99C026I

Project Number: 43-JXR-1029

WILDLIFE WEB DATABASE

An Interactive Qualifying Project Report
submitted to the Faculty
of the
WORCESTER POLYTECHNIC INSTITUTE
in partial fulfillment of the requirements for the
Degree of Bachelor of Science
by

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and

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Date: February 26, 1989

Approved:

Professor Jill Rulfs, Major Advisor

1. Wildlife Rehabilitation
2. World Wide Web
3. Veterinary Medicine

Abstract

This project is the expansion of an Internet site containing blood values for normal, healthy, wildlife species. It provides a previously unavailable reference for wildlife professionals so that they may better treat the injured and ill animals in their clinics. A survey was also conducted to better direct future expansion of the site.

Acknowledgements

We would like to thank Dr. Mark Pokras, our co-advisor at Tufts, for all of his assistance in finding information for the site, and Professor Jill Rulfs for all of her great advising and encouragement.

Table of Contents

Introduction

Wildlife veterinarians face the daily challenge of finding hematology and serum chemistry blood values on normal, healthy animals so that they can treat sick or injured animals in their clinics. Having these guidelines is invaluable in allowing veterinarians to determine what diseases or specific organ toxicities they must deal with. Some wildlife veterinarians or rehabilitators had compiled information gathered on wild species, but it was usually obtained animal by animal, under conditions of injury or illness, and was not easily available to other wildlife practitioners. Money is simply not available for the large-scale studies needed to establish reliable databases for wildlife species. In contrast, someone looking for information on human, cat or dog blood values would not have far to look, as clinical databases devoted to those species are widely available.

To aid wildlife care professionals, a database distributed via the Internet was created in collaboration with Dr. Mark Pokras of Tufts University School of Veterinary Medicine as an Interdisciplinary Qualifying Project at Worcester Polytechnic Institute in 1997. This database included complete normal range blood counts and serum chemistry values on a variety of mammalian and avian species. The data were compiled from journals, books, and individuals in the field. However, as the surveys collected from users of the site showed, this information only made a small dent in the problem. To further assist these wildlife care providers, more had to be done to both expand and improve the site.

The original IQP included a survey, prepared and placed on the site to allow veterinarians and rehabilitators to inform the site administrators of their needs. The survey created for this project was similar in that respect, but also concentrated on

assessing the accuracy of the page, as well as identifying which species should be included in the future. Also included on both surveys were questions about the occupations and the involvement in wildlife health care of the survey takers. This provided valuable information about whom the site should be tailored to. As most of the site's visitors were wildlife veterinarians, technicians, or rehabilitators, it was appropriate that the site continue be to constructed along technical and clinical lines, as opposed to concentrating on or adding natural history. Both surveys should have and did become a source of great information as the site expansion began to take shape, and they will continue to prove invaluable to site development in the future.

There were only seventeen avian and sixteen mammalian species on the original site. This narrow range of animals, although useful to some, could not significantly aid rehabilitators everywhere. Both categories needed more species and a greater geographical diversity of species. For this page to be useful to wildlife professionals everywhere, information that would assist these people globally, as well as locally, should be available. Not only was the supply of information for specific mammals and birds short, but other creatures such as reptiles and amphibians were not even included on the page. This left out snakes, marine animals, and a plethora of other species commonly seen by rehabilitators. Therefore, the first objective of this project was to significantly expand the total number of species on this page, and to increase the number of globally known species.

Additionally, though there were not data for many exotic species on the page, there also were not many entries for species indigenous to the New England area. Common animals such as opossums, squirrels, and sparrows were not included.

Although these animals are familiar to local wildlife professionals, most clinics and individuals have no information available on site to assist in their treatment. Therefore, since the site was being developed for and supported by Tufts University School of Veterinary Medicine, another objective was to include more species common to North America and especially New England.

For many species already on the page there was incomplete information, which added to the frustration of the wildlife care professionals. Not all of the serum chemistry or CBC categories that were selected for the site were found in the original series of references that were used. Finding and filling in these blank spaces would make the species entries on the site that much more valuable, and was a major objective of the update.

Lastly, this IQP should provide a basis for future expansion of the site. This future expansion should be guided by the surveys that have been completed. This work should include the addition of the most requested species, as well as other topics such as parasitology that were also petitioned for.

Methods and Materials

Before publishing to the database was possible, the majority of the information to be added was compiled. In addition to hematology and serum chemistry values, the heart rates, respiration rates, average adult weights, and temperatures were also included, when available, on each species page. This information was gathered from textbooks and

journals at Tufts University School of Veterinary Medicine. In addition, information was also solicited from relevant sources found on the Internet and twelve individuals were contacted via email. Six did not reply, five answered that they would not contribute any data, and one individual replied that she would contribute data, but subsequent emails were not answered.

From the information that was compiled, it had to be decided what information would be reliable. Reliable data was defined as data having been collected from seven or more animals, and having been collected from animals that did not have any illness or injury. This allowed for a representative, objective view of the values by a wildlife care professional. Seven, although a fairly small number, would allow most studies to be included (as many studies consisted of a few individuals), but it also is large enough to get a reasonably good idea of what the normal value is for a species. Known sample sizes were added to the pages to allow wildlife care professionals to accurately assess the validity of the data. If the information for a species was obtained from captive or migrating animals, this was noted in the reference section on each page. To prevent misleading anyone that was going to use the information, if the animals were under anesthesia or completely wild, such a note was also added to the pertinent pages.

Overall, twenty-four birds, nineteen mammals, one amphibian, and three reptiles were added to the site. The references from which any values were obtained were also placed on the corresponding page. For two of the species already present on the site, more information was obtained and subsequently added to the site. It was very difficult to find normal heart rates, respiration rates, average adult weights, or temperatures in any of the journal articles. These data values, however, are much more likely to be affected

by anesthesia or captivity than, perhaps, the blood values were. Although the weights do not change, the temperature, heart rate, and respiration rate of an anesthetized animal generally drops, and the extent of the change depends on the anesthetic used. Therefore, this information would not be as accurate or useful as one would hope.

In addition to the original surveys that were received along with the project, another survey was constructed in order to assess the progress of the site and its overall value. Dr. Mark Pokras emailed this survey to wildlife rehabilitation and wildlife health list servers. Completed surveys were returned via email and the information contained within used to outline a plan for the expansion of the site. These surveys, as well as those from the original database survey were returned to either margew@wpi.edu or kahlua@wpi.edu. Completed surveys, soliciting information for this expansion, are contained in Appendix B1. Others, from both the WPI and Tufts database sites, are contained in Appendix B2. These have not been cataloged for information regarding any further expansion.

Netscape Composer 4.0 was used to organize the data, create new pages, and eventually publish the site extensions to both the WPI and the Tufts servers. When inputting the data into the charts to be published, the simple fact that the charts were of the html made for some difficulty. The data and standard deviations, when added to a page, had to correspond with the units given. This was not noted originally and, therefore, caused some error in input. However, these errors were caught before they ever reached the database site. All pages added to the site are included in Appendixes A3, A5, A6, & A7.

Results

The original surveys provided a list of animals for which information was requested. Out of a very long list, some of the animals could be found, but data on many others was rare. Information found and included on the site were specifically the Ridley turtle, American bullfrog, and the Florida manatee. Also integrated were the Eastern Gray Squirrel, the White Tailed Deer, a seal (specifically Northern Fur Seal), the Sharp Shinned Hawk, and the Short Eared Owl. Difficulties arose in attempting to add other species such as marine mammals, as requested in the original surveys. This was due to the lack of information available on such species, and the best source of information may be data provided by individuals who care for this type of animal. Much of the data that was added in this period of expansion was greatly needed, as some species are very common, such as the squirrel, or somewhat exotic, such as the Florida manatee.

Feedback that was received in the last three months included both the new survey that was sent out over list servers and results from the feedback page. All of it was in response to Dr. Pokras' email to the list servers, with the exception of a few corrections of scientific names. Out of the total numbers of both surveys, which was 30, 67% were rehabilitators, 10% were veterinarians, and 10 % were veterinary technicians. There was also a professor, a biologist, and there were two individuals who did not list their involvement with the field of wildlife health. From the feedback page, of the respondents who worked at or supervised a wildlife clinic, most of these clinics had between 1 and 250 animals, and the staff consisted of fewer than five people. Also from the feedback page, it was determined that 64% thought that frames would be a helpful addition to the

page, 4% did not like the idea, and 32% did not have an opinion on the subject. From the total number of respondents 18% said that they would be willing to contribute data to be published on the site, 23% said they did not have any data or that they would not contribute, and 59% did not respond.

On the new survey, the respondents were asked to rate the site on the qualities of maneuverability, clarity, user friendliness, diversity of species, and accuracy. They were to rate the site on a scale from 1 to 5, with 1 being the worst and 5 being the best. 83% gave the site a 5 for maneuverability and clarity, while 17% did not respond. 67% gave the site a 5 for "user friendliness", 17% gave it a 3, and another 17% did not respond. For diversity of species, 17% gave it a 5, 33 % gave it a 4, another 33% gave it a 3, and 17% did not respond. As for accuracy, 17% gave the site a 5, 17% gave the site a 4, and another 67% did not respond. This percentage that did not respond on the subject of accuracy also remarked that they were unsure of the accuracy, or that it was accurate in their experience. Also on the new site was the question of whether or not the survey taker would visit the site again, to which 83% replied that they would, no one replied that they would not, and 17% did not answer.

As far as both surveys were concerned, every respondent requested the addition of information other than blood values. Management, parasitology, zoonoses, diseases specific to a species, genetic predispositions of a species, formularies, and DNA information were all requested or suggested.

Discussion

Throughout the completion of this project, problems arose that either hindered the development of the site or its accessibility. The site developers encountered difficulty in obtaining information to be placed on the site. Information was obtained from the library at Tufts in Grafton. This provided a large variety of birds and mammals to add, however only one amphibian and one reptile were found. New indices were created for these groups, and research conducted for more species to add to these indices. For accessibility, difficulties were the result of inability to have the database placed on the web viewed Tufts site. To add to the database on the Tufts server, a user name, ID, and write permissions to database pages had to be established. Once a user name was acquired, the difficulty was making the updates accessible on the Tufts site. The WPI site was viewable throughout the updating process. However, either the Tufts web site procedures prohibits students from holding write permissions to a Tufts site, or the Tufts web coordinators were not aware that they could authorize write permissions. After repeatedly requesting write permissions to the site, a specially made cover page was sent to the web coordinator at Tufts along with an upload request. This cover page was designed to give the Tufts visitors the opportunity to view the updates on the WPI site while in progress, so as to aid in the identification of errors in the newly added pages. Unfortunately, this page was never added to the Tufts site, therefore Tufts viewers were not able to aid in the debugging process. Finally, a copy of the updated web site was placed under the Tufts individuals homepage creation procedures so that the changes would be viewable. This site (http://www.tufts.edu/~clence01) was the home of the in

progress updates at Tufts and was to be transferred to the actual location of the Wildlife Rehabilitation Database once the updates were completed.

In the mean time, it was conveyed to the web coordinator at Tufts that the newly updated site should be viewable to the Tufts visitors, not just those that visit WPI's site. A request was then made for the web page address of the actual database to point to the in progress site. In response, the link from the Vet homepage at Tufts was pointed to the in progress pages, allowing some of that sites visitors to benefit from the changes. This, unfortunately, would not help those who have book-marked the original version of the database, or saved the sites address as one that is often visited. Finally, after a meeting with the Tufts web coordinator, holding pages pointing to the updated page under the Tufts "clence01" account were place at all known positions of the database on the Tufts web. Hopefully most visitors will continue to use the site and inform the site administrator of inaccuracies, even through periods of difficulty caused by future updates. This meeting ended with the hope that the future updates will be conducted, but by Tufts veterinary students who will have subsequent write permissions to the viewable database sites. The viewing difficulties associated with Tufts database site have, hopefully, been resolved.

Overall, the additions to the site included modifying the survey pages to mailto:margew@wpi.edu, creating new index pages for the new Reptilian and Amphibian indices, checking and updating the links page, and changing the feedback page to the correct electronic mail addresses. The main problems arose in the links to the indices, survey, etc., included on the newly created page. Once published, each page had to be fully explored to test all the links and their accuracy. According to the WPI statistics

page, which keeps page requests for all WPI pages, the mammalian index is the most used with an average of 80 to 90 hits per month. This information shows that perhaps more effort should be put into additions to the mammalian index. As far as the two new indices are concerned, they averaged about 15 hits in a seventeen-day period. Individual pages have hit amounts that vary greatly. The mammalian pages average hits of 10 to 12 per month while the avian index averages about 2 to 3. However, these statistics only include the WPI housed database and include requests made by current site administrators to check the validity and presentability of the page and associated links. The newer indices, reptilian and amphibian, have had hit averages of about 21 and 15 respectively; with average page hits of 7 and 15, again, respectively. These statistics can be viewed at http://www.wpi.edu/stats in the *Total transfers by URL* section under the respective page names. When choosing new additions for the site, keep in mind the areas most visited and used as well as those requested through feedback should be considered.

The first step of any future updates should be to create a template from a current page. It should to include the standard deviations, if applicable, sample size, and any important notes regarding the sampled group. Future expansion of this site should extend in many different directions. Although there were a great number of species added to the site, many of the most frequently requested species are still not included. Expansion in the direction of the addition of new species should concentrate on finding blood values for the species that were requested on the surveys. Specific searches and solicitations for information on those animals would be more lucrative than the random searches that had been conducted in the past. Future information on specifically requested species will most likely have to be solicited directly from researchers who work with those animals.

Unfortunately, the surveys indicated that there was not much support as far as contributions were concerned. Furthermore, many of these researchers may be unwilling to share data that they have worked so hard to compile, especially if it is unpublished. Any unpublished data that is received from an individual might not be accurate, particularly if it is from a small sample size, and as this site would be the first place of publication, validation is a concern. As more and more of this type of database are created, swapping links and integrating the data will expand the utility of this resource to those who use the site. New blood values may be more difficult to locate in the future, as number of the journal resources at TUSVM have been exhausted during this search for information.

Another direction of expansion should be into parasitology, zoonoses, diseases and management information for each species on the page. Each animal could be set up with a link to the hematology data, one to the parasitology data, and so on. For parasitology, pictures of different parasites could be included, as well as descriptions of tests and symptoms of each type of parasitic disease. Skin and blood parasites could be added along with the gastrointestinal parasites. The management section could include feeding and housing recommendations, as well as restraint methods and sites for venipuncture. Diseases and zoonoses would concentrate on the diseases most commonly encountered when dealing with a specific animal, as well as the symptoms, diagnostics and treatment for that disease. Whether it is a zoonotic disease, or one that can be transmitted to humans could be included on the same page as the disease itself instead of creating a separate link. Although including a formulary is a wonderful idea, this information would be even harder to come by than hematology data. It would have to

include dosing of the listed drugs, as well as restrictions on sick, young, or old animals, side effects, and whether or not it was a restricted access drug.

The incorporation of frames onto this web site does not appear to be necessary, although the surveys indicated a response in favor of including them. Most of those who took the survey found it to be easily maneuverable and "user friendly." Given the current formatting of the index pages, frames would create difficulties in the navigation of the site due to the width of the two-column table on the indices pages. If frames are to be used, perhaps the formatting of the index pages should be returned to the single-column alphabetical lists separating the scientific names from the common names. Since the database already is easy to maneuver and the reason for the implementation of frames is to make site navigation easier, energy would be better spent on the addition of more medical information.

The Wildlife Web Database is a project that not only provides information for wildlife rehabiliators, but also often may provide a source of information for veterinarians and other animal health individuals who do not have experience or knowledge of certain exotic animals. Maintenance and updates of this site should be completed periodically, so that the ever-increasing number of individuals caring for wildlife will have easy access to information regarding animals that they may have never seen in their clinics before.

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Appendixes

Appendix A1: Title Page

Wildlife Rehabilitation Database

This site is a joint project between students of Worcester Polytechnic Institute, Dr. Mark Pokras of Tufts University's School of Veterinary Medicine and members of the wildlife rehabilitation community. Currently the site contains baseline hematology data and basic biological information for some avian and mammalian species. As time progresses we will be adding more species as well as information about diseases, parasites, management and current issues for each individual species. We hope to shape the future expansion around the needs of the wildlife rehabilitation community, so please take the time to fill out the survey.

Avian Index
Mammalian Index
Amphibian Index
Reptilian

* **Survey** *

Links

Return to Tufts Wildlife Clinic Homepage

If you have comments or suggestions, please send us email.

Appendix A2: Feedback Page

Wildlife Rehabilitation Database Feedback	Home	Avian Index Mammal Index Amphibian Index

If you have questions or comments about coding or construction of the web page, please contact:

Chenoa Lencewicz
kahlua@wpi.edu
or
Marjorie Winemiller
margew@wpi.edu

If you have questions or comments about the content of the web page, please contact:

Mark Pokras, D.V.M.
MarkPokras@infonet.tufts.edu

Appendix A3: Original Mammalian Index

Common Names

Arctic Fox
American Black Bear
Black-footed Ferret
Bobcat
Coyote
Eastern Spotted Skunk
Fisher
Gray Wolf
Grizzly Bear
Lynx
Mountain Lion
Polar Bear
Puma
Raccoon
River Otter
Red Fox
Sea Otter
Timber Wolf

Scientific Names

Alopex lagopus
Canis latrans
Canis lupus
Enhydra lutris
Felis concolor
Felis lynx
Felis rufus
Lutra canadensis
Martes pennanti
Mustela nigripes
Procyon lotor
Spilogale putorius
Ursus americanus
Ursus arctos
Ursus maritimus
Vulpes fulva

This is the origional Mammalian Index.

Appendix A4: New Mammalian Index and Pages

Wildlife Rehabilitation Database Mammalian Index	**Home**	**Avian Index** **Mammalian Index** **Amphibian Index** **Reptilian Index**

Common Names	Scientific Names
American Black Bear	*Ursus americanus*
Antillean Manatees	*Trichechus manatus*
Arctic Fox	*Alopex lagopus*
Asian Elephants	*Elephas maximus*
Australian Sea Lion	*Neophoca cinerea*
Black-footed Ferret	*Mustela nigripes*
Bobcat	*Felis rufus*
Chuditch	*Dasyurus geoffroii*
Coyote	*Canis latrans*
Eastern Spotted Skunk	*Spilogale putorius*
Fisher	*Martes pennanti*
Florida Manatees	*Trichechus manatis*
Giant Panda	*latirostru*
Golden Crowned Sifaka	*Ailuropoda melanoleuca*
Grey Squirrel	*Propithecus tattersalli*
Gray Wolf	*Sciunis carolinensis*
Grizzly Bear	*Canis lupus*
Llama	*Ursus arctos*
Lynx	*Lama glama*
Mountain Lion	*Felis lynx*
Nelson Desert Bighorn Sheep	*Felis concolor*
Northern Fur Seal	*Ovis canadensis*
Polar Bear	*Callorhinus ursinus*
Puma	*Ursus maritimus*
Raccoon	*Felis concolor*
Red Deer	*Procyon lotor*
Red Fox	*Cervus elaphus*
Red Panda	*Vulpes fulva*
River Otter	*Ailurus fulgens*
Sea Otter	*Lutra canadensis*
Timber Wolf	*Enhydra lutris*
Wapiti	*Canis lupus*
White Whale	*Cervus elaphus*
	Delphinaptenis leucas

Wildlife Rehabilitation Database	Home	Mammalian Index

Species	Antillean Mantees	Scientific Name	*Tri chechus manatus*
Respiration Rate	*	Heart Rate	*
Body Temperature	*	Weight	*

CBC	Mean	SD[a]	Units
PCV	30.5	3.2	%
RBC	2.5	0.3	$x10^{-6}/L$
HB	10	1.1	g/100ml
MCV	*	*	um^3
MCH	*	*	pg
MCHC	*	*	%
WBC	6.6	2.0	$x10^3/mm^3$

Serum Chemistry	Mean	SD[a]	Units
TP	6.9	0.4	g/100ml
Gluc	83.5	13.4	mg/100ml
BUN	40	2.4	mg/100ml
Uric Acid	*	*	mg/100ml
Cholesterol	*	*	mg/100ml
Tot Bili	0.3	0.1	mg/100ml
Creat	1.2	0.2	mg/100ml
LDH	*	*	mu/10ml
Alk	62.7	17.5	mu/10ml
Na	143.3	5.21	meq/L
K	4.6	0.4	mg/100ml
Cl	98.3	6.3	mg/100ml
Ca	10.2	0.6	mg/100ml
P	4.9	0.7	mg/100ml
Mg	*	*	mg/100ml

References:

"Hematology , Serum Chemistry, and Morphometric Reference Values for Antillean Manatees." Lisa J. Converse, B.S. et al. Journal of Zoo & Wildlife Medicine. 25(3):423-431. 1994.

Notes:

n=11

[a] Standard Deviation

* Data Not Available

If you have comments or suggestions, please send us email.

Wildlife Rehabilitation Database	Home	Mammalian Index

Species	Asian Elephants	Scientific Name	*Elephas maximus*
Respiration Rate	*	Heart Rate	*
Body Temperature	*	Weight	*

CBC	Mean	SD[a]	Units
PCV	38	3.3	%
RBC	3.2	0.7	$x10^{-6}/L$
HB	12.7	1.7	g/100ml
MCV	118	18	um^3
MCH	41	6	pg
MCHC	33.8	3.6	%
WBC	18	5	$x10^3/mm^3$

Serum Chemistry	Mean	SD[a]	Units
TP	8.4	1.2	g/100ml
Gluc	*	*	mg/100ml
BUN	10	3.5	mg/100ml
Uric Acid	*	*	mg/100ml
Cholesterol	*	*	mg/100ml
Tot Bili	0.42	0.2	mg/100ml
Creat	2	0.8	mg/100ml
LDH	*	*	IU/L
Alk	170	100	IU/L
Na	*	*	g/L
K	*	*	mg/100ml
Cl	*	*	mg/100ml
Ca	8.63	1.5	mg/100ml
P	4.5	1.4	mg/100ml
Mg	*	*	mg/100ml

References:

"Hematology, Plasma, and Serum Biochemistry Values in Free Ranging Elephants in Sri Lanka" Indira D. Silva B.V.SC, Ph.D & Vijitha Y. Kuniwita B.V.SC, Ph.D. Journal of Zoo & Wildlife Medicine. 24(4):434-439. 1993.

Notes:

n=> 8

[a] Standard Deviation

* Data Not Available

If you have comments or suggestions, please send us email.

Wildlife Rehabilitation Database		Home	Mammalian Index
Species	Australian Sea Lion	Scientific Name	*Neophoca cinerea*
Respiration Rate	*	Heart Rate	*
Body Temperature	*	Weight	*

CBC	Mean	SD[a]	Units
PCV	*	*	%
RBC	4.77-6.08	*	$x10^0/mm^3$
HB	16.2-21	*	g/100ml
MCV	96-112	*	um^3
MCH	*	*	pg
MCHC	31.1-35	*	%
WBC	*	*	$x10^3/mm^3$

Serum Chemistry	Mean	SD[a]	Units
TP	71	10.4#	g/100ml
Gluc	4.3	1.15	mg/100ml
Urea	11.6	5.85	mg/100ml
Uric Acid	*	*	mg/100ml
Cholesterol	6.1	1.7	mmol/L
Tot Bili	4	2.5	umol/L
Creat	0.09	0.03	mmol/L
LDH	599	146	IU/L
Alk	95	53	IU/L
Na	148	13.6	g/L
K	4.4	0.58	mg/100ml
Cl	105	8.7	mg/100ml
Ca	2.38	0.356	mg/100ml
P	2.19	0.439	mg/100ml
Mg	*	*	mg/100ml

References:

-"Plasma Biochemical Values of Clinically Normal Australian Sea-Lions." CF Cargill, DJ Needham, GJ Judson. Journal of Wildlife Diseases. Vol 15. P105-110. Jan 1979

-"Hematology of the Australian Sea Lion." D.J. Needham, C.F. Cargill & D. Sheriff. Journal of Wildlife Diseases. 16(1):103-107. Jan 1980.

Notes:

n=38

[a] Standard Deviation

* Data Not Available

n=36

If you have comments or suggestions, please send us email.

Wildlife Rehabilitation Database	Home	Mammalian Index

Species	Chuditch	Scientific Name	*Dasyurus geoffroii*
Respiration Rate	*	Heart Rate	*
Body Temperature	*	Weight	*

CBC		Mean	Units
	PCV	0.45	% L/L
	RBC	6.91-9.23	$x10^{12}/um^3$
	HB	156.6	g/L
	MCV	55.2	u^3
	MCH	18.4	uug
	MCHC	334.8	%
	WBC	4.85	$x10^9/mm^3$

Serum Chemistry		Mean	Units
	TSP	66.1	g/L
	Gluc	6.2	mmol/L
	BUN	19.9	mmol/L
	Uric Acid	*	mg/100ml
	Cholesterol	*	mg/100ml
	Tot Bili	2.7	umol/L
	Creat	54	umol/L
	LDH	*	IU/L
	ALP	469	IU/L
	Na	*	g/L
	K	*	mg/100ml
	Cl	*	mg/100ml
	Ca	2.42	mmol/L
	P	2.30	mmol/L
	Mg	*	mg/100ml

References:

"Hematology 7 Serum Biochemistry Reference Values for Anesthetized Churdich" A. Suensson, et al. Journal of Zoo & Wildlife Medicine. 29(3):311-314. 1998.

Notes:

n=unavailable

[a] Standard Deviation

* Data Not Available

If you have comments or suggestions, please send us email.

Wildlife Rehabilitation Database	Home	Mammal Index

Species	Coyote	Scientific Name	*Canis latrans*
Respiration Rate	115/min	Heart Rate	*
Body Temperature	38.6'C	Weight	44.5-111.5 Kg

CBC		Mean	Units
	PCV	39-56.4	%
	RBC	5.0-9.1	$x10^6/mm^3$
	HB	11.7-16.7	g/100ml
	MCV	56-74	fl
	MCH	14.7-22.9	pg
	MCHC	29.8	%
	WBC	11.8-28.8	$x10^3/mm^3$

Serum Chemistry		Mean	Units
	#TP	6.5+-0.3	g/100ml
	#Gluc	125+-28	mg/100ml
	BUN	25-31.4	mg/100ml
	#Uric Acid	0.4+-0.3	mg/100ml
	Cholesterol	118-188	mg/100ml
	Tot Bili	0-.1	mg/100ml
	#Creat	1.3+-0.3	mg/100ml
	#LDH	143+-86	IU/L
	#Alk	35+-15	IU/L
	#Na	145+-3.8	meq/L
	#K	4.9+-0.4	mg/100ml
	Cl	*	mg/100ml
	Ca	8-9.2	mg/100ml
	P	2.9-3.9	mg/100ml
	Mg	*	mg/100ml

References:

Hamilton & Whitaker: Mammals of Eastern US; Peter Anderson: In Search of the New England Coyote; Marc Bekoff: Coyotes-Biology, Behavior and Management; CBC and Serum Chem:Journ of Wildlife Dz vol. 16: 492; Louis E. Bueler: Wild Dogs of the World; Wallach & Boever: Diseases of Exotic Animals; Chapman & Feldhamer: Wild Mammals of North America; "Hematological Values of Conditioned, Captive, Wild Coyotes" Journal of WIldlife Diseases. Vol 12. 1976. p402; "Hematologic and Serum Chemistry Values of pen-raised Coyotes." J. E. Rich & N.L. Gates. Journal of Wildlife Diseases. Vol 15. pp115-119. 1979.

Notes:

* Data Not Available
# values are pen raised!

If you have comments or suggestions, please send us email.

Wildlife Rehabilitation Database	Home	Mammalian Index

Species	Florida Manatees	Scientific Name	*Trichechus Manatis Latirostris*
Respiration Rate	3-15 R/min	Heart Rate	50-60 /min
Body Temperature	*	Weight	600 kg (male) </= 1200 kg (female)

CBC	Mean	Units
PCV	*	%
RBC	2.41-3.06	$x10^5/mm^3$
HB	10.3-12.0	g/100ml
MCV	121-135	u^3
MCH	37-43	uug
MCHC	30-33	%
WBC	4-11.7	$x10^3/mm^3$

Serum Chemistry	Mean	Units
TP	6.8-7.3	g/100ml
Gluc	56-117	mg/100ml
BUN	6.4-16	mg/100ml
Uric Acid	*	mg/100ml
Cholesterol	109-328	mg/100ml
Tot Bili	0-0.1	mg/100ml
Creat	0.4-2.1	mg/100ml
LDH	*	IU/L
Alk	64-183	IU/L
Na	142-157	meg/L
K	4.2-6.6	meg/L
Cl	90-103	meg/L
Ca	10.1-12.2	mg/100ml
P	3-8	mg/100ml
Mg	*	meg/L

References:

"Manatee Medicine"Walsh, Bossart, Fowler and Miller. Zoo & Wild Animal Medicine. Current Therapy 4. pp 507-516. W.B. Saunders Co. Philadelphia. 1999.

Notes:

hemocrit = 33-38%
healthy
n=12
[a] Standard Deviation
* Data Not Available

If you have comments or suggestions, please send us email.

Wildlife Rehabilitation Database	Home	Mammal Index

Species	Giant Panda#	Scientific Name	*Ailuropoda melanoleuca*
Respiration Rate	*	Heart Rate	*
Body Temperature	*	Weight	*

CBC	Mean	SD[a]	Units
PCV	40.6	1.3	%
RBC	6.8	0.2	$x10^{-6}/L$
HB	*	*	g/100ml
MCV	59.4	2.6	μm^3
MCH	*	*	pg
MCHC	*	*	%
WBC	7.0	0.7	$x10^3/mm^3$

Serum Chemistry	Mean	SD[a]	Units
TP	6.2	0.2	g/100ml
Gluc	92.4	6.1	mg/100ml
BUN	15	2	mg/100ml
Uric Acid	*	*	mg/100ml
Cholesterol	191	8	mg/100ml
Tot Bili	0.15	0.02	mg/100ml
Creat	1.6	0.1	mg/100ml
LDH	532	93	IU/L
Alk	125	23	IU/L
Na	128	3	mmol/L
K	3.7	0.3	mmol/L
Cl	94	3	mmol/L
Ca	2.5	0.2	mmol/L
P	1.4	0.1	mmol/L
Mg	1.1	0.1	mmol/L

References:

-"Giant Panda Management & Medicine in China." SA Mainka. p410-414. Fowler, 1999.
-"Hematology & Serum Biochemical Values for Healthy Captive Giant Pandas at the Wolong Reserve, Sichuan, China." Susan A. Mainka, et al. Journal of Zoo & Wildlife Medicine. 26(3):377-381, 1995.

Notes:

#Captive
males w/ high RBC, females w/high triglycerides (P412)
[a] Standard Deviation
* Data Not Available
n=15-18 (sample size)

If you have comments or suggestions, please send us email.

Wildlife Rehabilitation Database		Home	Mammal Index
Species	Golden Crowned Sifaka	Scientific Name	*Propithecus tattersalli*
Respiration Rate	*	Heart Rate	*
Body Temperature	*	Weight	*

CBC		Mean	SD[a]	Units
	PCV	*	*	%
	RBC	*	*	$x10^{-6}/L$
	HB	*	*	g/100ml
	MCV	*	*	um^3
	MCH	*	*	pg
	MCHC	*	*	%
	WBC	13.1	6.0	$x10^3/mm^3$

Serum Chemistry		Mean	SD[a]	Units
	TP	6.9	0.4	g/100ml
	Gluc	137.7	54	mg/100ml
	BUN	16.2	5.02	mg/100ml
	Uric Acid	*	*	mg/100ml
	Cholesterol	119.5	25.8	mg/100ml
	Tot Bili	0.5	0.2	mg/100ml
	Creat	0.9	0.2	mg/100ml
	LDH	*	*	IU/L
	Alk	129	83.9	IU/L
	Na	140.5	10	g/L
	K	3.8	0.8	mg/100ml
	Cl	100.3	5.1	mg/100ml
	Ca	10.9	0.7	mg/100ml
	P	3.0	1.1	mg/100ml
	Mg	*	*	mg/100ml

References:

"Hematology and Serum Chemistry Values for Free Ranging Golden Crowned Sifaka." Della M. Garell, D.V.M. & David M. Nyers, Ph. D. Journal of Zoo & WIldlife Medicine. 26(3):382-386. 1995.

Notes:

[a] Standard Deviation

* Data Not Available

n=34 (sample size)

If you have comments or suggestions, please send us email.

Wildlife Rehabilitation Database	Home	Mammalian Index

Species	Grey Squirrel	Scientific Name	*Sciurus carolinensis*
Respiration Rate	*	Heart Rate	*
Body Temperature	*	Weight	*

CBC	Mean	SD[a]	Units
PCV	*	*	%
RBC	*	*	$x10^{-6}/L$
HB	*	*	g/100ml
MCV	*	*	um^3
MCH	*	*	pg
MCHC	*	*	%
WBC	*	*	$x10^3/mm^3$

Serum Chemistry	Mean	SD[a]	Units
TP	5.5	0.3	g/100ml
Gluc	139	2.7	mg/100ml
BUN	20	0.7	mg/100ml
Uric Acid	1	0.00	mg/100ml
Cholesterol	248	4.3	mg/100ml
Tot Bili	*	*	mg/100ml
Creat	*	*	mg/100ml
LDH	*	*	mu/10ml
Alk	*	*	mu/10ml
Na	*	*	g/L
K	*	*	mg/100ml
Cl	115	1.0	mg/100ml
Ca	9	0.1	mg/100ml
P	7.3	0.2	mg/100ml
Mg	*	*	mg/100ml

References:

"Blood & Urinary Values in the Grey Squirrel." G.L. Hoff, et al. Journal of Wildlife Diseases. 12(3): 349-352. July 1976.

Notes:

Three n values given n=180, 107, and 71.

[a] Standard Deviation

* Data Not Available

If you have comments or suggestions, please send us email.

Wildlife Rehabilitation Database	Home	Mammalian Index

Species	Llama	Scientific Name	*Lama Glama*
Respiration Rate	10-30 R/min	Heart Rate	60-90 Bpm
Body Temperature	37.5-38.9 degrees C	Weight	113-250 Kg

CBC		Mean	Units
	PCV	29-39	%
	RBC	11.3-17.6	$x10^6/mm^3$
	HB	12.8-17.6	g/100ml
	MCV	21-28	u^3
	MCH	*	uug
	MCHC	43.2-46.6	%
	WBC	7.5-21.5	$x10^3/mm^3$

Serum Chemistry		Mean	Units
	TP	4.7-7.3	g/100ml
	Gluc	76-176	mg/100ml
	BUN	9-36	mg/100ml
	Uric Acid	*	mg/100ml
	Cholesterol	0-128	mg/100ml
	Tot Bili	*	mg/100ml
	Creat	0.9-2.8	mg/100ml
	LDH	10-695	IU/L
	Alk	*	IU/L
	Na	148-158	meq/L
	K	3.6-6.2	meq/L
	Cl	98-120	meq/L
	Ca	7.6-10.9	mg/100ml
	P	1.6-11	mg/100ml
	Mg	*	mg/100ml

References:

Characterization of Erythrocytic Indices & Serum Iron Values in Healthy Llamas. Weiser, M.G; et al. Am.J. Vet. Res 53(10): 1776-1779. 1992.

Medicine & Sx of So. Am. Camelids. Fowler, Murray, & Dum. Iowa St. University Press Ames. pp 364-369. 1998.

Notes:

n=unavailable
[a] Standard Deviation
* Data Not Available

If you have comments or suggestions, please send us email.

Wildlife Rehabilitation Database	Home	Mammalian Index

Species	Nelson Desert Bighorn Sheep	Scientific Name	*Ovis canadensis*
Respiration Rate	83 +/- 19.0 /min	Heart Rate	132 +/- 46.6 /min
Body Temperature	104.9 +/- 1.1 deg F	Weight	*

CBC	Mean	SD[a]	Units
PCV	*	*	%
RBC	*	*	$x10^{-6}/L$
HB	*	*	g/100ml
MCV	*	*	um^3
MCH	*	*	pg
MCHC	*	*	%
WBC	10.8	1.4	$x10^3/mm^3$

Serum Chemistry	Mean	SD[a]	Units
TP	*	*	g/100ml
Gluc	226	38.2	mg/100ml
BUN	21	5.1	mg/100ml
Uric Acid	*	*	mg/100ml
Cholesterol	61	10.2	mg/100ml
Tot Bili	0.9	0.3	mg/100ml
Creat	1.9	0.1	mg/100ml
LDH	826	230.8	mU/10ml
Alk	372	204.2	mU/10ml
Na	*	*	g/L
K	*	*	mg/100ml
Cl	*	*	mg/100ml
Ca	10	0.4	mg/100ml
P	5.5	2.3	mg/100ml
Mg	*	*	mg/100ml

References:

From the "Group 1" the unanesthetized group "Physiologic and Hematologic Values in Nelson Desert Bighorn Sheep" Scott E. McDonald, Steven R. Paul, & Thomas D. Bunch. Journal of Wildlife Diseases. 17 (1):131-134. Jan 1981.

Notes:

n=11

[a] Standard Deviation

* Data Not Available

If you have comments or suggestions, please send us email.

Wildlife Rehabilitation Database	Home	Mammalian Index

Species	Red Panda	Scientific Name	*Ailurus fulgens*
Respiration Rate	*	Heart Rate	*
Body Temperature	*	Weight	*

CBC	Mean	SD[a]	Units
PCV	*	*	%
RBC	8.8	0.07	$x10^{-6}/uL$
HB	13.5	0.10	g/100ml
MCV	47	0.17	um^3
MCH	15	0.05	pg
MCHC	33	0.16	%
WBC	10.8	1.4	$x10^3/uL$

Serum Chemistry	Mean	SD[a]	Units
TP	7.2	0.05	g/100ml
Gluc	115.9	3.34	mg/100ml
BUN	25	0.63	mg/100ml
Uric Acid	*	*	mg/100ml
Cholesterol	281	11.4	mg/100ml
Tot Bili	0.24	0.01	mg/100ml
Creat	1.1	0.02	mg/100ml
LDH	*	*	mu/10ml
Alk	26.6	2.1	mu/10ml
Na	138.2	0.48#	g/L
K	5.1	0.05	mg/100ml
Cl	*	*	mg/100ml
Ca	9.2	0.09	mg/100ml
P	4.9	0.13	mg/100ml
Mg	*	*	mg/100ml

References:

"Hematology and Serum Chemistry Values for the Red Panda: Variation with Sex, Age, Health Status, & Restraint." Michael J. Wolf, D.V.M. et al. Journal of Zoo & Wildlife Medicine. 21(3): 326-333. 1990.

Notes:

n>/=210

[a] Standard Deviation

* Data Not Available

n>/=54

If you have comments or suggestions, please send us email.

Wildlife Rehabilitation Database	Home	Mammalian Index

Species	Red Deer	Scientific Name	*Cervus elaphus*
Respiration Rate	27+/-8.5 R/min	Heart Rate	80+/-13 bpm
Body Temperature	40 degrees C	Weight	100-120 kg

CBC	Mean	Units
PCV	*	%
RBC	7.1-16.5	$x10^{12}/mm^3$
HB	96-212	g/L
MCV	45.3-52.7	fl
MCH	14.9-17.4	uug
MCHC	330-400	g/L
WBC	2.4-14.5	$x10^{9}/mm^3$

Serum Chemistry	Mean	Units
TP	52-86	g/L
Gluc	6.9	mmol/L
BUN	8.56	mmol/L
Uric Acid	*	mg/100ml
Cholesterol	*	mg/100ml
Tot Bili	*	mg/100ml
Creat	*	umol/L
LDH	1028+/-19	IU/L
Alk	287	IU/L
Na	70-220	mmol/L
K	21-21.4	mmol/L
Cl	*	mg/100ml
Ca	2.13	mmol/L
P	1.75-4.13	mmol/L
Mg	*	mmol/L

References:

"Farming Wapiti & Red Deer" Jerry C. Haigh & Robert J. Hudson. Mosby Yr Bk Inc. Boston. 1993.

Notes:

n=unavailable

[a] Standard Deviation

* Data Not Available

If you have comments or suggestions, please send us email.

Wildlife Rehabilitation Database	Home	Mammalian Index

Species	Wapiti	Scientific Name	*Cervus elaphus*
Respiration Rate	*	Heart Rate	*
Body Temperature	*	Weight	*

CBC	Mean	Units
PCV	*	%
RBC	6.91-9.23	$x10^{12}/mm^3$
HB	144-153	g/L
MCV	42.1-44.6	u^3
MCH	*	uug
MCHC	*	%
WBC	4.57-7.76	$x10^9/mm^3$

Serum Chemistry	Mean	Units
TP	61-81	g/100ml
Gluc	5.8-9.2	mmol/L
BUN	5.6-9.8	mmol/L
Uric Acid	*	mg/100ml
Cholesterol	*	mg/100ml
Tot Bili	*	mg/100ml
Creat	135-195	umol/L
LDH	3730+/-910	IU/L
Alk	184-426	IU/L
Na	135-147	mmol/L
K	5.48+/-0.65	mg/100ml
Cl	99-107	mg/100ml
Ca	2.31-2.79	mmol/L
P	1.18-2.68	mmol/L
Mg	0.76-1.16	mg/100ml

References:

"Farming Wapiti & Red Deer" Jerry C. Haigh & Robert J. Hudson. Mosby Yr Bk Inc. Boston. 1993.

Notes:

North American

n=unavailable

[a] Standard Deviation

* Data Not Available

If you have comments or suggestions, please send us email.

Wildlife Rehabilitation Database		Home	Mammalian Index
Species	White Whale	Scientific Name	*Delphinaptenis leucas*
Respiration Rate	*	Heart Rate	*
Body Temperature	*	Weight	*

CBC		Mean	Units
	PCV	*	%
	RBC	3.26	$x10^6/mm^3$
	HB	21	g/100ml
	MCV	171	u^3
	MCH	65	uug
	MCHC	38	%
	WBC	8.4	$x10^3/mm^3$

Serum Chemistry		Mean	Units
	TP	6.9	g/100ml
	Gluc	104	mg/100ml
	BUN	51	mg/100ml
	Uric Acid	*	mg/100ml
	Cholesterol	224	mg/100ml
	Tot Bili	*	mg/100ml
	Creat	1.4	mg/100ml
	LDH	118	IU/L
	Alk	128	IU/L
	Na	*	g/L
	K	*	mg/100ml
	Cl	109	mg/100ml
	Ca	9.5	mg/100ml
	P	5.8	mg/100ml
	Mg	*	mg/100ml

References:

"Hematology and Serum Chemistry Values in the Beluga." L.H. Cornell, et al. Journal of Wildlife Diseases. 24(2): 220-224. 1988.

Notes:

n=31

[a] Standard Deviation

* Data Not Available

If you have comments or suggestions, please send us email.

Appendix A5: Original Avian Index

Wildlife Rehabilitation Database		Home	Mammalian Index
Species	Northern Fur Seal#	Scientific Name	*Callorhinus ursinus*
Respiration Rate	*	Heart Rate	*
Body Temperature	*	Weight	*

CBC		Mean	Units
	PCV	*	%
	RBC	*	$x10^6/mm^3$
	HB	*	g/100ml
	MCV	*	u^3
	MCH	*	uug
	MCHC	*	%
	WBC	*	$x10^3/mm^3$

Serum Chemistry		Mean	Units
	TP	7.0	g/100ml
	Gluc	104	mg/100ml
	BUN	26.2	mg/100ml
	Uric Acid	3.0	mg/100ml
	Cholesterol	260	mg/100ml
	Tot Bili	1.2	mg/100ml
	Creat	1.4	mg/100ml
	LDH	995	IU/L
	Alk	150	IU/L
	Na	*	g/L
	K	*	mg/100ml
	Cl	*	mg/100ml
	Ca	10.4	mg/100ml
	P	5.7	mg/100ml
	Mg	*	mg/100ml

References:

"Clinical Blood Values of the Northern Fur Seal, Comparison of Fresh Versus Stored Frozen Serum." Journal of Wildlife Diseases. Vol 14. 1978.

Notes:

n=25

[a] Standard Deviation

* Data Not Available

Fresh values? vs. Frozen

If you have comments or suggestions, please send us email.

Common Names

American Kestrel
American White Pelican
Bald Eagle
Barn Owl
Black Duck
Buzzard
Canada Goose
Eastern Screech Owl
Golden Eagle
Great Horned Owl
Herring Gull
Mallard Duck
Ostrich
Peregrine Falcon
Red-tailed Hawk
Trumpeter Swan
Whooping Crane

Scientific Names

Anas platyrhynchos
Anas rubripes
Aquila chrysaetos
Branta canadensis
Bubo virginianus
Buteo buteo
Buteo jamaicensis
Cygnus buccinator
Falco peregrinus
Falco sparverius
Grus americana
Haliaeetus leucocephalus
Larus argentatus
Otus asio
Pelecanus erythrorhynchos
Struthio camelus
Tyto alba

Appendix A6: New Avian Index and Pages

Wildlife Rehabilitation Database Avian Index	Home	Avian Index Mammalian Index Amphibian Index Reptilian Index

Common Names	Scientific Names
American Kestrel	*Falco sparverius*
American White Pelican	*Pelecanus erythrorhynchos*
Ancient Murrelet	*Synthliboramphus antiguus*
Bald Eagle	*Haliaeetus leucocephalus*
Barn Owl	*Tyto alba*
Black Duck	*Anas rubripes*
Black Legged Kittiwake	*Rissa triactyla*
Buzzard	*Buteo buteo*
Canada Goose	*Branta canadensis*
Crested Auklet	*Aethia cristatella*
Eastern Screech Owl	*Otus asio*
Eurasian Buzzard	*Bueto Bueto*
Ferrunginous Hawk	*Bueto Regalis*
Flamingos	*Phoenicopterus ruber*
Glaucous-Winged Gull	*Larus glaucesceris*
Golden Eagle	*Aquila chrysaetos*
Great Horned Owl	*Bubo virginianus*
Harris' Hawk	*Parabueto unicinctus*
Hawaiian Goose	*Branta sandvicensis*
Herring Gull	*Larus argentatus*
Horned Puffin	*Fratercula corniculata*
Lagger Falcon	*Falco jugger*
Lanner Falcon	*Falco biarmicus*
Mallard Duck	*Anas platyrhynchos*
Marbled Murrelet	*Brachuramphus marmoratus*
Merlin Falcon	*Falco columbaris*
Northern Eagle Owl	*Glaucidium gnoma*
Northern Goshawk	*Accipiter genilis*
Ostrich	*Struthio camelus*
Parakeet Auklet	*Cyclorrhynchus psitiacula*
Peregrine Falcon	*Falco peregrinus*
Pigeon Guillemot	*Cepphus columba*
Red-tailed Hawk	*Buteo jamaicensis*
Saker Falcon	*Falco cherrug*
Swan	*Olor Buccinator*
Tawny Eagle	*Aquila ropax*
Trumpeter Swan	*Cygnus buccinator*
Tufted Puffin	*Lunda cirrhata*
White Winged Wood Duck	*Aix sponsa*
Whooping Crane	*Grus americana*

Wildlife Rehabilitation Database	Home	Avian Index

Species	Ancient Murrelet	Scientific Name	*Synthliboramphus antiguus*
Respiration Rate	*	Heart Rate	*
Body Temperature	*	Weight	*

CBC		Mean	Units
	PCV	40	%
	RBC	*	$x10^6/mm^3$
	HB	*	g/100ml
	MCV	*	u^3
	MCH	*	uug
	MCHC	*	%
	WBC	4083	$x10^3/mm^3$

Serum Chemistry		Mean	Units
	TP	4.5	g/100ml
	Gluc	271	mg/100ml
	BUN	*	mg/100ml
	Uric Acid	28	mg/100ml
	Cholesterol	300	mg/100ml
	Tot Bili	1.5	mg/100ml
	Creat	*	mg/100ml
	LDH	2920	IU/L
	Alk	62	IU/L
	Na	*	g/L
	K	*	mg/100ml
	Cl	*	mg/100ml
	Ca	9.3	mg/100ml
	P	*	mg/100ml
	Mg	*	mg/100ml

References:

"Hematology and Plasma Biochemical Reference Ranges of Alaskan Seabirds: Thier Ecological Significance and Clinical Importance." S.H. Newman, J.F. Piatt, and J. White. **Seabird Blood Parameters. Colonial Waterbirds**. 20(3): 492-504. 1997.

Notes:

n=10

[a] Standard Deviation

* Data Not Available

If you have comments or suggestions, please send us email.

Wildlife Rehabilitation Database		Home	Avian Index
Species	Black Legged Kittiwake	Scientific Name	*Rissa tridactyla*
Respiration Rate	*	Heart Rate	*
Body Temperature	*	Weight	*

CBC	Mean	Units
PCV	41	%
RBC	*	$x10^6/mm^3$
HB	*	g/100ml
MCV	*	u^3
MCH	*	uug
MCHC	*	%
WBC	4180	$x10^3/mm^3$

Serum Chemistry	Mean	Units
TP	3.8	g/100ml
Gluc	331	mg/100ml
BUN	*	mg/100ml
Uric Acid	19	mg/100ml
Cholesterol	387	mg/100ml
Tot Bili	1.5	mg/100ml
Creat	*	mg/100ml
LDH	715	IU/L
Alk	123	IU/L
Na	*	g/L
K	*	mg/100ml
Cl	*	mg/100ml
Ca	9.8	mg/100ml
P	*	mg/100ml
Mg	*	mg/100ml

References:

"Hematology and Plasma Biochemical Reference Ranges of Alaskan Seabirds: Thier Ecological Significance and Clinical Importance." S.H. Newman, J.F. Piatt, and J. White. **Seabird Blood Parameters. Colonial Waterbirds**. 20(3): 492-504. 1997.

Notes:

n=10

[a] Standard Deviation

* Data Not Available

If you have comments or suggestions, please send us email.

If you have comments or suggestions, please send us email.

Wildlife Rehabilitation Database		Home	Avian Index
Species	Crested Auklet	Scientific Name	*Aethia cristatella*
Respiration Rate	*	Heart Rate	*
Body Temperature	*	Weight	*

CBC		Mean	Units
	PCV	40	%
	RBC	*	$x10^6/mm^3$
	HB	*	g/100ml
	MCV	*	u^3
	MCH	*	uug
	MCHC	*	%
	WBC	2529	$x10^3/mm^3$

Serum Chemistry		Mean	Units
	TP	3.2	g/100ml
	Gluc	238	mg/100ml
	BUN	*	mg/100ml
	Uric Acid	17	mg/100ml
	Cholesterol	221	mg/100ml
	Tot Bili	1.8	mg/100ml
	Creat	*	mg/100ml
	LDH	1055	IU/L
	Alk	131	IU/L
	Na	*	g/L
	K	*	mg/100ml
	Cl	*	mg/100ml
	Ca	8.6	mg/100ml
	P	*	mg/100ml
	Mg	*	mg/100ml

References:

"Hematology and Plasma Biochemical Reference Ranges of Alaskan Seabirds: Thier Ecological Significance and Clinical Importance." S.H. Newman, J.F. Piatt, and J. White. **Seabird Blood Parameters. Colonial Waterbirds**. 20(3): 492-504. 1997.

Notes:

n=11

[a] Standard Deviation

* Data Not Available

If you have comments or suggestions, please send us email.

Wildlife Rehabilitation Database		Home	Avian Index
Species	Eurasian Buzzard	Scientific Name	*Bueto Bueto*
Respiration Rate	*	Heart Rate	*
Body Temperature	*	Weight	*

CBC		Mean	Units
	PCV	0.32-0.44	% l/l
	RBC	2.13-2.76	$x10^2/L$
	HB	101-167	g/L
	MCV	151-165	fl
	MCH	48-53	pg
	MCHC	307-339	% g/L
	WBC	5-13	$x10^9/L$

Serum Chemistry		Mean	Units
	TP	*	g/100ml
	Gluc	*	mg/100ml
	BUN	*	mg/100ml
	Uric Acid	*	mg/100ml
	Cholesterol	*	mg/100ml
	Tot Bili	*	mg/100ml
	Creat	*	mg/100ml
	LDH	*	IU/L
	Alk	*	IU/L
	Na	*	g/L
	K	*	mg/100ml
	Cl	*	mg/100ml
	Ca	*	mg/100ml
	P	*	mg/100ml
	Mg	*	mg/100ml

References:

Manual of Reptiles, Pigeons, & Waterfowl. Peter H. Benyon. British Small Animal Vet Association Limited. Gloucestershire. 1996.

Notes:

n=26

[a] Standard Deviation

* Data Not Available

If you have comments or suggestions, please send us email.

Wildlife Rehabilitation Database	Home	Avian Index

Species	Flamingos	Scientific Name	*Phoenicoptenus ruber*
Respiration Rate	*	Heart Rate	*
Body Temperature	*	Weight	*

CBC		Mean	Units
	PCV	0.4-0.53	%
	RBC	2.25-3.45	$x10^6/mm^3$
	HB	143-193	g/100mL
	MCV	141-207	ul
	MCH	53-65	pg
	MCHC	290-360	%
	WBC	3.5-13.3	$x10^3/mm^3$

Serum Chemistry		Mean	Units
	TP	34-40	g/100mL
	Gluc	9.5-13.2	mg/100mL
	Urea	0.35-1.25	mg/100mL
	Uric Acid	183-685	mg/100mL
	Cholesterol	3.6-8.2	mg/100mL
	Bile Acids	*	mg/100mL
	Creat	44-91	mg/100mL
	LDH	125-685	IU/L
	ALP	11-95	IU/L
	Na	149-158	g/L
	K	2.5-3.8	mg/100mL
	Cl	*	mg/100mL
	Ca	2.2-2.85	mg/100mL
	P	0.65-1.72	mg/100mL
	Mg	*	mg/100mL

References:

Manual of Reptiles, Pigeons, & Waterfowl. Peter H. Benyon. British Small Animal Vet Association Limited. Gloucestershire. 1996.

Notes:

n=25

[a] Standard Deviation

* Data Not Available

If you have comments or suggestions, please send us email.

Wildlife Rehabilitation Database	Home	Avian Index

Species	Glaucous-winged Gull	Scientific Name	*Larus glaucescens*
Respiration Rate	*	Heart Rate	*
Body Temperature	*	Weight	*

CBC	Mean	Units
PCV	38	%
RBC	*	$x10^6/mm^3$
HB	*	g/100ml
MCV	*	u^3
MCH	*	uug
MCHC	*	%
WBC	5077	$x10^3/mm^3$

Serum Chemistry	Mean	Units
TP	3.4	g/100ml
Gluc	320	mg/100ml
BUN	*	mg/100ml
Uric Acid	28	mg/100ml
Cholesterol	268	mg/100ml
Tot Bili	0.7	mg/100ml
Creat	*	mg/100ml
LDH	1010	IU/L
Alk	252	IU/L
Na	*	g/L
K	*	mg/100ml
Cl	*	mg/100ml
Ca	9.6	mg/100ml
P	*	mg/100ml
Mg	*	mg/100ml

References:

"Hematology and Plasma Biochemical Reference Ranges of Alaskan Seabirds: Thier Ecological Significance and Clinical Importance." S.H. Newman, J.F. Piatt, and J. White. **Seabird Blood Parameters. Colonial Waterbirds**. 20(3): 492-504. 1997.

Notes:

n=9

[a] Standard Deviation

* Data Not Available

If you have comments or suggestions, please send us email.

Wildlife Rehabilitation Database	Home	Avian Index

Species	Harris Hawk	Scientific Name	*Parabuteo unicinctus*
Respiration Rate	*	Heart Rate	*
Body Temperature	*	Weight	*

CBC	Mean	Units
PCV	0.4-0.55	% L/L
RBC	2.63-3.5	$x10^2$/L
HB	121-171	g/L
MCV	147-163	fl
MCH	45.4-51.1	pg
MCHC	301-330	g/l
WBC	4.8-10	$x10^9$/L

Serum Chemistry	Mean	Units
TP	31-45.7	g/L
Gluc	12.2-15.7	mmol/L
Urea	0.7-1.9	mmol/L
Uric Acid	535-785	umol/L
Cholesterol	6.6-13.1	mmol/L
Bile Acids	*	umol/L
Creat	20-59	umol/L
LDH	160-563	IU/L
ALP	20-96	IU/L
Na	155-171	mmol/L
K	0.8-2.3	mmol/L
Cl	113-119	mmol/L
Ca	2.1-2.66	mmol/L
P	0.8-2.14	mmol/L
Mg	*	mmol/L

References:

Manual of Reptiles, Pigeons, & Waterfowl. Peter H. Benyon. British Small Animal Vet Association Limited. Gloucestershire. 1996.

Notes:

n=53 for CBC and 17 for Serum

[a] Standard Deviation

* Data Not Available

If you have comments or suggestions, please send us email.

Wildlife Rehabilitation Database	Home	Avian Index

Species	Hawaiian Goose	Scientific Name	*Branta sandvicensis*
Respiration Rate	*	Heart Rate	*
Body Temperature	*	Weight	*

CBC		Mean	Units
	PCV	0.38-0.45	%
	RBC	2.35-2.89	$x10^6/mm^3$
	HB	129-170	g/100mL
	MCV	156-161	ul
	MCH	54.9-59.3	pg
	MCHC	340-380	%
	WBC	6.2-13.4	$x10^3/mm^3$

Serum Chemistry		Mean	Units
	TP	*	g/100mL
	Gluc	*	mg/100mL
	Urea	*	mg/100mL
	Uric Acid	*	mg/100mL
	Cholesterol	*	mg/100mL
	Bile Acids	*	mg/100mL
	Creat	*	mg/100mL
	LDH	*	IU/L
	ALP	*	IU/L
	Na	*	g/L
	K	*	mg/100mL
	Cl	*	mg/100mL
	Ca	*	mg/100mL
	P	*	mg/100mL
	Mg	*	mg/100mL

References:

Manual of Reptiles, Pigeons, & Waterfowl. Peter H. Benyon. British Small Animal Vet Association Limited. Gloucestershire. 1996.

Notes:

n=10

[a] Standard Deviation

* Data Not Available

If you have comments or suggestions, please send us email.

Wildlife Rehabilitation Database		Home	Avian Index
Species	Horned Puffin	Scientific Name	*Fratercula corniculata*
Respiration Rate	*	Heart Rate	*
Body Temperature	*	Weight	*

CBC		Mean	Units
	PCV	44	%
	RBC	*	$x10^6/mm^3$
	HB	*	g/100ml
	MCV	*	u^3
	MCH	*	uug
	MCHC	*	%
	WBC	4333	$x10^3/mm^3$

Serum Chemistry		Mean	Units
	TP	4.3	g/100ml
	Gluc	318	mg/100ml
	BUN	*	mg/100ml
	Uric Acid	30	mg/100ml
	Cholesterol	323	mg/100ml
	Tot Bili	1.5	mg/100ml
	Creat	*	mg/100ml
	LDH	886	IU/L
	Alk	109	IU/L
	Na	*	g/L
	K	*	mg/100ml
	Cl	*	mg/100ml
	Ca	14.2	mg/100ml
	P	*	mg/100ml
	Mg	*	mg/100ml

References:

"Hematology and Plasma Biochemical Reference Ranges of Alaskan Seabirds: Thier Ecological Significance and Clinical Importance." S.H. Newman, J.F. Piatt, and J. White. **Seabird Blood Parameters. Colonial Waterbirds**. 20(3): 492-504. 1997.

Notes:

n=17

[a] Standard Deviation

* Data Not Available

If you have comments or suggestions, please send us email.

Wildlife Rehabilitation Database	Home	Avian Index

Species	Lagger Falcon	Scientific Name	*Falco Jugger*
Respiration Rate	*	Heart Rate	*
Body Temperature	*	Weight	*

CBC		Mean	Units
	PCV	0.39-0.51	% L/L
	RBC	2.65-3.63	$x10^2$/L
	HB	128-163	g/L
	MCV	123-145	*fl*
	MCH	38-47.7	pg
	MCHC	312-350	% g/l
	WBC	5-9	$x10^9$/l

Serum Chemistry		Mean	Units
	TP	*	g/L
	Gluc	*	mmol/L
	Urea	*	mmol/L
	Uric Acid	*	*u*mol/L
	Cholesterol	*	mmol/L
	Bili Acids	*	mg/100ml
	Creat	*	*u*mol/L
	LDH	*	IU/L
	ALP	*	*u/L*
	Na	*	mmol/L
	K	*	mmol/L
	Cl	*	mmol/L
	Ca	*	mmol/L
	P	*	mmol/L
	Mg	*	mmol/L

References:

Manual of Reptiles, Pigeons, & Waterfowl. Peter H. Benyon. British Small Animal Vet Association Limited. Gloucestershire. 1996.

Notes:

n=13

[a] Standard Deviation

* Data Not Available

If you have comments or suggestions, please send us email.

Wildlife Rehabilitation Database	Home	Avian Index

Species	Lanner Falcon	Scientific Name	*Falco Biarmicus*
Respiration Rate	*	Heart Rate	*
Body Temperature	*	Weight	*

CBC		Mean	Units
	PCV	0.37-0.53	% L/L
	RBC	2.63-3.98	$x10^2$/L
	HB	122-171	g/L
	MCV	127-150	fl
	MCH	42.3-48.8	pg
	MCHC	317-353	g/l
	WBC	3.5-11	$x10^9$/l

Serum Chemistry		Mean	Units
	TP	33-42	g/L
	Gluc	11-15	mmol/L
	Urea	1.3-2.7	mmol/L
	Uric Acid	318-709	umol/100ml
	Cholesterol	3-8.8	mmol/L
	Bile Acids	*	umol/L
	Creat	37-75	umol/L
	LDH	434-897	IU/L
	ALP	180-510	u/L
	Na	152-164	mmol/L
	K	1-2.1	mmol/L
	Cl	*	mmol/L
	Ca	2.07-2.45	mmol/L
	P	0.68-2.0	mmol/L
	Mg	*	mg/100ml

References:

Manual of Reptiles, Pigeons, & Waterfowl. Peter H. Benyon. British Small Animal Vet Association Limited. Gloucestershire. 1996.

Notes:

n=42 for CBC and 26 for Serum

[a] Standard Deviation

* Data Not Available

If you have comments or suggestions, please send us email.

Wildlife Rehabilitation Database	Home	Avian Index

Species	Marbled Murrelet	Scientific Name	*Brachramphus marmoratus*
Respiration Rate	*	Heart Rate	*
Body Temperature	*	Weight	*

CBC	Mean	Units
PCV	41	%
RBC	*	$x10^6/mm^3$
HB	*	g/100ml
MCV	*	u^3
MCH	*	uug
MCHC	*	%
WBC	5682	$x10^3/mm^3$

Serum Chemistry	Mean	Units
TP	4.9	g/100ml
Gluc	228	mg/100ml
BUN	*	mg/100ml
Uric Acid	30	mg/100ml
Cholesterol	246	mg/100ml
Tot Bili	1.2	mg/100ml
Creat	*	mg/100ml
LDH	1342	IU/L
Alk	129	IU/L
Na	*	g/L
K	*	mg/100ml
Cl	*	mg/100ml
Ca	10.1	mg/100ml
P	*	mg/100ml
Mg	*	mg/100ml

References:

"Hematology and Plasma Biochemical Reference Ranges of Alaskan Seabirds: Thier Ecological Significance and Clinical Importance." S.H. Newman, J.F. Piatt, and J. White. **Seabird Blood Parameters. Colonial Waterbirds**. 20(3): 492-504. 1997.

Notes:

n=11

[a] Standard Deviation

* Data Not Available

If you have comments or suggestions, please send us email.

Wildlife Rehabilitation Database	Home	Avian Index

Species	Merlin	Scientific Name	*Falco columbaris*
Respiration Rate	*	Heart Rate	*
Body Temperature	*	Weight	*

CBC		Mean	Units
	PCV	0.39-0.51	% L/L
	RBC	2.85-4.1	$x10^2$/L
	HB	132-179	g/L
	MCV	105-130	*f*l
	MCH	36-45.9	pg
	MCHC	340-360	g/l
	WBC	4-9.5	$x10^9$/l

Serum Chemistry		Mean	Units
	TP	27.5-39	g/L
	Gluc	9-12	mmol/L
	BUN	*	mmol/L
	Uric Acid	174-800	*u*mol/100ml
	Cholesterol	3-7.8	mmol/L
	Bile Acids	*	*u*mol/L
	Creat	16-50	*u*mol/L
	LDH	320-630	IU/L
	ALP	54-310	IU/L
	Na	155-170	mmol/L
	K	1-1.8	mmol/L
	Cl	*	mmol/L
	Ca	2-2.45	mmol/L
	P	0.95-1.79	mmol/L
	Mg	*	mg/100ml

References:

Manual of Reptiles, Pigeons, & Waterfowl. Peter H. Benyon. British Small Animal Vet Association Limited. Gloucestershire. 1996.

Notes:

n=33 for CBC and 39 for Serum

[a] Standard Deviation

* Data Not Available

If you have comments or suggestions, please send us email.

Wildlife Rehabilitation Database	Home	Avian Index

Species	Northern Eagle Owl	Scientific Name	*Glaucidium gnoma*
Respiration Rate	*	Heart Rate	*
Body Temperature	*	Weight	*

CBC		Mean	Units
	PCV	0.36-0.52	%
	RBC	1.65-2.35	$x10^6/mm^3$
	HB	107-180	g/100ml
	MCV	189-204	um^3
	MCH	64.6-76	pg
	MCHC	325-376	g/dl
	WBC	3.5-13.1	$x10^3/mm^3$

Serum Chemistry		Mean	Units
	TP	30.1-34.5	g/100mL
	Gluc	13.5-21.7	mg/100ml
	Urea	0.9-2.9	mg/100ml
	Uric Acid	475-832	mg/100ml
	Cholesterol	3.9-7.1	mg/100ml
	Tot Bili	*	mg/100ml
	Creat	31-49	mg/100ml
	LDH	*	IU/L
	ALP	*	IU/L
	Na	*	meq/L
	K	*	meq/L
	Cl	*	meq/L
	Ca	2.16-2.61	mg/100ml
	P	1.15-1.94	mg/100ml
	Mg	*	mg/100ml

References:

Manual of Reptiles, Pigeons, & Waterfowl. Peter H. Benyon. British Small Animal Vet Association Limited. Gloucestershire. 1996.

Notes:

-Pygmy
n=20
[a] Standard Deviation
* Data Not Available

Wildlife Rehabilitation Database	Home	Avian Index

Species	Northern Goshawk	Scientific Name	*Accipiter gentilis*
Respiration Rate	*	Heart Rate	*
Body Temperature	*	Weight	*

CBC		Mean	Units
	PCV	0.43-0.53	% L/L
	RBC	2.6-3.48	$x10^2$/L
	HB	121-177	g/L
	MCV	141-156	fl
	MCH	44.5-51.6	pg
	MCHC	305-343	g/L
	WBC	4-11	$x10^9$/L

Serum Chemistry		Mean	Units
	TP	26.3-42	g/L
	Gluc	11.5-15.9	mmol/L
	Urea	*	mmol/L
	Uric Acid	511-854	umol/L
	Cholesterol	4-11.5	mmol/L
	Bile Acids	*	umol/L
	Creat	41-94	umol/L
	LDH	120-906	IU/L
	ALP	15.6-87.5	IU/L
	Na	*	mmol/L
	K	*	mmol/L
	Cl	*	mmol/L
	Ca	2.15-2.69	mmol/L
	P	0.8-1.97	mmol/L
	Mg	*	mmol/L

References:

Manual of Reptiles, Pigeons, & Waterfowl. Peter H. Benyon. British Small Animal Vet Association Limited. Gloucestershire. 1996.

Notes:

n=43 for CBC and 24 for Serum

[a] Standard Deviation

* Data Not Available

If you have comments or suggestions, please send us email.

Wildlife Rehabilitation Database	Home	Avian Index

Species	Parakeet Auklet	Scientific Name	*Cyclorrhynchus psitracula*
Respiration Rate	*	Heart Rate	*
Body Temperature	*	Weight	*

CBC		Mean	Units
	PCV	42	%
	RBC	*	$x10^6/mm^3$
	HB	*	g/100ml
	MCV	*	u^3
	MCH	*	uug
	MCHC	*	%
	WBC	4988	$x10^3/mm^3$

Serum Chemistry		Mean	Units
	TP	4.2	g/100ml
	Gluc	298	mg/100ml
	BUN	*	mg/100ml
	Uric Acid	14	mg/100ml
	Cholesterol	206	mg/100ml
	Tot Bili	1.1	mg/100ml
	Creat	*	mg/100ml
	LDH	1100	IU/L
	Alk	128	IU/L
	Na	*	g/L
	K	*	mg/100ml
	Cl	*	mg/100ml
	Ca	9.7	mg/100ml
	P	*	mg/100ml
	Mg	*	mg/100ml

References:

"Hematology and Plasma Biochemical Reference Ranges of Alaskan Seabirds: Thier Ecological Significance and Clinical Importance." S.H. Newman, J.F. Piatt, and J. White. **Seabird Blood Parameters. Colonial Waterbirds**. 20(3): 492-504. 1997.

Notes:

n=26

[a] Standard Deviation

* Data Not Available

Wildlife Rehabilitation Database		Home	Avian Index
Species	Pigeon Guillemot	Scientific Name	*Cepphus columba*
Respiration Rate	*	Heart Rate	*
Body Temperature	*	Weight	*

CBC		Mean	Units
	PCV	47	%
	RBC	*	$x10^6/mm^3$
	HB	*	g/100ml
	MCV	*	u^3
	MCH	*	uug
	MCHC	*	%
	WBC	4039	$x10^3/mm^3$

Serum Chemistry		Mean	Units
	TP	4.0	g/100ml
	Gluc	323	mg/100ml
	BUN	*	mg/100ml
	Uric Acid	24	mg/100ml
	Cholesterol	293	mg/100ml
	Tot Bili	2.4	mg/100ml
	Creat	*	mg/100ml
	LDH	1062	IU/L
	Alk	150	IU/L
	Na	*	g/L
	K	*	mg/100ml
	Cl	*	mg/100ml
	Ca	12.2	mg/100ml
	P	*	mg/100ml
	Mg	*	mg/100ml

References:

"Hematology and Plasma Biochemical Reference Ranges of Alaskan Seabirds: Thier Ecological Significance and Clinical Importance." S.H. Newman, J.F. Piatt, and J. White. **Seabird Blood Parameters. Colonial Waterbirds**. 20(3): 492-504. 1997.

Notes:

n=7

[a] Standard Deviation

* Data Not Available

If you have comments or suggestions, please send us email.

Wildlife Rehabilitation Database	Home	Avian Index

Species	Saker Falcon	Scientific Name	*Falco Cherrug*
Respiration Rate	*	Heart Rate	*
Body Temperature	*	Weight	*

CBC		Mean	Units
	PCV	0.38-0.49	% L/L
	RBC	2.54-3.96	$x10^2$/L
	HB	115-165	g/L
	MCV	124-147	fl
	MCH	41.4-45.4	pg
	MCHC	304-349	g/l
	WBC	3.8-11.5	$x10^9$/l

Serum Chemistry		Mean	Units
	TP	27-36	g/L
	Gluc	12-14	mmol/L
	Urea	0.5-2.6	mmol/L
	Uric Acid	320-785	umol/100ml
	Cholesterol	4.5-8.6	mmol/L
	Bile Acids	20-90	umol/L
	Creat	23-75	umol/L
	LDH	551-765	IU/L
	ALP	285-450	IU/L
	Na	154-161	mmol/L
	K	0.8-2.3	mmol/L
	Cl	114-125	mmol/L
	Ca	2.15-2.61	mmol/L
	P	0.72-2.16	mmol/L
	Mg	*	mg/100ml

References:

Manual of Reptiles, Pigeons, & Waterfowl. Peter H. Benyon. British Small Animal Vet Association Limited. Gloucestershire. 1996.

Notes:

n=50 for CBC and 38 for Serum

[a] Standard Deviation

* Data Not Available

If you have comments or suggestions, please send us email.

Wildlife Rehabilitation Database		Home	Avian Index
Species	Swan	Scientific Name	*Olor Buccinator*
Respiration Rate	*	Heart Rate	*
Body Temperature	*	Weight	*

CBC		Mean	Units
	PCV	0.32-0.5	%
	RBC	1.96-2.9	$x10^6/mm^3$
	HB	110-165	g/100mL
	MCV	164-200	um^3
	MCH	52.9-65.5	pg
	MCHC	290-365	%
	WBC	6.3-22	$x10^3/mm^3$

Serum Chemistry		Mean	Units
	TP	35.5-54.5	g/100mL
	Gluc	6.2-12.6	mg/100mL
	Urea	0.1-2.4	mg/100mL
	Uric Acid	126-700	mg/100mL
	Cholesterol	3-7.8	mg/100mL
	Bile Acids	*	mg/100mL
	Creat	18-89	mg/100mL
	LDH	165-724	IU/L
	ALP	*	IU/L
	Na	132-150	g/L
	K	3-5	mg/100mL
	Cl	*	mg/100mL
	Ca	2.19-2.89	mg/100mL
	P	0.7-2.36	mg/100mL
	Mg	*	mg/100mL

References:

Manual of Reptiles, Pigeons, & Waterfowl. Peter H. Benyon. British Small Animal Vet Association Limited. Gloucestershire. 1996.

Notes:

n=50

[a] Standard Deviation

* Data Not Available

If you have comments or suggestions, please send us email.

Wildlife Rehabilitation Database	Home	Avian Index

Species	Tawny Eagle	Scientific Name	*Aquila rapax*
Respiration Rate	*	Heart Rate	*
Body Temperature	*	Weight	*

CBC		Mean	Units
	PCV	0.37-0.47	%
	RBC	2.32-2.83	$x10^6/mm^3$
	HB	108-175	g/100ml
	MCV	163-188	um^3
	MCH	54-62	pg
	MCHC	3296-360	%
	WBC	5-9.5	$x10^3/mm^3$

Serum Chemistry		Mean	Units
	TP	29-41.4	g/L
	Gluc	13.5-21.7	mg/100ml
	Urea	0.9-2.9	mg/100ml
	Uric Acid	413-576	mg/100ml
	Cholesterol	3.9-7.1	mg/100ml
	Tot Bili	*	mg/100ml
	Creat	31-49	mg/100ml
	LDH	211-369	IU/L
	ALP	17.1-69.7	IU/L
	Na	153-157	g/L
	K	1.5-3.1	mg/100mL
	Cl	114-123	mg/100mL
	Ca	2.21-2.66	mg/100mL
	P	1.2-1.78	mg/100mL
	Mg	*	mg/100mL

References:

Manual of Reptiles, Pigeons, & Waterfowl. Peter H. Benyon. British Small Animal Vet Association Limited. Gloucestershire. 1996.

Notes:

n=29 for CBC and 13 for Serum

[a] Standard Deviation

* Data Not Available

If you have comments or suggestions, please send us email.

Wildlife Rehabilitation Database		Home	Avian Index
Species	Tufted Puffin	Scientific Name	*Lunda cirrhata*
Respiration Rate	*	Heart Rate	*
Body Temperature	*	Weight	*

CBC		Mean	Units
	PCV	41	%
	RBC	*	$x10^6/mm^3$
	HB	*	g/100ml
	MCV	*	u^3
	MCH	*	uug
	MCHC	*	%
	WBC	3978	$x10^3/mm^3$

Serum Chemistry		Mean	Units
	TP	4.7	g/100ml
	Gluc	279	mg/100ml
	BUN	*	mg/100ml
	Uric Acid	21	mg/100ml
	Cholesterol	347	mg/100ml
	Tot Bili	*	mg/100ml
	Creat	*	mg/100ml
	LDH	952	IU/L
	Alk	74	IU/L
	Na	*	g/L
	K	*	mg/100ml
	Cl	*	mg/100ml
	Ca	11.7	mg/100ml
	P	*	mg/100ml
	Mg	*	mg/100ml

References:

"Hematology and Plasma Biochemical Reference Ranges of Alaskan Seabirds: Thier Ecological Significance and Clinical Importance." S.H. Newman, J.F. Piatt, and J. White. **Seabird Blood Parameters. Colonial Waterbirds**. 20(3): 492-504. 1997.

Notes:

n=30

[a] Standard Deviation

* Data Not Available

If you have comments or suggestions, please send us email.

Wildlife Rehabilitation Database	Home	Avian Index

Species	Whitewinged Wood Duck	Scientific Name	*Aix sponsa*
Respiration Rate	*	Heart Rate	*
Body Temperature	*	Weight	*

CBC		Mean	Units
	PCV	0.46-0.57	%
	RBC	2.6-3.48	$x10^6/mm^3$
	HB	122-181	g/100mL
	MCV	163-177	ul
	MCH	46.6-51.9	pg
	MCHC	270-321	g/l
	WBC	4.7-9.4	$x10^3/mm^3$

Serum Chemistry		Mean	Units
	TP	34-54	g/100mL
	Gluc	8-13.4	mg/100mL
	Urea	0.76-1.05	mg/100mL
	Uric Acid	165-691	mg/100mL
	Cholesterol	*	mg/100mL
	Bile Acids	*	mg/100mL
	Creat	6-14	mg/100mL
	LDH	*	IU/L
	ALP	0-198	IU/L
	Na	*	g/L
	K	*	mg/100mL
	Cl	*	mg/100mL
	Ca	2.01-2.52	mg/100mL
	P	0.55-1.66	mg/100mL
	Mg	*	mg/100mL

References:

Manual of Reptiles, Pigeons, & Waterfowl. Peter H. Benyon. British Small Animal Vet Association Limited. Gloucestershire. 1996.

Notes:

n=30 for CBC and 18 for Serum

[a] Standard Deviation

* Data Not Available

If you have comments or suggestions, please send us email.

Appendix A7: Amphibian Index and Pages

Wildlife Rehabilitation Database Amphibian Index	Home	Avian Index Mammalian Index Amphibian Index Reptilian Index

Common Names	Scientific Names
American Bullfrog	*Rana catesbeina*

How Do You Like The Changes?

If you have comments or suggestions, please send us email.

Wildlife Rehabilitation Database	Home	Amphibian Index

Species	American Bullfrogs	Scientific Name	*Rana catesbeina*
Respiration Rate	*	Heart Rate	*
Body Temperature	*	Weight	289-468 g

CBC	Mean	SD[a]	Units
PCV	22	5	%
RBC	*	*	$x10^{-6}/L$
HB	4.7	0.9	g/100ml
MCV	*	*	um^3
MCH	*	*	pg
MCHC	*	*	%
WBC	5.2	2.9	$x10^3/mm^3$

Serum Chemistry	Mean	SD[a]	Units
TP	*	*	g/100ml
Gluc	*	*	mg/100ml
BUN	3	1	mg/100ml
Uric Acid	0.06	0.05	mg/100ml
Cholesterol	*	*	mg/100ml
Tot Bili	*	*	mg/100ml
Creat	0.99	0.20	mg/100ml
LDH	33	20	mu/10ml
Alk	*	*	mu/10ml
Na	108	5	g/L
K	2.7	0.4	mg/100ml
Cl	77	6	mg/100ml
Ca	8.05	0.88	mg/100ml
P	3.3	0.7	mg/100ml
Mg	2.05	0.35	mg/100ml

References:

-"Serum Chemistry and Hematology for Anesthetized American Bullfrogs." Tama Cathers, M.A., D.V.M. et al. Journal of Zoo & Wildlife Medicine. 28(2): 171-174. 1997.

Notes:

These animals were commercially obtained & under lab conditions.

n=11

[a] Standard Deviation

* Data Not Available

If you have comments or suggestions, please send us email.

Appendix A8: Reptilian Index and Pages

Wildlife Rehabilitation Database Reptilian Index	Home	Avian Index Mammalian Index Amphibian Index Reptilian Index

Common Names	Scientific Names
Green Sea Turtles	*Chelonia mydas*
Kemp's Ridley	*Lepidochelys kempii*
Radiated Tortoise	*Testudo radiata*

If you have comments or suggestions, please send us email.

Wildlife Rehabilitation Database		Home	Reptilian Index
Species	Green Sea Turtles	Scientific Name	*Chelonia mydas*
Respiration Rate	*	Heart Rate	*
Body Temperature	*	Weight	*

CBC	Mean	SD[a]	Units
PCV	34.5	1.25	%
RBC	0.40	0.095	$x10^{12}/mm^3$
HB	9.4	0.3	g/100ml
MCV	894.9	43.8	μm^3
MCH	242.2	10.1	pg
MCHC	27.4	0.7	%
WBC	1.88	0.2	$x10^3/mm^3$

Serum Chemistry	Mean	SD[a]	Units
TP	5.73	0.55	g/100ml
Gluc	*	*	mg/100ml
BUN	12.28	9.53	mg/100ml
Uric Acid	*	*	mg/100ml
Cholesterol	226.08	123.06	mg/100ml
Tot Bili	*	*	mg/100ml
Creat	0.43	0.11	mg/100ml
LDH	211.66	139.39	IU/L
Alk	27.21	9.65	IU/L
Na	146	5.4	g/L
K	6.61	2.22	mg/100ml
Cl	93.78	10.46	mg/100ml
Ca	6.86	3.0	mg/100ml
P	8.06	1.96	mg/100ml
Mg	7.6	0.24	mg/100ml

References:

-Normal Blood Chemistry of Free Living Gree Sea Turtles, Chelonia mydas, from the United Arab Emirates. CR Hasbun et al. Comp Hematology International. 8:174-177. 1998.

-Normal Hematological Values (adult females, minor statistical differences). VH Samour et al. 8:102-107. 1998

Notes:

from large female data in paper (difference not statistically significant)

[a] Standard Deviation

* Data Not Available

If you have comments or suggestions, please send us email.

Wildlife Rehabilitation Database		Home	Reptilian Index
Species	Kemp's Ridley Turtle	Scientific Name	*Lepidochelys kempii*
Respiration Rate	*	Heart Rate	*
Body Temperature	*	Weight	15-20 g

CBC		Mean	Units
	PCV	*	%
	RBC	*	$x10^6/mm^3$
	HB	*	g/100ml
	MCV	*	u^3
	MCH	*	uug
	MCHC	*	%
	WBC	*	$x10^3/mm^3$

Serum Chemistry		Mean	Units
	TP	3.2	g/dl
	Gluc	118-7	mg/100ml
	BUN	*	mg/100ml
	Uric Acid	*	mg/100ml
	Cholesterol	*	mg/100ml
	Tot Bili	*	mg/100ml
	Creat	2832	IU/L
	LDH	6297-7	IU/L
	Alk	465.3	IU/L
	Na	150	meq/L
	K	4.1	meq/L
	Cl	115.5	meq/L
	Ca	6.3	mg/dl
	P	9.0	mg/dl
	Mg	*	mg/100ml

References:

"Med. Mgt. of Sea Turtles in Aquaria." Brent R. Whitaker Howard Krum. . p.217-231. Fowler. 1999.

Notes:

NE Aquarium

Healthy Post-Rehab Pre-release

n=15

[a] Standard Deviation

* Data Not Available

If you have comments or suggestions, please send us email.

Wildlife Rehabilitation Database	Home	Reptile Index

Species	Radiated Tortoise	Scientific Name	Testudo Radiata
Respiration Rate	*	Heart Rate	*
Body Temperature	*	Weight	*

CBC	Mean	SD[a]	Units
PCV	*	*	%
RBC	0.51	0.115	$x10^6/mm^3$
HB	6.7	1.51	g/100ml
MCV	*	*	um^3
MCH	*	*	pg
MCHC	*	*	%
WBC	*	*	$x10^3/mm^3$

Serum Chemistry	Mean	SD[a]	Units
TP	3.97	0.452	g/100ml
Gluc	59.8	12.72	mg/100ml
BUN	*	*	mg/100ml
Uric Acid	0.28	0.194	mg/100ml
Cholesterol	105.2	25.96	mg/100ml
Tot Bili	*	*	mg/100ml
Creat	*	*	mg/100ml
LDH	401.8	121.12	IU/L
Alk	92.7	14.37	IU/L
Na	126.8	3.34	g/L
K	5.5	0.24	mg/100ml
Cl	96.5	2.69	mg/100ml
Ca	12.2	0.91	mg/100ml
P	3.19	0.455	mg/100ml
Mg	*	*	mg/100ml

References:

-Hematological and Serum Chemistry of the Radiated Tortoise (Testudo radiata). Steven Marks DMV & Scott Citino DMV. Journal of Zoo and Wildlife Medicine. 21(3)342-344.

Notes:

[a] Standard Deviation
* Data Not Available

If you have comments or suggestions, please send us email.

Appendix B1: Surveys from Database Site

Form reply from mailto

i...name.f: Fábio

i...name.l: Costa

i..email: cviana@gold.com.br

i.involvement: Other

i.involvement.text: Student - interest

i.facility.animals:

i.facility.employees:

p.Management: Yes

p.Parasites: Yes

p.Diseases: Yes

p.Zoonoses: Yes

p.other.text:

p.Comments: More cervids and edentata species

p.contribute.data?:

w.frame: no

w.Comments:

Remote host: cache-1.horizontes.com.br

Form reply from mailto

i...name.f: Katherine

i...name.l: Dolan

i..email: dolankm@musc.edu

i.involvement: Other

i.involvement.text: volunteer at a rehab center

i.member.nwra: Yes

i.facility.animals: 250

i.facility.employees: 3

p.Management: Yes

p.Parasites: Yes

p.Diseases: Yes

p.Zoonoses: Yes

p.other: Yes

p.other.text: any microbiological information on raptors esp dealing with normal flora of healthy raptors.

p.Comments:

p.contribute.data?: unfortunately, no

w.Comments: very interesting and useful site.

Remote host: 128.23.110.140

Form reply from mailto

i...name.f: Max

i...name.l: Farrugia

i..email: iarm093@waldonet.net.mt

i.involvement: Rehabilitator

i.involvement.text:

i.facility.animals: 400

i.facility.employees: 3

p.Diseases: Yes

p.other.text:

p.Comments:

p.contribute.data?: Reports prepared by our hospital

w.frame: yes

w.Comments:

Remote host: proxy.keyworld.net

Form reply from mailto

i...name.f: Robert

i...name.l: Gottschalk

i..email: Bfrises@aol.com

i.involvement: Other

i.involvement.text: Biologist and Rehabilitator

i.facility.animals: ~40

i.facility.employees: 1

p.Parasites: Yes

p.Diseases: Yes

p.Zoonoses: Yes

p.other: Yes

p.other.text: Diagnosis, Treatment, Etiology, Pathogenisis of Diseases.

p.Comments:

p.contribute.data?:

w.frame: yes

w.Comments: This site has an excellent beginning. It will be on my list of favorites.

Remote host: spider-pa033.proxy.aol.com

Form reply from mailto

i...name.f: Peggy

i...name.l: Hayes

i..email: peg55@hotmail.com

i.involvement.text: Animal Care Service

i.facility.animals: hundreds

i.facility.employees: 1

p.Parasites: Yes

p.other.text:

p.Comments: all of them, add them as you can

p.contribute.data?: records of hand-raising babies of many species
formulas, diarrhea, medicines given
ages when eyes open, etc

w.frame: no

w.Comments: For 20 years I have wished for exactly the information you are collecting! I think it is wonderful! I'll be back here often!!

Remote host: slip-32-101-127-157.il.us.ibm.net

Form reply from mailto

i...name.f: Robin

i...name.l: Hayes

i..email: jhh2@scss50.msu.edu

i.involvement: Other

i.involvement.text: Bat Conservation of Michigan

i.member.nwra: Yes

i.member.iwrc: Yes

i.facility.animals:

i.facility.employees: 2

p.Management: Yes

p.Parasites: Yes

p.Diseases: Yes

p.Zoonoses: Yes

p.other.text:

p.Comments: Bats- The United States has 40 species of bats. World wide the is about 900-1000 species (depending on what books you are referenceing.

p.contribute.data?: What kind of data sets are you looking for? I would be glad to help in this area.

w.frame: yes

w.Comments: Bat Conservation of Michigan is an educational and conservational organization. Our goal is to provide a balance between people and bats.

Robin L. Hayes
Bat Conservation of Michigan
4311 Old Castle Circle
Lansing, Michigan 48911
(517)393-2787
I am glad to have found this data base.

Remote host: pm387-36.dialip.mich.net

Form reply from mailto

i...name.f: Yvette

i...name.l: Hernandez

i..email:

i.involvement: Veterinary Technician

i.involvement.text:

i.member.nwra: Yes

i.facility.animals: 6000

i.facility.employees: 51

p.Parasites: Yes

p.Zoonoses: Yes

p.other.text:

p.Comments:

p.contribute.data?:

w.frame: yes

w.Comments:

Remote host: ca-public.value.net

Form reply from mailto

i...name.f: Judy

i...name.l: Holzman

i..email: ibica@aol.com

i.involvement: Rehabilitator

i.involvement.text:

i.member.nwra: Yes

i.member.iwrc: Yes

i.facility.animals: ~300

i.facility.employees: -0-

p.Parasites: Yes

p.Diseases: Yes

p.other.text:

p.Comments:

p.contribute.data?:

w.Comments:

Remote host: spider-wg032.proxy.aol.com

Form reply from mailto

i...name.f: Rebecca

i...name.l: Lessard

i..email: beccabirds@aol.com

i.involvement: Rehabilitator

i.involvement.text:

i.member.nwra: Yes

i.member.iwrc: Yes

i.facility.animals: 30-45

i.facility.employees: 1

p.Parasites: Yes

p.other: Yes

p.other.text: homeopathy

p.Comments:

p.contribute.data?:

w.frame: no

w.Comments:

Remote host: spider-wn052.proxy.aol.com

Form reply from mailto

i...name.f: David

i...name.l: Meyers

i..email: otterind@aol.com

i.involvement: Other

i.involvement.text: PreFalconer

i.facility.animals: 120

i.facility.employees: none paid

p.Management: Yes

p.Parasites: Yes

p.Diseases: Yes

p.Zoonoses: Yes

p.other.text:

p.Comments: accipitors(Coppers,sharpshin)
Falcon (merlin,gyr)
Hawks(all not on list :)

p.contribute.data?:

w.frame: no

w.Comments:

Remote host: spider-tj032.proxy.aol.com

Form reply from mailto

i...name.f: John

i...name.l: Ludders

i..email: jwl1@cornell.edu

i.involvement: DVM/VMD

i.involvement.text:

i.facility.animals:

i.facility.employees: >800

p.other.text:

p.Comments:

p.contribute.data?:

w.Comments: Very nice data base and quite useful in its current format. Something I suggest you consider is to somehow document the conditions under which the "normal" values were obtained. Most of the values are obtained from anesthetized or heavily sedated animals and this can affect the variables that are presented as "normal". Also, it may be helpful to workers in field settings who have access to handheld biochemical analyzers if other variables are presented such as blood gas data.

Good job and i look forward to using your site in the future.

John Ludders
jwl1@cornell.edu

Remote host: 128.253.33.21

Form reply from mailto

i...name.f: Scott

i...name.l: Newman

i..email: sonewman@ucdavis.edu

i.involvement: DVM/VMD

i.involvement.text:

i.member.nwra: Yes

i.member.iwrc: Yes

i.facility.animals: hundreds/thousands

i.facility.employees: 3 full time vets/ hundreds of rehabilitators

p.other: Yes

p.other.text: On blood values, sample sizes used to establish these numbers are important to includeyes

p.Comments: a variety of marine bird species

p.contribute.data?: yesHi Mark,

w.frame: no

w.Comments:

Remote host: reqe-048.ucdavis.edu

Form reply from mailto

i...name.f: Cynthia

i...name.l: Stadler

i..email: cstadler@wildlife-museum.org

i.involvement: DVM/VMD

i.involvement.text:

i.member.nwra: Yes

i.member.iwrc: Yes

i.facility.animals: 6000

i.facility.employees: 50

p.Parasites: Yes

p.Diseases: Yes

p.Zoonoses: Yes

p.other.text:

p.Comments: red-shouldered hawk, merlin, cooper's hawk, sharp-shinned hawk, black-crowned night heron, burrowing owl, cottontail, muskrat, gray fox, black-tailed deer

p.contribute.data?: yes

w.frame: no

w.Comments: How can we fax some data that may be useful to the database?

Would it be possible to incorporate some ISIS values for captive mammals and birds?

Would it be possible to have a set of data that relate to young animals of each species?

Remote host: ca-public.value.net

Form reply from mailto

i...name.f: catherine

i...name.l: zamecnik

i..email: zamecnik@snet.net

i.involvement: Rehabilitator

i.involvement.text:

i.facility.animals: 200-300

i.facility.employees: 2

p.Management: Yes

p.Parasites: Yes

p.Diseases: Yes

p.Zoonoses: Yes

p.other.text:

Appendix B2: Survey Sent to Listservs

Survey/Evaluation of Wildlife Rehabilitation Database

Name:

E-mail address:

Associations/Universities affiliated with:

Are you a zoo veterinarian, wildlife veterinarian, or a wildlife rehabilitator?

Please rate the following qualities of the website:

	Not at all		Somewhat		Very much
Maneuverability	1	2	3	4	5
Clarity	1	2	3	4	5
"User friendliness"	1	2	3	4	5
Diversity of Species	1	2	3	4	5
Accuracy	1	2	3	4	5

Did the page have a sufficient number of different serum chemistry and CBC values?

Do the values seem accurate? If no, please explain which species and why.

Have you noticed discrepancies in the values between the sexes of some species that should be noted?

Should more exotic/foreign species be included?

What species in particular should be added?

Would any of the following areas be helpful to have included on the site: parasitology, toxicology, zoonoses, diseases, or genetic predispostitions?

Overall, do you find that this web site may be helpful to you?

What could be done to make it more helpful to you?

What could be done to make it more helpful to others in your field?

If you have any data sets of your own that we could possibly include on this page, please email Dr. Mark Pokras at markpokras.infonet.tufts.edu.

Appendix B3: Surveys Returned from Listservs

Name: Lisa Barlow
E-mail address: Buteosvr@aol.com
Associations/Universities affiliated with: Wildlife Response, Inc
What is your occupation? Veterinary Assistant

Please rate the following qualities of the website:

Did you find the site:	Not at all		Somewhat		Very much
to be manuverable?	1	2	3	4	5
to be clear?	1	2	3	4	5
to be "user friendly?"	1	2	3	4	5
to have a sufficient diversity of species?	1	2	3	4	5
to be accurate?	1	2	3	4	5

Did the page have a sufficient number of different serum chemistry and CBC values? Yes

Do the values seem accurate? If not, please explain which species and value, and why. Yes

In your practice or experience, have you noticed differences in the values between the sexes of some species that should be noted? Haven't had a chance to compare.....

Should the site be expanded to include more species from all over the world? Only if you think it's neccessary

What species in particular should be added? Pelagic bird species

Would any of the following areas be helpful to have included on the site?
Parasitology, toxicology, zoonoses, diseases, or genetic predispostions?

Are there any other areas you are interested in? Yes, all.

Would DNA information be appropriate?

Overall, do you find that this website may be helpful to you? Yes, it already had been useful to me. :)

What could be done to make it more helpful to you? Not sure.....

What could be done to make it more helpful to others in your field? Not sure

Have you visited the site before this visit? Yes

Will you visit it again? Yes

Name:Kaye Baxter, Sarvey Wildlife Care Center, Arlington, WA
E-mail address:hihanska@aol.com
Associations/Universities affiliated with:Sarvey Wildlife Care Center,IWRC, NWRA
What is your occupation?Director, SarveyWildlife Care Center 20 yrs

Please rate the following qualities of the website:
Did you find the site: Not at all Somewhat Very much

to be manuverable? 5 very much

to be clear? 5 very much

to be "user friendly?" 5 very much

to have a sufficient diversity
of species? 3 somewhat

to be accurate? 4

Did the page have a sufficient number of different serum chemistry and CBC values? All the serum chemisty and CBC are not included for all species

Do the values seem accurate? If not, please explain which species and
value, and why. The value seem to be accurate

In your practice or experience, have you noticed differences in the values
between the sexes of some species that should be noted? We have not noted any difference between the sexes of the species that we have tested

Should the site be expanded to include more species from all over the world?
As a rehabilitator I have do not get the exotics with the rare exception

What species in particular should be added? Marine mammals, black tail deer, different species of falcons and accipiters

Would any of the following areas be helpful to have included on the site?
Parasitology, toxicology, zoonoses, diseases, or genetic predispostions?

Are there any other areas you are interested in? Parasitology, toxicology and diseases would be excellent

Overall, do you find that this website may be helpful to you? I have found this website to be very useful. I have printed it out and have placed it in looseleaf binder that contains our blood norms. I have also recommended this site to other rehabilitators and those that were not on line I have copied the material and mailed it or faxed it to those who could use it. Great job. I am very impressed with your efforts. Keep it up!

What could be done to make it more helpful to you? More animals and more information, needless to say. This field is difficult to get medical values in. With our limited budgets it is very difficult to purchase all the veterinary books and periodicals. We purchase some but still feel the need for more informtion.

What could be done to make it more helpful to others in your field? See above.

Have you visited the site before this visit? I visited the site when it was first put on line and go back regularly to see if anything new has been added

Will you visit it again? Of course!!!!!

Name: Wendi Pencille
E-mail address: wldlfrus@buffnet.net
Associations/Universities affiliated with: graduated Cornell University 1985
What is your occupation? Environmental Microbiologist - Major Pharmaceutical Co.

Please rate the following qualities of the website:

Did you find the site:	Not at all	Somewhat	Very much
to be manuverable?			5X
to be clear?			5X
to be "user friendly?"			5X
to have a sufficient diversity of species?		3X but understandably it's early	
to be accurate?	??	of the ones I have values for you're right on the money, but I am only familiar with a few.	

Did the page have a sufficient number of different serum chemistry and CBC values? From recent personal experience - Taurine and L-carnitine would be useful in the cats and skunks because of links to DCM dilated cardiomyopathy

Do the values seem accurate? If not, please explain which species and value, and why. See note above

In your practice or experience, have you noticed differences in the values between the sexes of some species that should be noted? Not enough data collected to tell

Should the site be expanded to include more species from all over the world? Yes if it's going to be on the web. we've got list members from all over the world who could potentially benefit from this information

What species in particular should be added? I'd like to see differences in the different species of skunks

Would any of the following areas be helpful to have included on the site?
Parasitology, toxicology, zoonoses, diseases, or genetic predispostions?

Are there any other areas you are interested in? All

Overall, do you find that this website may be helpful to you? Extremely - I'll pass the site address on to our local rehab vets. They would be very interested

What could be done to make it more helpful to you? ??

What could be done to make it more helpful to others in your field? ??

Have you visited the site before this visit? no

Will you visit it again? yes - added it to my bookmarks already

Great site information!Wendi Pencille
Shelby, NY, Bless the Beasts Foundation Inc.
rehab 12 yrs. mainly raptors and waterfowl
wldlfrus@buffnet.net

Name:Freda Remmers
E-mail address:fremmers@blast.net
Associations/Universities affiliated with:co-director, Raritan River Wildlife Refuge
What is your occupation?college professor

Please rate the following qualities of the website:

Did you find the site:	Not at all		Somewhat		Very much
to be manuverable?	1	2	3	4	xx5
to be clear?	1	2	3	4	xx5
to be "user friendly?"	1	2	xx3	4	5
to have a sufficient diversity of species?	1	2	3	xx4	5
to be accurate?	1	2	3	4	5

Did the page have a sufficient number of different serum chemistry and CBC values? yes

Do the values seem accurate? If not, please explain which species and value, and why.

In your practice or experience, have you noticed differences in the values between the sexes of some species that should be noted?

Should the site be expanded to include more species from all over the world? at least from all over the U.S.

What species in particular should be added?

Would any of the following areas be helpful to have included on the site?
Parasitology, toxicology, zoonoses, diseases, or genetic predispostions?

Are there any other areas you are interested in? parasitology, diseases, genetic predispositions

Overall, do you find that this website may be helpful to you? It already has been; we've used it before to give info to vets.

What could be done to make it more helpful to you?

What could be done to make it more helpful to others in your field?

Have you visited the site before this visit? yes

Will you visit it again? yes

Name:Louise Sagaert
E-mail address:LSagaert@AOL.COM
Associations/Universities affiliated with:none
What is your occupation? Teacher/wildlife rehabilitator

Please rate the following qualities of the website:
Did you find the site: Not at all Somewhat Very much

to be manuverable? 5

to be clear? 5

to be "user friendly?" 5

to have a sufficient diversity
of species? 4

to be accurate? 5

Did the page have a sufficient number of different serum chemistry and CBC values? Yes, I would like to see more common mammal values available on the site also.

Do the values seem accurate? If not, please explain which species and value, and why. they appear to be

In your practice or experience, have you noticed differences in the values between the sexes of some species that should be noted? no

Should the site be expanded to include more species from all over the world? not sure

What species in particular should be added? more common N.A. mammal species-Fox and Red Squirrels, Woodchuck, Grey Fox, bat species

Would any of the following areas be helpful to have included on the site?
Parasitology, toxicology, zoonoses, diseases, or genetic predispostions?

Are there any other areas you are interested in? all of the above would be great!!!

Overall, do you find that this website may be helpful to you? absolutely!

What could be done to make it more helpful to you? see above

What could be done to make it more helpful to others in your field? not sure

Have you visited the site before this visit? yes

Will you visit it again? Yes

Name:
E-mail address:
Associations/Universities affiliated with:
What is your occupation? Police Academy instructor,/ home-based wildlife rehabilitator

Please rate the following qualities of the website:

Did you find the site:	Not at all		Somewhat		Very much
to be manuverable?	1	2	3	4	5
to be clear?	1	2	3	4	5
to be "user friendly?"	1	2	3	4	5
to have a sufficient diversity of species?	1	2	3	4	5
to be accurate? (unknown)	1	2	3	4	5

Did the page have a sufficient number of different serum chemistry and CBC values?

Do the values seem accurate? If not, please explain which species and value, and why.

In your practice or experience, have you noticed differences in the values between the sexes of some species that should be noted?

Should the site be expanded to include more species from all over the world?

What species in particular should be added?

Would any of the following areas be helpful to have included on the site?
Parasitology, toxicology, zoonoses, diseases, or genetic predispostions?

Are there any other areas you are interested in? Parasitology, zoonoses, diseases, genetic predispositions

Overall, do you find that this website may be helpful to you? Yes, especially when you are able to add some of the more commonly handled species

What could be done to make it more helpful to you? Add more of the commonly handled species

What could be done to make it more helpful to others in your field?

Have you visited the site before this visit? yes.....tried to visit it again a couple of days ago to look up = "normals" for Beaver, but that species was not yet listed on the site

Will you visit it again? yes