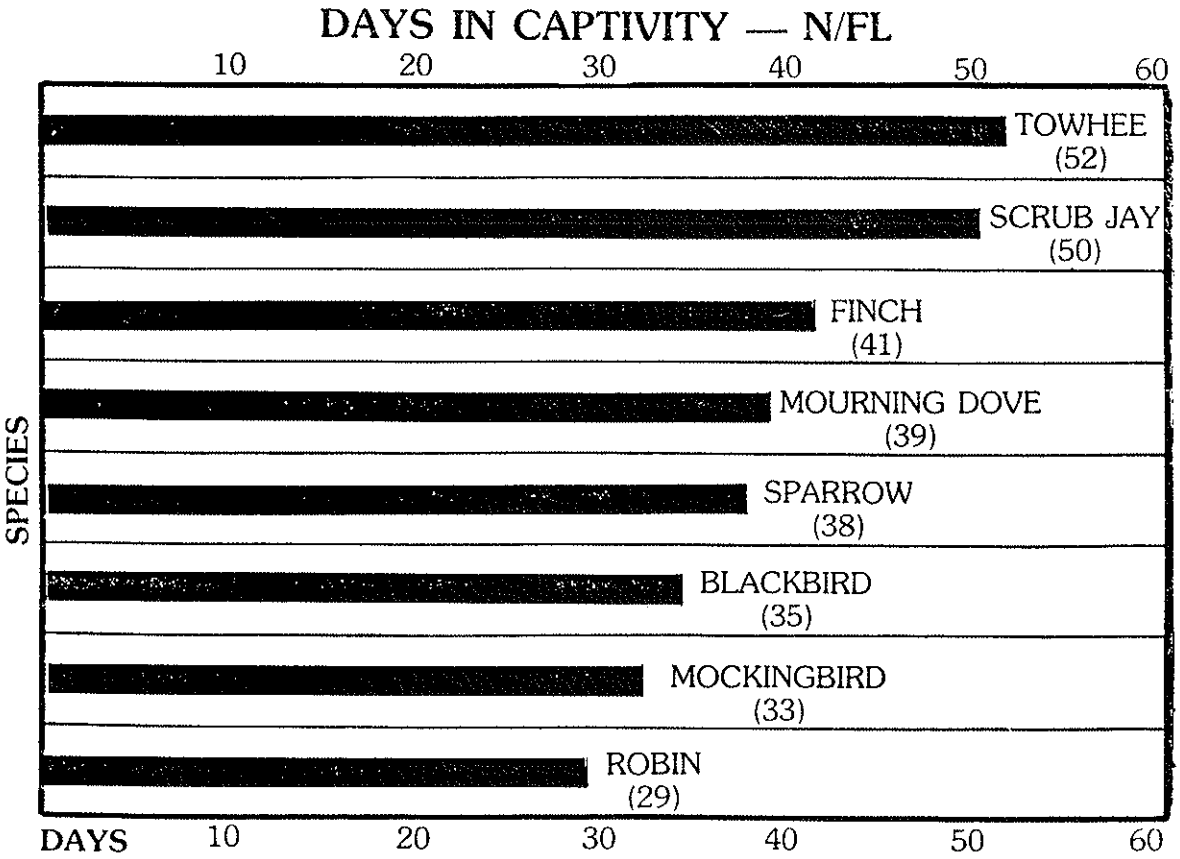


Figure 15.

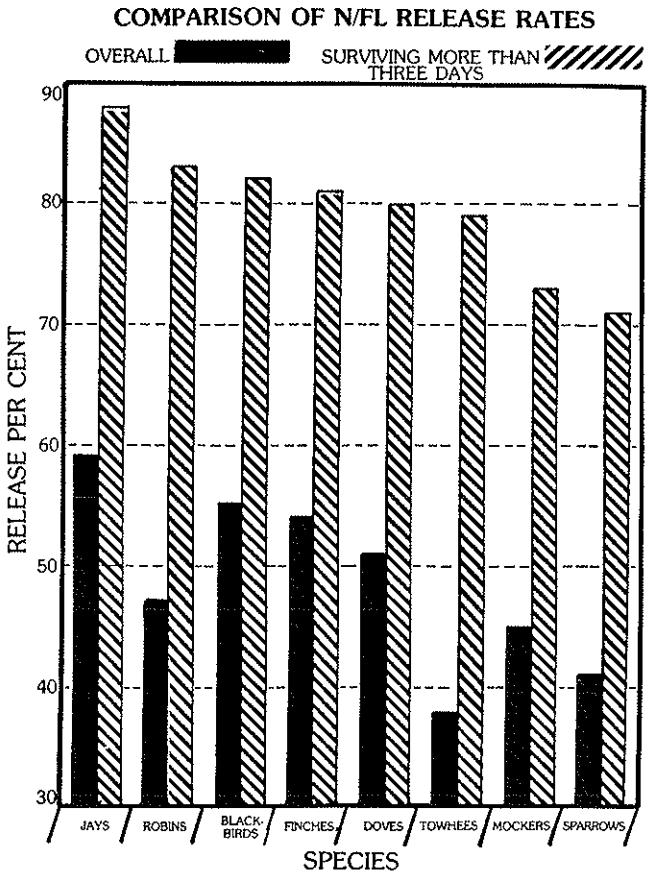
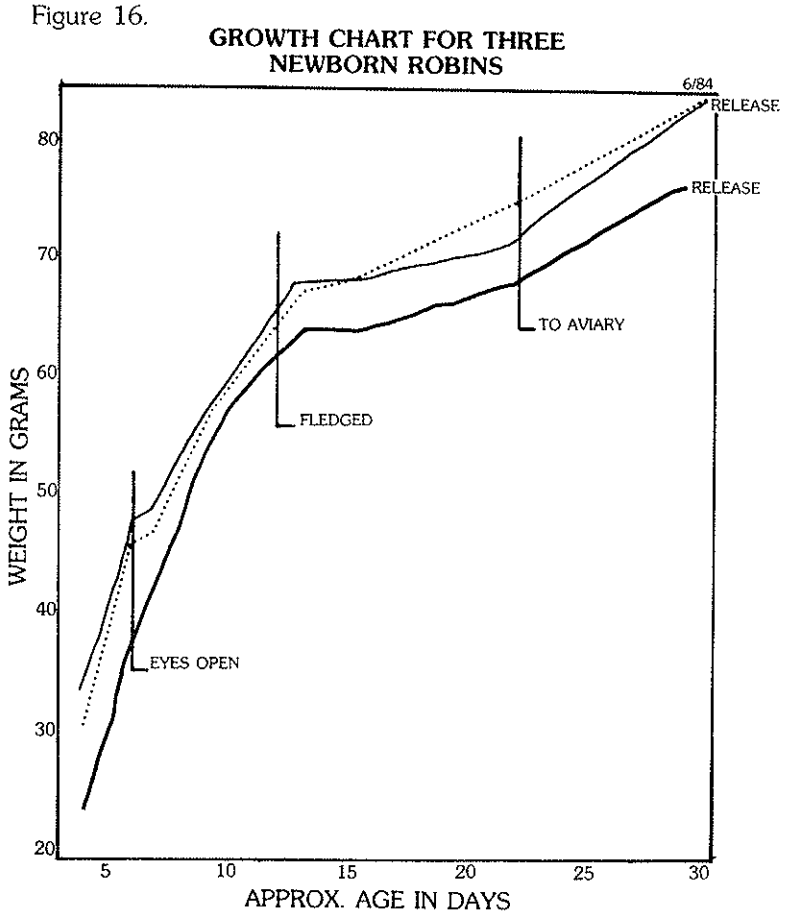


Figure 16.



At the end of the three days, we will return to the shelter with our survivors. There will not be as many towhees in the towhee basket as there are jays in the jay basket; but all eight baskets will contain birds who, while their overall release rates may vary, have one thing in common. They have all survived for 72 hours. As indicated by the striped bars, these birds now have a dramatically improved chance of release. THIS is the time to place them with volunteers! Even the towhee who looks so unpromising in the overall release statistics has almost an 80% chance of being released. This kind of statistical comparison certainly goes a long way toward removing the chi-chi surrounding some species.

Most of us probably aren't generating statistics for an entire organization, but we do "work with the numbers" in our own way. All of us are statisticians. Our statistics are important. Figure 16 is a growth chart for three newborn robins who came my way a few years ago. Anyone with a scale, a piece of graph paper and some subjects could make a chart like this. Growth charts are wonderfully USEFUL. Mine is a golden yardstick against which I can measure robins trying a new diet or receiving a particular course of treatment. It is certainly more valuable to me than anything I can generate from the "electronic log." The most meaningful statistics are those we gather as individuals. Each of us has a unique contribution to make. We can all draw valid conclusions based on our own experience and observations. They are as good as anyone's. Perhaps you don't think of yourself as a statistician, but you collected the data - who better to analyze and interpret it?

And most importantly, we must all communicate what we have learned - share it with other volunteers. We can tack up a copy of our findings where all can see it or write an article for our newsletter. We have valuable information to share. As we observe the wildlife entrusted to our care, we are in a unique position to uncover a vast array of meaningful data, and, by sharing that information with others, to make a significant contribution.

1986 Pacific States Fall Graduates of the Basic Wildlife Rehabilitation 1AB Class

All individuals listed below received a passing score of 70% or better on the IWRC Basic Wildlife Rehabilitation Exam and have completed two sets of homework on nutrition and calculating drug dosages. Additionally, all participants have successfully demonstrated adequate skills in wildlife care and handling in a supervised laboratory session. These individuals are IWRC certified in Basic Wildlife Rehabilitation.

Colleen M. Averill
Anchorage, AK

Charlotte Van Zant-King
Fairbanks, AK

Ami Wright
Anchorage, AK

Harriet Kwasny
Juneau, AK

Jill Thayer
Sitka, AK

Mary Jo Anderson
Portland, OR

Mary Beechler
Maupin, OR

Lynne Breese
Prineville, OR

Ken Brewer
Seattle, WA

Laurie Dix
Eagle River, AK

Callene Manasmith
Anchorage, AK

Carol Ann Lovejoy
North Pole, AK

Gail Sage
Juneau, AK

Marcus Horton
Petersburg, AK

Carol Bauer
Seattle, WA

Laura Bischof
Portland, OR

John Breese
Prineville, OR

Rosale Brown
Astoria, OR

Kristine Moerlein
Kasilof, AK

Kip Kermdian
Haines, AK

Mary Keller
Eagle, AK

Irene Shaw
Juneau, AK

Val Britten
Wasilla, AK

Radford Bean
Vancouver, WA

Diana Bratton
Aloha, OR

G. Renee Breuer
Lake Oswego, OR

Marcie Cole-MCullough
Vancouver, WA

Susan Edwards
Tigard, OR

Michelle Fudge
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Barbara Johnson
Portland, OR

Susan LaFontaine
Salem, OR

Anne Moore
Vancouver, WA

Lisa Rouse
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Mary Heckert
Seaside, OR

Jim Braniff
Santa Rosa, CA

Annette Dunklin
San Francisco, CA

Kathy Gilman
Redding, CA

Susan Heckly
Danville, CA

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Tonya Vaughan
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Bill Eberly
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Sandy Johnson
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Tova Oliver
Portland, OR

Ginny Taylor
Portland, OR

Elizabeth Bischoff
San Francisco, CA

Norma Campbell
Campbell, CA

Jeff Feather
San Jose, CA

Jerry Granger
Carmel Valley, CA

Carolyn Johnson
Sebastopol, CA

Gwen Mays
Pleasant Hill, CA

Cathy Ortiz
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Palo Alto, CA

Debbie Reinhardt
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Paso Robles, CA

Chip Greendale
Portland, OR

Jennifer Hulett
Sheridan, OR

Barbara Klick
Portland, OR

Sue Mistretta
Lake Oswego, OR

Robyn Price
Portland, OR

Linda Vick
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Kay Brady
Sonoma, CA

Jennifer Clarke
Sonora, CA

Penny Fleischer, DVM
Walnut Creek, CA

Janet Grundstrom
San Anselmo, CA

Jeff Kemp
Santa Rosa, CA

Donna McDonald
Pacifica, CA

Beverly Peck
Rohnert Park, CA

Jan Polon
Palo Alto, CA

Debbie Smith
Modesto, CA

Pamela Swift, DVM
San Francisco, CA

Barbara Van Etten
Santa Rosa, CA

Book Review

City Critters: How to Live with Urban Wildlife

David Bird
Eden Press, Montreal, Canada,
115 pp., 1986, $8.95

City Critters: How to Live with Urban Wildlife is an informative and often amusing book on how to coexist with some of the more common wild animals found in the city environment. Natural history and common habits are discussed, as well as how to prevent these animals from becoming pests, and what to do if they have overstayed their welcome. There are also helpful hints on how to attract certain animals if desired. In some cases the author will direct the reader to a local pest control company if the problem is a serious one. Usually, if all efforts to discourage an animal fail, live trapping is the logical best resort, with relocation to an appropriate area.

Obviously, the chapter on skunks was most entertaining. When all efforts to discourage Mr. Skunk have failed, trapping is a very easy matter indeed. However, major problems present themselves after the animal is in the trap. The author suggests throwing the familiar burlap sack over the trap and hoping the skunk doesn't spray. The author then describes the latest methods of deodorizing both humans and pets in the event of an accident. It should be noted that the method described is based on open wired traps. In the last decade, trap companies made open wire traps instead of solid sided traps. Currently, some solid sided traps are again being made available, providing a method that reduces handler risk and the inconvenience of spraying.

Some of the natural history information is most interesting. Did you know that tree squirrels will occasionally catch and eat small birds, as well as eggs? That opossums are very resistant to rattlesnake bites and have rated above the dog and pig in intelligence tests? That bats, after a rare miscalculation, end up in water and can swim up to sixty meters? If their fur is not too wet, a lift off from the water can be made.

This book proved to be enjoyable reading, in part because the author has made an attempt to find virtue with even the most notorious of wildlife pests. The basic philosophy is that it is preferable to live in harmony with one's wild neighbors and prevent problems before they occur, rather than having to trap or exterminate the unwanted animals. Coupled with the entertaining and often amazing illustrations of Sandra Letendre, this book would be a delightful addition to any library.

Dorothy Johnson
Youth Science Institute,
San Jose, California

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