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# Emergency Wildlife Care and Management

An Interdisciplinary Qualifying Project Report

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**Worcester Polytechnic Institute**

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Degree of Bachelor of Science

by

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# Introduction:

Wildlife is everywhere. From urban areas to the countryside, the soil itself teems with life that is essential to our survival, for worms and a million other creatures break down dead material, making nutrients available to new plants; insects provide nutrition for many birds; every bank roadside, wood, field, and garden will be home for some species of rodent which in turn is prey for foxes and other carnivores. Nature does indeed seem to be a cruel and random business, but as we discover more, the picture changes, and we realize there is an all-over design (Jordan and Hughes, 1983). More and more often the presence of humans can be seen to disturb the delicate balance of nature. For example, prey species have, through natural selection, become adapted to being preyed upon, so that if they escape they are able to quickly recover and resume their normal behavior. Humans, however, can cause injuries to animals that they are not adapted for. Wild creatures are killed and injured by humans in large numbers. Accidentally, many are run over by cars, poisoned by pesticides, or contaminated by oil. Many others are injured intentionally through hunting, trapping and poisoning. As human expansion continues these interactions are only going to become more frequent and worse.

Animal rehabilitators make an effort to aid animals that have been unfortunate enough to become injured. A good portion of the problems seen by private rehabilitators and Audubon societies could be avoided if the general public were supplied with the necessary information on the correct actions to take when they encounter an injured animal in their own backyard. This is why it is our intention to inform the general public of the proper measures that should be taken if they were to encounter an injured animal.

In general, the public knows very little about the wild species that live around them. Most do not understand the balance and harmony that should encompass all life. Humans are mainly concerned with maintaining their maximum comfort level and in doing so fail to understand the consequences that this arrogance inflicts upon the surrounding animal community. This is very unfortunate for these species that suffer form our expansion. People's ignorance to this situation is often the main problem. There are very few resources available to the general public in which they can be informed of the proper way to interact with and respect wildlife in the proper fashion, and what to do when encountered with an injured animal.

Many people want to help but without the proper information their help could be more of a hindrance to the well being of wildlife. There are many misconceptions about wildlife that are held by the public. For example, many times an infant animal is found alone and is assumed to be orphaned. The person, assuming the animal to be orphaned, "rescues" the animal and brings it to the nearest animal shelter or refuge, when the best action would have been to leave the animal where it was and observe it for a period of time. Certain species have been known to leave their young on their own for long periods of time. After a long period of observation one could make a better assessment of the situation, and if the baby actually turns out to be orphaned action could be taken.

People have many misconceptions such as these that present a problem for wildlife species. Not all people live near Audubon sanctuaries or rehabilitation clinics where they can get help. Possibly, they just are not aware of these few resources. In any case, wildlife species suffer because of negligence and ignorance of the general public to their necessary treatment and care.

If the proper information were supplied to the general public, situations that endanger an animal could be avoided. If the major misconceptions were cleared up, it is perceivable that numbers of certain cases seen would decrease. Wildlife populations would not be as threatened by human activity. Of course the problem would not be totally alleviated, but it would be a step in the right direction.

With the general public educated about having respect for wildlife, and how to keep their daily life styles from adversely affecting wildlife, large changes would be seen. It is our belief that with the proper knowledge the general public would have a greater understanding of the creatures that live near and around them. Wildlife species require better treatment from human society as a whole. The destruction of one species within a habitat can cause adverse effects on every other species. No species is better than any other is. As earlier stated, nature is a delicate balance, and there is no way to foresee the ultimate effect of the extinction of a species until it is too late. Every species is equally important, and that is why it is necessary to preserve all species.

## Project Goals

It is obvious that there is a great need for education of the general public in the area of emergency care and treatment of injured wildlife. It is around this fact that we have developed the content of this project. We aim to address, to the best of our abilities, the needs of the general public. The question we aim to answer with this project is:

**"What are the best methods to care for the welfare of wild animals? Also, if an injured wild animal is found, what emergency care a member of the general public can provide in order to get it safely to a licensed rehabilitator?**

It has been our goal within this project to provide the public with a means of easily accessing information that will answer the above stated questions. We began our pursuit of this goal by collecting data on the most common species of the New England area and what to do if they are found injured. We also collected data on such things as misconceptions held by the general public, zoonotic diseases affecting wildlife in the area, laws and regulations to be aware when dealing with wild animals, and what resources are available to the public in the area. Outlined in the following pages is the exact methodology and a discussion of the resources that we have utilized in an effort to accomplish the goals we have set.

We first sent out a survey to all of the rehabilitators in the area to receive feedback on what they believed to be the most important information to include in our research. The results of our survey provided us with information that has proven to be invaluable to this project. The feed back from this survey gave a better understanding of the exact methods to take to effectively attain our goals. We shaped the final content of our finalized product based on this data.

Additional sources of information include the Massachusetts Audubon Society. This organization provided us with a good deal of information concerning the effects of domesticated cats on wildlife, and information on how to peacefully coexist with the wildlife in your own back yard. This in addition to their library that provided us with a good deal of literature that aided us in our research. A great amount of first hand information came from Mark Pokras, a wildlife rehabilitation expert from the Tufts wildlife clinic. His input was extraordinarily valuable to us, providing us with

knowledge gained from his years of experience and ideas of how to go about finding additional information.

From this wealth of information we have created a practical manual that will inform a member of the general public exactly what he or she should do when confronted with an injured wild animal. This manual contains proper emergency care practices and information on the proper authorities to contact for different species.

The manual also attempts to clear up any misconceptions held by the public about care practices for wild animals and about wild animals in general. For example, some people see a baby animal by itself and automatically assume that the animal is orphaned. They then immediately take the animal into their own care. The animal may, however, not be orphaned at all. Animal mothers of certain species are often found to leave their babies alone for long periods of time. The baby will be taken care of much better by its mother. This and other common misconceptions held by the public may lead to actions which could prove to be more detrimental than beneficial to the health and well being of the animal. The species included in our manual has been narrowed down to common indigenous species of the northeast.

We did not just cover the most common species of the area, we have also included information on species that are of particular interest to rehabilitators for preservation. The Loon is on such animal that we have included in our manual. The Loon may not be found injured with great frequency but since then are an endangered species, it would be of particular interest to the wildlife rehabilitation community to try to save the animal. Our manual presents this information in a very clear and straightforward manner.

We hope that this manual will help to build the public's awareness of the proper techniques for the emergency care of injured wildlife. Furthermore, to increase public interest in the preservation of endangered species found injured by the public. In order for this manual to be effective in fulfilling our goals we have devised several means in which to distribute it in a manner that will make the information available to those who could use it.

Currently the public, as a means of finding information, is increasingly using the World Wide Web. The web is becoming an increasingly powerful, global, interactive, and dynamic medium for delivering information. A web page can offer the end-user the possibility of "browsing," or "navigating" a particular knowledge domain in a flexible, learner-directed manner. This allows the learners to proceed at their own particular pace, allowing for complete absorption of the material being discussed. The Web is able to provide one with information in any medium, on any subject, in any order, at any time, and in any place. This fact alone makes the web a great place to provide our information to the most members of the general public. As each day passes more and more people from almost all walks of life have at least some access to the Internet. This is a very inexpensive way to get our manual out to the most people.

In addition to the web form we have also produced a hard copy form of our manual. The hard copy forms of our manual will be distributed to rehabilitators. We hope that in the future, if we can find someone to sponsor us, we will be able to produce the hard copy of the manual on a larger scale and possible distribute it to area veterinarians, libraries, and schools for distribution to the general public.

We have found that the public is largely unaware of the species that live around them, and the detrimental effects that their presence has on the well being of these species. We hope that through our efforts will be able to increase public awareness of the topic of wildlife care. Also, to provide those members of the public that would like to help injured wild animals but do not have the knowledge, a source of information so their efforts will not be detrimental to the animal. We also hope to clear up any misconceptions the general public may have about the animal community.

## Methodology:

The first portion of our Interactive Qualifying Project (IQP) was to send out a simple survey directed towards the wildlife rehabilitators in Massachusetts, Rhode Island, Connecticut, and New York. This survey was intended to give us feedback on what the most vital issues are to teach the public, as the professionals see it. This survey was aimed at rehabilitators because they are the ones who see injured or orphaned animals brought in by the community. Moreover, they know the general misconceptions the public tends to hold regarding injured or orphaned wildlife. We feel that the majority of the general public has not been taught enough about major issues concerning the well being of wildlife. One of our goals is to remedy the misconceptions and humanely educate people about the safety and preservation of wildlife species (App. A 1).

We then planned on creating a web page to enable the general public to access information about our topic and learn what animals live in their area and how to live with them and protect their well being. Our first task was to gain information for the web page. Through web browsing and research in various libraries, we were able to gain

identification and habitat information on the species native to the area. Then through analysis of the first survey and talks with Dr. Mark Pokras we narrowed down the number of species we were going to include on the web page. After this initial research, we once again talked with Dr. Mark Pokras and other rehabilitators on the proper procedures to follow when faced with injured wildlife. This included correcting popular myths on when and what to do to help injured wildlife. Once the information was gathered we had to find an appropriate way to post it to the web. Using Frontpage2000, we were able to create a user friendly web page where users can easily find information that is needed and increase their knowledge on the subject.

After completion of our web page, we had to determine a method for elucidating the educational value of the site. It is for this purpose that we created our second survey. This survey consisted of two parts. The first was distributed to members of the general public who have not viewed the web page. The second was distributed to members of the general public that had viewed the web page. This was done by randomly distributing a paper survey to members of the general public and including an electronic survey on the web page. The survey distributed to both of these groups was exactly the same. The survey consisted of 12 multiple choice questions, covering some of the main points of our project (App. A 2).

The main goal of this survey was to demonstrate the educational benefit of the web page. By comparing the results of a survey given to those who have not seen the web page, with the results of those who have seen the web page, we hope to show that having viewed our web site one gains an increased knowledge of the topic of Emergency Wildlife Care and Management. The results of these two surveys were compared using

an individual group t-test based upon 50 completed surveys from people who have not seen the web page and 50 completed surveys from people who have viewed the web page.

## Results of the First Survey:

We received around 35-40% of the responses back out of 125 surveys sent out to local rehabilitators. Region was of importance to us because it helped give us a better interpretation of possible misconceptions the public may hold. If a family lives in a more rural area, they may also encounter a number of nuisance animals; this is an important topic. Responses did not vary substantially between the three groups with 34% rural rehabilitators, 32% urban rehabilitators, and 34% suburban rehabilitators.

In response to question #4, the rehabilitators stated that most of the general public does not have sufficient available resources for assistance, as well as education. However, some were lucky enough to live in an area with an Audubon society or humane society. Some know of the local rehabilitators as well as local veterinarians that are willing to take in injured and/or orphaned wildlife. Tufts University School of Veterinary Medicine is renown in central Massachusetts. Any nearby library has a surplus of information, if people have the spirit to peruse it.

We felt that some questions on euthanasia were necessary because most people do not understand that a great deal of wildlife animals brought into the veterinary clinics or rehabilitators homes are put to sleep. Results state that all rehabilitators feel that euthanasia is necessary when the animal cannot be saved. It was agreed that the most important thing is to eliminate suffering for the animal. Occasionally, non-terminal

injuries allow future education of that particular species. The following results were acquired from question number 7; 29% of the rehabilitators euthanized ≤ 10% of their cases, 16% euthanized 25-30% of their cases, 32% euthanized 40-50% of their cases and 23% euthanized 75-90% of their cases.

One of the most important things we thought to educate the general public about was zoonoses. As predicted, the majority of rehabilitators agree that most people are unaware of zoonoses. Some people are aware of only rabies; however, there are a number of zoonotic diseases that the public most definitely should be made aware of.

Finally, we asked a few questions asking for their opinion on what we they feel we *should* be concentrating on with our project. These questions pertained to our web site; specifically the most important information that we should convey to the public. First, we would like to state that we received an almost unanimous response that a web site is an excellent idea; 84% of responding rehabilitators felt the web posted information would be a good concept. As for questions 5 and 12, the most important issues according to rehabilitators were as follows:

- when and when not to leave an animal alone
- the temporary care until a professional is sought
- handling dangers
- zoonoses
- who and where to call; list of rehabilitators in the surrounding areas; list of rehabilitators which specialize in certain species
- living with the nuisance wildlife
- how to keep injured species warm, quiet, and comfortable until a professional sees it
- education regarding cats
- try to leave baby animals alone
- life history and identification of each species seen in the surrounding areas

- misconceptions about the injured (know when an animal is actually injured)
- misconceptions about the orphaned (know when an animal is actually orphaned)
- an understanding of the laws regarding the possession of wildlife
- a bibliography of books and/or magazines concerning wildlife
- educational opportunities; how to help
- the fact the state rehabilitators do not get paid for their efforts
- donations towards rehabilitators are their only means of assistance

The responses that we received where crucial in the development of the scope of our project. We gained a good deal of insight into the issue of animal rehabilitation as the experts, the rehabilitators themselves, see it. This survey enabled us to modify the goals of our project in order to best accommodate the need of the general public, while not giving them information that the rehabilitators felt was impertinent or possibly harmful to the health and well being of both the public and the animals themselves.

## Results of the Second Survey:

After the completion of our website, we used a second survey, described earlier, to determine the educational benefit of the site. We based our analysis on 50 survey responses from individuals who had not viewed our website, and 50 survey responses from individuals who had viewed our website. Both of these groups received identical surveys, each containing the same eleven multiple-choice questions that were about topics discussed in our website. We compared the responses from these two groups in order to determine if there was a significant increase from the mean score of those who had not seen the website to the mean score of those who had seen the website. In order to ensure that our above findings have statistical relevance we performed an independent

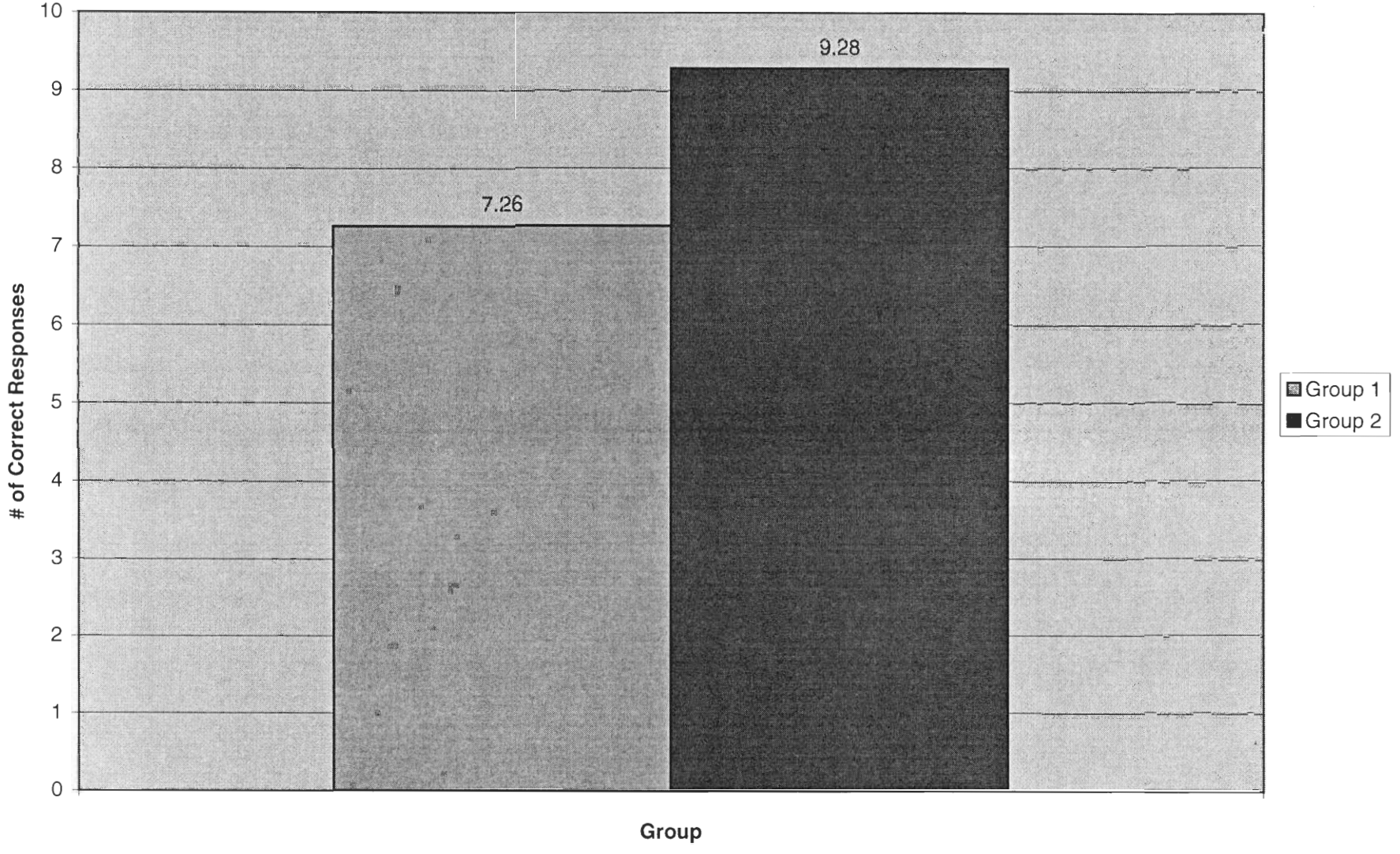
group t-test using the WINKS statistical data analysis program (Table 1). The two independent groups used in this case were group 1: the survey scores of those individuals who have not viewed our website, and group 2: the survey scores of those individuals who had viewed our website.

After analysis of the results we have found that the mean score of those survey results coming from those who had not seen the survey was lower than the mean score of those survey results coming from individuals that had seen the web page (N = 50,50 $Mean_1 = 7.26$, $SD_1 = 1.98$, $Mean_2 = 9.28$, $SD_2 = 2.01$, $t = -5.06$, $p < 0.001$). There is a significant increase in the number of correct responses from group 1 to group 2 (Fig. 1). These finding lead us to believe that our web page does in fact have an educational benefit.

**Table 1: Independent Group t-test Results**

| | | |
|---|---|---|
| Group Means and Standard Deviations: | | |
| Group 1: Mean = 7.26 | S.D. = 1.9775 | N = 50 |
| Group 2: Mean = 9.28 | S.D. = 2.0106 | N = 50 |
| Test for Equality of Variance: | | |
| F = 1.03 with (49, 49) D.F. | p = 0.908 | |
| Since the p-value for equality of variance is greater than 0.05, we have used the Equal Variance t-test. | | |
| Equal Variance t-test Results: | | |
| t = -5.06 with 98 D.F. | p < 0.001 | |

**Figure 1: Difference in the Mean Scores Between Group 1 and Group 2**



**Question by Question Analysis**

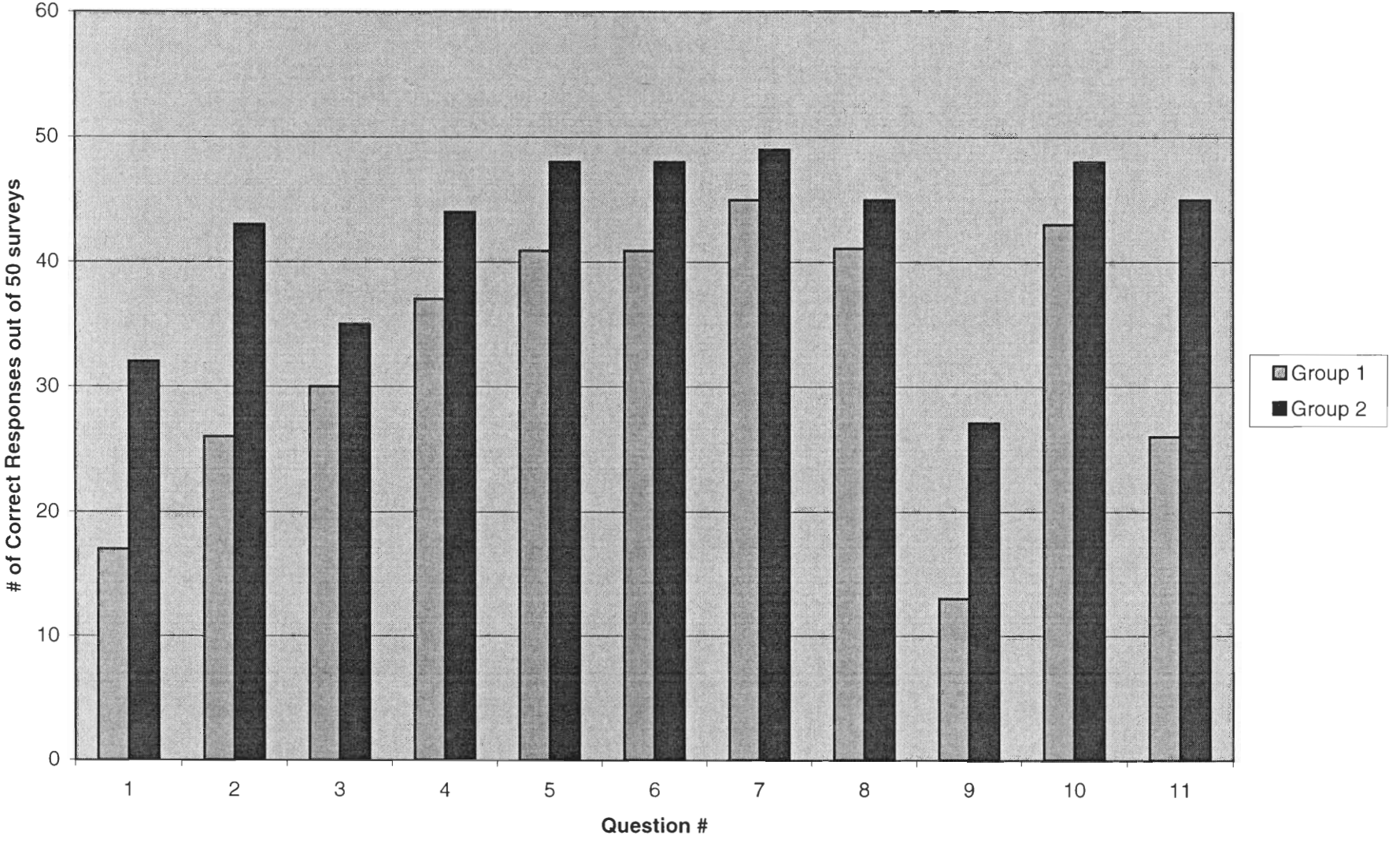
After analysis of the results of our second survey it would appear that our web site led to an increase in an individuals knowledge of the subject of wildlife awareness and emergency care. After performing a question by question analysis of the responses given by group 1 and group 2 it can be seen that there were significant gains in the ability of an individual to answer each of the questions asked in the survey having viewed the website (Fig. 2). These results show that our website did a good job dispelling several of the most common misconceptions held by the public about wildlife.

The first question of the survey asked, "if you handle a baby bird, the mother will reject it". The correct answer to this question is "false". Group 1 had a very difficult time with this question, while group 2 performed much better. Significant educational gains were also produced by the website with question 11, which asked about the proper emergency care of a rabbit in shock. Of the individuals of group 1 that had not seen the website, only around 50% of the survey responses showed a correct response for this question. Group 2, having viewed our website, faired much better with around 90% of the survey responses showing the correct response. Similar gains were also shown questions 2, and 9.

# Discussion:

Wild animals are among us in our everyday lives and activities. They live in our parks, backyards, schoolyards and even in or near our places of business. Indeed, wildlife is everywhere around us. Unfortunately, however, our life styles pose serious threats to those species that share our communities. The ill effects on wildlife are

**Figure 2: Comparison of Responses to First and Second Portion of Second Survey by Question**



probably greater today than at any other time in human history. This is probably not only true for wildlife but for our ecosystem in general. As our technology has advanced, our threat to the environment has increased. Problems such as global warming, natural resource depletion, and a growing hole in the ozone layer have arisen within this century. They are a result of our expansion across the globe and technological advancements. Our numbers keep climbing, only to create more problems for our environment. Of these major problems is our treatment and lack of respect to the other species that we share this earth with.

The goal of our project has been to help alleviate this growing problem. We hope to change the attitudes people have toward wildlife in order to help ensure a growing awareness of the problem for future generations. We realize that we cannot possibly reach every individual and will never fully solve the problem by ourselves. However, we feel that this project will at least play a small role in alleviating the problem and hopefully will inspire others to join in and take action. We have formulated a web based informational guide about northeastern wildlife and emergency care methods that can be utilized by the general public. This informational guide is meant to provide answers about wild animals to the public. We give them straightforward information on numerous topics, including species identification, diseases that can be contracted from wildlife, effects of domesticated cats, means for preventing nuisance wildlife encounters and emergency measures for injured wildlife. We by no means urge individuals to care for injured wildlife on their own. The treatment of wildlife should be left to the professionals. We instead aim for prevention of injury and harmful encounters (for both the animals and people). Our basic goal is to provide correct information to the public

about the wildlife in their backyard. We planned to clear up many of the misconceptions that people hold about wildlife and instill within them a proper attitude to have toward wildlife. We hope people will learn to respect the place of wild animals in our ecosystem and treat them accordingly.

As we see it now, there is an overall poor regard for wildlife by the public. Most people do not understand nature's balance and the role of wild animals in that balancing act. Humans have gotten very far away from a state of nature. Most people do not realize that humans at one point existed as the animals do. We were not always civilized people. We are on the same level as all other life on the planet. We are born only to reproduce and die. That is the simplest purpose of all life. Within our society, however, we are taught differently. We lead stressful, fast paced lives in which we are constantly worrying about our comfort levels. We worry about our clothes, cars, vacations, mansions and other toys. People are shielded from a natural state. Every day we move further away from nature. We are an arrogant species that holds ourselves in very high regard. As a result, there is a basic lack of respect and understanding of wildlife and nature.

We see many things that show this lack of respect for wildlife. We hunt and fish for pure entertainment. We raise certain animals for the sole purpose of making fur coats or leather boots. We have no qualms about destroying a natural habitat so we can build a new condominium or shopping mall. All of these things are more important to us than the welfare of the animals and the ecosystem.

More and more we encroach upon the habitats of wild animals and damage the environment. We keep pushing and pushing and then wonder where all of these

problems come from and how we can stop them. For example, on the news was a story about coyote attacks occurring in small communities. They had documented footage of coyotes killing woodchucks right in the backyards of people's homes. Of course this was deemed as a huge problem and the homeowners wanted something done about it. The thing that the public doesn't realize is that the coyotes aren't the problem. The coyotes are just doing what is natural. They are forced to hunt in our backyards because we encroach so much upon their environment.

We are the real problem. We cause all of the problems with the environment that we are facing right now. This is really what people have to realize. Professional rehabilitators see many different injuries inflicted on wild animals. The majority of these cases include animals hit by cars, poisoned from pesticides, injured by a hunter/trapper or even injuries from collisions with other man made structures. These all stem from our way of life. We want people to realize and understand this, hopefully urging them to be more careful and attentive or possibly get involved themselves. We are basically aiming at those people who in general do care about wildlife. We want to provide these people with a simple tool that will give them proper instruction and information, and that is what we feel we have done.

As discussed about in the methodology section, we sent surveys out to 125 local rehabilitators. The responses we received gave us ideas of what information needed to be included in our guide. From the responses, we obtained some general areas of focus: temporary care for injured wildlife, zoonotic disease information, effects of domestic cats, identification of orphaned wildlife, prevention of nuisance wildlife, wildlife laws and regulations, northeastern species identification and frequently asked questions. In all

cases, we expect that most people have some general knowledge of the topic. However, we realize that there is a lot of misinformation out there.

The most common example is people believing that a mother will abandon her young if it was handled by a human. This is just one such example though. There is a lot of incorrect information within all of these topics. Our major area of concern was in what information to give the public on treatment of injured wildlife. The survey responses we received urged us not to give any information on the actual treatment methods. Instead we provided proper handling and care methods that should be administered until a professional could be contacted. We also made sure to include means of protecting one self while handling or transporting the animal. We tried to stress personal safety the whole time.

Our Zoonotic disease section goes along with this safety issue. Most people are aware of rabies, but know nothing of the many other types of diseases that can be carried by animals. Our section included a large list of diseases from various sources, including viral, bacterial, mycotic, parasitic, protozoal and ticks. The section on nuisance wildlife gives methods on how to keep wildlife at bay. This included very simple instructions on means of prevention. The less contact people have with wildlife, the fewer the injuries to the animals and humans will be. This also cuts back on the chances of an individual or their pets contracting a disease from a wild animal.

We also had a large portion on domestic cats. People have little idea about the damage our domesticated pets cause to wildlife. House cats are responsible for a huge amount of bird deaths each year. Our pets are not part of nature's balance and can really

have adverse effects on wildlife. We conveyed this idea and urged that people keep their cats inside.

One of the smaller sections was the identification of orphaned wildlife. Many people misidentify when an animal is orphaned. This is especially the case with birds. We want to prevent any unnecessary "rescuing" of young animals. A lot of the time people are out to do well but they end up causing more harm. The last two sections, species identification and wildlife laws, did not encompass many falsehoods. We felt that these sections were important information that the public should have. The laws and regulations concerning wildlife is an area that most people probably know little about. We also felt the identification would be good for letting the public know the major species that they live among. These were the major areas of focus on our web page. Once the information was up and running, we were able to analyze the effectiveness of our project.

In order to test how well our site suited its purpose, we utilized another survey. This survey, which is discussed in detail in the methodology section, was given to two different sample groups. These groups were those people who had not looked through our site and those people who had. We took 50 responses from each sample group and performed our statistical analysis on them. The results of our t-test showed that our web site did indeed serve the purpose we intended. Overall, those who looked at our web site scored better on our survey. After analyzing the overall scores, we analyzed differences among each individual question. Looking at the bar graph we made, it is seen that the number of correct answers for each of the 11 questions goes up for the second group (those who used the site). This goes along with the t-test in showing the overall better

scores by the second group. However, the bar graph provides us with some additional insight into the usefulness of our site. Questions 1, 2, 9 and 11 showed much larger increases in the number of correct answers. These four questions encompass some of the major misconceptions that we believed were held by the general public.

Question 1 was "If you handle a baby bird, the mother will reject it. True or false." This is one of the largest misconceptions that we have already spoken about. There was a very large increase in the number of people who gave the correct answer of false. Many people believe that a mother will reject its young if it has been handled. This is definitely untrue. We placed this question in the survey to confirm our suspicion. It showed exactly what we expected.

Questions 2 and 11 both dealt with basically the same misconception. Question 2 was "A baby bird fell out of a tree, the best thing to do is: a. Put it back in the nest, b. Bring it to a rehabilitator, c. Keep tour distance and watch for 15-30 minutes." The correct answer is choice C. From the first group, there were 14 responses that chose A and 10 responses that chose B. Question 11 was "Your dog is barking at a rabbit in the yard. You put the dog in but the rabbit still hasn't moved. You should: a. Approach it and physically check if it is okay, b. Take it to a rehabilitator, c. Watch from a distance for 30 minutes." Again, the correct answer is C. From the first group, there were 15 responses that chose A and 10 responses that chose B. Though the questions do pertain to different situations, they still show us that people feel it is okay to physically handle wild animals. They do not realize that doing less is actually doing more. People should be wary of any wild animal in the first place. Physically checking or moving a wild animal is not really a good idea, especially when it is completely unnecessary. One could

easily end up harming an uninjured animal or causing it unneeded stress and physical trauma. That is why observing from a distance is the best choice. Observation will allow one to correctly determine if the animal is in need of help, and then that help should be administered. People should never make assumptions and just dive right in. This is the idea we wanted to convey to people through our site, and our results show that it did indeed do that.

Question 9 was "Squirrels may carry the Bubonic Plague. True or false." The correct answer is true. This was the question with the most incorrect answers (from both groups). We put this question in to see the extent of knowledge about zoonotic diseases. Most people really had no idea. This is a large area where people have little information. Our results from the first group confirm this by the small number of correct responses. The second group had about twice as many correct answers for this question, showing that our site did prove effective once again.

The results received show that we did fulfill the goals that we set for our project. One of our major goals was to clear up the misconceptions that the public has about wildlife. Some of the biggest problem areas were covered in questions 1, 2, 9 and 11 from the survey. These showed the largest increases in correct answers which is exactly what we wanted to see. We addressed the largest problem areas and were able to convey the right information to those who utilized our site. Our statistical analyses of the surveys show that our web site was overall very effective. We were able to create an easy to use informational guide that provided the public with correct information on the wildlife in their backyard.

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# Appendix A1
# Survey 1

Dear wildlife rehabilitator,

We are students attending Worcester Polytechnic Institute. Currently we are working on our Interactive Qualifying Project (IQP). The goal of the IQP is to relate technology and science to society. We have chosen to focus our work on wildlife rehabilitation. Currently we are working with Mark Pokras of Tufts University of Veterinary Medicine. He is one of the leading directors of wildlife rehabilitation at the University. Our goal is to formulate an informational packet composed of proper care and treatment techniques for Northeastern wildlife species. This packet will be designed for use by the general public. We want to inform communities about the animals living in their back yards. It seems that there are not a lot of resources on this issue accessible to communities. Our aim is to produce this informational packet and actually distribute it among communities.

We have put together a survey aimed at wildlife rehabilitators in order to isolate the major problems seen among Northeastern communities. Your expertise in the field of wildlife rehabilitation would provide us with crucial information for our project. Your response would be greatly appreciated.

Sincerely,

David Quattrucci

Jay McNally

David Levine

Dan Tiber

Questions:

1.) What species do you typically see brought into your clinic for treatment?

2.) What species do you feel are the most crucial to educate the public about?

3.) What are some common misconceptions you have seen the public to hold?

4.) In your opinion, what resources are available to the general public (in your area) about the care and maintenance of wildlife species?

5.) What do you feel are the most important issues the public should be made aware of (e.g., specific care techniques, handling, dangers, etc.)?

6.) Where do you find the majority of the cases you see come from (i.e. rural or urban)?

7.) What is your standpoint on euthanasia of injured animals brought into your clinic?

8.) What is the approximate percentage of cases euthanized at your clinic?

9.) What is the approximate percentage of cases released back into the wild?

10.) Do you feel that the general public is aware of zoonoses (i.e. rabies, etc.) and other possible dangers they face from wild injured animals?

11.) How beneficial would web posted information be to the public? What things do you feel should be included?

12.) Are there any other facts you have that may aid our project?

# Appendix A2
# Survey 2

**Thank you for filling out our survey.**

1) If you handle a baby bird, the mother will reject it.

● True ● False

2) A baby bird fell out of a tree, the best thing to do is:

● A. Put it back in the nest.

● B. Bring it to a rehabilitator.

● C. Keep your distance and watch for 15-30 minutes.

3) Small prey have natural defenses against cats.

● True ● False

4) If you find a baby mammal the best thing to do is:

● A. Bring it inside and feed it.

● B. Bring it to a rehabilitator.

● C. Leave it alone.

5) An unaccompanied baby bird sitting by a tree is an orphan.

● True ● False

6) All animals that approach humans in daylight are rabid.

● True ● False

7) What type of sustenance should you provide to a wild animal?

- A. Nothing
- B. Milk and cookies
- C. Ho-Ho crackers

8) Which of the following are not good means to prevent nuisance animals.

- A. Have a well lit outdoors.
- B. Fence around your property.
- C. Feeding your animals outdoors.

9) Squirrels may carry the Bubonic Plague.

- True
- False

10) If you are bitten by a mammal, you have rabies.

- True
- False

11) Your dog is barking at a rabbit in the yard. You put the dog in but the rabbit still hasn't moved. You should:

- A. Approach it and physically check if it is okay
- B. Take it to a rehabilitator
- C. Watch from a distance for 30 minutes

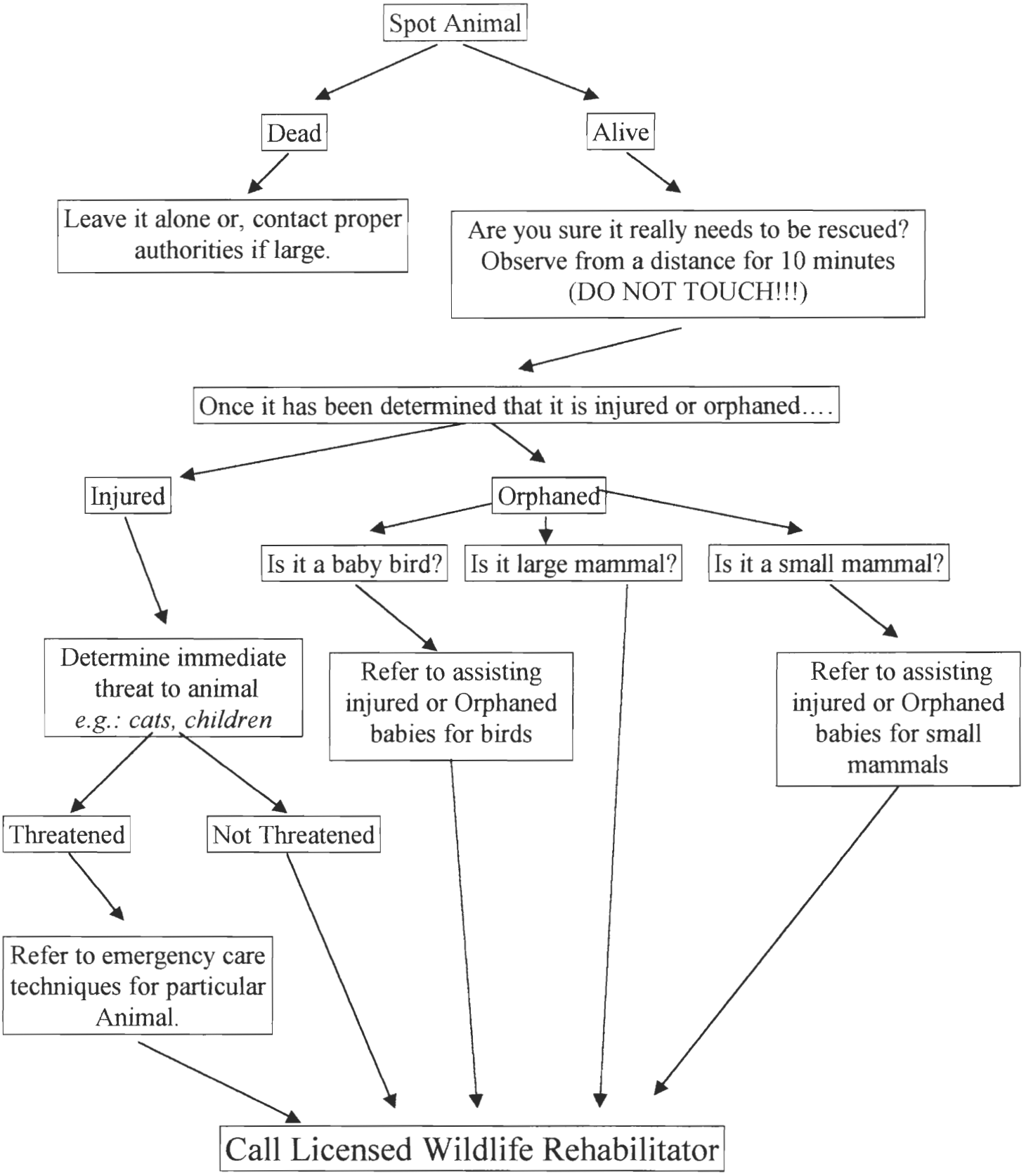
# Appendix B
# Web Page

**A Guide to Emergency Care and Proper Treatment of Wildlife of the Northeast**

Wildlife is everywhere. From urban areas to the countryside, the soil itself teams with life that is essential to our survival. As one looks more closely at the nature around us it becomes clear that there is an overall design. Increasingly the presence of humans can be seen to upset this delicate balance. Humans can cause injuries to animals that they are not adapted for. Every day wild creatures are killed and injured by humans in ever increasing numbers. Accidentally, many are run over by cars, poisoned by pesticides, or contaminated by oil. Many others are injured intentionally through hunting, trapping, and poisoning. As human expansion continues these interactions are only going to become more frequent and worse. It is for this reason that we have created this web page.

We designed this site for use by you. We hope to inform individuals of the animals that live in their backyard and how to live in harmony with them. When people are faced with injured wildlife in their neighborhood, they are not sure what to do. Many people will do the wrong thing and take the animals into their homes trying to rehabilitate them. Our goal is to inform you on what to do in emergency situations and what steps to take to insure the safety of yourself and the wildlife. Another major problem is nuisance animals. We hope to inform you on what steps you can take to keep the animals from damaging your property and in turn protecting the animals from hurting themselves. We would also like to inform you on laws and regulations, diseases and general recognition of the animals that share your neighborhood. We hope you enjoy our web page, and feel free to send comments, we would love to hear from you.

Please fill out our survey before proceeding and once again when you are done with the site. This will help us to see what our web page has accomplished. Thanks for visiting, hope to see you again.


Spot Animal
Dead
Alive
Leave it alone or, contact proper authorities if large.
Are you sure it really needs to be rescued? Observe from a distance for 10 minutes (DO NOT TOUCH!!!)
Once it has been determined that it is injured or orphaned....
Injured
Orphaned
Is it a baby bird?
Is it large mammal?
Is it a small mammal?
Determine immediate threat to animal e.g.: cats, children
Refer to assisting injured or Orphaned babies for birds
Refer to assisting injured or Orphaned babies for small mammals
Threatened
Not Threatened
Refer to emergency care techniques for particular Animal.
Call Licensed Wildlife Rehabilitator

# Emergency Care Methods

# EMERGENCEY CARE METHODS

This section is intended to give general methods for immediate care of injured wildlife. This is in no way meant to supplement for the care of professional rehabillitators. This is simply what to do until a professional can be reached.

In dealing with injured wildlife, it is first necessary to understand the shock and stress the animal is subject to. Shock is often the number one killer of injured wildlife, just as it is in injured humans. Being the first person to come into contact with an injured animal, you have the ability to minimize its shock and stress and thereby increase its chances for a healthy recovery. Shock is basically the loss of heat and fluids from the body. It is a natural response to injury. Interaction with humans can add additional stress to the animal, which could kill an already shocked animal. Stress is a cumulative process. One stressor may be insignificant, but a bunch piled up could be fatal. Common stressors include: handling, strange sights, noises, and smells, unfamiliar foods, lack of food or water, restraint, injuries, heat, cold, light and the presence of people's pets.

It is natural to want to comfort and help an injured wild animal, but it is important to realize that they don't understand our good intentions. The animal views you as any other predator. Human interaction is threatening to an animal. One must also realize the potential dangers in handling injured wildlife. A stressed animal may easily be provoked into attacking its caretaker. Not only is there threat from physical attack, but also from infectious disease. For your own safety, gloves should be worn AT ALL TIMES when caring for an injured animal. The thicker the gloves are, the better. Direct contact with the animal should also be avoided. Following these tips and the guidelines below will help in minimizing stress on the animal and ensuring a healthy recovery.

**Safe Handling:** In handling a small bird or mammal, make sure to cover the animal in a towel or cloth. Gently but securely take a hold of the animal. The towel helps to reduce the stress on the animal from handling, while at the same time, offering the handler some protection (on top of the gloves). Remember that the animal doesn't understand that you are trying to help it. Birds and mammals will try to protect themselves if they are able to. This is their natural response and is to be expected. It shouldn't be considered a vicious act.

**Temporary Housing:** Prepare a box of appropriate size (depending on the animal). The box should be covered but well ventilated. Line the inside of the box with newspaper or clean cloths (without rips and ragged ends). Place the box in an area that is safe, dark and quiet. The area should be free of human and pet traffic. Place a heating pad set to the lowest temperature under half of the box. This gives the animal the option to move away from the heat. If it is hot out, do not use the heating pad. Never feed the animal or give it water. Only a professional can know what is safe for the animal. Even just giving it water could be fatal. Never attempt to treat an animal's injuries. Leaving the animal alone is the best treatment you can give it until you get it to a professional. One exception is excessive bleeding. If there is excessive bleeding, just apply gentle pressure to the area (making sure to wear gloves). Never apply a tourniquet. Finally, make sure to contact a licensed rehabilitator and arrange to bring the animal in.

**Transporting:** Place the box with the animal on a seat or on the floor of your car. Keep the car warm and quiet. Leave the radio off and keep talking to a minimum. Never let anyone (especially children) hold the animal during the ride. Keep the animal in the box and leave it alone.

# Guide to Assisting Injured or Orphaned Wildlife Babies

# Guide to Assisting Injured or Orphaned Wildlife Babies

## Baby Birds

Mostly seen in the summer months, it is not unusual to find a bird which has fallen out of its nest. There are two stages in development which the baby might be at:

**Nestling** (occasionally referred to as a pinkie):
A nestling is completely naked or naked for the most part with a few feathers coming in. It carries a pink color. A found nestling may have fallen out and usually will be sitting on the ground.

If you have found an injured nestling:
Mostly, the baby bird has simply fallen out of the nest or was blown out by winds. If you can locate the nest it has fallen out of, try to place the nestling back in the box. Remember, a parent bird will not abandon a baby bird if humans have come in contact with it. If you cannot locate the nest, produce a home-made nest using a Cool-Whip© container or small plastic margarine dish. Cut holes in the container for drainage. Line to bottom of the container with paper towels, or if accessible, some dry brown grassings. This provides warmth and stability as a nest. Lastly, place the makeshift nest in the tree close to where you found the abandoned baby. The parent will use the new nest as a second nest, and may fly between the two nests, still nursing all of its babies. Another important consideration is that the baby maybe an orphan, in which it has been truly abandoned. If this is suspect, observe the baby in the homemade nest for at least two or three hours. If the parent does not return after this point, it is necessary to transport the orphan to the closest licensed wildlife rehabilitator immediately. The longer one waits to bring in the baby, the less chance of survival it has. An orphaned nestling bird requires constant feeding about every 15-20 minutes while it is awake. Make certain that the bird is kept warm. Get a warm wash cloth and gently place it next to the orphan. Do not attempt to feed the baby or administer liquids. Leave that to the professionals. More importantly to note is whether the bird is injured or not. Before bringing the baby in, one must be absolutely sure that the bird is injured, and how it obtained injury.

**Fledgling:**
A fledgling is partially feathered. Often a fledgling will be sitting on the ground by a tree. At this point in life, a fledgling is in his flight training stage, where he makes his attempts by jumping out of a tree. Of course, a bird cannot learn how to fly immediately.

If you find a fledgling:
Leave it there. Again, it is probably in its flight stage. If it is in a high traffic or potentially dangerous spot on the ground, move it out of harms way to some nearby bushes.

## Baby Squirrels

Most often, a baby is found after the nest had been blown down from a tree. If you spot a baby squirrel, place it in box (do not touch the animal-use gloves) and set it at the base of the tree. The mother customarily retrieves its young. If there is no mother in sight, take the squirrel in for a night. Keep it in the box with toweling. At this point, contact a local rehabilitator for instructions on noting whether or not it is injured. Be extremely careful to avoid touching the squirrel. Every haired-mammal is a threat to possess rabies and other zoonotic diseases.

## Baby Rabbits

Baby rabbits (primarily the Cottontail Rabbit in this area) are commonly disturbed by people mowing their lawn or raking. They make nests out of small depressions in the grass. Often cats and dogs will dig up the nests and injure or kill the babies. If you find a baby rabbit, return it to its nest. It is now important to observe the baby for hours, possibly until dusk. Frequently, mother rabbits only feed their young at dawn and dusk, and leave their young all day. If it looks certain that the mother is not going to return, put the orphans in a warm, dark box with towels. Bring the baby in to a rehabilitator only if you are sure that it is an orphan. Baby rabbits often die from humans attempted to raise it; for the simple handling puts a large amount of stress on it. One last thing to conceive is that when the rabbit is 5" long, it is on its own, and is not orphaned.
Like all mammals, avoid contact with the rabbit, for fear of zoonotic diseases.

# Identification

# Small Birds

| | |
|---|---|
| **Red-winged Blackbird** *(Agelaius phoeoniceus)* | |
| **Identification** | 7-9 ½". Male is black w/ bright red patches; Female is streaked w/ dusty brown. |
| **Habitat** | Marshes, swamps, meadows, and pastures. Breeds from AK then southeast across Canada to Newfoundland; south into CA, the Gulf Coast, FL; winters in the Great Lakes and New England. |
| **Habits** | Nests by virtually any body of water; occasionally flying in huge flocks with other birds such as grackle, cowbird; these flocks can be so large that they are considered a health hazard (flocks up to 1 million birds). |
| **Weapons** | |
| **Nutrition** | Few spiders, grass and forb seeds. |
| **Young** | 3-5 pale blue eggs spotted w/ dark blue or purple in a cup of marsh grass in marsh. |
| **Disease Dangers** | |

**Red-eyed Vireo**
*(Vireo olivaceus)*

| | |
|---|---|
| **Identification** | 5 ½-6 ½". Olive-green above, white below; white eyebrow bordered with black; gray crown; red eyes. |
| **Habitat** | Deciduous forests, and shade trees in residential areas. Breeds from British Columbia and Ontario then south to OR, CO, New England and FL. |
| **Habits** | One of the most abundant birds in eastern North America; adept singer-often calls a lot at dusk. |
| **Weapons** | |
| **Nutrition** | Mostly insects; snails, spiders. |
| **Young** | 3-4 white eggs lightly spotted with brown in a thin pendant of bark attached to a twig. |
| **Disease Dangers** | |

**Red-breasted Nuthatch**

***(Sitta canadenis)***

| | |
|---|---|
| **Identification** | 4 ½-4 ¾". Male has blue-gray upperparts and pale rusty underparts; crown is blue (gray in females). |
| **Habitat** | Coniferous forests. Breeds across Canada from Manitoba to Newfoundland, and south to CA, east to Great Lakes and the Appalachians. |
| **Habits** | Migrate south in large numbers. The Red-breasted Nuthatch is smaller than the White-breasted Nuthatch. They usually forage on twigs and branches in search of food. |
| **Diet** | Primarily seeds from a coniferous forest. |
| **Nesting** | 5-6 white (with red spots) in a cup of twigs and grass in a tree. |

| **Purple Finch *(Carpodacus purpureus)*** | |
|---|---|
| **Identification** | 5 ½-6 ½". Has thick bill. The male is rosy-red on head and rump. The female is heavily streaked with dull brown; they also have a bold eyebrow. |
| **Habitat** | Mixed and coniferous forests, gardens, forest edges. Breed in British Columbia and east to Newfoundland, then south covering entire United States |
| **Habits** | |
| **Diet** | Primarily seeds, tree buds and blossoms in the winter; insects in the springtime; fruit in the summer |
| **Nesting** | 4-5 blue green eggs. |

| **Pileated Woodpecker *(Bryocopus pileatus)*** | |
|---|---|
| **Identification** | 17". Black and white with neck stripes. Have white wing linings and a prominent red crest. |
| **Habitat** | Forests and forest borders, parks, wooded shrubs. Breeds in British Columbia and east to Nova Scotia, then south into U.S. (east of the Mississippi). |
| **Habits** | Shy. Often found in the outskirts of large cities. It is detectable from its noises. |
| **Diet** | Mostly insects; some fruit, acorn, nuts, sap. |
| **Nesting** | 4 white eggs in a tree. |

| | |
|---|---|
| **Rock-Dove *(Columbia livia)*<br>(Common Pigeon)** | |
| **Identification** | 12", chunky frame. Short, rounded tail. Bluish-gray with 2 blue wing stripes and a white behind. *There are many variants, however, this description is the most abundant.* |
| **Habitat** | City parks, suburban areas, gardens, farmlands. Always found near human habitations. The common Pigeon is a resident of nearly the entire North American continent. |
| **Habits** | Extremely common. Adept fliers; very gregarious. |
| **Diet** | Mostly grain. Occasionally green leaves; inverts. |
| **Nesting** | 2 white eggs in a nest made of sticks and debris on a window ledge, bridge, or tree. |

| | |
|---|---|
| **Common Nighthawk**<br>***(Chordeiles minor)*** | |
| **Identification** | 10". Usually seen in flight; has a wing span of 27". It is dark with pointed wings and a white patch on wing; square-shaped tail with a notch. Male has a white throat patch and white stripe. Female has buffy throat patch and *no* white tail bar. |
| **Habitat** | Open country; cities and towns. Breed from southern Yukon and east to northern Ontario and Nova Scotia, then southward into U.S. |
| **Habits** | Catches insects on its wing. Eats tremendously; sweeping with loud noises. Opposing its name, the Common Nighthawk does <u>not</u> fly at night, and also is not a hawk. |
| **Diet** | Flying insects. |
| **Nesting** | 2 olive-gray eggs on soil or gravel. |

| **Mourning Dove *(Zenaida macroura)*** | |
|---|---|
| **Identification** | 12". Sandy colored. Has a pointy tail bordered with white and black spots on its wings. |
| **Habitat** | Open fields, parks, lawns with trees and shrubs. Breeds from southeast AK and east to New Brunswick; winters in northeast U.S. |
| **Habits** | Common in rural portions of U.S. and also city parks. Has a swirling flight. |
| **Diet** | Seeds including waste grain from cultivated lands. |
| **Nesting** | 2 white eggs in a nest of twigs and grass in trees |

**Northern Mockingbird**

***(Minus polylottus)***

| | |
|---|---|
| **Identification** | 9-11". Gray with white patches on its wings and tail. Slender body and long tail. |
| **Habitat** | Residential areas, city parks, farmlands, open country with thickets, desert brush; suburbs. Breeds in CA and eastward covering the entire U.S. except Pacific Northwest. |
| **Habits** | Produces beautiful songs (most common singing bird in the spring). Often imitates other bird calls; strongly territorial. Shows to have pair bonding; flashes its wings to get insects. |
| **Diet** | Crayfish, sowbugs, snails, a few small verts; berries. |
| **Nesting** | 3-5 blue-green eggs spotted with brown in a cup of twigs and weed stems in a bush or low tree. |

| | |
|---|---|
| **Marsh Wren** *(Cistothorus palostris)* | |
| **Identification** | 4-4 ½". Brown above, pale buff below; bold white eyebrow; white streaked back. |
| **Habitat** | Freshwater and brackish marshes (often w/ reeds, sedges, and cattails). Breeds from British Columbia, Manitoba, Nova Scotia, and south to Mexico, Gulf Coast, and FL; winters often in NJ and New England (on coasts). |
| **Habits** | Male has a member of female mates; male builds numerous dummy nests; good singers; often destroy other eggs. |
| **Weapons** | |
| **Nutrition** | Includes aquatic insects; occasionally the contents of other birds' eggs. |
| **Young** | 5-6 pale brown eggs, speckled w/ dark brown in a globular nest of cattails, feathers in reeds. |
| **Disease Dangers** | |

| **Horned Lark *(Eremophila alpestris)*** | |
|---|---|
| **Identification** | 7-8". Brown with a black stripe below eyes; white and/or light yellow stripe above eye. Has a black crescent on its breast; black "horns." |
| **Habitat** | Plains, fields, airports, beaches, tundra. |
| **Habits** | Very early nesting. Favors barren habitats. Flies with mixed flocks in the fall. Males struts before female with erect horns and dropped wings in courtship. |
| **Diet** | Spiders and snails; grass and forbs. |
| **Nesting** | 3-5 brown-spotted gray eggs in the hollow ground with grass. |

| | |
|---|---|
| **Golden-crowned Kinglet**<br>***(Regulus satrapa)*** | |
| **Identification** | 3 ½-4". Olive-green above, paler below. 2 dull white wing bars; white eyebrow; crown is orange bordered. |
| **Habitat** | Dense, old coniferous forests, deciduous forests, thickets. Breeds from AK, Alberta, Manitoba, and Newfoundland; then south to U.S. including CA and the southwest U.S., MI, and southern New England. |
| **Habits** | Winter visitors. Often seen in mixed flocks. Adept insect hunters; particularly tame in the nest. |
| **Diet** | Mostly spiders; some fruit and seeds. |
| **Nesting** | 8-9 brown-speckled cream eggs in moss and lichens with twigs in a tree. |

| **Belted Kingfisher *(Ceryle alcyon)*** | |
|---|---|
| **Identification** | 13". Brushy crest with a sharp bill. Blue-gray on top and white on bottom. Chestnut brown band across abdomen. |
| **Habitat** | Rivers, lakes, saltwater estuaries. Its winters are along the Pacific coast, then to Great Lakes; southwest to Atlanta and east to New England. |
| **Habits** | Often hovers when a fish is visible, then dives vertically. Patrols streams and lakeshores for fish. |
| **Diet** | Aquatic fish, amphibians, reptiles, insects, young birds, mice, oysters, and infrequently squid (along coasts). |
| **Nesting** | 5-8 white eggs in logs or dug in sand. |

| **Killdeer (Charadrius vociferus)** | |
|---|---|
| **Identification** | 9-11". Brown above, white below with 2 black bands across breast. Long legs and tail |
| **Habitat** | Generally open country; very common |
| **Habits** | Noisy caller. Often feigns injury to defend nest from predators. |
| **Diet** | 75% insects, the remainder is a variety of inverts. |
| **Nesting** | 4 eggs |

**Ruby-Throated Hummingbird**

***(Archilochus colobris))***

| | |
|---|---|
| **Identification** | 3 ½". Very small bird with a needle-like bill. Metallic green on top and a white below. Male has a bright red throat. Female has a green top with white throat and breast, and white-tipped tail feathers. |
| **Habitat** | Suburban gardens, parks, woodlands. Only hummingbird east of the Mississippi. Breeds from southern Canada and south to the Gulf States. |
| **Habits** | Attracted to red flowers and artificial feeders. Has the ability to flap its wings 100s times a second. Also has the ability to fly backwards and hover. This hummingbird is constantly in motion. It produces a high pitched chirp (squeak almost). |
| **Diet** | Nectar; also, small spiders and tree sap. |
| **Nesting** | 2 tiny white eggs (1/2") in a woven plant nest of silk on a branch. |

| | |
|---|---|
| **House Wren**<br>*(Troglodytes aedon)* | |
| **Identification** | 4 ½-5 ½", tiny. Short tail that is often held cocked over the back; dusky brown above, paler below. |
| **Habitat** | Residential areas, city parks, farmlands, and woodland edges. Breeds across British Columbia to New Brunswick, then south to AZ, TX, TN, and FL. |
| **Habits** | Often nests in odd places such as mailboxes and flowerpots; shy outside the breeding season; often mail makes a dummy nest; known to destroy eggs of other birds (only in breeding season though) |
| **Weapons** | |
| **Nutrition** | Includes millipedes, spiders, and snail. |
| **Young** | 5-8 white eggs lightly spotted with brown in a cup lined with feathers, sticks, and grass in a natural cavity. |
| **Disease Dangers** | |

| **House Sparrow *(Passer domesticus)*** | |
|---|---|
| **Identification** | 5 ½-6". Male has black throat, white cheeks and chestnut on the back of neck. Gray crown and rump. Female has streaked dull brown, otherwise is same as male. |
| **Habitat** | Cities, towns, and agricultural areas. The House Sparrow is a resident throughout temperate North America. |
| **Habits** | Extremely common and always associated with humans. Occasionally eats crops. |
| **Diet** | Insects, weed seeds. |
| **Nesting** | 5-6 brown-speckled white eggs in loose grass or nest in a tree. |

| **House Finch *(Carpodacus mexicanos)*** | |
|---|---|
| **Identification** | 5-6". Male is streaked brown with a bright red breast, forehead, eyebrow, and rump. Female lacks red and is finely streaked. |
| **Habitat** | Cities and residential areas. Breeds from northern MS and eastward to the Atlantic. |
| **Habits** | |
| **Diet** | Berries and ornamental shrubs. |
| **Nesting** | 4-5 pale blue eggs. |

| **Hairy Woodpecker *(Picoides villosu)*** | |
|---|---|
| **Identification** | 9". Black and white (unspotted) with a long bill. |
| **Habitat** | Deciduous forests. Breeds from AK then southeast across Canada and south throughout United States. |
| **Habits** | Primarily a forest bird, the Hairy Woodpecker is shy. It often hammers on dead wood as part of its courtship and proclamation of victory. It also contributes to the ecosystem by consuming insects which may eat away trees. |
| **Diet** | Largely insects. Also, sap from a sapsucker hole. |
| **Nesting** | 4 white eggs in a hole in a tree. |

| **Northern Flicker *(Colaptes auratus)*<br>(Yellow-shafted Flicker)** | |
|---|---|
| **Identification** | Brown back with dark bars and spots. Also has a white with black spots. Black crescent on back; red patch on nape. |
| **Habitat** | Open country with trees; parks and large gardens. Breeds in AK then southeast across southern Canada to Newfoundland, then south throughout U.S. |
| **Habits** | Only brown-backed woodpecker in the east. Mainly feeds on the ground; hammers on dead wood. |
| **Diet** | Mostly ants. Also seeds, acorn, nuts and grain. |
| **Nesting** | 6-8 white eggs in a tree. |

| | |
|---|---|
| **Eastern Meadowlark** *(Sturnella magna)* | |
| **Identification** | 9-11". Stocky frame. Brown-streaked w/ white edged tail; bright yellow throat and breast. |
| **Habitat** | Meadows, pastures, prairies, and open country. Breeds in southeast Canada and south through eastern U.S., west to NE and AZ. |
| **Habits** | Common in America's farmlands; melodious songcaller; polygamous w/ its mate; during migration many different species of meadowlarks will flock together. |
| **Weapons** | |
| **Nutrition** | Few spiders, grass and forb seeds, some fruit. |
| **Young** | 3-5 white eggs spotted w/ brown in a cup of grass depressed in a meadow. |
| **Disease Dangers** | |

| | |
|---|---|
| **Eastern Chipmunk**<br>***(Tamius striatus)*** | |
| **Identification** | Head and body 8 ½-11-3/4". Tail 3-4 ¼". Reddish-brown above, belly is white. 1 white stripe bordered by 2 black stripes on sides; also a dark center stripe. 2 white stripes on back. Bushy, relatively flat tail. |
| **Habitat** | Open deciduous woodlands, forest edges, brushy areas. It is commonly found in bushes and stone walls around houses. Range is in southeastern Canada and northeast United States. Also, ND and OK. |
| **Habits** | Hibernates from late fall to early spring, which is considered to be short-term. Primarily a ground species. Stores food in burrows. Somewhat territorial. Makes cutting sounds as it eats nuts; knaws and chews with additions of forepaws. Life expectancy is around 3 years. It is populated 2-4 per acre. Has been noted to destroy some garden fruit and/or bulbs. |
| **Diet** | Mainly nuts and acorns, occasionally seeds. Also, slugs and snails, carrion (small vertebrates). |
| **Dangers** | Rabies. Sharp claws and teeth. |
| **Nesting** | Mates in early May, also in August-September. 3-5 young with a gestation period of 31 days. Nests are in small burrows in the ground. |

| **Downy Woodpecker *(Picoides pubescens)*** | |
|---|---|
| **Identification** | 6". Black and white. Males have a small red patch on the nape and a stubbier bill. |
| **Habitat** | Woodlands, parks, and gardens. Breeds from AK then southeast across Canada, throughout Northeast U.S. |
| **Habits** | |
| **Diet** | |
| **Nesting** | 4-5 white eggs in a hole in a tree. |

**Dark-eyed Junco**
*(Junco hyemalis)*

| | |
|---|---|
| **Identification** | 5-6 ½". Slate-gray or gray-brown above, white stomach, pink bill. |
| **Habitat** | Coniferous, deciduous, or mixed forests, fields, gardens, city parks. Breeds from AK and east across Canada to Newfoundland, then south covering the entire U.S. |
| **Habits** | Among the most common winter birds, flies in large flocks with other species of birds. |
| **Weapons** | |
| **Nutrition** | Spiders, a variety of seeds |
| **Young** | 3-6 brown spotted pale green-blue eggs in a cup of grass, moss, and bark concealed on the ground. |
| **Disease Dangers** | |

| **American Crow (Common Crow)**<br>***(Corus Brachyrhynchos)*** | |
|---|---|
| **Identification** | 17-21", stocky frame. Entirely black. Short bill and fan-shaped tail. |
| **Habitat** | Woodlands, farmlands, and suburban areas. Breeds from British Columbia and south to the Gulf Coast, covering almost the entire United States. |
| **Habits** | Very common, especially along highways and in the countryside. It is a very stable species. Intelligent, high reproductive capability. Have the ability to mimic humans. Possible threat to crops, however, they also aid the farmers through their diet. |
| **Diet** | Insects (including grasshoppers) and other inverts. Carrion, small verts, bird eggs, seeds, corn, fruit, nuts. |
| **Nesting** | 4-6 dull green, dark-brown spotted eggs in twigs, feathers and/or grass in a tree. |

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|---|---|
| **Brown Creeper**<br>***(Certhia americana)*** | |
| **Identification** | 5-5 ¾", slender body. Brown with buff on flanks. |
| **Habitat** | Deciduous and mixed forests (particularly pine forests). Breeds from AK through Ontario to Newfoundland and south covering the entire U.S.; largely New England. |
| **Habits** | Inconspicuous, often detected by its soft call. Often walks up a tree probing for insects. |
| **Diet** | Spiders (and other inverts). Also acorns and beachnuts. |
| **Nesting** | 6-7 brown-speckled white eggs in a cup of bark, feathers, and sticks against a tree. |

| | |
|---|---|
| **Common Grackle** *(Quiscalus quiscula)* | |
| **Identification** | 12" long, wedge shaped tail, appears all black at a distance but is iridescent w/ blue-green; bronze in the sunlight; bright yellow eyes. |
| **Habitat** | Lawns, parks, fields, and open woodlands. Breeds in Alberta and east to Newfoundland, then south to the Gulf Coast; winters in New England and the Great Lakes. |
| **Habits** | Common early in the spring to late fall (long stays); fly in huge flocks which sometimes may be damaging to crops. |
| **Weapons** | |
| **Nutrition** | Insects, crustaceans, fish, small invertebrates, bird eggs, fruit, grain, acorns, nuts, seeds, terrestrial, and aquatic inverts. |
| **Young** | 5 pale blue eggs in a stick nest w/ grass paced in a bush or tree. |
| **Disease Dangers** | |

| **Chimney Swift *(Chartura pelagica)*** | |
|---|---|
| **Identification** | 4 ½-5 ½", stubby frame. Brown-gray body with a short tail. Long, narrow, curved wings. |
| **Habitat** | Roosts in chimneys; open country and towns. Breeds in southeast Canada and south to the Gulf States. |
| **Habits** | Very fast flier. Flies during the day and rests at night. Often gathers communally in chimneys. Occasionally will fly in a "V" pattern. |
| **Diet** | Exclusively flying insects. |
| **Nesting** | 4-5 white eggs in a twig nest (made with saliva) often in chimneys, caves, or hollow trees. |

**Black-capped Chickadee**

***(Parus atricapillus)***

| | |
|---|---|
| **Identification** | 4 ¾-5 ¾". Top of head and neck are black. White cheeks and a gray back. Dull white underparts; narrow wings. |
| **Habitat** | Deciduous and mixed forests. Open woodlands, suburban areas. Breeds from AK and east across Canada to Newfoundland; also, south to northern U.S. |
| **Habits** | Tame and inquisitive, this bird often visits feeders. Often seen mixed flocks with woodpeckers, nuthatches, creepers, and kinglets. Common in cities in the winter; woodlands in spring. Often feeds upside down. |
| **Diet** | Spiders and their eggs. |
| **Nesting** | 6-8 brown-speckled white eggs in a cup of grass and feathers in a hole in a tree. |

## Gray Catbird

*(Dumetella carolinesis)*

| | |
|---|---|
| **Identification** | 9-9 ¼". Dark gray with a black cap and rusty undertail. Slender body with a long tail. |
| **Habitat** | Thickets and dense brush in moist areas; residential areas and gardens. Breeds from British Columbia, Manitoba, and Nova Scotia and south to WA, TX, and GA. |
| **Habits** | Often announces its presence by a cat-like whine. Produces pleasant sounds. |
| **Diet** | Spiders, berries, fruit. |
| **Nesting** | 4-5 blue-green glossy eggs in a mass of twigs, stems, and leaves in dense bush. |

| **Northern Cardinal**<br>***(Cardinalis cardinalis)*** | |
|---|---|
| **Identification** | 8-9". Male is bright red with crest, black face and a stout red bill. Female is buff brown with red on its wings and tail. |
| **Habitat** | Forest edges, thickets, gardens. Breeds from eastern U.S. and southern Canada, then south to Gulf Coast and TX. |
| **Habits** | Aggressive, loud songcallers. They occupy territories year-round. Displays pair bonding. |
| **Diet** | Insects; fruit and seeds. |
| **Nesting** | 3-4 pale green eggs, spotted with reddish-brown in a deep cup of twigs and leaves in a thicket. |

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|---|---|
| **Brown-throated Cowbird** *(Molothrus ater)* | |
| **Identification** | 6-8". Male is black w/ glossy brown head; female is plain gray-brown. |
| **Habitat** | Agricultural land, fields, woodland edges, and suburbs. Breed from British Columbia and east to Quebec and Newfoundland, then south throughout the U.S. |
| **Habits** | "brood parasites": they leave their eggs in other birds' nests, leaving their young to the foster parent (most often the foster parent will take it in); occasionally the abandoned chick will grow to be larger than its "mother" |
| **Weapons** | |
| **Nutrition** | Grain, grass, and forb seeds. |
| **Young** | 4-5 white eggs lightly speckled w/ brown in the nests of other songbirds. |
| **Disease Dangers** | |

| **Rose-breasted Grosbeak** *(Pheuticus ludovicianus)* | |
|---|---|
| **Identification** | 8". Pinkish white bill; male is black and white w/ red patches on breast; female is white above and brown-streaked below w/ a white eyebrow. |
| **Habitat** | Moist woodlands, open fields, orchards. Northern British Columbia then southeast to MN, the great lakes and east to New England. |
| **Habits** | Very conspicuous, beneficial to farmers by their diets |
| **Weapons** | |
| **Nutrition** | Flowers, potato beetles and larvae, seeds, wild fruit. |
| **Young** | 4-5 purple spotted white eggs in a loose nest of twigs and grass in a branch. |
| **Disease Dangers** | |

| **Eastern Bluebird**<br>***(Sialia sialis)*** | |
|---|---|
| **Identification** | 7". Bright blue above and on wings. Rusty throat and breast with a white belly and undertail. Females are similar but duller. |
| **Habitat** | Open woodlands and farmlands with scattered trees; forest edges. Breed east of the Rockies to the Gulf Coast and the Atlantic. |
| **Habits** | Favorite among public. Competes for nests with House Sparrows and European Starlings. Unfortunately, the Eastern Bluebird is a declining population. |
| **Diet** | Earthworms, snails and other inverts; berries. |
| **Nesting** | 4-6 pale blue eggs in a cup of grass and stems in a tree cavity. |

| **Blue Jay** ***(Cyanocitta cristata)*** | |
|---|---|
| **Identification** | 12". Bright blue above with a lot of white and black on the tail and wings. White below, black facial markings; large crest. |
| **Habitat** | Oak forests, city parks, suburban yards. |
| **Habits** | Often chases other smaller birds. Buries its seeds or acorns. Blue Jays are considered to be "mob predators," traveling in large packs. |
| **Diet** | Insects and other inverts. Bird eggs, nestlings, acorns, fruit, nuts, seeds. |
| **Nesting** | 4-5 brown-spotted green eggs in a nest of sticks and grass. |

| **Black-billed Cuckoo** ***(Coccyzus erythropthalamus)*** | |
|---|---|
| **Identification** | 12". Brown above and white below. Its bill is almost entirely black; wings are brown. Has a red ring around eyes. |
| **Habitat** | Open woodlands; moist thickets in overgrown pastures and orchards. Breeds from Manitoba and east to New England; south to TX, AR and SC. |
| **Habits** | Adept at hiding. Deep repetitive tones. They have been noted to be beneficial to farmers through their diet. |
| **Diet** | Mainly hairy caterpillars. Also mollusks, fish, eggs, fruits, berries. |
| **Nesting** | 2-4 blue-green eggs in a shallow nest of twigs and grass. |

| **Barn Swallow *(Hirundo rustica)*** | |
|---|---|
| **Identification** | 5 ¾-7 ¾". Possesses a deeply forked tail. Its upperparts are dark black and underparts are buff; throat and forehead are rusty. |
| **Habitat** | Agricultural land, suburban areas, marshes, and lakeshores. Breeds from AK and east across Canada to Newfoundland, then south into entire U.S. except TX and the Gulf Coast. |
| **Habits** | Majority of these birds nest on or in buildings; also occasionally in caves or under bridges. They perform long hibernation; they are swift and graceful fliers. |
| **Diet** | Occasionally berries, seeds. |
| **Nesting** | 4-6 white brown-spotted eggs in a mud cup on a building ledge or rafter. |

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|---|---|
| **American Goldfinch** *(Carduelis tristis)* | |
| **Identification** | Dull yellow w/ gray; black wings and tail; white wing bars; breeding male is bright yellow w/ a white rump. |
| **Habitat** | Brushy thickets, weedy grasslands, and nearby trees. Breeds from British Columbia and east to Newfoundland, south to CA, CO, OK, and the Carolinas. |
| **Habits** | Begins its nesting late (mid to late summer); remain in large flocks until breeding period; females sit in nest a lot. |
| **Weapons** | |
| **Nutrition** | Seeds of deciduous trees, forbs, grass, floral buds, and berries. |
| **Young** | 4-5 pale blue eggs in a cup of grass and bark placed in a shrub or sapling. |
| **Disease Dangers** | |

| **American Tree Sparrow** *(Spizella arborea))* | |
|---|---|
| **Identification** | 5 ½-6 ½". Gray head with rofous crown and ear stripe, streaked with brown above. Has two prominent wing bars, gray underneath with a single dark spot in the center of the breast. |
| **Habitat** | Willows, birch thickets, fields with scattered trees, roadside thickets. Seen in winter in CA, AR, the Carolinas, then north to central Quebec and Newfoundland. |
| **Habits** | Appear in flocks with soft calls. Often visits feeders. Apparently possesses social hierarchy. |
| **Diet** | Few spiders, grass, forbs, buds of willows and birches, berries. |
| **Nesting** | 4-5 pale blue eggs, speckled with brown, in a pile of bark strips and feathers. |

**American Robin**

***(Turdus migratorius)***

| | |
|---|---|
| **Identification** | 9-11". Gray above, dark red below. Males have a black head and tail; females have a dull gray head and tail. |
| **Habitat** | Towns, gardens, open woodlands, agricultural parks, parks. Breeds from AK and east across Canada, then south covering the entire U.S. |
| **Habits** | Rather shy, this Robin prefers large shade trees on lawns. These birds frequent the cedar bogs and swamps in the winter; often gather in very large roosts (up to 100,000). |
| **Diet** | Earthworms, snail; a lot of fruit. |
| **Nesting** | 3-5 blue-green eggs in a cup of mud with grass and twigs in a tree. Also may be on a building ledge or windowsill; occasionally shrubs. |

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|---|---|
| **Winter Wren** *(Troglodytes troglodytes)* | |
| **Identification** | 4-4 ½", tiny. Dark brown w/ a very short tail; pale eyebrow, similar to the House Wren. |
| **Habitat** | Coniferous and mixed forests. Breeds from AK and British Columbia across southern Canada to Newfoundland, south to CA, the great lakes and New England. |
| **Habits** | Creeps around a lot; male often builds dummy nests; secretive nature; habitually teeters and bobs. |
| **Weapons** | |
| **Nutrition** | Included spiders, occasionally berries. |
| **Young** | 5-7 brown speckled white eggs in a bulky mass of twigs and moss often in a hole in a tree, in or on a fallen tree. |
| **Disease Dangers** | |

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|---|---|
| **White-breasted Nuthatch**<br>***(Sitta carolinensis)*** | |
| **Identification** | 5-6". Blue-gray above, white below. Has a white face and a black crown. The White-breasted Nuthatch is larger than the Red-breasted Nuthatch. |
| **Habitat** | Deciduous forests; prefers decaying trees. It is a resident in U.S. with exception of the Great Plains. |
| **Habits** | Generally sedentary. Most often seen in pairs. Will occasionally join in flocks with woodpeckers and other birds. Seemingly attracted to birdfeeders. |
| **Diet** | Spiders. In winter, may eat acorns or nuts. |
| **Nesting** | 5-6 white eggs, speckled with red-brown in a cup of twigs and grass. |

**Cedar Waxwing**

***(Bomtoycilla cedrorum)***

| | |
|---|---|
| **Identification** | 6 ½-8". A sleek brown-crested bird with a black mask and yellow-tipped feathers. |
| **Habitat** | Open woodlands, orchards, and residential areas. Breed in southern Canada and east to Newfoundland, then south to New England and Gulf Coast. |
| **Habits** | Often found in flocks. Shows erratic movements; flies to berry patches and then leaves suddenly in flocks. Apparent food sharing habits. Gluttonous and tame. |
| **Diet** | Majority is berries. Some insects in the summer, flowers. |
| **Nesting** | 4-6 blue-gray eggs spotted with brown and black in a cup of twigs and grass in a tree. |

**Warbling Vireo**
*(Vireo gilvus)*

| | |
|---|---|
| **Identification** | 5-6". Similar to Red-eyed Vireo: olive-green above, white below; white eyebrow, but not bordered w/ black. |
| **Habitat** | Deciduous woodlands, especially near streams, shade trees. Breeds in British Columbia east to Newfoundland, and south to the U.S., common in New England. |
| **Habits** | Often found close to streams, very defensive of nest; somewhat aggressive. |
| **Weapons** | |
| **Nutrition** | Almost entirely insects, occasionally fruit. |
| **Young** | 3-4 brown-spotted white eggs in a well made pendant of bark, leaves vegetable fibers, and grass attached to a twig. |
| **Disease Dangers** | |

| | |
|---|---|
| **Veery**<br>***(Catharus fusescens))*** | |
| **Identification** | 6 ½-7 ¼". Cinnamon-brown above with light spotting in upper breast. |
| **Habitat** | Deciduous woodlands (shaded and moist). Breeds from southern British Columbia and east to Newfoundland. South to AR, SD, MN, NJ, and New England. |
| **Habits** | Produces beautiful sounds, especially at dusk. |
| **Diet** | Spiders; some fruit in the fall and winter months. |
| **Nesting** | 4 blue-green eggs in a bulky cup of moss and leaves on the ground, usually in a clump of leaves. |

**Tufted Titmouse**
*(Parus bicolor)*

| | |
|---|---|
| **Identification** | 6". Gray above and white below; light orange sides; gray chest. |
| **Habitat** | Swampy or moist woodlands; shade trees in villages and city parks. Northeast U.S.; also ME and New England, then west and south to Gulf Coast, TX, and FL. |
| **Habits** | Social bird (especially in the winter); join in mixed flocks with chickadees, nuthatches, kinglets, and small woodpeckers; pairs w/ female. |
| **Weapons** | |
| **Nutrition** | Spiders and their eggs, few snails, acorns in the winter. |
| **Young** | 5-6 brown-spotted white eggs in a tree cavity |
| **Disease Dangers** | |

| **Tree Swallow *(Tachycineta bicolor))*** | |
|---|---|
| **Identification** | 5-6 ¼". Metallic blue or blue-green upperparts and plain white underparts. The young have dull brown above. |
| **Habitat** | Lakeshores, meadows, marshes, and streams. |
| **Habits** | Often gather in enormous flocks in the fall; sometimes will circle with a large group. Seen in nest boxes. |
| **Diet** | Berries eaten when insect supply is unavailable. |
| **Nesting** | 4-6 white eggs in a cup of grass in a tree. |

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|---|---|
| **Wood Thrush**<br>***(Hylocichlas mustelina))*** | |
| **Identification** | 8". Brown on top, bright rusty head. White below with large black spots. |
| **Habitat** | Moist deciduous woodlands; parks and gardens, especially near water. Breeds in the United States east of the Mississippi. |
| **Habits** | Most familiar of the brown Thrushes; often nests near house. Produces beautiful songs; prefers moist substrate. |
| **Diet** | Spiders; fruit. |
| **Nesting** | 4 green-blue eggs in a cup of grass and twigs in a bush or sapling. |

**Brown Thrasher**

***(Torostoma rufum)***

| | |
|---|---|
| **Identification** | 11 ½". Distinct brown above with white below. Has dark brown streak; curved bill, a long tail, and particular yellow eyes. |
| **Habitat** | Thickets, fields with scrubs; woodland borders; suburbs. Breeds in southern Manitoba and Ontario, then south to New England and the Gulf Coast. |
| **Habits** | Secretive bird, feeds on the ground. Often carries twigs. It uses its string bill to dig and sweep away debris in search of food. |
| **Diet** | Insects, inverts, small verts; also berries or fruit, nuts. |
| **Nesting** | 4-5 light blue eggs with brown spots in a nest of twigs and grass in a bush. |

**Scarlet Tanager**

***(Piranga olivacea)***

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|---|---|
| **Identification** | 7 ½-8 ½". A brilliant scarlet red with black wings and tail. Occasionally have olive-green wings. |
| **Habitat** | Mainly woodlands, especially oak and pine. Breeds from northeast and central U.S. |
| **Habits** | Conspicuous in sunlight, inconspicuous in the dark. |
| **Diet** | Terrestrial inverts, insects; few berries, bark. |
| **Nesting** | 3-4 brown-spotted green eggs in a shallow nest of twigs, stems, and grass on a branch. |

**European Starling**

***(Sturnus vulgaris)***

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|---|---|
| **Identification** | 7 ½-8 ½". Short-tailed, chunky; iridescent black. Its long, pointy tail is yellow in the summer but dark in the fall. |
| **Habitat** | Cities, suburban areas, farmlands, ranches. Breeds predominantly in all of Canada, U.S. and northern Mexico. |
| **Habits** | May be found in very large roosts. They are loud birds, aggressive and competitive. |
| **Diet** | Insects, inverts; berries. |
| **Nesting** | 4-6 pale blue eggs in twigs, grass, debris, and feathers in a tree or building cavity. |

| **Spotted Sandpiper *(Actitis macularia)*** | |
|---|---|
| **Identification** | 7 ½". During breeding season this Sandpiper has a brown above and a white below, black spots on the breast and belly. In the fall it lacks black spots and has slight brown on the side of the breast. |
| **Habitat** | Ponds, streams, along coasts. Breeds from Northern AK and eastward throughout Canada, then south covering the entire U.S. |
| **Habits** | Widely known shorebird. Constantly bobs rear portion of body. Flies with short bursts of speed followed by brief glides. Possesses the ability to dive and swim. |
| **Diet** | Largely flying insects; worms, fish, crustacean, mollusks, carrion. |
| **Nesting** | 4 spotted brown eggs in grass in depressed ground. |

**Solitary Vireo**
*(Vireo solitarius)*

| | |
|---|---|
| **Identification** | 5-6". Olive-green and white below; dull yellow flanks; sides of head blue-gray; white eyebrows. |
| **Habitat** | Coniferous and mixed forests. Breeds from Newfoundland and south; found only east of the Mississippi, especially in southern New England and the Appalachians. |
| **Habits** | Moves slowly through trees, tilts head sideways in search of insects; extraordinarily tame; ignorant of human contact. |
| **Weapons** | |
| **Nutrition** | Almost entirely insects, and some fruit. |
| **Young** | 3-5 white eggs, lightly speckled with brown in a pendant cup of bark strips, attached to a twig. |
| **Disease Dangers** | |

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|---|---|
| **Rufous-sided Towee** *(Pipilo erythrophthalamus)* | |
| **Identification** | 7-8 ½". Male has black head and upperparts, white underparts, rufous patches; female is similar, but has brown head and upperparts. |
| **Habitat** | Thickets and forest edges. Breed from British Columbia east to ME, southwest U.S., LA, FL; New England in winters. |
| **Habits** | Often feeds on the ground, scratches loudly at dry leaves, sometimes feigns injury to protect nest. |
| **Weapons** | |
| **Nutrition** | Terrestrial inverts, grass and forb seed, acorns, dull berries. |
| **Young** | 3-6 white eggs spotted with light brown in a cup of stems and grass on the ground in a dense cover |
| **Disease Dangers** | |

# Large Birds

| **Northern Bobwhite (*Colinus virginianus*):** | |
|---|---|
| **Identification:** | 10-11 inches. Males have brown to brownish-black coloration above. Chin and breast are white (although sometimes black). Underside is barred with black and white. Also have white eye stripe that extends from the bill to the back of the neck. Females buff colored chin, upper throats and eye stripes. Also have buff colored underparts and is more heavily mottled of barred than male. |
| **Habitat:** | Open fields and farmlands. Common wherever there is a mixture of woodland or brush and open fields. |
| **Habits:** | Forages for food on ground. Uses tall grasslands, brushy fields, open woodland and cultivated fields for nesting. Nest is a small depression in ground covered by a woven arch of vegetation. Has a small side entrance. |
| **Voice:** | Series of increasingly louder "hoy, hoy-poo!" and "hoyee!". |
| **Diet:** | Leaves, fruit, buds, tubers, spiders, snails and small vertebrates. |
| **Young/Nesting:** | Roughly 85% vegetation. Eats more insects in summer.<br>12-16 white or cream colored eggs. Layed in grass lined nest.<br>Incubation takes between 23-24 days. Young birds can fly after one week. |

| **Mute Swan (*Cygnus olor*):** | |
|---|---|
| **Identification:** | 58-60 inches. Wingspan is approximately 7'11" (2.4 meters). Coloring is completely white. Bill is orange with a black knob at the base. Young birds are the same, except they are a dingy gray color. Holds neck in a graceful curve. |
| **Habitat:** | Ponds, rivers, coastal lagoons and bays. Breeds mostly in freshwater environments, but sometimes in brackish environments. |
| **Habits:** | Feeds in same manner as Canada Geese. Nest is placed at edge of a pond or marsh. Makes huge mound like nest. |
| **Voice:** | Hissing and barking notes. Sometimes a loud trumpeting call. |
| **Diet:** | Leaves, seeds and roots of aquatic vegetation, insects, crustaceans and occasionally small invertebrates. |
| **Young/Nesting:** | 4-6 gray or blue green eggs. Layed in nest lined with feathers and down. Incubation takes between 36-37 days. Young birds can fly after 115-155 days. |

| **Mallard (*Anas platyrhynches*):** | |
|---|---|
| **Identification:** | 18-27 inches. Male has a green irridescent head with a white neck ring, dark brown chest and a gray body. Speculum is metallic purplish blue and bordered in front and back with white. Female is mottled brown with a white tail and purplish blue speculum. Bill is mottled orange and black. |
| **Habitat:** | Ponds, lakes and marshes. Winters throughout U.S. south to central America and West Indies. |
| **Habits:** | Finds food by dabbling as does the American Black Duck. Prefers to build nest near water (ponds, lakes, marshes, flooded fields, etc.). Makes nest of cottontails, reeds, grass and conceals with vegetation in a hollow log, abandoned nests or at base of a tree. |
| **Voice:** | Males make soft reedy notes. Females make a loud quack. |
| **Diet:** | Seeds and shoots of sedge and grass, aquatic vegetation, acorns, insects and aquatic invertebrates. Laying females eat twice as much. |
| **Young/Nesting:** | 8-10 pale greensish buff eggs. Layed in shallow grass depression and lined with down. Incubation takes between 28-30 days. Young birds can fly after 42-60 days. |

| **Herring Gull (*Larus argentatus*):** | |
|---|---|
| **Identification:** | 23-26 inches. White with light gray back and wings. Black wing tip has white spots. Bill is yellow with a red spot on the lower mandible. First year birds are brownish. |
| **Habitat:** | Lakes, rivers, estuaries and beaches. Common in all aquatic habitats Breeds on sandy coasts, tundra, lakeside cliffs, grassy islands and salt marshes. Winters as far south as Baja and California. |
| **Habits:** | Gets food by skimming waters surface or by high diving to catch fish or waterfowl. Makes nest on ground or cliff (usually on an island). Nest in colonies. |
| **Voice:** | Loud "kuk, kuk, kuk!...yukka, yukka,yukka!". |
| **Diet:** | Scavenger. Will eat anything from garbage to berries. Opportunistic hunter of adult birds, eggs and young of other gulls. |
| **Young/Nesting:** | 2-4 olive brown eggs with heavy spotting. Placed in a mound of seaweed or dried grass. Perennial site which is constantly rebuilt. Incubation takes between 24-28 days. Young can fly after 35 days. |

| **Great Black Backed Gull (*Larus marinus*):** | |
|---|---|
| **Identification:** | 30 inches. A very large gull. Black back and wings, with rest of plumage white. Bill is yellow. Young bird is mottled brown, with a paler head and breast. |
| **Habitat:** | Coastal beaches, estuaries and lagoons. Less commonly found on inland lakes and rivers Winters south to Florida. |
| **Habits:** | High dives into water to catch fish and other water fowl. Very commonly found at refuse dumps. Likes to breed on rocky coasts, isles, grassy slopes and occasionally lakes and salt marshes. |
| **Voice:** | A deep "keeow!". Similar to Herring Gull, but deeper. |
| **Diet:** | Birds, eggs, fish (often stolen from smaller birds), squid, small mammals, carrion, offal , berries and grain. |
| **Young/Nesting:** | 3 olive eggs with dark brown splotches. Incubation takes between 26-29 days. Nest is made on bare or grassy areas. It is a large mound of seaweed, moss and rubbish lined with fine grass. Young birds can fly after 49-56 days. |

| **Common Loon (*Gavia immer*):** | |
|---|---|
| **Identification:** | 28-36 inches. Large, heavy bodies loon. Has a thick, pointed black or dark gray bill. While breeding, head, back and neck are black with white bands on neck and white spots on back. In winter, crown, hindneck and upperparts are dark grayish and underparts are white. |
| **Habitat:** | Nests on forested lakes and rivers. Winters mainly on coastal bays and oceans. |
| **Habits:** | Dives and swims underwater to catch food. Likes to place nest on the waters edge (usually on islands). Keeps building nest during incubation. The nest is perennial. |
| **Voice:** | A loud, wailing laugh. Also a mournful "oo-ah-ho!" and a loud, ringing "kee-a-ree, kee-a-ree!". |
| **Diet:** | Fish and some aquatic invertebrates (especially crustaceans). |
| **Young/Nesting:** | 2 olive brown or greenish eggs with light spotting. Layed in a heavy mat of wet vegetation and slightly concealed. Incubation takes between 26-31 days. Young birds can fly after 75-80 days. |

| **Canada Goose (*Branta candensis*):** | |
|---|---|
| **Identification:** | Small races- 22-26 inches, large races- 35-45 inches. Brownish body, black head and neck and a conspicuous white cheek patch. |
| **Habitat:** | Lakes, bays, rivers and marshes. Winters south to Northern Mexico and Gulf Coast. |
| **Habits:** | Skims bottom lakes, rivers, etc. for its food. Often feeds in open grasslands and stubble fields. Nest is usually near water. It is made from dry grass, moss, sticks, aquatic vegetation, etc.. Sometimes uses abandoned nest or man made structure. |
| **Voice:** | Small- high pitched cackling. Large- musical honking. |
| **Diet:** | Shoots, roots and seeds of grass and sedges, bulbs, grain, berries, insects, crustaceans and mollusks. Mostly eats grain and foliage during the winter. |
| **Young/Nesting:** | 4-8 whitish eggs. Layed in nest lined with down and feathers. Incubation takes between 25-30 days. Young birds can fly after 40-73 days. |

| **Ring Billed Gull (*Larus delawarensis*):** | |
|---|---|
| **Identification:** | 18-20 inches. Silvery gray on back, white on head, tail and underparts. Bill has narrow black ring around it. Young birds are mottled brown. |
| **Habitat:** | Lakes and rivers. Many found on saltwater in winter. Winters south to Cuba, Gulf Coast and Southern Mexico. |
| **Habits:** | Finds food in same manner as the Herring Gull. Likes to breed on rocky islets or isolated coasts. Occassionaly uses marshes. Likes to nest in hollow trees. Nests in colonies with other gulls, tyically on freshwater islands. |
| **Voice:** | Loud raucous cry. |
| **Diet:** | Fish, insects, worms, rodents, bird eggs and offal. In winter, a lot of garbage is eaten. |
| **Young/Nesting:** | 2-4 spotted buff or olive eggs. Layed in a grass and feather lined nest. Sometimes concealed among rocks or matted vegetation. Incubation takes about 21 days. |

| **Ring Necked Pheasant (*Phasianus calchicus*):** | |
|---|---|
| **Identification:** | 30-36 inches. Has a long pointed tail. Male has a green head, red eye patch and white neck ring with light brown and iridescent rust colored body. Female is mottled sandy brown and has a shorter tail. |
| **Habitat:** | Farmlands, pastures and grassy woodland edges. |
| **Habits:** | Skims ground and lake/pond bottoms for food. Prefers to breed in open country, cultivated areas, marshes, woodlands or forests edge. Makes depression in dense foliage to place nest. |
| **Voice:** | Loud, crowing "caw-cawk!". |
| **Diet:** | Insects, terrestrial and aquatic invertebrates, small vertebrates, seeds, grain and fruit. |
| **Young/Nesting:** | 6-15 buff-olive eggs. Layed in a nest hidden in dense vegetation and lined with leaves and grass. Incubation takes 23-25 days. Young can fly after 12 days. |

| **Spruce Grouse (*Dendragapus canadensis*):** | |
|---|---|
| **Identification:** | 15-17 inches. A dark chicken like bird with a fan shaped tail. Male is gray-brown, has red comb over eye, black throat and upper breast is spotted white. Female is a darker brown and is barred on underside. |
| **Habitat:** | Coniferous forests (especially those with a mix of spruce and pine) and on edges of bogs. Breeds among old growth coniferous forests. Usually with a dense understory. |
| **Habits:** | Forages among vegetation for food. Builds nest in a hollow usually concealed on the ground by the low branches of a spruce tree. Usually consists of dry leaves, pine needles and grass. |
| **Voice:** | Males give a low "krrrk, krrrk, krrrk, krrrk!". Females make low clucking notes. |
| **Diet:** | Mostly spruce, fir and jackpine buds and needles. Also eats some berries, seeds, fruit and insects (especially grasshoppers). |
| **Young/Nesting:** | 8-11 buff eggs with brown spots. Layed in grass and feather lined hollow. Incubation takes 17-24 days. Young can fly after 10 days. |

| **WildTurkey (*Melegris gallopavo*):** | |
|---|---|
| **Identification:** | Male- 48 inches. Female- 36 inches. Unmistakable. Dark brown with iridescent bronze sheen and barred with black. Head and neck are naked with bluish and reddish wattles. Tail is fan shaped. Male has spurs and a long "beard" on its breast. |
| **Habitat:** | Oak woodlands and pine or oak forests. Breeds in mature coniferous or deciduous forests. |
| **Habits:** | Finds food in same manner as Ring Necked Pheasant. Uses open woodlands (especially on mountains) for nesting spots. Makes shallow depression in grass or shrubs. |
| **Voice:** | Gobbling calls. |
| **Diet:** | Mostly seeds, nuts, fruit, leaves of many plants. Also eats insects (especially grasshoppers), terrestrial invertebrates and small vertebrates. |
| **Young/Nesting:** | 8-15 buff eggs with brown spotting. Placed in grass nest lined with few leaves. Incubation takes 27-28 days. Young can fly after 6-10 days. |

| **Wood Duck (*Aix sponsa*):** | |
|---|---|
| **Identification:** | 17-20 inches. Beautiful crested and multicolored. Male is patterned with iridescent greens, purples and blues. Also has distinctive white chin patch and face stripes. Has a red bill and a long tail. Female is grayish with a broad white eye ring. |
| **Habitat:** | Wooded rivers, ponds and swamps In summer and fall, can be found in freshwater marshes. Winters near Pacific coast north to Washington and to New Jersey in East. |
| **Habits:** | Finds food in the same dabbling manner. Places nest in a tree cavity or possibly an artificial nest box. May even place nest 50 feet high in a tree. |
| **Voice:** | Female makes loud "wooo-eeek!". Male makes a softer "jee!" of "ter-wee!". |
| **Diet:** | Seeds, acorns, berries, grain, aquatic and terrestrial insects. |
| **Young/Nestling:** | 9-12 whitish tan eggs. Layed in nest lined with wood chips and down. Incubation takes between 28-37 days. Young birds can fly after 56-70 days. |

| **American Black Duck (*Anas rubripes*):** | |
|---|---|
| **Identification:** | 19-22 inches. Sooty brown body with a paler head and conspicuous white wing linings and violet speculum. Bill is olive or dull yellow. |
| **Habitat:** | Found in marshes, lakes, streams, coastal mudflats and estuaries. Breeds in freshwater and brackish wetlands (especially those with tall vegetation). Winters in southern Minnesota and Nova Scotia south to Texas and Florida. |
| **Habits:** | Finds food by pivoting head first into water and searching bottom for plants/animals. Builds nest in concealed grass tussock in wooded swamp, thicket or meadow. It is a small depression filled with dry leaves, vegetation, etc. Rarely use an abandoned tree nest. |
| **Voice:** | Typical duck quack |
| **Diet:** | Insects, worms, snails, aquatic vegetation, seeds, grass, berries and grain. |
| **Young/Nesting:** | 9-12 greenish buff eggs. Layed in ground nest lined with feathers and down. Incubation takes between 26-29 days. Young birds can fly after 58-63 days. |

| **Ruffed Grouse (*Bonasa umbellus*):** | |
|---|---|
| **Identification:** | 16-19 inches. A brown or gray-brown chicken like bird with fan shaped and black banded tail, barred flanks and black ruffs on the side of neck. |
| **Habitat:** | Deciduous and mixed forests (especially those with scattered clearings and dense undergrowth) and overgrown pastures. |
| **Habits:** | Forages for food on ground and in vegetation. Builds nest near tree or shrub so as to be concealed by lower branches. |
| **Voice:** | Male beats chest making a drumming sound. Female makes soft hen like clucks. |
| **Diet:** | About 80% are buds, leaves, flowers, seeds and fruit. 20% is insects, spiders, snails and small vertebrates. |
| **Young/Nesting:** | 9-12 pinkish buff eggs with dull brown spotting. Layed in nest lined with grass and feathers. Incubation takes between 23-25 days. Young can fly after 7-10 days.<br>birds can fly after one week. |

# Raptors/Birds of Prey

**Red tailed Hawk (*Buteo jamaicensis*):**

| | |
|---|---|
| **Identification:** | One of the most common raptors of North America. It has broad wings and a short fan shaped tail. Has a whitish breast with rust colored tail. The coloration varies with season and location within the United States. Stands between 19 ½ - 22 inches tall. Wingspan is approximately four feet (1.2 meters). |
| **Habitat:** | Found mainly in deciduous forests and open country (including tundra, plains, farmland, etc.). Breeds in woodlands or open country with scattered trees. Sometimes seen in desert. Winters north to southern British Colombia and Canada's Maritime Provinces. |
| **Habits:** | Often seen circling high in the sky. It hunts by swooping down on prey from high in the sky. Nests are usually placed between 30-70 feet high in an oak tree, especially in red oaks. Also known to nest in dry woodlands and white pines. |
| **Voice:** | A high pitched descending, raspy scream, "keeeer!". |
| **Diet:** | About 85% of diet is rodents and other small mammals. The rest is from lizards, amphibians, game birds, skunks, raccoons, woodchucks, muskrats and bats. |
| **Young/Nesting:** | 2-3 white eggs with brown spots. Incubated for 30-35 days. Egg laying dates range from early March (in Florida) to early April (in Mass.). The nest is a bulky pile of sticks lined with shreds of bark and small pieces of fresh green vegetation. Young birds can fly after 45-46 days. |

| **Broad winged Hawk (*Buteo platypterus*):** | |
|---|---|
| **Identification:** | A small stocky bird. It is the only raptor known to migrate in flocks. Adults are plain brown above and barred with rusty color on underside. Also, has broad black and white tail bands. Juveniles are sparsely spotted or blotched on their underside and have less distinctive tail bands. Stands between 14- 18 inches tall. Wingspan is approximately 3.3 feet (84 centimeters). |
| **Habitat:** | Found mostly in deciduous woodlands during the breeding season. Most winter to Central and South America (sometimes Florida and Cuba). |
| **Habits:** | Migrate in enormous flocks (largest counted was ≈ 14,000 birds). Builds nest 25-50 feet high in a hardwood tree. Hunts by swooping down on prey from a perch (i.e. tree ranch, cactus, etc.). |
| **Voice:** | Very vocal bird. Call is a thin, shrill whistle, "ta-weeee!". |
| **Diet:** | Has a very mixed diet. Eats snakes, toads, frogs, small birds, rodents and insects. In the summer, particularly fond of caterpillars of large moth species. |
| **Young/Nesting:** | 2-3 off white eggs blotched with brown. Incubation period is a month. Hatching occurs in late May in Washington D. C. area, mid June in New England and in late June near Michigan. Nest is made of sticks lined with green leaves. Young birds can fly after 35 days. |

| **Barred Owl (*Strix varia*):** | |
|---|---|
| **Identification:** | A large, stocky, round headed owl. It has a gray brow and dark eyes. The body is brown with light barring. It has a white breast with dark brown barring. Has no ear tufts. Stands between 16- 18 inches. Wingspan is approximately 3'8" (1.1 meters). |
| **Habitat:** | Prefers low, wet woods, river bottoms and swampy forests. Winters on the Mass. and New York coastal plains but don't breed there. |
| **Habits:** | Hunts by hovering low in the air and then pouncing on its prey. Often hunts diurnally. Makes nest in white pines or hemlocks. Usually chooses a tree cavity or reuses a crow or red shouldered hawk nest. Prefer cavities over two feet in depth. |
| **Voice:** | A loud barking "hoo, hoo, ho-ho....hoo,hoo,ho-ho-aw!". Also uses variety of other barking calls and screams. |
| **Diet:** | Mice, squirrels, hares, shrews, crayfish, amphibians and snakes. Rarely eats fish and insects. |
| **Young/Nesting:** | 2-4 dull white eggs. Eggs are typically laid in March. Both parents incubate for about a month. The parents care for the chicks through their first summer. Incubation period is between 28-33 days. Young birds can fly after about 42 days. |

**Turkey Vulture (*Cathartes aura*):**

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|---|---|
| **Identification:** | Dark brown or black body with blue, green and purple irridescence. Underside is a lighter shade of brown. Head and neck are bald, but sparsely bristled. It is the only black raptor that flies with its wings in a shallow V or dihedral. Stands between 25-32 inches tall. Wingspan is approximately six feet (1.8 meters). |
| **Habitat:** | Mainly found in deciduous forests and woodlands. Breeds in open habitats in both lowlands and mountains. Winters in the Southwest and in the East northward to southern New England. |
| **Habits:** | Searches woodlands and nearby open country for animal carcasses. Locates carrion at least partially through its acute sense of smell. Makes nest in crevices between rocks or hollow trees/logs. Gather in large roosts at night. |
| **Voice:** | Usually is silent. When nesting or feeding, makes hisses and grunts. |
| **Diet:** | Feeds only on dead animals. |
| **Young/Nesting:** | 2 whitish eggs marked heavily with dark brown. The eggs are layed from March (in Florida) to May (in New York). No nesting or lining is used. Incubation period is between 37-48 days. Young birds can fly after 66-88 days. |

**Saw-Whet Owl (*Aegolius acadicus*):**

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|---|---|
| **Identification:** | The smallest owl in the east. It is the size of a bluebird. It has a brown body with white spotting on back and wings. Face has conspicuous white eyebrows that form a broad V between the eyes. Chest is white with dark streaks. Stands between 6-8 inches. Wingspan is approximately 7 inches (18 centimeters). |
| **Habitat:** | Coniferous woodlands, evergreen thickets, parks, gardens and isolated pine trees. Breeds in dense coniferous and mixed coniferous/deciduous forests. Winters south to Arkansas and North Carolina. |
| **Habits:** | Swoops down on prey from a perch. Nest inside dead trees, birdhouses and often abandoned woodpecker holes. |
| **Voice:** | Usually silent. In late winter and spring, it makes a series of monotonous, tooting whistles. Sounds more like an insect call. |
| **Diet:** | Mice, chipmunks, bats and sometimes animals larger than themselves such as rats and squirrels. |
| **Young/Nesting:** | 4-6 white eggs. Eggs are layed in April or May (in Northeast) and late March or April (in South). Cavity has no lining except for possibly some woodchips. Incubation period is between 26-28 days. Young birds can fly after 27-34 days. |

**Screech Owl (*Otus asio*):**

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|---|---|
| **Identification:** | A robin sized owl. It has two color phases: rusty red and gray. It is mottled with dark brown and white (dark orange in red phase). The color phases aren't due to sex, age or geographical location. They depend on their cryptic coloration as a means of hiding in the day. It also has prominent ear tufts. Stands between 7-9 inches. |
| **Habitat:** | Open deciduous woodlands, woodlots, suburban areas, lakeshores, cemeteries and orchards. It is a very suburban species. It is essentially non migratory, however some to travel south for the winter. |
| **Habits:** | They are active during the night and mainly hide during the day. It rests in tree cavities or on low perches. Swoops down on prey from its low perch. Usually nest under 30 feet high in a tree cavity or abandoned nest. Also nest in building crevices. |
| **Voice:** | It has two calls: a deep, mournful wail, and a rapid series of purrs. |
| **Diet:** | Eats just about anything- large moths, beetles, caterpillars, worms, snails, frogs, bats, small rodents and small birds. |
| **Young/Nesting:** | 4-6 pure white eggs. It lays the eggs in April on leaves, wood chips or similar debris. Incubation period is about 26 days. Young birds can fly after about 27 days. |

**Sharp shinned Hawk (*Accipiter striatus*):**

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|---|---|
| **Identification:** | It is a jay sized hawk with a square tail and rounded wings, very close in appearance to the cooper's hawk. The square tail is really the only way to distinguish it from the cooper's hawk It has a slate gray back and a pale breast with rusty colored barring. The female has a more dark brown back and a paler underside. The female is also larger than the male. Stands between 10-14 inches tall. Wingspan is approximately 21 inches (53 centimeters). |
| **Habitat:** | Found to breed in mountainous coniferous and deciduous forests. While migrating or wintering, it can be seen almost anywhere, including the shore. It is a very fast and agile flyer. Soars above prey and swoops down on them, killing them in mid air. |
| **Habits:** | Builds nest 30-40 high on a branch or in the crotch of a tree. Nest is two feet in diameter, which is huge in comparison to other birds of its size. Favors nesting in coniferous woods and groves with spruce, white pine and hemlock. |
| **Voice:** | A series of sharp, rapid cackles, "kik-kik-kik-kik!". |
| **Diet:** | About 90% of diet is preyed birds (mostly songbirds). The rest consists of mice, insects, bats and other small mammals. |
| **Young/Nesting:** | 4-5 spherical, pale blue or white eggs with brown splotches forming a ring around either end. Eggs are laid on alternating days in early May (in Massachussetts) and in late May (in northern New England). Incubation period is between 32-35 days. Young birds can fly after 24-27 days. |

**American Kestrel or "Sparrow Hawk"**

**(*Falco sparverius*):**

**Identification:**

Very small raptor about the size of a blue jay. It has pointed wings and a narrow tail. It is the only falcon with a reddish back. Tail has this color as well. The male has slate blue wings, while the female has rust colored wings (same as back and tail) and narrow bands on its tail. Both sexes have two black stripes on face. Stands between 9-11 inches tall. Wingspan is approximately 21 inches (53 centimeters).

**Habitat:**

It is adapted to the open country and farmlands where hovering is possible. It is also found frequently in towns and city parks. It winters north to British Colombia, Great Lakes and New England. Also in the American tropics.

**Habits:**

Vary well adapted to civilization. It is seen frequently within towns in cities. Often seen hovering over open land. It hunts by swooping down on its prey and capturing it on the ground. Builds nest in a natural cavity 15-30 feet high in an old tree.

**Voice:**

A shrill "killy-killy-killy!".

**Diet:**

In the summer, eats mainly grasshoppers and crickets. In the winter, switches to mice and small birds (particularly house sparrows).

**Young/Nesting:**

3-5 whitsh/pinkish eggs blotched with brown. The eggs are layed on alternate days in April (in the South) to late May (in New England). Nest is a natural or man made cavity. No nesting or lining is used. Incubation period is about one month. Young birds can fly after one month as well.

# Small Mammals

| **Red Fox (Vulpes vulpes)** | |
|---|---|
| **Identification** | 12-15 pounds. Head and body 22-25"; tail 14-16". Height is 15-16". Carries a thick coat of reddish-yellow. In the winter, its coat changes to a silver-gray. It is dark on back with a white belly. Has a bushy tail with a white tip. Prominent pointed ears. |
| **Habitat** | Mixed cultivated and wooded areas, open country and brushlands. Often seen on the side of roads. Range is most of Canada and U.S. except some of the northwest U.S. and parts of British Columbia. |
| **Habits** | Creposcular, active at night but mostly at dusk and dawn. The Red Fox lives in solitude and prefers to stay away from mankind. Kills mice and rats which are beneficial to the farmer. When hunting, it presents a cat-like stalking method. |
| **Diet** | Anything available; its diet changes from season to season. Mainly carnivorous: grouse, quail, pheasants, young deer, sometimes chicken. Also, rabbit, meadow vole, small burrowing mammals; birds including ducks and gulls. Insects such as beetles, grasshoppers, and crickets. Wild fruits, berries. |
| **Dangers** | Rabies, mange, distemper. |
| **Nesting** | 1 litter a year in March or April. Gestation period is ~50 days. Nest (den) is usually in sparse ground cover on a slight rise. Also in a hollow tree, stream bank or slope. Entrance hole is ~3 feet in diameter surrounded by a mound of packed dirt. |

**RACCOONS**
*(Procyon lotor )*

| | |
|---|---|
| **Identification** | Head and Body 18 - 28 in; wt. 12 - 35 lb. Body pepper-and salt color, "black mask" over eyes, and alternating yellowish white and black rings on the tail. Often seen dead along highway. |
| **Habitat** | Wide distribution across the United States and into Canada. They generally avoid higher elevations and colder climates. Most are found in wooded areas close to lakes and streams. |
| **Habits** | Chiefly nocturnal animals but will occasionally venture out during the day. Feeds mostly along the shores of streams and lakes. Dens in hollow trees, hollow logs, rock crevices, or ground burrows during cold spells, but does not hibernate. Home range up to 2 mi. across, normally less than 1 mi. |
| **Weapons** | |
| **Nutrition** | Food extremely varied. In the wild will eat such freshwater foods as clams, crawfish, frogs and turtles. Will rob fields of corn, vegetables, nuts, and fruit. Birds and their eggs, and poultry if available, are in their diet. Raccoons are not hard to feed in captivity. Table scraps, meat, fish, bread, vegetables, and eggs are all acceptable. |
| **Young** | Females mate Feb.-March. Young are born in April or may; litters range from 2-7. Eyes open at about 3 weeks. Leave den with mother at 2 months; leave mother in the fall. Females have 1 litter per year. |
| **Disease Dangers** | Rabies |
| **Emergency Care Techniques** | |

| | |
|---|---|
| **COTTONTAIL RABITS** *(Sylvilagus floridanus)* | |
| **Identification** | Head and body 14-17 in.; ear 2 ½-3 in.; wt. 2-4 lb. Body brownish to gray in color. Cottony white tail with whitish feet. |
| **Habitat** | Heavy brush, weed patches, strips of forest with open areas nearby, around the edges of swamps. |
| **Habits** | Active in the early evening until the late morning. Spends day in burrow or partially concealed beneath a brushpile. |
| **Weapons** | |
| **Nutrition** | In the wild cottontails feed on green vegetation during the summer, and on bark and twigs over the winter. In captivity a healthy diet includes hay and rolled oats. Green and root vegetables should also be included in a rabbits diet. |
| **Young** | Young are born mainly in March-May, some are also born in Sept. 3-4 young per litter. Young are born blind, placed in a nest in a depression in the ground. Mother returns to nest t suckle young. Mother may leave young unattended for a long period of time |
| **Disease Dangers** | |
| **Emergency Care Techniques** | |

**OPOSSUMS**
*(Didelphis marsupialis)*

| | |
|---|---|
| **Identification** | Head and Body 15-20 in.; tail 9-20 in.; wt. 9-13 lb. Usually whitish gray in color. Face is white with pointed nose, and black paper thin ears. Tail is rat-like, round, prehensile, may be partially missing due to cold. Heavy body with short legs resembles a large rodent. Often seen dead along highway |
| **Habitat** | Generally found in wooded lowland areas along stream beds, where low water provides good hunting and fishing. Also inhabits farmland. |
| **Habits** | Usually active only at night. May make it's home in old dens, beneath buildings, in hollow trees or logs, and brushpiles. May, "play possum," fake death when frightened. Usual home range 15-40 acres. |
| **Weapons** | |
| **Nutrition** | In the wild the diet of the opossum consists of fruits, vegetables, nuts, meat, eggs, insects, and carrion. In captivity, a opossum can be fed just about anything. Bread, meat, fish, vegetables, milk. |
| **Young** | Up to 14 per litter; 1-2 litters per year. Tiny at birth (approx. 1/15 oz.) , remain in pouch for about 2 months. Later may travel on mother's back. |
| **Disease Dangers** | |
| **Emergency Care Techniques** | |

## Coyotes:

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|---|---|
| **Identification:** | Grizzled gray or orange-gray on top with long lighter underside. Legs are long and yellowish in color with darker vertical line on lower part. Tail is bushy with a black tip. Snout is usually pointed. Individuals weigh anywhere from 20-55 pounds. |
| **Habitat:** | Coyotes are found throughout the United States and Canada. In the east, coyotes are found mostly in brushy areas and on edges where forests meet plains. |
| **Habits:** | Coyotes spend most of their time awake, scavenging and hunting for food. Dens are usually found near riverbanks and in well-drained slopes and have an opening of 1-2 feet in diameter. Dens are not permanent and coyotes will move around except when nursing young. Males may stay with females for a few years before moving on. The distinctive howl followed by yelps is a way of communicating to others on location. Coyotes hunt in packs or alone. |
| **Weapons:** | Coyotes posses large teeth and a powerful jaw. Be extremely careful if near an injured coyote, for it can inflict serious damage with its bite. |
| **Nutrition:** | Coyotes are opportunistic, feeding on mice, squirrels, gophers, rabbits, and other small mammals. Coyotes will also eat birds, frogs, snakes, insects, as well as a variety of fruit. During the winter, carrion from deer is a crucial supplement to the coyote diet. |
| **Young:** | Coyotes mate once a year during February-April. A litter of 1-19 young are born during April-May. Young are born in dens and will remain there for a couple of months. |
| **Disease Dangers:** | |
| **Emergency Care Techniques:** | |

**BEAVERS**
*(Casto canadensis)*

| | |
|---|---|
| **Identification** | Head and body 25-30 in.; tail 9-10 in.; wt. 30-60 lb. Brown in color with large naked tail shaped like a paddle. Large front teeth. Hind feet webbed. |
| **Habitat** | Streams or lakes with surrounding wooded areas. |
| **Habits** | Mainly a nocturnal animal, but occasionally seen during the day. Makes home in a lodge, a large conical structure of sticks and mud, near the edge of a lake. May also burrow in the banks of a stream. Beavers are know for building stick and mud dams across streams, creating artificial lakes. |
| **Weapons** | |
| **Nutrition** | Beavers feed on the bark and small twigs of such trees as aspen, poplar, birch, maple, willow, and alder. |
| **Young** | Young are born April-July; usually 2-4 per litter. 1 litter per year. Kits are born covered with fur and with eyes open. |
| **Disease Dangers** | |
| **Emergency Care Techniques** | |

**WOODCHUCKS**
*(Marmota monax)*

| | |
|---|---|
| **Identification** | Head and body 16-20 in.; tail 4-7 in.; wt. 5-10 lb. Yellowish-brown to brown in color, fur appears slightly frosted. Underside is paler than back. Heavy bodied short legged compact-looking, short-tailed bullet-headed animal. A.K.A ground hog. |
| **Habitat** | Open woods, brushy and rocky ravines |
| **Habits** | Diurnal for the most part. Dens in extensive burrows around rocks or old rock walls with two or more openings, may be 4-5 ft. deep, and 25-30 ft. long. Dens usually only have excavated dirt at 1 opening, others dug from below for camouflage. Is known to locate near gardens. Hibernates Oct.-Feb. Home range, 40-160 acres. |
| **Weapons** | |
| **Nutrition** | Feeds on tender, succulent plants. Can be fed milk and all types of vegetable material. |
| **Young** | Females mate in March or April. Young are born around April or May 2-6 young per litter, born naked and blind. One litter produced per year. |
| **Disease Dangers** | |
| **Emergency Care Techniques** | |

**SKUNKS**
*(Mephitis mephitis)*

| | |
|---|---|
| **Identification** | Head and body 13-18 in.; tail 7-10 in.; wt. 6-14 lb. About the size of a house cat, very recognizable due to it's black body with white stripe. Stripe begins on the middle of the forehead continuing across neck and splitting into a V on the shoulder blades. Black tail, possibly with white tip. Has well developed scent glands. Presence of a skunk is usually first detected by odor. |
| **Habitat** | Semi-open country; mixed woods, brushland, and open prairie preferred. Within 2 mi. of water. |
| **Habits** | Chiefly nocturnal; hunts shortly after sundown and retires at sunrise. Dens in ground burrows beneath building, or beneath wood and rock piles. Does not hibernate. Several females may den together in the winter. Males, however, tend to be solitary. |
| **Weapons** | Skunks posses the ability to spray a pungent fluid from sacs beneath the tail when it feels threatened. This fluid is nauseating at close proximity, burning to the skin, and if landing in t he eyes can cause temporary but painful blindness. |
| **Nutrition** | Skunks are omnivorous animals. Their diet consists of mice, eggs, insects, grubs, and berries. Skunks, like raccoons, will eat almost anything available. |
| **Young** | Females mate in Feb.-Mar. Young are born in early May. Their are usually 5-6 young per litter. The young accompany the mother in late June or July, usually follow in single file |
| **Disease Dangers** | |
| **Emergency Care Techniques** | |

# Large Mammals

| **Whitetail Deer** *(Odocoileus virginianus)* | |
|---|---|
| **Identification** | Height 3-3 ½ ft. Wt. Males: 75-400 lbs.; Females: 50-250 lbs. Reddish brown color in summer, blue-gray in winter. Male bears antlers. Long thin legs. Commonly seen on back roads and in fields in the morning and evening. |
| **Habitat** | Forests, swamps, and open brushy areas |
| **Habits** | Most active in the morning, evening and moonlight nights. May be alone or in small group (2-3). Home range more than 1 mi. across. Can run 35-40 mph. and jump 30 ft. horizontally |
| **Weapons** | Hooves, antlers (male), teeth |
| **Nutrition** | Deers are browsers feeding mainly on small twigs, shrubs, fungi, acorns, and grass. |
| **Young** | Females mate at age 1 ½. Mating occurs in Nov.-Feb. Young are usually born 2 per female (1-3). The young are weened at 4 months. May run with mother for a full year. |
| **Disease Dangers** | |
| **Emergency Care Techniques** | See technique for large mammal |

# Amphibians/Reptiles

| | |
|---|---|
| **Wood Turtle** *(Clemmys insculpta)* | |
| **Identification** | 5 ½ -8 in. in length. Very rough shell with large pyramidal scutes. Orange colorations on the neck and limbs. Brown shell. |
| **Habitat** | Commonly found in the woods, meadows, and farmland close to the water. |
| **Habits** | Very terrestrial, but quite at home in the water. Hibernates in the water over the winter. Mates in the water. Very nomadic by nature. |
| **Weapons** | |
| **Nutrition** | Omnivorous; feeding mainly on vegetation, aquatic invertebrates, and fish. |
| **Young** | 1 1/8-1 5/8 in. in length at hatching. Shell broad and low, brown to grayish brown. No orange coloring. Tail as long as shell. |
| **Disease Dangers** | |
| **Emergency Care Techniques** | See technique for reptiles |

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|---|---|
| **Eastern Painted Turtle** *(Chrysemys picta picta)* | |
| **Identification** | 4 ½-6 in. in length. Shell marked with vivid yellow or red blotches and stripes, especially around its margins. Coloring also appears on bottom of shell. Brown and yellow stripes on head and neck. Red markings on legs. |
| **Habitat** | Shallow freshwater with profuse vegetation and soft and muddy bottoms. Such as ponds, marshes, ditches, edges of lakes, and streams. |
| **Habits** | Aquatic turtle. Frequently seen basking on logs. Hibernates underwater during the winter months. |
| **Weapons** | |
| **Nutrition** | Omnivorous; adults feed mainly on aquatic vegetation. Also eats insects, crayfish, and small mollusks. |
| **Young** | Hatchlings are usually 7/8-1 1/8 in. in length, very small. Mating occurs in the spring, females lay 4-10 eggs in early summer. Hatchlings are mainly carnivorous. |
| **Disease Dangers** | |
| **Emergency Care Techniques** | See technique for reptiles |

| | |
|---|---|
| **Eastern Box Turtle** *(Terrapene carolina carolina)* | |
| **Identification** | 4 1/6 to 6 in. in length. Possesses a high dome-like shell with hinged portion that can be tightly closed when animal feels threatened. Extremely variable coloration and pattern. Upper and lower shells may be yellow, orange or olive on black or brown. Four toes on each hind foot. Commonly kept as pets. |
| **Habitat** | The Eastern Box is a land turtle and is therefore essentially terrestrial. Is, however, at home in the water. |
| **Habits** | Commonly seen soaking in shallow water or in mud. Have been known to make their burrows beneath logs or in rotting piles of vegetation. |
| **Weapons** | |
| **Nutrition** | Ominvorous; will feed on fruits, berries, hamburger. |
| **Young** | 1 1/8-1 3/8 in. in length at hatching. Hinge of box is not functional at birth. |
| **Disease Dangers** | |
| **Emergency Care Techniques** | See technique for reptiles |

| | |
|---|---|
| **Snapping Turtle** *(Chelydra serpentina)* | |
| **Identification** | 8-14 in. in length. Wt. 10-35 lbs. Very ugly apperance. Possesses a large head and a long tail that is as long as shell. Color varies from blackish to light brown. Shell very rough with 3 well defined keels. |
| **Habitat** | Freaswater streams, lakes, rivers, and swamps. Any permanent body of water. Will even enter brackish waters. |
| **Habits** | In water fairly inoffensive. Often buries itself in the mud in shallow waters. On the land may strike repeatedly. Turtle will rise up on its hind legs, open mouth and lunge forward at target. Very rarely will it bask like other turtles |
| **Weapons** | Extremely dangerous bite. Sharp claws. Can be picked up by tail, and held with top of shell facing leg. |
| **Nutrition** | Omnivorous; feeds on various small aquatic invertebrates, fish, reptiles, birds, mammals, and a large amount of vegetation. |
| **Young** | Born with a very rough shell, smoothes with age. Blackish to dark brown with a light spot on the edge of each marginal scute. |
| **Disease Dangers** | |
| **Emergency Care Techniques** | See technique for reptiles |

# Keeping Cats Indoors

# Keeping Cats Indoors

Although few know about it, the problem with domesticated cats in the United States is widespread. Domesticated cats kill a significant amount of small mammals and birds every day. Cat owners that allow their cats outdoors are endangering the wildlife around them as well as endangering their cats. This problem will not go away until the public is informed of the problem and takes action to prevent further damage to our natural wildlife.

*Felis catus*, the domesticated cat, originates from the wild cat of Asia and Africa *Felis silvestris libyca*. These cats were domesticated and brought to the United States by European immigrants. Cats have an extremely well refined hunting ability. The domesticated cat can adapt to a variety of environments, from the rural backcountry to the urban streets.

## Dangers to Cats:

There are around sixty-six million cats in the United States. The life span of a strictly indoor cat can be seventeen years old or older, as opposed to outdoor cats that have an average life span of two to five years old. Cats that are allowed to go outdoors face the dangers of getting run over by cars, disease, parasites, traps, poisoning, animal attacks and human cruelty. Millions of cats are run over by cars each year. Cats may also climb into car engines to keep warm during cold weather and die when the car is started. Motorists risk accidents by trying to avoid free roaming cats every day. Veterinarians treat cats each year with scratches torn ears and tails from animal attacks including dogs, raccoons, coyotes and foxes. Some of these cats may die from their wounds. Veterinarians also treat cats each year that have been stabbed or lit on fire from humans. Cats that are not supervised or left indoors are exposed to the dangers of wildlife hating humans. Cats are also maimed and killed each year in traps set up for fur bearing animals. Pesticides, antifreeze and other poisons also claim the life of thousands of cats each year. Cats enjoy the sweet smell and taste of antifreeze, which is deadly. Disease is also a large cat killer. Cats that are exposed to the outdoors risk getting fatal diseases including rabies, feline immunodeficiency virus (FIV), feline leukemia, and distemper. Vaccines for these diseases are not one hundred percent, and there

is no vaccine for FIV. Outdoor cats that are not neutered are the number one reason for overpopulation of cats. As a result millions of cats with no homes must be euthanized each year.

Approximately thirty-five percent are kept strictly indoors, leaving around forty million cats free to kill wildlife. In addition there are millions of stray cats (feral) and their descendants free to roam the streets and kill wildlife. Keeping cats indoors is not only safer for the wildlife that cats kill, but also for the health and safety of the cat as well.

**Damage to Wildlife:**

Every year hundreds of millions of birds and three times as many small mammals are killed by free roaming cats. Cats are extremely effective hunters. Since cats are not natural predators in the United States their prey have no natural defenses to the avid hunters. Many cat owners feel that they take preventative measures to ensure that their cats do not kill wildlife. These include placing a bell on their cat's collars and keeping food outside to insure their cats are not hungry. These measures are not productive in the protection of wildlife.

Cats carry and spread many diseases. Cats are the number one domestic animal reported to have rabies. Cats are also suspected of spreading Feline leukemia to mountain lions and may have infected the endangered Florida panther with Feline distemper. Feline infectious peritonitis has been diagnosed in both the lynx and the mountain lion and Feline immunodeficiency virus (FIV) has been found in the Florida panther and in the bobcat. These reports show the effect a cat attack can have on wildlife even if the animal escapes. Although some of these animals are predators and may have attacked the cats, the diseases that the domestic cat carries are not native to the area and could cause significant problems if they were to spread.

Cat's can also learn to hunt quietly when wearing a bell. Even when cats do not hunt quietly, prey animals do not recognize the bell as a sign of danger. Most small mammals and birds do not have a natural defense against the sound of a bell or for that matter, cats. Another common misconception that cat owners have is that animals that escape from the claws or jaws of cats live. Most prey that are attacked by cats die from the infection due to the high counts of bacteria on the claws and in the saliva of cats.

**Studies Conducted on Cat Instinct, predation, and damage to wildlife:**

Several studies have been done to collect data on several aspects of cat predation including the number of species a cat kills per year, number of animals a cat kills per year, and rural cats versus urban cats. At the University of Wisconsin a four-year study was conducted to get a range of values for the number of birds killed by cats in a year. The findings were that rural free roaming cats kill at least 7.8 million birds a year in Wisconsin alone. The University estimates that up to 217 million birds are killed a year by cats in Wisconsin. They also estimated that in some areas of Wisconsin the number of free roaming cats per square mile was 114, outnumbering all other natural predators.

In Virginia, researchers compared the predation of free roaming rural cats to the predation of free roaming urban cats by the number of species they kill and number of prey they killed. The researchers found that a single rural cat captured a total of twenty-seven native species (eight bird, two amphibian, nine reptile, eight mammal). Twenty-one native species (six bird, seven reptile, eight mammal) were caught by four urban cats. The ten-month study in 1990 had each cat killing on average twenty-six prey animals in the urban area and eighty-three in the rural area. In another study one cat at an experiment station killed over 1600 animals (mostly small mammals) in an eighteen-month period.

Studies have also shown that hunger and hunting come from two different places in a cat's brain. This study placed cats in an area with their favorite food. After the cats started to eat a rat was placed in the same area. Every cat in the study stopped eating, killed the rat, and then continued to eat the food given. Studies like this show that even well fed cats will instinctively hunt.

Although cats are not the major cause for the decline of endangered species, cats do not select the prey they kill on order of how plentiful they are. The Endangered Species Act protects any wildlife near extinction. The second most significant cause for the decline of endangered species is listed as predation. Even the loss of one endangered animal from the predation of cats hurts the whole species a great deal.

**How we can help:**

In general, cats are not to blame for the problems they cause to wildlife. Cat owners are at fault for allowing their cats to prowl the outdoors in search of prey. Cats are merely following their natural instinct to hunt. Cats do not realize that they are killing off endangered species and large numbers of bird populations. Only cat owners can help. By limiting their cats to outdoor pens or keeping their cats indoors, the predation on wildlife by the non-native feline would not occur.

# Diseases

**RABIES**

**Infectious Agent:** Rhabdovirus

**Hosts:** Can occur in any animal. In North America, it is most common in skunks, raccoons, foxes and bats. It is very rare in small rodents (mice, rats, squirrels, etc.) and rabbits. Domestic dogs, cats and livestock are often infected by rabid animals. In the U.S., cats are more likely to be infected than dogs.

**Transmission:** The salivary glands are the organs most important in the spread of the virus from one animal to another. The virus is transmitted through the saliva of the infected animal. Bites are the most common means of transmission. Scratches from a rabid animal can also cause transmission if the animal has licked its claws. Infected saliva applied to a mucous membrane (eyelid for example) can also result in transmission. Bat excrement also is a major means of rabies transmission. The fecal matter holds enough rabies virus that it can be caught simply by breathing in the aerosol within bat caves.

**Symptoms:** Rabies is almost always a fatal disease of mammals, even humans. In humans, the incubation period (period from exposure to the virus to the onset of illness) ranges from five days to more than a year. Two months is the average incubation period. Once the disease has developed, there is no treatment! It is 100% FATAL! The first symptoms last from 2- 10 days can include fever, headache, malaise (an overall ill feeling), lose of appetite and vomiting. In the next stage, victims develop a difficulty swallowing, from which the phrase "foaming at the mouth" arose (since they can't swallow their own saliva). Victims also can become agitated, disoriented or even paralyzed. Death usually results from paralysis of respiratory muscles. In animals, any abnormal behavior is cause for concern. This includes lack of fear of humans and normally nocturnal animals being out during the day.

**Treatment:** There is no known effective treatment for rabies once the symptoms have developed. If a bite should occur, make sure to immediately clean the wound with soap and water. The wound should be flushed repeatedly to physically remove the virus. Call a doctor for further advice. Recommendations will vary depending upon the individual circumstances.

# Laws and Regulations

# Laws Regarding Wildlife

**The Migratory Bird Treaty Act**

Passed in 1918, this act provides protection against the taking, import, export, possession, buying, selling, purchase or barter of any migratory bird. Eggs, feathers, and other products from the birds are also protected by this act. Take is defined as pursuit, hunting, shooting, poisoning, wounding, killing, capturing, trapping or collecting. Some species may be hunted during designated seasons. Check with your local wildlife administrator for hunting seasons and permits. The fine for violation of this law is up to $5,000 for individuals and $10,000 for organizations and may include up to six months imprisonment. Felony violations may result is $250,000 fines for individuals, $500,000 fines for organizations and may include up to two years imprisonment.

**The Endangered Species Act**

Passed in 1973 and reauthorized in 1988, this act protects any "Endangered animal" from import, export, taking (refer to definition above), possession, selling, carrying, transporting, delivering, and selling. Scientists may receive special permission for research on some endangered species. Rewards may be available for any individual providing information leading to a civil penalty or criminal conviction of anyone breaking this act. Penalties are up to $100,000 fines and one year in prison for individuals, and $200,000 fines for organizations.

**The Eagle Protection Act**

Passed in 1940, this act includes the protection of the Bald and Golden Eagle against import, export, taking, selling, purchase or barter of the animals or its products (eggs, nests, feathers). Permits may be granted for scientific research and cultural use by Native Americans. Misdemeanor fines are up to $100,000 for individuals and $200,000 fines for organizations with a year imprisonment. Felony convictions carry fines of $200,000 and $500,000 for individuals and organizations respectively. Rewards may be given to any individual providing information that leads to a conviction.

**Wild Bird Conservation Act**

Passed in 1992 and in effect as of October 1993, this act protects all CITES-listed-birds (~1000 species) from import. Fines included are up to $25,000 and no more than two years imprisonment.

# Frequently Asked Questions

# Frequently Asked Questions (FAQs)

**Q:** If I handle a baby bird, the mother is going to reject it, right?

**A:** Absolutely false. A bird is incapable of smelling humans odor on their young.

**Q:** If I find a baby bird, I should just give it bread crumbs and milk.

**A:** Definitely not. Giving a bird bread is actually very unhealthy for birds. In fact, some common pigeons are in bad health because so many well-natured individuals give them crumbs at local parks. Milk is not a wise thing to feed the bird as well. Leave all of the feeding and administration of fluids to a licensed professional.

**Q:** What is the best thing to do when I find a baby bird?

**A:** For the most part, leave it there. Refer to the Guide to Assisting Injured or Orphaned Wildlife.

**Q:** What is rabies, and how is it transmitted?

**A:** Rabies is viral disease that affects the central nervous system of its victim. If untreated, the mortality rate is 100%. Rabies is passes from either animal to animal or animal to human via saliva. Therefore a bite which punctures the skin is a threat. Also, it can be transmitted through licking an open or sore wound.

**Q:** What kinds of animal have a possibility of carrying rabies?

**A:** Raccoons are the forerunner. But basically, and fur-bearing mammal can carry rabies. Other exigencies are skunks, foxes, and bats. Less seen but still very capable are beavers, rats, mice, chipmunks, rabbits, and squirrels. The domestic animals (i.e. dogs and cats) are at high risk due to the possible contact with rabid animals.

**Q:** What if I got bit by a mammal, does this mean that I now have rabies?

**A:** No, not necessarily. Because of the severity of this disease, however, seek medical attention immediately. There is a vaccine (given by injection) which, if treated in time, is 100% chance of cure.

**Q:** I think that my cat or dog got bitten. Does she need a shot now? What should I do?

**A:** Yes. Always be on the safe side. If you suspect that your pet has been bitten, segregate it so no one comes in contact with it. Avoid contact yourself; use extreme caution! Contact your veterinarian immediately; only a licensed professional would truly know whether or not a shot is necessary.