

ALBINISM IN WILD VERTEBRATES

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Hayley McCardle, B.S.

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ALBINISM IN WILD VERTEBRATES

Committee Members Approved:

John T. Baccus, Chair

Thomas R. Simpson

M. Clay Green

Approved

J. Michael Willoughby

Dean of the Graduate College

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ABSTRACT

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Texas State University-San Marcos

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SUPERVISING PROFESSOR: JOHN T. BACCUS

Although rare, albinism has been observed in almost every vertebrate species on earth and wild animals persist in nature even with this seemingly adverse condition. Albinistic animals have been recorded and studied since Carolus Linnaeus in the mid-1700s. A number of comprehensive lists of albino animals observed in the wild were published in the mid-1900s and numerous articles continue to be published today. Albinism can be displayed for a number of reasons aside from inheritance including genetic mutations, diet, living conditions, age, disease, or injury. Albinistic traits can vary and individuals are usually classified as true albino, partial albino, or leucistic. Albino animals demonstrate both positive and negative responses to their albinistic characteristics. I looked at albinism from the point of view of the predator and the prey. Some scientists and raptor rehabilitators tend to believe raptors do not usually respond to

albino prey when compared to pigmented prey. Other scientists believe raptors will attack odd-colored prey when given the opportunity. The goal of this study was to document and observe albinistic animals at wildlife rehabilitation centers. I ascertained the animals' conditions and kept track of each to determine their fate. I found 22 albinistic individuals, consisting of 6 albino, 7 partial albino, and 9 leucistic animals from 10 species. Partial albinos tended to thrive better and were released into the wild more often than true albino and leucistic animals. I also conducted a literature review of albinistic vertebrates reported in the wild. Results showed 572 species in 51 Orders. Of the 620 total animals documented, 358 were albino, 210 partial albino, and 48 leucistic.

CHAPTER I

INTRODUCTION

Albinism is primarily an integumentary coloration condition and epidermal-derived features in humans and animals due to a lack of melanin pigment. Albinism is best recognized by abnormal coloration of the skin, hair, feathers, scales, or eyes (Hiler 1983). Albinism can be defined in several different ways, but there are a few distinctive types of albinism depending on certain defining characteristics. True or complete albinism is the total absence of integumentary and retinal pigmentation (Sandoval-Castillo et al. 2006). Partial albinism occurs when pigment is reduced or absent from the skin, feathers, or eyes (Berdeen and Otis 2011). Partial albinism can be broken down further to levels of incomplete, imperfect, and partial albinism (Jehl 1985, Berdeen and Otis 2011). Leucism or leukism is a form of partial albinism characterized by retention of color in the eyes, bill, and legs but the skin or plumage contains no color pigment (Forrest and Naveen 2000). Xanthic animals only produce a yellow pigment (Hiler 1983) and are generally described as blonde. The pied or piebald condition results from an intermixture of a pattern of localized irregular patches with an absence of pigment in a normally pigmented individual (Acevedo et al. 2008). There are discrepancies in these definitions depending on the time of publication and the author. Some older articles have defined albino as an animal with

any lack of pigment on the body, while others use the term leucistic for what should, by these definitions, be termed partial (Jehl 1985, Owen and Shimmings 1992, Castillo-Geurrero et al. 2005). Xanthic is not commonly used and tends to be interchangeable with leucistic. Melanism is the opposite of albinism and is caused by excessive melanin pigment deposition. It is even more infrequent than albinism and results in individuals with a very dark appearance and a dark brown or black coat color (Sage 1963).

Albinism is caused by several different genes (Summers 2009), while leucism is controlled by a single recessive allele (Owen and Shimmings 1992). Albino animals are rare because the albino series of alleles are recessive. Multiple alleles control skin, hair and eye pigmentation and different alleles control the amount of pigmentation. Pheomelanin, which is responsible for red and yellow coloring, is first affected; then eumelanin, which is responsible for black and brown pigmentation, is reduced step by step (Searle 1968, Acevedo et al. 2008). Two animals with recessive albino alleles must breed and even then, the probability of albino offspring is still remote. Infrequently, passage of these genes continues from one generation to the next, and albinos, albeit rare, are still perpetuated in the wild.

Aside from hereditary influence, albinism has been attributed to many different factors. Sage (1962) showed albinism can also be due to diet, senility, shock, disease or injury; total or partial albinism can be present at birth, develop later in life, or diminish as an individual ages. Acevedo et al. (2009) suggested another reason for albinism was a genetic hereditary deficiency involving the metabolism during prenatal development or changes in melanocyte development altering the

spatial distribution or density of pigmentation across the body or along individual hairs.

Scientists attribute albinism to environmental factors such as low quality habitat and diet. Partial albinistic individuals are more frequently in small and isolated populations (Holyoak 1978, Bensch et al. 2000). This is expected since inbreeding is more likely to occur. Bensch et al. (2000) found a semi-isolated population of great reed warblers (*Acrocephalus arundinaceus*) in Sweden recovering from a genetic bottleneck where partial albinistic warblers occurred at a much higher frequency in the population and suggested monitoring partial albinism in large-scale geographic studies may help identify populations exposed to environmental stress or inbreeding.

Radioactive contamination in the Chernobyl region of Ukraine caused a significant increase in partial albinistic barn swallows (*Hirundo rustica*). Moller and Mousseau (2001) compared barn swallows from the contaminated area to those from a control area and found affected albino swallows had lower mean phenotypic values (beak length, beak width, tarsus, wing span, body mass, etc.) than barn swallows from the control area.

A hand-raised, albinistic, nestling Cape sparrow (*Passer melanurus*) demonstrated poor appetite, difficulty swallowing, and a large gas bubble in its crop (Du Toit 1969). With proper treatment it thrived but probably would not have survived in the wild; hence, it may have been purposefully pushed out of its nest. Du Toit (1969) suggested albinism in wild birds may be caused by deficiencies in diet

and questioned whether, in this case albinism could have been caused by the parent's diet or the young bird's poor digestion and absorption of food.

Slagsvold et al. (1987) suggested partial albinism may be related to feeding conditions during nestling development. Slagsvold et al. (1987) derived this hypothesis specifically from a large-scale study of hooded crows (*Corvus coronecornix*) where 5% of fledged young displayed partial albinism, but they could not determine whether the resulting albinism was due to the amount of food received, type of food, or possibly an unbalanced diet as a nestling; however, they concluded the condition resulted from the diet instead of genetic deficiencies. Leucism in seabirds has also been attributed to deficiencies in diet (Castillo-Guerrero et al. 2005). Clapp (1974) considered leucism to be related to inadequate diet in blackbirds (*Turdus merula*) and associated with white-wing bars in turkeys (*Meleagris gallopavo*). Clapp (1974) also studied leucism in a population of black noddies (*Anous minutus*) and attributed their condition to dietary deficiencies.

Ecologists consider albinism a major disadvantage to animals in the wild for a number of reasons, the most obvious being an animal's lack of crypsis with its surroundings (Uieda 2000, Sandoval-Castillo et al. 2006, Acevedo et al. 2009). It is easier for a predator to see a white animal compared to one that blends with its environment. Albino animals are also at a disadvantage because of poor eyesight. A lack of pigment in the eyes affects vision, making it harder for animals to find food or avoid danger (Miller 2005). Two visual abnormalities are usually associated with albinism, foveal hypoplasia and misrouted optic nerve fibers (Heiduschka and Schraermeyer 2007). Heiduschka and Schraermeyer (2007) used electroretinography

(ERG) to compare two closely related strains of rats differing only by one mutation in the tyrosinase gene, making one strain albino (Wistar) and the other pigmented (Long-Evans). They tested *a*-waves and *b*-waves, then compared *b*:*a* ratios and showed Wistar rats had much lower amplitudes originating from the activity of post-receptoral systems than Long-Evans rats. In albino animals the central retina is underdeveloped leading to a deficit in rods and the central ganglion cell density is 25% below normal. Since birds have a cone-dominated retina, they are not affected by this problem as often as mammals (Esteve and Jeffery 1998). Esteve and Jeffery (1998) found central cell densities < 5% lower in albino grey squirrels (*Sciurus carolinensis leucopis*) than pigmented squirrels. Since the species has a cone-rich retina, visual deficits are only minor. This could explain why grey squirrels are a slightly more common albinistic species and have established albinistic colonies in some areas (Guiles 1997). Guiles (1997) reported at least 20 established colonies of albino grey squirrels occur in the United States. There is also a well-established colony of leucistic eastern fox squirrels (*Sciurus niger*) (Weber and Weber 2012) in Austin, Texas.

Guillery et al. (1999) studied visual abnormalities in albino wallabies to determine whether marsupials suffered from the same vision conditions as albino eutherian mammals. He found the optic chiasm of marsupials was different from eutherian mammals, so they examined the optic chiasm and retina of albino and normally pigmented wallabies. Since the uncrossed pathway of the albino is smaller and cell density is reduced, Guillery et al. (1999) concluded the characteristic visual abnormalities of albino eutherians also exist in albino marsupials.

Since vision is a raptor's main sense for locating and catching prey, albinistic raptors would arguably have difficulty finding food if they suffered visual impairments. Adult albinistic raptors have been observed in the wild (Eakin 1994, Whitford 1994, Harmata and Montopoli 1998, Tinajero and Rodriguez-Estrella 2010), which leads one to conclude that birds, or possibly just raptors, must not suffer from the same visual disadvantages as other albino species.

Survival of albinistic individuals may be related to the quality of habitat (Reed 1991, Peles et al. 1995, Kehas et al. 2005). It is generally believed that conspicuously colored animals are selected against in natural populations by predation. Coat-color selection by predators may be minimized in high-quality habitats due to an excess of vegetative cover and a high-quality food source (Peles et al. 1995). Specifically, no significant difference in growth and structure of populations of albino meadow voles versus agouti meadow voles was found in nutritionally high-quality habitats and heavy vegetative cover (Peles et al. 1995). Reed (1991) found leucistic young zebra finches (*Taeniopygia guttata*) lacked pigmented gape markings, which may have affected their ability to attract as much attention during feeding. Their survival was largely dependent on environmental conditions; thus, when food was readily available and environmental conditions (social and territorial) were favorable, the young survived and when conditions were poor, the leucistic young were sacrificed for their normally pigmented siblings (Reed 1991). Uieda (2000) suggested sheltered roosts favor survival of albino bats by offering protection against sunlight, water loss, and visual hunting predators. Uieda (2000) showed 38 of 39 albino bats found in the wild were living in sheltered roosts. Additionally, two true albino Brazilian free-tailed

bats (*Taderida brasiliensis mexicana*) were found living in caves in Oklahoma (McCoy 1960).

Another potential problem for an albino individual is intraspecific interactions. Roberts (1978) observed both storm petrels (*Hydrobates pelagicus*) and oystercatchers (*Haematopus ostralegus*) chasing an albino from their groups. Alternatively, normal intraspecific behavior with albinistic individuals has been observed (Garner 1997, Forrest and Naveen 2000, Castillo-Guerrero et al. 2005, Acevedo et al. 2008). A recently fledged Carolina wren (*Thryothorus ludovicianus*) exhibiting extreme leucism was observed foraging in the understory in the company of other wrens, possibly a family group (Senaca 1985). Talerico et al. (2008) observed a leucistic little brown bat (*Myotis lucifugus*) behaved like other little brown bats captured in their study area.

Tracking aberrant animals is difficult, especially when seen only by chance. Four different healthy, leucistic Antarctic fur seals (*Arctocephalus gazelle*) were observed feeding with their mothers at Cape Shirreff in 1997-2000 (Acevedo and Aguayo 2008). Acevedo and Aguayo (2008) speculated their absence after 2000 was because these pups did not survive or immigrated to other locations. Braun and Boyd (1979) hypothesized that more albinistic mourning doves (*Zenaida macroura*) are produced each year than observed or reported, however, because of selection pressure, few survive long enough to be observed in the wild. This could be true for many other species as well. Slagsvold et al. (1988) noted albinistic, young hooded crows tended toward smaller size and the rate of mortality in juveniles must be high since the frequency of albinos in the population decreased rapidly at adulthood. Ring

and Smyth, Jr. (1990) also documented increased mortality rates associated with albinism in avian species and hypothesized an immunological component might be associated with the impaired ability of young to survive. By testing normally pigmented and completely albino chickens, they found impairment in albinistic chicks' ability to absorb maternal antibodies contributed to neonatal mortality and not an inability to produce an active immune response capacity. Conversely, albino individuals have been observed multiple times in the wild. In albino bats, one Indiana bat (*Myotis sodalis*) survived at least 7 years (Uieda 2000). Additionally, an 11-year-old albino elephant lived in a herd of normally pigmented elephants in Sri Lanka in 2004 (Holden 2004).

Once an albino has survived to adulthood, ultimately the next issue is whether it can reproduce. Clearly traits associated with albinism are inherited from one generation to the next, and although rare, several species exist in an albino phenotype. Sandoval-Castillo et al. (2006) speculated a lack of color might be disadvantageous in making organisms more noticeable to predators or possibly less attractive for reproduction. A pregnant albino tiger shark (*Galeocerdo cuvier*) proved albinism in elasmobranchs is not the determining factor in survival and reproductive capacity of these cartilaginous fish (Sandoval-Castillo et al. 2006). A leucistic little brown bat was pregnant (Talerico et al. 2008). A normally pigmented garter snake (*Thamnophis sirtalis*) collected in Ohio was gravid and produced a litter containing 7 albino offspring (Smith and Kyle 1992). Castillo-Guerrero et al. (2005) observed 5 (3 females and 2 males) leucistic brown boobies (*Sula leucogaster*) in the Gulf of California, Mexico from 2003-2004. Although 3 of these females were not observed

mating, both leucistic males mated with normal-pigmented females and produced normal-colored offspring for 2 consecutive years. Owen and Shimmings (1992) reported no difference in pairing or breeding performance between leucistic and pigmented barnacle geese (*Branta leucopsis*). Rogers et al. (1979) studied a nest of partial albino red-headed woodpeckers (*Melanerpes erythrocephalus*) in which the adult female was partially albino; some of her primaries were white and her head was a much lighter red than a normally pigmented individual of this species. She produced 3 young, all with normal pigmentation. Rogers et al. (1979) observed her attentiveness to her young was normal for the species. Bensch et al. (2000) reported albinistic great reed warblers experience similar lifetime reproductive success as normally pigmented birds. Owen and Shimmings (1992) studied a population of barnacle geese with a number of leucistic individuals and found the median lifespan of leucistic geese was only 2-3 years compared to 8-10 years for normally pigmented birds. Alternatively, they found one 18-year-old leucistic goose produced 13 young, both rare feats even in normally pigmented geese. Perhaps most well-known, Pale Male, a partial albino red-tailed hawk (*Buteo jamaicensis*) that lived on 5th Avenue in Central Park since the early 1990s. He has had at least four normally pigmented mates and raised numerous young (Barron 2011).

Some species now appear to be selecting for albinism. Mexican tetra, (*Astyanax mexicanus*) use albinism and the subsequent lack of eye pigmentation as an advantage in some cave populations (Roder and Linsenmair 1998, Gross et al. 2009). There is a possibility that albinism can be inherited more frequently than would be expected when advantageous. Albinism in cavefish is a monogenic trait caused by

loss-of-function (melanin content in melanophores reduced over time) recessive alleles independently mutating in multiple cave populations of Mexican tetras (Protas et al. 2006, Gross et al. 2009). Protas et al. (2006) determined albinism in two separate populations of Mexican tetra had a mutation at the same gene, and these cave populations live in relatively closed, nutrient-poor, dark environments. If albinism is linked to any of these conditions, as many researchers have predicted, then aside from pigment being unnecessary, their environment could be the overall cause of this mutation.

Gloyd's linked albinism has been observed in at least 5 specimens of the prairie rattlesnake (*Crotalus viridus*) (Chace and Smith 1968). These snakes had both albinistic characteristics and pattern deviation, which has not been reported in any other albinistic individuals of any species. Although there are no apparent advantages or disadvantages, it is clear the two traits are linked (Chace and Smith 1968).

My study will provide information about albino vertebrates and their ability to survive in the wild. Since there is very little information about albino vertebrates due to their rare occurrence, I had a small sample size because even large rehabilitation centers normally see less than 5 albinistic animals per year. There is also the possibility that albinistic vertebrates will not be seen again once released into the wild, which will lead to inconclusive evidence as to whether or not they survived in the wild. I hypothesize that albino individuals are able to survive in the wild although at a disadvantage in comparison to normal-pigmented individuals. Alternatively, their color may be advantageous and aid in their survival.

CHAPTER II

STUDY AREA

I studied the occurrence of albinism in central Texas. My study included wildlife rehabilitation centers and individual wildlife rehabilitators. The two main rehabilitation centers, Wildlife Rescue, Inc. in Austin, Texas and Wildlife Rescue & Rehabilitation, Inc. in Kendalia, Texas were my primary contacts from early 2010 to late 2011. They kept me informed about albino and albinistic animals that came under their care. When an individual came in, I visited the rehabilitator or center to get information about each animal and its condition.

CHAPTER III

METHODS

For each albinistic individual under the care of a rehabilitator or rehabilitation center, I photographed and tracked its progress. I documented each individual's initial condition and how they fared in captivity. If an animal survived to release, the rehabilitator informed me of the release site. Depending on circumstances, I either obtained permission from the landowner to have access to their land, or I resorted to citizen science in which the landowner agreed to keep watch and notify me if the animal was seen again. If I had access to the land, I tracked the animal's progress by setting up game cameras in the area of release. Since more albinistic individuals did not survive to release, I only set up cameras once. In this case, I worked with the landowner and set up a soft release site with a feeding station near cameras. This is a typical practice for releasing animals raised in captivity since an animal tends to stay near the release site, at least short-term. In theory, this meant I should have seen the albino animal come for food each night.

I talked to current wildlife rehabilitators about albinistic animals they had previously had in their care. I also used information from the time I worked at Wildlife Rescue, Inc. and compiled a list of albino species similar to the one kept during my research.

I talked to raptor rehabilitators in central Texas to get a better idea of hawk and owl behavior and response to different types of prey. As an animal care manager at Wildlife Rescue, Inc., I witnessed a behavior by raptors in that most raptors ignored albino rats and mice in favor of pigmented ones. This led me to hypothesize that albinistic individuals may not be recognized as prey because they are uncommon in nature. Furthermore, I conducted an in-depth literature review to summarize previous research on the effects of albinism on wildlife. I compiled a comprehensive list of albino and albinistic animals documented in the wild.

CHAPTER IV

RESULTS

From early 2010 to late 2011, I found 9 albinistic individuals (Table 1) including Virginia opossums (*Didelphis virginiana*) (Fig. 2), grey squirrels (*Sciurus carolinensis*), a common starling (*Sturnus vulgaris*) (Fig. 3) and a common grackle (*Quiscalus quiscula*). Three were true albino, 2 partial albinos, and 4 leucistic. Two healthy leucistic sibling grey squirrels were raised and released, although they were not observed again by the landowner. Another was released but never captured again on game cameras. A completely white opossum with pigmented eyes was raised from a young age and kept as a permanent resident at a nature center in Austin, Texas (Fig. 4). The common grackle (Fig. 5) was healthy upon arrival and survived at the rehabilitation center but once it moved outside to prepare for release, it died within 2 days. The other individuals were unhealthy from the time they came into a rehabilitator and did not survive.

I also compiled a list of 13 albinistic individuals that rehabilitators had documented previous to my research (Table 2). Although these animals were not tracked after release, 7 thrived and were released into the wild, 2 lived at rehabilitation centers, and one barred owl (*Strix varia*) lived 16 years in captivity (Fig. 6 and Fig. 7). Two sibling leucistic eastern fox squirrels (*Sciurus niger*) were

observed multiple times after their release in 2008 (Fig. 8). A red-tailed hawk (Fig. 9), a striped skunk (*Mephitis mephitis*), and a white-winged dove (*Zenaida asiatica*) were all blind and unable to feed, indicating the connection between albinism and visual abnormalities.

Of the 22 total individuals representing 10 species, 6 were albino, 7 partial albinos, and 9 leucistic. Partial albino animals tended to thrive better than true albino or leucistic individuals and accounted for most releases. In my study, all true albinos died before release except ones kept in captivity. Several partial albinos and a few leucistic animals were healthy enough for release.

Since albinistic animals are difficult to find, let alone track in the wild, I conducted a literature review to determine which species have been previously documented as albino, partial albino, or leucistic. Appendix I shows 572 species in 51 Orders have been documented as living and surviving in the wild. Of the 620 total animals, 358 were albino, 210 partial albinos, and 48 leucistic.

I interviewed raptor rehabilitators Sallie Delahoussaye and Preston Doughty at Wildlife Rescue, Inc. in Austin, Texas about their experiences with hawk and owl food preference. Delahoussaye stated, "In the wild a healthy raptor may prey upon albino or light colored prey if it is moving and the appropriate size. Likewise in the wild, an injured raptor will prey upon any animal recognized as catchable to avoid starvation. However, in a rehab situation, an injured wild raptor will not recognize white mice or rats as edible. If you present a raptor with a dark-colored mouse or rat (size dependent on raptor and its normal prey), it will recognize this as food and eat. This is why we often have to cut open a white prey item before the raptor realizes it is

food.” Doughty also agreed, “It has been my experience that most raptors do not easily recognize white rodents when they are first presented as food. The rodents will be ignored as a food source. As soon as a dark-colored rodent is presented, the raptor will immediately recognize it as food.” Doughty recalled a previous experience that led him to believe raptors tend to recognize pigmented prey as compared to their albino relatives. “As a college student, I worked in and around the barn areas at the university. The resident owls kept the rodent population low. A well-meaning student tried to save some of the white lab mice from another department from euthanasia [and] released them in the barn. I didn't realize until years later why these white mice seemed to survive when the wild mice were scarce. The pellets left by the owls rarely had white fur in them although the opportunity was there. The fact that light-colored and albino mammals survive to adulthood leads me to suspect that they are not as common a target for predators as one would think. White opossums, blond squirrels, and blond raccoons seem to have a good survival rate. One would think these abnormalities would make these animals a primary target, but they seem to survive in spite of their lack of normal coloration. Delahoussaye also explained why rehabilitated raptors are always raised on pigmented prey, “Otherwise they will be looking for white rodents once released. A few years ago there was a great horned owl preying on golf balls at a golf course in Georgia. After a couple of weeks of this behavior, the owl was trapped by rehabilitators. (The golfers weren't happy with an owl swooping down and capturing their golf balls.) The owl had been banded and when records were checked with the Bird Banding Lab, they found a rehabilitator had raised the owl and trained it prey on white mice. When trapped the owl was quite

thin. There was also a cache of white golf balls under the tree where the owl had been roosting. He had been going after what he thought was prey. The bird was re-trained on dark rodents and released again.” I remember similar experiences while working at Wildlife Rescue, Inc. If a new person started working and accidentally gave an adult raptor a white mouse or rat, it would still be sitting in the cage the next day. As soon as I switched it over to a pigmented rodent, the raptor jumped on it and started eating. This leads me to believe raptors select what they are used to eating. Their predator search image enables them to quickly recognize what is most common; hence, it makes sense for rehabilitators to raise young raptors on pigmented prey, so they can find food upon release.

Table 1. Records of albinism in central Texas vertebrates from 2010-2011 based on records from wildlife rehabilitators.

Species	Common Name	Type	Incoming Date	Condition	Intake Age	Outcome
<i>Didelphis virginiana</i>	Virginia opossum	Albino	23 April 2010	unhealthy	4 mon.	Blind, died after 1 wk.
<i>Sturnus vulgaris</i>	Common starling	Albino	6 May 2010	unhealthy	3 wks.	Died after 3 days
<i>Quiscalus quiscula</i>	Common grackle	Leucistic	20 June 2010	healthy	1 mon.	Died in outside cage before release
<i>Sciurus carolinensis</i>	Grey squirrel (2)	Leucistic	12 June 2010	healthy	3 wks.	Released, not seen again
<i>Sciurus carolinensis</i>	Grey squirrel	Leucistic	3 March 2010	unhealthy	1 wk.	Died after 4 wks.
<i>Sciurus carolinensis</i>	Grey squirrel	Partial	7 July 2010	unhealthy	1 mon.	Released, no capture on game camera
<i>Didelphis virginiana</i>	Virginia opossum	Partial/White	2 May 2011	healthy	2 mon.	Permanent resident at Nature Center
<i>Didelphis virginiana</i>	Virginia opossum	Albino	11 July 2011	unhealthy	2 mon.	Died after 2 days

Table 2. Previous records of albinism in vertebrates in central Texas obtained from wildlife rehabilitators.

Species	Common Name	Type	Incoming Date	Condition	Intake Age	Outcome
<i>Didelphis virginiana</i>	Virginia opossum	Partial/White	8 May 2009	healthy	1 mon.	Released
<i>Buteo jamaicensis</i>	Red-tailed hawk	Partial	2009	healthy	2 wks.	Blind, euthanized at 3 mon.
<i>Didelphis virginiana</i>	Virginia opossum	Partial/White	17 July 2008	healthy	6 wks.	Released
<i>Mephitis mephitis</i>	Striped skunk	Partial	15 June 2008	healthy	1 wk.	Blind, permanent resident at wildlife center
<i>Sciurus niger</i>	Fox squirrel (2)	Leucistic	3 Feb 2008	healthy	2 wks.	Released, observed in wild multiple times
<i>Zenaida asiatica</i>	White-winged dove	Albino	2008	unhealthy	2 wks.	Blind, euthanized at 3 mon.
<i>Sciurus carolinensis</i>	Grey squirrel	Leucistic	15 Sep 2007	healthy	2 wks.	Released
<i>Sciurus carolinensis</i>	Grey squirrel	Leucistic	5 Sep 2007	healthy	2 wks.	Released
<i>Turdus migratorius</i>	American robin	Albino	2007	healthy	1 mon.	Permanent resident, 3 yrs. at wildlife center
<i>Strix varia</i>	Barred Owl	Albino	1990s	healthy	2 wks,	Lived 16 yrs. in captivity
<i>Bubo virginianus</i>	Great horned owl	Leucistic	1990s	unhealthy	1 mon.	Died after 2 mon.
<i>Buteo jamaicensis</i>	Red-tailed hawk	Partial/White	1980s	unhealthy	adult	Lice infestation, re-released after molt

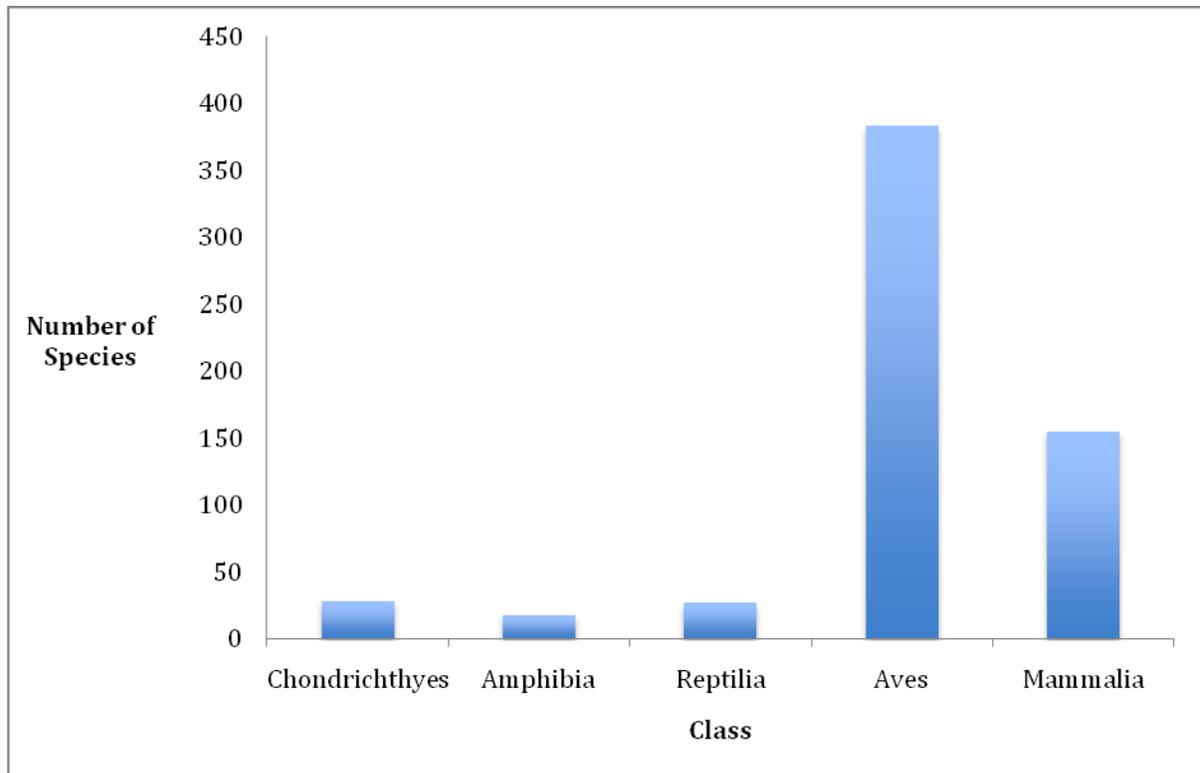


Figure 1. Number of albinistic vertebrate species listed by class from published literature (Appendix I).



Figure 2. True albino Virginia Opossum (*Didelphis virginiana*).



Figure 3. True albino Common Starling (*Sturnus vulgaris*).



Figure 4. White Virginia Opossum with pigmented eyes.



Figure 5. Leucistic Common Grackle (*Quiscalus quiscula*).



Figure 6. True albino Barred Owl (*Strix varia*) nestling with normally pigmented sibling.



Figure 7. Albino Barred Owl as an adult, lived 16 years in captivity.



Figure 8. Leucistic Fox Squirrel (*Sciurus niger*).



Figure 9. Leucistic Red-tailed Hawk (*Buteo jamaicensis*).

CHAPTER V

DISCUSSION

Many biologists studied albinism in wildlife in the early to mid-1900s. Sage (1962), Ross (1963), and Gross (1965) were some of the first to compile lists of albino animals recorded in the wild. Alfred O. Gross published a list of 54 families with a total of 1,297 records of albino North American birds (Appendix II) in 1965 (Gross 1965), and Bryan L. Sage compiled a list of 42 families with a total of 3,134 records of albinism in British birds (Appendix III) in 1962 (Sage 1962). It would seem based on the fewer reported records of albinistic animals in the recent literature that albinism is declining in wild animals compared to the numbers reported 50 years ago in the literature. There are several reasons for this. Most likely, albinistic animals are still being seen, but these records are not reported since a record already exists in the literature. Conversely, it is possible these animals experience physical afflictions that either cause greater depredation or mortality such that their numbers are slowly decreasing (Friederici 2000). Also, many of these animals were shot for museum collections in the early 1900s or killed by hunters due to their rarity, in turn decreasing their numbers. Another possibility is albino-inducing genes are becoming more diluted because albinos generally breed with pigmented individuals of their species (Rogers, Jr. et al. 1979, Sudbeck 1990, Castillo Guerrero et al. 2005). From the results of the literature review (Appendix I, Fig. 1), there

are very few albinistic records for Chondrichthyes, Amphibia, and Reptilia compared to Aves and Mammalia. There are more records of albinistic birds. Since Esteve and Jeffery (1998) showed birds are not affected by the same visual abnormalities as other species, this could account for more observations of albinistic birds and records in the literature.

As predicted, I had a small sample size since albinos are so rare in the wild. Of the 22 albinistic animals, 8 died, 4 were kept in captivity, and 10 were released. Since it is hard to determine whether animals released would have survived in the wild without the help of a rehabilitator, it is hard to analyze even these results. Only 8 of the 22 (36%) animals that came to a rehabilitator were healthy and subsequently released. Conversely, for such a small region of central Texas, 8 albinistic animals thriving and 22 records in 2 years, is substantial. Although these animals are difficult to study in the wild, many biologists continue to analyze the effects of albinism, whether it can be a predictor of population bottlenecks, and how predators react to different prey. Biologists continue to address the benefits of albinism in cave populations and survival in terms of being unrecognizable as prey.

There is considerable speculation as to whether albinistic animals are preyed on more or less frequently than normally pigmented animals. Unfortunately, most experiments to test this question have to be conducted on tame predators or those captured and then contained. There is no preference by predators for albino versus normal-pigmented prey according to Balgooyen (1971), Mueller (1975), Troncone and Silveira (2001). Smallwood (1987) studied American kestrel (*Falco sparverius*) behavior and habitat selection during winter in Florida. Bal-chatri traps were presented with either

a pigmented or albino mouse. Males were 91% more likely to attack an albino mouse than females (Smallwood 1987). He also found male territories were inferior in foraging quality to females, and therefore, predicted a predator inhabiting an area of lower quality would be less likely to reject prey even if it was unusual. Neophobia has been documented in several bird species such as kestrels, blue jays (*Cyanocitta cristata*), and chestnut-sided warblers (*Dendroica pensylvanica*) (Smallwood 1987), but with the option between starving and preying on an odd-colored animal, the odd-colored animal prey was eaten. Contrary to this belief, Mueller (1975, 1977) suggested hawks select odd prey instead of normal-colored prey. Mueller (1975) worked with tame American kestrels to disprove Tinbergen's idea of specific searching image (SSI) whereby predators have a tendency to select prey of the color in which they are habituated. Mueller (1975) presented grey and white mice as prey to kestrels. The kestrels chose the odd-color mouse more often than the white mice they had been offered the previous 10 days. Mueller (1977) tested with mice and chicks and found kestrels often chose whichever was different from food offered the previous 10 days. Another consideration is the type of predator species when trying to determine if there is preference for or against albino prey. It seems likely that a snake would have no preference (compared to a raptor), since they tend to rely on senses as well as vision to capture prey and can easily alternate between visual and infrared stimuli without loss of predatory performance (Kardong and Berkhoudt 1999). Zeeya (2006) found pit vipers and boid snakes hunt in complete darkness using infrared sensing organs. Concurrently, predatory behavior tested with Brazilian jararaca snakes (*Bothrops jararaca*) indicated color of the prey was not a relevant factor in prey selection (Troncone and Silveira 2001).

The idea of apostatic selection or frequency-dependent selection suggests if the relationship between prey type frequency and predation risk of the prey is positive, then the rare prey type is favored (Merilaita and Ruxton 2009). If this concept is applied to albinism, it means normal-pigment (or common) prey will be captured and albinistic prey overlooked. Since it is more difficult to search for two or more prey types, visual predators should tend to focus on the most abundant form and overlook others. Additionally, if a certain prey type is infrequently encountered, then a predator's searching image will focus on what they are used to seeing, leading to consumption of more abundant prey types in excess (Bond 2007). From this, it seems albino animals in the wild may have a harder time due to the physical effects of albinism and not their lack of crypsis.

I spoke with raptor rehabilitators Sallie Delahoussaye and Preston Doughty at Wildlife Rescue, Inc. in Austin, Texas about their experiences with hawk and owl food preference. Both Delahoussaye and Doughty agreed that in a rehabilitation situation, a wild adult raptor will not recognize a white rat or mouse as prey; they will only eat pigmented prey. This supports the concept that a predator's searching image allows them to focus only on what they are used to encountering (Bond 2007). Delahoussaye added that in certain situations a raptor in the wild may go after white prey if they are out of options. To avoid starvation, raptors suffering from an injury or if there is a lack of prey, may go after white prey as a last resort. Doughty reaffirmed, "The fact that light-colored and albino mammals survive to adulthood leads me to suspect that they are not as much of a target for predators. White opossums, blond squirrels, and blond raccoons seem to have a good survival rate. One would think these abnormalities would make these

animals a primary target, but they seem to do very well in spite of their lack of normal coloration.”

APPENDIX I

LIST BY ORDER OF ALBINISTIC, WILD VERTEBRATE SPECIES PREVIOUSLY RECORDED IN THE LITERATURE

Species	Common Name	Order	Type	Source
<i>Accipiter striatus</i>	Sharp-shinned hawk	Accipitriformes	Leucistic	Eakin 1994
<i>Haliaeetus leucocephalus</i>	Bald eagle	Accipitriformes	Partial	Harmata and Montopoli 1998
<i>Haliaeetus leucocephalus</i>	Bald eagle	Accipitriformes	Albino	Ross 1963
<i>Micronisus gabar</i>	Gabar goshawk	Accipitriformes	Albino	Mendelsohn 1998
<i>Torgos tracheliotos</i>	Lappet-faced vulture	Accipitriformes	Partial	Van Grouw 2011
<i>Coragyps atratus</i>	Black vulture	Accipitriformes	Albino	Ross 1963
<i>Aix sponsa</i>	Wood duck	Anseriformes	Partial	Ross 1963
<i>Anas acuta</i>	Pintail	Anseriformes	Partial	Ross 1963
<i>Anas carolinensis</i>	Green-winged teal	Anseriformes	Partial	Ross 1963
<i>Anas crecca</i>	Common teal	Anseriformes	Partial	Ross 1963
<i>Anas cyanoptera</i>	Cinnamon teal	Anseriformes	Partial	Ross 1963
<i>Anas discors</i>	Blue-winged teal	Anseriformes	Albino	Ross 1963
<i>Anas platyrhynchos</i>	Mallard	Anseriformes	Albino	Gross 1965
<i>Anas rubipes</i>	Black duck	Anseriformes	Albino	Ross 1963
<i>Anas strepera</i>	Gadwall	Anseriformes	Albino	Ross 1963
<i>Anser albifrons</i>	White-fronted goose	Anseriformes	Partial	Ross 1963
<i>Anser anser</i>	Greylag goose	Anseriformes	Partial	Guerra-Garcia et al. 1999
<i>Anser brachyrhynchus</i>	Pink-footed goose	Anseriformes	Albino	Sage 1963
<i>Anser fabalis</i>	Bean goose	Anseriformes	Albino	Sage 1963
<i>Anser fabalis</i>	Bean goose	Anseriformes	Partial	Ross 1963

<i>Anytha affinis</i>	Lesser scaup	Anseriformes	Partial	Ross 1963
<i>Aythya americana</i>	Redhead	Anseriformes	Partial	Ross 1963
<i>Aythya valisineria</i>	Canvasback	Anseriformes	Partial	Ross 1963
<i>Branta bernicla</i>	Brant goose	Anseriformes	Partial	Ross 1963
<i>Branta canadensis</i>	Giant Canada goose	Anseriformes	Albino	Wheeler 1996
<i>Branta canadensis</i>	White-cheeked goose	Anseriformes	Albino	Marquardt 1961
<i>Branta canadensis</i>	Canada goose	Anseriformes	Partial	Skinner 1963
<i>Branta leucopsis</i>	Barnacle goose	Anseriformes	Leucistic	Owen and Shimmings 1992
<i>Branta leucopsis</i>	Barnacle goose	Anseriformes	Partial	Ross 1963
<i>Bucephala albeola</i>	Bufflehead	Anseriformes	Albino	Ross 1963
<i>Bucephala clangula</i>	Common goldeneye	Anseriformes	Partial	Ross 1963
<i>Chen hyperborea</i>	Snow goose	Anseriformes	Albino	Ross 1963
<i>Clangula hyemalis</i>	Oldsquaw	Anseriformes	Partial	Ross 1963
<i>Dendrocygna bicolor</i>	Fulvous tree duck	Anseriformes	Partial	Ross 1963
<i>Mareca americana</i>	American widgeon	Anseriformes	Partial	Ross 1963
<i>Melanitta deglandi</i>	White winged scoter	Anseriformes	Partial	Ross 1963
<i>Melanitta fusca</i>	Velvet scoter	Anseriformes	Albino	Ross 1963
<i>Melanitta perspicillata</i>	Surf scoter	Anseriformes	Partial	Ross 1963
<i>Mergus merganser</i>	Common merganser	Anseriformes	Partial	Ross 1963
<i>Mergus serrator</i>	Red-breasted merganser	Anseriformes	Albino	Ross 1963
<i>Oidemia negra</i>	Common scoter	Anseriformes	Partial	Ross 1963
<i>Oxyura jamaicensis</i>	Ruddy duck	Anseriformes	Partial	Ross 1963
<i>Somateria mollossima</i>	Common eider	Anseriformes	Albino	Ross 1963
<i>Spatula clypeata</i>	Spoon-bill ducks	Anseriformes	Albino	Deane 1905
<i>Bufo bufo</i>	Common toad	Anura	Albino	Pash et al. 2007
<i>Xenopus laevis</i>	Clawed toad	Anura	Partial	Eagleson et al. 2010
<i>Rana curtipes</i>	Malabar frog	Anura	Partial	Desai and Pancharatna 2003
<i>Rana lessonae</i>	Pool frog	Anura	Albino	Kotlik et al. 1997

<i>Rana sylvatica</i>	Wood frog	Anura	Albino	Luce and Moriarty 1999
<i>Rana temporaria</i>	Common frog	Anura	Partial	Knight 1980
<i>Rhacophorus arboreus</i>	Tree frog	Anura	Albino	Okada and Okada 2008
<i>Apus apus</i>	Common swift	Apodiformes	Partial	Jacobs 1999
<i>Apus apus</i>	Swift	Apodiformes	Leucistic	Gory and Serge 1994
<i>Chaetura pelagica</i>	Chimney swift	Apodiformes	Albino	Ross 1963
<i>Archilochus alenandri</i>	Black-chinned hummer	Apodiformes	Albino	Ross 1963
<i>Archilochus colubris</i>	Ruby-throated hummer	Apodiformes	Partial	Ross 1963
<i>Calypte anna</i>	Anna's hummer	Apodiformes	Partial	Ross 1963
<i>Antelope cervicapra</i>	Blackbuck	Artiodactyla	Albino	Smielowski 1987
<i>Bison bison</i>	Buffalo	Artiodactyla	Leucistic	Ray 2011
<i>Boselaphus tragocamerlus</i>	Blue bull	Artiodactyla	Albino	Smielowski 1987
<i>Capra aegagrus hircus</i>	Billy goat	Artiodactyla	Albino	Weird Science 2008
<i>Gazella gazella bennetti</i>	Chinkara	Artiodactyla	Albino	Smielowski 1987
<i>Gazella subgutturosa</i>	Goitered gazelle	Artiodactyla	Albino	Tourenq et al. 2003
<i>Camelus bactrainus</i>	Bactrian camel	Artiodactyla	Albino	Weird Science 2008
<i>Lama glama</i>	Llama	Artiodactyla	Partial	Weird Science 2008
<i>Vicugna pacos</i>	Alpaca	Artiodactyla	Partial	Weird Science 2008
<i>Cervus axis</i>	Axis deer	Artiodactyla	Albino	Smielowski 1987
<i>Cervus canadensis</i>	Elk	Artiodactyla	Albino	Weird Science 2008
<i>Odocoileus virginianus</i>	White-tailed deer	Artiodactyla	Albino	Ryel 1963
<i>Odocoileus virginianus</i>	White-tailed deer	Artiodactyla	Partial	Ryel 1963
<i>Rangifer tarandus</i>	Caribou	Artiodactyla	Albino	Curatolo 1979
<i>Giraffa camelopardalis</i>	Giraffe	Artiodactyla	Partial	Weird Science 2008
<i>Caprimusgus vociferus</i>	Whip poor will	Caprimulgiformes	Leucistic	Ross 1963
<i>Carcharhinus ambionensis</i>	Shark	Carcharhiniformes	Albino	Sandoval-Castillo et al. 2006
<i>Galeocerdo cuvier</i>	Tiger shark	Carcharhiniformes	Albino	Sandoval-Castillo et al. 2006
<i>Sphyrna lewini</i>	Hammerhead	Carcharhiniformes	Albino	Sandoval-Castillo et al. 2006

<i>Hemitriakis japonica</i>	Topeshark	Carcharhiniiformes	Albino	Sandoval-Castillo et al. 2006
<i>Mustelus californicus</i>	Hound shark	Carcharhiniiformes	Albino	Sandoval-Castillo et al. 2006
<i>Mustelus schmitti</i>	Hound shark	Carcharhiniiformes	Albino	Sandoval-Castillo et al. 2006
<i>Triakis semifasciata</i>	Leopard shark	Carcharhiniiformes	Albino	Sandoval-Castillo et al. 2006
<i>Canis latrans</i>	Coyote	Carnivora	Albino	Ozoga 1966
<i>Canis latrans</i>	Coyote	Carnivora	Albino	Stroman 1925
<i>Canis lupus</i>	Dingo	Carnivora	Partial	Weird Science 2008
<i>Mephitis mephitis</i>	Striped Skunk	Carnivora	Albino	Hollister 1943
<i>Mustela erminea</i>	Stoat	Carnivora	Albino	Schamberger 1972
<i>Mustela putorius furo</i>	Ferret	Carnivora	Albino	Blaszczyk et al. 2007
<i>Taxidea taxus</i>	Badger	Carnivora	Partial	Roest 1961
<i>Arctocephalus gazella</i>	Antarctic fur seal	Carnivora	Partial	Acevedo et al. 2008
<i>Callorhinus ursinus</i>	Northern fur seal	Carnivora	Albino	Acevedo et al. 2009
<i>Eumetopias jubatus</i>	Steller's sea lion	Carnivora	Albino	Acevedo et al. 2009
<i>Otaria flavescens</i>	South American sea lion	Carnivora	Leucistic	Acevedo and Aguayo 2008
<i>Otaria flavescens</i>	Southern sea lion	Carnivora	Albino	Acevedo et al. 2009
<i>Zalophus californicus</i>	Californial sea lion	Carnivora	Albino	Acevedo et al. 2009
<i>Leptonychotes weddellii</i>	Weddell seal	Carnivora	Albino	Acevedo et al. 2009
<i>Mirounga leonina</i>	Southern elephant seal	Carnivora	Partial	Bried and Haubreux 2000
<i>Mirounga leonina</i>	Elephant seal	Carnivora	Leucistic	Reisinger et al. 2009
<i>Mirounga leonina</i>	Southern elephant seal	Carnivora	Albino	Acevedo et al. 2009
<i>Phoca vitulina</i>	Harbour seal	Carnivora	Albino	Acevedo et al. 2009
<i>Procyon lotor</i>	Raccoon	Carnivora	Albino	Allen and Neill 1956
<i>Ursus americanus</i>	Black bear	Carnivora	Albino	Standley 1921
<i>Ambystoma maculatum</i>	Yellow-spotted salamander	Caudata	Albino	Rye 1991
<i>Ambystoma mexicanum</i>	Axolotl	Caudata	Albino	Giardina et al. 1999
<i>Ambystoma texanum</i>	Smallmouth salamander	Caudata	Albino	Jones 1991
<i>Plethodon cinereus</i>	Red-backed salamander	Caudata	Leucistic	Mitchell and Mazur 1998

<i>Plethodon cinereus</i>	Eastern redback salamander	Caudata	Leucistic	Rye 1991
<i>Plethodon hubrichti</i>	Peaks of Otter salamander	Caudata	Albino	Hayslett et al. 1998
<i>Pseudontriton ruber ruber</i>	Northern red salamander	Caudata	Albino	Garriock 2000
<i>Taricha torosa</i>	California newt	Caudata	Albino	Wells 1964
<i>Notophthalmus perstriatus</i>	Striped newt	Caudata	Albino	Johnson and Franz 1999
<i>Balaena mysticetus</i>	Bowhead whale	Cetacea	Albino	Acevedo et al. 2009
<i>Eubalaena australis</i>	Southern right whale	Cetacea	Albino	Acevedo et al. 2009
<i>Balaenoptera borealis</i>	Sei whale	Cetacea	Albino	Acevedo et al. 2009
<i>Balaenoptera musculus</i>	Blue Whale	Cetacea	Albino	Acevedo et al. 2009
<i>Balaenoptera physalus</i>	Fin whale	Cetacea	Albino	Acevedo et al. 2009
<i>Megaptera novaeangliae</i>	Humpback whale	Cetacea	Albino	Acevedo et al. 2009
<i>Cephalorhynchus heavisidii</i>	Heaviside's dolphin	Cetacea	Albino	Acevedo et al. 2009
<i>Delphinus delphis</i>	Saddleback dolphin	Cetacea	Albino	Hain and Leatherwood 1982
<i>Globicephala melaena</i>	Atlantic pilot whale	Cetacea	Albino	Hain and Leatherwood 1982
<i>Globicephala melas</i>	Long-finned pilot whale	Cetacea	Albino	Acevedo et al. 2009
<i>Grampus griseus</i>	Risso's porpoise	Cetacea	Albino	Acevedo et al. 2009
<i>Lagenorhynchus obliquidens</i>	Pacific white-sided dolphin	Cetacea	Partial	Tsutsui et al. 2001
<i>Lagenorhynchus acutus</i>	Atlantic white-sided dolphin	Cetacea	Albino	Acevedo et al. 2009
<i>Lagenorhynchus obliquidens</i>	Pacific white-sided dolphin	Cetacea	Albino	Acevedo et al. 2009
<i>Lagenorhynchus obscurus</i>	Dusky dolphin	Cetacea	Albino	Acevedo et al. 2009
<i>Lissodelphis peronii</i>	Southern right whale dolphin	Cetacea	Albino	Acevedo et al. 2009
<i>Orcinus orca</i>	Killer whale	Cetacea	Albino	Speckman and Sheffield 2001
<i>Orcinus orca</i>	Killer whale	Cetacea	Albino	Acevedo et al. 2009
<i>Stenella attenuata</i>	Pantropical spotted dolphin	Cetacea	Albino	Acevedo et al. 2009

<i>Stenella frontalis</i>	Atlantic spotted dolphin	Cetacea	Albino	Acevedo et al. 2009
<i>Stenella longirostris</i>	Spinner dolphin	Cetacea	Albino	Acevedo et al. 2009
<i>Steno bredanensis</i>	Rough-toothed dolphin	Cetacea	Albino	Acevedo et al. 2009
<i>Tursiops truncatus</i>	Bottlenose dolphin	Cetacea	Albino	Fertl et al. 1999
<i>Eschrichtius robustus</i>	Grey whale	Cetacea	Albino	Acevedo et al. 2009
<i>Caperea marginata</i>	Pigmy right whale	Cetacea	Albino	Acevedo et al. 2009
<i>Phocoena phocoena</i>	Harbor porpoise	Cetacea	Albino	Acevedo et al. 2009
<i>Phocoenoides dalli</i>	Dall's porpoise	Cetacea	Albino	Acevedo et al. 2009
<i>Physeter catodon</i>	Sperm whale	Cetacea	Albino	Hain and Leatherwood 1982
<i>Physeter macrocephalus</i>	Sperm whale	Cetacea	Albino	Acevedo et al. 2009
<i>Astyanax mexicanus</i>	Blind cavefish	Characiformes	Albino	Gross et al. 2009
<i>Astyanax sp.</i>	Cavefish	Characiformes	Albino	Protas et al. 2006
<i>Alca torda</i>	Razorbill	Charadriiformes	Partial	Ross 1963
<i>Cephus columba</i>	Pigeon guillemot	Charadriiformes	Albino	Ross 1963
<i>Cephus grylle</i>	Black guillemot	Charadriiformes	Albino	Ross 1963
<i>Fratercula arctica</i>	Common puffin	Charadriiformes	Albino	Ross 1963
<i>Plautus alle</i>	Dovekie	Charadriiformes	Albino	Ross 1963
<i>Uria aalga</i>	Common murre	Charadriiformes	Albino	Ross 1963
<i>Uria lomvia</i>	Thick-billed murre	Charadriiformes	Albino	Reinsch 1983
<i>Uria lomvia</i>	Thick billed murre	Charadriiformes	Albino	Ross 1963
<i>Charadriidae sp.</i>	Lapwing	Charadriiformes	Partial	Terluin 1984
<i>Pluvialis dominica</i>	American golden plover	Charadriiformes	Albino	Ross 1963
<i>Thinornis novaeseelandiae</i>	Shore plover	Charadriiformes	Partial	Dowding and Gummer 2003
<i>Vanellus armatus</i>	Blacksmith plover	Charadriiformes	Leucistic	Konrad 1984
<i>Vanellus coronatus</i>	Crowned plover	Charadriiformes	Albino	Schmidt 1970
<i>Haematopus ostralegus</i>	Oystercatcher	Charadriiformes	Albino	Roberts 1978

<i>Haematopus</i> sp.	Oystercatcher	Charadriiformes	Partial	Bengtsson 1995
<i>Larus argentatus</i>	Herring gull	Charadriiformes	Albino	Ross 1963
<i>Larus delawarensis</i>	Ring-billed gull	Charadriiformes	Leucistic	Svingen and Eckert 1999
<i>Larus delawarensis</i>	Ring billed gull	Charadriiformes	Albino	Ross 1963
<i>Larus heermanni</i>	Heermann's gull	Charadriiformes	Albino	Gross 1965
<i>Larus marinus</i>	Great black-backed gull	Charadriiformes	Partial	Ross 1963
<i>Larus occidentalis</i>	Western gull	Charadriiformes	Partial	Ross 1963
<i>Larus philadelphia</i>	Bonaparte's gull	Charadriiformes	Albino	Ross 1963
<i>Larus pipixcan</i>	Franklin's gull	Charadriiformes	Albino	Ross 1963
<i>Rissa tridactyla</i>	Black legged kittiwake	Charadriiformes	Partial	Ross 1963
<i>Calidris canutus</i>	Knot	Charadriiformes	Albino	Ross 1963
<i>Calidris temminckii</i>	Temminck's stint	Charadriiformes	Partial	de Groot 1991
<i>Capella gallinago</i>	Common snipe	Charadriiformes	Partial	Ross 1963
<i>Catoptrophorus semipalmatus</i>	Willet	Charadriiformes	Leucistic	Ross 1963
<i>Crocethis alba</i>	Sanderling	Charadriiformes	Partial	Ross 1963
<i>Ereunetes pusillus</i>	Semipalmated sandpiper	Charadriiformes	Partial	Ross 1963
<i>Erolina alpina</i>	Dunlin	Charadriiformes	Albino	Ross 1963
<i>Erolina minutilla</i>	Least sandpiper	Charadriiformes	Partial	Ross 1963
<i>Limosa haemastica</i>	Hudsonian godwit	Charadriiformes	Albino	Ross 1963
<i>Lobipes lobatus</i>	Northern phalarope	Charadriiformes	Partial	Ross 1963
<i>Numenius phaeopus</i>	Whimbrel	Charadriiformes	Albino	Ross 1963
<i>Numenius</i> sp.	Curlew	Charadriiformes	Partial	Sage 1962
<i>Philohela minor</i>	American woodcock	Charadriiformes	Partial	Ross 1963
<i>Philomachus pugnax</i>	Ruff	Charadriiformes	Partial	Tree 1965
<i>Scolopax rusticola</i>	Woodcock	Charadriiformes	Albino	Sage 1963
<i>Totanus flavipes</i>	Lesser yellowlegs	Charadriiformes	Albino	Ross 1963
<i>Totanus melanoleucus</i>	Greater yellowlegs	Charadriiformes	Partial	Ross 1963
<i>Tringa semipalmata</i>	Willet	Charadriiformes	Leucistic	Collins 2003

<i>Tringa solitaria</i>	Solitary sandpiper	Charadriiformes	Partial	Ross 1963
<i>Stercorarius parasiticus</i>	Parasitic jaeger	Charadriiformes	Partial	Ross 1963
<i>Anous tenuirostris</i>	Black noddy	Charadriiformes	Albino	Clapp 1974
<i>Chlidonias niger</i>	Black tern	Charadriiformes	Albino	Ross 1963
<i>Sterna hirundo</i>	Common tern	Charadriiformes	Partial	Ross 1963
<i>Onychoprion fuscatus</i>	Sooty tern	Charadriiformes	Leucistic	Rauzon 1985
<i>Tadarida brasiliensis</i>	Mexican free-tailed bat	Chiroptera	Partial	McCoy 1960
<i>Chaerephon plicatus</i>	Northern free-tailed bat	Chiroptera	Albino	Uieda 2000
<i>Molossus fortis</i>	Mastiff bat	Chiroptera	Albino	Heatwole et al. 1964
<i>Molossus molossus</i>	Velvery free-tailed	Chiroptera	Albino	Uieda 2000
<i>Mormopterus planiceps</i>	Southern free-tailed bat	Chiroptera	Partial	Holsworth 1988
<i>Taderida brasiliensis</i>	Mexican free-tailed bat	Chiroptera	Albino	Uieda 2000
<i>Pteronotus parnellii</i>	Parnell's mustached bat	Chiroptera	Albino	Uieda 2000
<i>Nycteris nana</i>	Dwarf slit-faced bat	Chiroptera	Albino	Uieda 2000
<i>Artibeus lituratus</i>	Great fruit-eating bat	Chiroptera	Albino	Uieda 2000
<i>Artibeus planirostris</i>	Fruit bat	Chiroptera	Albino	Uieda 2000
<i>Desmodus rotundis</i>	Vampire bat	Chiroptera	Albino	Uieda 2000
<i>Desmodus rotundus</i>	Vampire bat	Chiroptera	Albino	Uieda 2000
<i>Glossophaga longirostris</i>	Miller's long-tongued bat	Chiroptera	Albino	Uieda 2000
<i>Glossophaga soricina</i>	Pallas's long-tongued bat	Chiroptera	Albino	Uieda 2000
<i>Hipposideros terasensis</i>	Formosan leaf-nosed bat	Chiroptera	Albino	Hsu 2003
<i>Macrotus waterhousii</i>	Waterhouse's leaf-nosed bat	Chiroptera	Albino	Uieda 2000
<i>Rousettus leschenaulti</i>	Leschenault's rousette bat	Chiroptera	Albino	Uieda 2000
<i>Hipposideros lankadiva</i>	Indiana roundleaf bat	Chiroptera	Albino	Uieda 2000
<i>Hipposideros ruber</i>	Noack's roundleaf bat	Chiroptera	Albino	Uieda 2000
<i>Rhinolophus cornutus</i>	Little Japanese horseshoe bat	Chiroptera	Albino	Uieda 2000
<i>Rhinolophus euryale</i>	Mediterranean horseshoe bat	Chiroptera	Albino	Uieda 2000

<i>Rhinolophus ferrumequinum</i>	Greater horseshoe bat	Chiroptera	Albino	Uieda 2000
<i>Rhinolophus hipposideros</i>	Lesser horseshoe bat	Chiroptera	Albino	Uieda 2000
<i>Rhinopoma hardwickei</i>	Lesser mouse-tailed bat	Chiroptera	Albino	Uieda 2000
<i>Rhinopoma microphyllum</i>	Rat-tailed bat	Chiroptera	Albino	Bhati 1988
<i>Rhinopoma microphyllum</i>	Rat-tailed bat	Chiroptera	Albino	Uieda 2000
<i>Antrozous pallidus</i>	Pallid bat	Chiroptera	Albino	Uieda 2000
<i>Eptesicus capensis</i>	Cape Serotine bat	Chiroptera	Albino	Uieda 2000
<i>Eptesicus serotinus</i>	Serotine bat	Chiroptera	Albino	Uieda 2000
<i>Lasurus borealis</i>	Eastern red bat	Chiroptera	Albino	Uieda 2000
<i>Miniopterus schreibersii</i>	Common bent-wing bat	Chiroptera	Albino	Uieda 2000
<i>Myotis bechsteinii</i>	Bechstein's bat	Chiroptera	Albino	Uieda 2000
<i>Myotis daubentonii</i>	Daubenton's bat	Chiroptera	Albino	Uieda 2000
<i>Myotis lucifugus</i>	Little brown bat	Chiroptera	Albino	Uieda 2000
<i>Myotis macrodactylus</i>	Eastern long-fingered bat	Chiroptera	Albino	Uieda 2000
<i>Myotis myotis</i>	Mouse-eared bat	Chiroptera	Albino	Uieda 2000
<i>Myotis mystacinus</i>	Whiskered bat	Chiroptera	Albino	Uieda 2000
<i>Myotis sodalis</i>	Indiana bat	Chiroptera	Albino	Uieda 2000
<i>Myotis velifer</i>	Cave myotis	Chiroptera	Albino	Uieda 2000
<i>Nyctalus noctula</i>	Common noctule bat	Chiroptera	Albino	Uieda 2000
<i>Pipistrellus pipistrellus</i>	Common pipistrelle	Chiroptera	Albino	Uieda 2000
<i>Pipistrellus subflavus</i>	Eastern pipistrelle	Chiroptera	Albino	Uieda 2000
<i>Plecotus auritus</i>	Brown long-eared bat	Chiroptera	Albino	Uieda 2000
<i>Vespertilio superans</i>	Asian particolored bat	Chiroptera	Albino	Uieda 2000
<i>Eptesicus serotinus</i>	Serotine bat	Chiroptera	Albino	Obada and Gas 2003
<i>Myotis myotis</i>	Mouse-eared bat	Chiroptera	Albino	Leblanc and Taupin 2005
<i>Myotis sodalis</i>	Indiana bat	Chiroptera	Albino	Brack and Scott 1990
<i>Pipistrellus abramus</i>	Japanese house bat	Chiroptera	Albino	Hsu 2003
<i>Myotis lucifungus</i>	Brown bat	Chiroptera	Leucistic	Talerico et al. 2008

<i>Egretta garzetta</i>	Little egret	Ciconiiformes	Leucistic	Tree 1965
<i>Plegadis chihi</i>	White faced ibis	Ciconiiformes	Partial	Ross 1963
<i>Zenaida macroura</i>	Mourning dove	Columbiformes	Albino	Braun and Boyd 1979
<i>Zenaida macroura</i>	Mourning dove	Columbiformes	Partial	Berdeen and Otis 2011
<i>Megaceryle alcyon</i>	Belted kingfisher	Coraciiformes	Partial	Ross 1963
<i>Dacelo sp.</i>	Kookaburra	Coraciiformes	Albino	Weird Science 2008
<i>Merops apiaster</i>	European bee-eater	Coraciiformes	Albino	Palmer 1997
<i>Upupa epops</i>	Hoopoe	Coraciiformes	Albino	Mullins 1975
<i>Alligator mississippiensis</i>	Alligator	Crocodylia	Albino	Weird Science 2008
<i>Coccyzus erythrophthalmus</i>	Black-billed cuckoo	Cuculiformes	Albino	Ross 1963
<i>Crotophaga ani</i>	Smooth-billed ani	Cuculiformes	Albino	Ross 1963
<i>Didelphis virginiana</i>	Opossum	Didelphimorphia	Albino	Science News-Letter 1941
<i>Macropus rufogriseus</i>	Wallaby	Diprodontia	Albino	Guillery et al. 1999
<i>Macropus sp.</i>	Kangaroo	Diprodontia	Albino	Weird Science 2008
<i>Phascolarctos cinereus</i>	Koala	Diprodontia	Albino	Weird Science 2008
<i>Erinaceus europaeus</i>	European hedgehog	Erinaceomorpha	Leucistic	Morris and Tutt 1996
<i>Accipiter cooperii</i>	Coopers hawk	Falconiformes	Partial	Ross 1963
<i>Aquila chrysaetos</i>	Golden eagle	Falconiformes	Albino	Ross 1963
<i>Buteo jamaicensis</i>	Red-tailed hawk	Falconiformes	Albino	Whitford 1991
<i>Buteo jamaicensis</i>	Red-tailed hawk	Falconiformes	Albino	Hoelscher 1996
<i>Buteo jamaicensis</i>	Red-tailed hawk	Falconiformes	Albino	Whitford 1994
<i>Buteo jamaicensis</i>	Red-tailed hawk	Falconiformes	Albino	Nicoletti et al. 1998
<i>Buteo lineatus</i>	Red-shouldered hawk	Falconiformes	Albino	Ross 1963
<i>Buteo swainsoni</i>	Swainson's hawk	Falconiformes	Partial	Ross 1963
<i>Circus pygargus</i>	Montagu's Harrier	Falconiformes	Albino	Sage 1963
<i>Crcus aeruginosus</i>	Marsh Harrier	Falconiformes	Partial	Tree 1965
<i>Gyps fulvus</i>	Eurasian griffon vulture	Falconiformes	Leucistic	Camina 2005
<i>Gyps fulvus</i>	Eurasian griffon vulture	Falconiformes	Partial	Camina 2005

<i>Caracara plancus</i>	Crested caracara	Falconiformes	Partial	Tinajero and Rodriguez-Estrella 2010
<i>Cathartes aura</i>	Turkey vulture	Falconiformes	Partial	Tinajero and Rodriguez-Estrella 2010
<i>Falco columbarius</i>	Pigeon hawk	Falconiformes	Leucistic	Ross 1963
<i>Falco mexicanus</i>	Prairie falcon	Falconiformes	Leucistic	Ross 1963
<i>Falco peregrinus</i>	Peregrine falcon	Falconiformes	Partial	Ross 1963
<i>Falco sparverius</i>	American kestrel	Falconiformes	Albino	Newman 1988
<i>Falco sparverius</i>	Sparrow hawk	Falconiformes	Albino	Ross 1963
<i>Falco tinnunculus</i>	Common kestrel	Falconiformes	Leucistic	Barbalat and Bottin 2003
<i>Falco vespertinus</i>	Red-footed falcon	Falconiformes	Partial	Corso 2000
<i>Callipepla gambelii</i>	Gambell's quail	Galliformes	Albino	Smith 1999
<i>Callipepla squamata</i>	Scaled quail	Galliformes	Partial	Ross 1963
<i>Colinus virginianus</i>	Northern bobwhite	Galliformes	Albino	Gross 1965
<i>Lophortyx californicus</i>	California quail	Galliformes	Albino	Gross 1965
<i>Lophortyx gambelii</i>	Gambel's quail	Galliformes	Partial	Ross 1963
<i>Oreortyx pictus</i>	Mountain quail	Galliformes	Partial	Ross 1963
<i>Bonasa umbellus</i>	Ruffed grouse	Galliformes	Albino	Ross 1963
<i>Canachites canadensis</i>	Spruce grouse	Galliformes	Partial	Ross 1963
<i>Coturnix japonica</i>	Japanese quail	Galliformes	Albino	Ring and Smyth, Jr. 1990
<i>Dendragapus obscurus</i>	Blue grouse	Galliformes	Albino	Braun et al. 1973
<i>Gallus domesticus</i>	Chicken	Galliformes	Albino	Ring and Smyth, Jr. 1990
<i>Lagopus lagopus</i>	Red grouse	Galliformes	Albino	Sage 1963
<i>Meleagris gallopavo</i>	Turkey	Galliformes	Leucistic	Ross 1963
<i>Pavo cristatus</i>	Peacock	Galliformes	Albino	Weird Science 2008
<i>Pediocetes phasianellus</i>	Sharp-tailed grouse	Galliformes	Partial	Ross 1963
<i>Perdix perdix</i>	Partridge	Galliformes	Albino	Sage 1963
<i>Phasianus colchicus</i>	Ring-necked pheasant	Galliformes	Albino	Gross 1965
<i>Tympanuchus cupido</i>	Greater prairie chicken	Galliformes	Partial	Ross 1963

<i>Gavia immer</i>	Common loon	Gaviiformes	Albino	Ross 1963
<i>Gavia stellata</i>	Red-throated loon	Gaviiformes	Albino	Ross 1963
<i>Grus canadensis</i>	Sandhill crane	Gruiformes	Partial	Ross 1963
<i>Grus grus</i>	Common crane	Gruiformes	Leucistic	Munoz-Pulido et al. 1989
<i>Fulica sp.</i>	Coot	Gruiformes	Albino	Parasharya et al. 1996
<i>Fulica americana</i>	Coot	Gruiformes	Albino	Ross 1963
<i>Porzana carolina</i>	Sora	Gruiformes	Partial	Ross 1963
<i>Rallus longirostris</i>	Clapper rail	Gruiformes	Partial	Ross 1963
<i>Notorynchus cepedianus</i>	Broadnose sevengill shark	Hexanchiformes	Albino	Sandoval-Castillo et al. 2006
<i>Sylvilagus floridanus</i>	Cottontail rabbit	Lagomorpha	Albino	Rose 1973
<i>Cetorhinus maximus</i>	Basking shark	Lamniformes	Albino	Sandoval-Castillo et al. 2006
<i>Carcharodon carcharias</i>	Great white shark	Lamniformes	Albino	Sandoval-Castillo et al. 2006
<i>Lamna nasus</i>	Porbeagle	Lamniformes	Albino	Sandoval-Castillo et al. 2006
<i>Dasyatis americana</i>	Southern stingray	Myliobatiformes	Albino	Sandoval-Castillo et al. 2006
<i>Dasyatis pastinaca</i>	Common stingray	Myliobatiformes	Albino	Sandoval-Castillo et al. 2006
<i>Manta birostris</i>	Manta ray	Myliobatiformes	Albino	Sandoval-Castillo et al. 2006
<i>Myliobatis californica</i>	Bat ray	Myliobatiformes	Albino	Sandoval-Castillo et al. 2006
<i>Rhinoptera bonasus</i>	Cownose ray	Myliobatiformes	Albino	Sandoval-Castillo et al. 2006
<i>Nebrius ferrugineus</i>	Nurse shark	Orectolobiformes	Albino	Sandoval-Castillo et al. 2006
<i>Chiloscyllium plagiosum</i>	Bamboo shark	Orectolobiformes	Albino	Sandoval-Castillo et al. 2006
<i>Orectolobus japonicus</i>	Wobbegong	Orectolobiformes	Albino	Sandoval-Castillo et al. 2006
<i>Stegostoma fasciatum</i>	Zebra shark	Orectolobiformes	Albino	Sandoval-Castillo et al. 2006
<i>Acrocephalus aequinoctialis</i>	Bokikokiko	Passeriformes	Partial	Holyoak 1978
<i>Acrocephalus arubdinaceus</i>	Great reed warbler	Passeriformes	Partial	Bensch et al. 2000
<i>Acrocephalus arundinaceus</i>	Great reed warbler	Passeriformes	Albino	Adam 1989
<i>Acrocephalus atyphus</i>	Tuamotu reed-warbler	Passeriformes	Partial	Holyoak 1978
<i>Acrocephalus eremus</i>	Makatea Island warbler	Passeriformes	Partial	Holyoak 1978
<i>Acrocephalus palmarum</i>	Anaa Island warbler	Passeriformes	Partial	Holyoak 1978

<i>Acrocephalus percernis</i>	Northern Marquesan reed warbler	Passeriformes	Partial	Holyoak 1978
<i>Acrocephalus ravus</i>	Hao Island warbler	Passeriformes	Partial	Holyoak 1978
<i>Acrocephalus rimitarae</i>	Rimatara reed-warbler	Passeriformes	Partial	Holyoak 1978
<i>Acrocephalus taiti</i>	Henderson reed warbler	Passeriformes	Partial	Holyoak 1978
<i>Acrocephalus vaughani</i>	Pitcairn reed-warbler	Passeriformes	Partial	Holyoak 1978
<i>Eremophila alpestris</i>	Horned lark	Passeriformes	Albino	Ross 1963
<i>Bombycilla cedrorum</i>	Cedar waxwing	Passeriformes	Partial	Ross 1963
<i>Bombycilla garrulus</i>	Bohemian waxwing	Passeriformes	Partial	Ross 1963
<i>Bombycilla garrulus</i>	Bohemian waxwing	Passeriformes	Partial	Lind 2003
<i>Plectrophenax nivalis</i>	Snow bunting	Passeriformes	Albino	Ross 1963
<i>Cardinalis cardinalis</i>	Northern cardinal	Passeriformes	Albino	Brammer 1997
<i>Passerina cyanea</i>	Indigo bunting	Passeriformes	Albino	Ross 1963
<i>Pheucticus ludovicianus</i>	Rose breasted grosbeak	Passeriformes	Partial	Ross 1963
<i>Piranga olivacea</i>	Scarlet tanager	Passeriformes	Partial	Ross 1963
<i>Piranga rubra</i>	Summer tanager	Passeriformes	Partial	Ross 1963
<i>Pyrrhuloxia sinuata</i>	Pyrrhuloxia	Passeriformes	Partial	Ross 1963
<i>Richmondia cardinalis</i>	Cardinal	Passeriformes	Albino	Ross 1963
<i>Aphelocoma coerulescens</i>	Scrub jay	Passeriformes	Albino	Ross 1963
<i>Corvus brachyrhynchos</i>	Common crow	Passeriformes	Albino	Gross 1965
<i>Corvus corax</i>	Common raven	Passeriformes	Partial	Ross 1963
<i>Corvus corone cornix</i>	Crow	Passeriformes	Partial	Slagsvold et al. 1987
<i>Corvus corone orientalis</i>	Carrion crow	Passeriformes	Partial	Kuro-o and Katakura 2003
<i>Corvus frugilegus</i>	Rook	Passeriformes	Albino	Roberts 1933
<i>Corvus monedula</i>	Jackdaw	Passeriformes	Albino	Sage 1963
<i>Corvus ossifragus</i>	Fish crow	Passeriformes	Albino	Ross 1963
<i>Corvus varius</i>	Raven	Passeriformes	Partial	Sage 1962
<i>Cyanocitta cristata</i>	Blue jay	Passeriformes	Albino	Laskey 1973

<i>Cyanocitta cristata</i>	Blue jay	Passeriformes	Albino	Hollis 1997
<i>Cyanocitta stelleri</i>	Stellar's jay	Passeriformes	Partial	Ross 1963
<i>Garrulus glandarius</i>	Eurasian Jay	Passeriformes	Albino	Reinsch 1983
<i>Nucifraga columbiana</i>	Clark's nutcracker	Passeriformes	Partial	Ross 1963
<i>Perisoreus canadensis</i>	Gray jay	Passeriformes	Partial	Ross 1963
<i>Pica pica</i>	Black-billed magpie	Passeriformes	Partial	Ross 1963
<i>Ammospiza caudacuta</i>	Shar- tailed sparrow	Passeriformes	Albino	Gross 1965
<i>Ammospiza maritima</i>	Seaside sparrow	Passeriformes	Partial	Ross 1963
<i>Amphispiza bilineata</i>	Blac- throated sparrow	Passeriformes	Partial	Ross 1963
<i>Calamospiza melanocorys</i>	Lark bunting	Passeriformes	Albino	Rigli 1993
<i>Calamospiza melanocorys</i>	Lark bunting	Passeriformes	Partial	Ross 1963
<i>Emberiza calandra</i>	Corn bunting	Passeriformes	Albino	Sage 1963
<i>Junco hyemalis</i>	Gray-headed junco	Passeriformes	Partial	Lloyd 2004
<i>Junco hyemalis</i>	Dark-eyed junco	Passeriformes	Partial	Dowlan 2000
<i>Junco hyemalis</i>	Slate-colored junco	Passeriformes	Albino	Gross 1965
<i>Junco oreganus</i>	Oregon junco	Passeriformes	Partial	Ross 1963
<i>Melospiza georgiana</i>	Swamp sparrow	Passeriformes	Partial	Ross 1963
<i>Melospiza melodia</i>	Song sparrow	Passeriformes	Albino	Gross 1965
<i>Passerculus sancwichensis</i>	Savannah sparrow	Passeriformes	Partial	Ross 1963
<i>Passerella iliaca</i>	Fox sparrow	Passeriformes	Albino	Gross 1965
<i>Pipilo erythrophthalmus</i>	Rufous-sided towhee	Passeriformes	Partial	Ross 1963
<i>Pipilo fuscus</i>	Brown towhee	Passeriformes	Partial	Ross 1963
<i>Pooecetes gramineus</i>	Vesper sparrow	Passeriformes	Partial	Ross 1963
<i>Spizella arborea</i>	Tree sparrow	Passeriformes	Partial	Ross 1963
<i>Spizella passerina</i>	Chipping sparrow	Passeriformes	Albino	Ross 1963
<i>Spizella pusilla</i>	Field sparrow	Passeriformes	Albino	Gross 1965
<i>Zonotrichia albicollis</i>	White-throated sparrow	Passeriformes	Albino	Gross 1965
<i>Zonotrichia atricapilla</i>	Golden-crowned sparrow	Passeriformes	Partial	Ross 1963

<i>Zonotrichia leucophrys</i>	White-crowned sparrow	Passeriformes	Partial	Ross 1963
<i>Neochmia ruficauda</i>	Star finch	Passeriformes	Leucistic	Collins and Jessop 1997
<i>Taeniopygia guttata</i>	Zebra finch	Passeriformes	Leucistic	Reed 1991
<i>Acanthis flammea</i>	Common redpoll	Passeriformes	Partial	Ross 1963
<i>Carduelis cannabina</i>	Linnet	Passeriformes	Albino	Sage 1963
<i>Carduelis tristis</i>	Goldfinch	Passeriformes	Partial	Sage 1962
<i>Carpodacus cassinii</i>	Cassin's finch	Passeriformes	Partial	Ross 1963
<i>Carpodacus maxicanus</i>	House finch	Passeriformes	Albino	Plooster 1997
<i>Carpodacus mexicanus</i>	House finch	Passeriformes	Partial	Ross 1963
<i>Carpodacus purpureus</i>	Purple finch	Passeriformes	Partial	Ross 1963
<i>Chloris chloris</i>	Greenfinch	Passeriformes	Albino	Sage 1963
<i>Fringilla coelebs</i>	Chaffinch	Passeriformes	Leucistic	Guillet 2005
<i>Hesperiphona vespertina</i>	Evening grosbeak	Passeriformes	Albino	Gross 1965
<i>Leucosicte tephrocotis</i>	Gray-crowned rosy finch	Passeriformes	Partial	Ross 1963
<i>Loxia curvirostra</i>	Red crossbill	Passeriformes	Albino	Ross 1963
<i>Pinicola enucleator</i>	Pine grosbeak	Passeriformes	Partial	Ross 1963
<i>Spinus pinus</i>	Pine siskin	Passeriformes	Partial	Ross 1963
<i>Spinus tristis</i>	American goldfinch	Passeriformes	Albino	Ross 1963
<i>Hirundine</i>	Swallow	Passeriformes	Albino	Remy Malher 2003
<i>Hirundo rustica</i>	Barn swallow	Passeriformes	Albino	Whitford 1995
<i>Iridoprocne bicolor</i>	Tree swallow	Passeriformes	Albino	Ross 1963
<i>Petrochelidon pyrrhonota</i>	Cliff swallow	Passeriformes	Partial	Ross 1963
<i>Progne subis</i>	Purple martin	Passeriformes	Albino	Ross 1963
<i>Riparia riparia</i>	Bank swallow	Passeriformes	Partial	Ross 1963
<i>Stelgidopteryx ruficollis</i>	Rough-winged swallow	Passeriformes	Partial	Ross 1963
<i>Tachycineta bicolor</i>	Tree swallow	Passeriformes	Albino	Lederle et al. 1988
<i>Tachycineta thalassina</i>	Violet-green swallow	Passeriformes	Albino	Ross 1963
<i>Agelaius phoeniceus</i>	Redwing blackbird	Passeriformes	Albino	Gross 1965

<i>Cassidix mexicanus</i>	Boat-tailed grackle	Passeriformes	Albino	Ross 1963
<i>Dolichonyx orizivorus</i>	Bobolink	Passeriformes	Partial	Ross 1963
<i>Euphagus carolinensis</i>	Rusty blackbird	Passeriformes	Partial	Ross 1963
<i>Euphagus cyanocephalus</i>	Brewer's blackbird	Passeriformes	Albino	Gross 1965
<i>Euphagus cyanocephalus</i>	Brewer's blackbird	Passeriformes	Partial	Sage 1962
<i>Icterus cucullatus</i>	Hooded oriole	Passeriformes	Partial	Ross 1963
<i>Icterus galbula</i>	Baltimore oriole	Passeriformes	Albino	Ross 1963
<i>Molothrus ater</i>	Brown headed cowbird	Passeriformes	Albino	Gross 1965
<i>Quiscalus quiscula</i>	Common grackle	Passeriformes	Albino	Gross 1965
<i>Sturnella magna</i>	Eastern meadowlark	Passeriformes	Partial	Ross 1963
<i>Sturnella neglecta</i>	Western meadowlark	Passeriformes	Partial	Ross 1963
<i>Xanthocephalus xanthocephalus</i>	Yellow headed blackbird	Passeriformes	Partial	Ross 1963
<i>Lanius excubitor</i>	Great Grey shrike	Passeriformes	Albino	Sudbeck 1990
<i>Lanius ludovicianus</i>	Loggerhead shrike	Passeriformes	Albino	Ross 1963
<i>Lanius schach</i>	Long-tailed shrike	Passeriformes	Partial	Watson and Watson 1983
<i>Dumetella carolinensis</i>	Catbird	Passeriformes	Albino	Gross 1965
<i>Mimus polyglottos</i>	Mockingbird	Passeriformes	Albino	Gross 1965
<i>Toxostoma rufum</i>	Brown thrasher	Passeriformes	Albino	Ross 1963
<i>Anthus novaseelandiae</i>	Richard's pipit	Passeriformes	Albino	Tree 1965
<i>Anthus pratensis</i>	Meadow pipit	Passeriformes	Albino	Ross 1963
<i>Anthus spinoletta</i>	Water pipit	Passeriformes	Partial	Ross 1963
<i>Motacilla aguimp</i>	Pied wagtail	Passeriformes	Partial	Tree 1965
<i>Motacilla flava</i>	Yellow wagtail	Passeriformes	Albino	Ross 1963
<i>Erythropygia coryphaeus</i>	Karoo robin	Passeriformes	Albino	Anderson 1998
<i>Ficedula albicollis</i>	Collared flycatcher	Passeriformes	Leucistic	Bures et al. 1995
<i>Muscicapa striata</i>	Spotted flycatcher	Passeriformes	Albino	Bezzi et al. 1988
<i>Oenanthe bifasciata</i>	Buff-streaked chat	Passeriformes	Albino	Cooper 1969
<i>Oenanthe oenanthe</i>	Wheatear	Passeriformes	Albino	Ross 1963

<i>Saxicola rubicola</i>	Stonechat	Passeriformes	Albino	Little 1984
<i>Cyanistes caeruleus</i>	Blue tit	Passeriformes	Partial	Sage 1962
<i>Parus atricapillus</i>	Black-capped chickadee	Passeriformes	Partial	Ross 1963
<i>Parus atricristatus</i>	Black-crested titmouse	Passeriformes	Partial	Ross 1963
<i>Parus bicolor</i>	Tufted titmouse	Passeriformes	Partial	Ross 1963
<i>Parus major</i>	Great tit	Passeriformes	Albino	Sage 1963
<i>Poecile atricapillus</i>	Black-capped chickadee	Passeriformes	Partial	Breckenridge 1989
<i>Dendroica auduboni</i>	Audubon's warbler	Passeriformes	Partial	Ross 1963
<i>Dendroica castanea</i>	Bay-breasted warbler	Passeriformes	Partial	Ross 1963
<i>Dendroica coronata</i>	Myrtle warbler	Passeriformes	Partial	Ross 1963
<i>Dendroica palmarum</i>	Palm warbler	Passeriformes	Partial	Ross 1963
<i>Dendroica striata</i>	Blackpoll warbler	Passeriformes	Albino	Ross 1963
<i>Geothlypis trichas</i>	Yellowthroat	Passeriformes	Partial	Ross 1963
<i>Icteria virens</i>	Yellow-breasted chat	Passeriformes	Albino	Ross 1963
<i>Parula americana</i>	Parula warbler	Passeriformes	Partial	Ross 1963
<i>Protonotaria citrea</i>	Prothonotary warbler	Passeriformes	Partial	Ross 1963
<i>Setophaga ruticilla</i>	American redstart	Passeriformes	Albino	Ross 1963
<i>Passer domesticus</i>	English sparrow	Passeriformes	Albino	O'Gara 1915
<i>Passer melanurus</i>	Cape sparrow	Passeriformes	Partial	Du Toit 1969
<i>Phylloscopus collybita</i>	Northern chiffchaff	Passeriformes	Leucistic	Gutierrez 2000
<i>Quelea erythrops</i>	Red-headed quelea	Passeriformes	Partial	Tree 1965
<i>Quelea quelea</i>	Red-billed quelea	Passeriformes	Partial	Tree 1965
<i>Prunella modularis</i>	Duncock	Passeriformes	Albino	Sage 1963
<i>Pycnonotus barbatus</i>	Black-eyed bulbul	Passeriformes	Albino	Marshall 1968
<i>Pycnonotus cafer</i>	Red-vented bulbul	Passeriformes	Albino	Joshua 1996
<i>Pycnonotus cafer</i>	Cape bulbul	Passeriformes	Leucistic	Gray 1998
<i>Pycnonotus capensis</i>	Cape bulbul	Passeriformes	Albino	Gray 1999
<i>Pycnonotus sp.</i>	Black-eyed bulbul	Passeriformes	Albino	Maberly 1970

<i>Regulus satrapa</i>	Golden-crowned kinglet	Passeriformes	Partial	Ross 1963
<i>Sitta carolinensis</i>	White-breasted nuthatch	Passeriformes	Albino	Ross 1963
<i>Lamprotornis australis</i>	Burchell's glossy starling	Passeriformes	Partial	Brown and Brown 1985
<i>Spreo bicolor</i>	Pied starling	Passeriformes	Albino	Van Niekerk 1996
<i>Sturnus vulgaris</i>	Common starlings	Passeriformes	Albino	Garner 1997
<i>Sturnus vulgaris</i>	Starling	Passeriformes	Albino	Ross 1963
<i>Turdoides malcolmi</i>	Large grey babbler	Passeriformes	Albino	Sharma 2003
<i>Telmatodytes palustris</i>	Long-billed marsh wren	Passeriformes	Partial	Ross 1963
<i>Thryothorus ludovicianus</i>	Carolina wren	Passeriformes	Leucistic	Seneca 1985
<i>Troglodytes aedon</i>	House wren	Passeriformes	Albino	Ross 1963
<i>Troglodytes ludovicianus</i>	Carolina wren	Passeriformes	Partial	Ross 1963
<i>Hylochchla fuscescens</i>	Veery	Passeriformes	Partial	Ross 1963
<i>Hylocichla guttata</i>	Hermit thrush	Passeriformes	Albino	Ross 1963
<i>Hylocichla mustelina</i>	Wood thrush	Passeriformes	Albino	Ross 1963
<i>Hylocichla ustulata</i>	Swainsons thrush	Passeriformes	Partial	Ross 1963
<i>Ixoreus naevius</i>	Varied thrush	Passeriformes	Partial	Ross 1963
<i>Myadestes townsendii</i>	Townsend's solitaire	Passeriformes	Partial	Ross 1963
<i>Sialia sialis</i>	Eastern bluebird	Passeriformes	Albino	Green 1997
<i>Sialia sialis</i>	Eastern bluebird	Passeriformes	Albino	Gross 1965
<i>Turdus merula</i>	Blackbird	Passeriformes	Partial	Brahier 2001
<i>Turdus migratorius</i>	American robin	Passeriformes	Albino	Johnson and Johnson 1997
<i>Turdus migratorius</i>	American robin	Passeriformes	Albino	Hendricks 1970
<i>Turdus philomelos</i>	Song thrush	Passeriformes	Albino	Sage 1963
<i>Contopus sordidulus</i>	Western wood pewee	Passeriformes	Partial	Ross 1963
<i>Contopus virens</i>	Eastern wood pewee	Passeriformes	Albino	Ross 1963
<i>Muscivora forficata</i>	Scissor-tailed flycatcher	Passeriformes	Albino	Ross 1963
<i>Sayornis nigricans</i>	Black phoebe	Passeriformes	Partial	Ross 1963
<i>Tyrannus tyrannus</i>	Eastern kingbird	Passeriformes	Albino	Ross 1963

<i>Tyrannus verticalis</i>	Western kingbird	Passeriformes	Partial	Ross 1963
<i>Vireo flavifrons</i>	Yellow-throated vireo	Passeriformes	Partial	Ross 1963
<i>Ardea cinerea</i>	Common heron	Pelecaniformes	Albino	Pajusalu 1982
<i>Ardea herodias</i>	Great blue heron	Pelecaniformes	Partial	Ross 1963
<i>Botaurus lentiginosus</i>	American bittern	Pelecaniformes	Partial	Ross 1963
<i>Fregata minor</i>	Great frigatebird	Pelecaniformes	Albino	Schreiber et al. 2006
<i>Fregata minor</i>	Great frigatebird	Pelecaniformes	Leucistic	Rauzon 1985
<i>Phalacrocorax pelagicus</i>	Pelagic cormorant	Pelecaniformes	Partial	Ross 1963
<i>Phalacrocorax auritus</i>	Double-crested cormorant	Pelecaniformes	Leucistic	Bardon 1997
<i>Phalacrocorax auritus</i>	Double-crested cormorant	Pelecaniformes	Partial	Ross 1963
<i>Phalacrocorax neglectus</i>	Bank cormorant	Pelecaniformes	Leucistic	Gray 1998
<i>Sula sp.</i>	Booby	Pelecaniformes	Partial	Castillo-Guerrero et al. 2005
<i>Echymipera kalubu</i>	Bandicoot	Peramelemorphia	Partial	Phillips and Wilson 1965
<i>Tapirus terrestris</i>	South American tapir	Perissodactyla	Albino	Lindberg 1984
<i>Tapirus terrestris</i>	American tapir	Perissodactyla	Albino	Smielowski 1987
<i>Centurus carolinensis</i>	Red-bellied woodpecker	Piciformes	Albino	Ross 1963
<i>Centurus uropygialis</i>	Gila woodpecker	Piciformes	Albino	Ross 1963
<i>Colaptes aurates</i>	Yellow-shafted flicker	Piciformes	Partial	Ross 1963
<i>Colaptes ausatus</i>	Yellow-shafted flicker	Piciformes	Albino	Gross 1965
<i>Dendrocopos major</i>	Great spotted woodpecker	Piciformes	Leucistic	Olszewski 2007
<i>Dendrocopos nuttallii</i>	Nuttall's woodpecker	Piciformes	Partial	Ross 1963
<i>Dendrocopos pubescens</i>	Downy woodpecker	Piciformes	Partial	Ross 1963
<i>Dendrocopos villosus</i>	Hairy woodpecker	Piciformes	Albino	Ross 1963
<i>Dryocopus pileatus</i>	Pileated woodpecker	Piciformes	Partial	Ross 1963
<i>Melanerpes erythrocephalus</i>	Red-headed woodpecker	Piciformes	Albino	Ross 1963
<i>Melanerpes erythrocephlus</i>	Red-Headed woodpecker	Piciformes	Partial	Rogers et al. 1979
<i>Melanerpes formicivorus</i>	Acorn woodpecker	Piciformes	Partial	Ross 1963
<i>Aechmophorus occidentalis</i>	Western grebe	Podicipediformes	Albino	Weller 1959

<i>Podiceps auritus</i>	Horned grebe	Podicipediformes	Partial	Weller 1959
<i>Podiceps caspicus</i>	Eared grebe	Podicipediformes	Partial	Weller 1959
<i>Podiceps cristatus</i>	Great crested grebe	Podicipediformes	Partial	Weller 1959
<i>Podiceps grisegena</i>	Red-necked grebe	Podicipediformes	Albino	Weller 1959
<i>Podiceps grisegena</i>	Red-necked grebe	Podicipediformes	Partial	Weller 1959
<i>Podiceps nigricollis</i>	Eared grebe	Podicipediformes	Leucistic	Jehl 2007
<i>Podiceps nigricollis</i>	Eared grebe	Podicipediformes	Leucistic	Jehl 1985
<i>Podilymbus podiceps</i>	Pied-billed grebe	Podicipediformes	Albino	Weller 1959
<i>Macaca mulatta</i>	Rhesus macaque	Primates	Albino	Singh Mohnot 2009
<i>Troglodytes gorilla</i>	Gorilla	Primates	Leucistic	Weird Science 2008
<i>Elephas sp.</i>	Elephant	Proboscidea	Albino	Holden 2004
<i>Hydrobates pelagicus</i>	Storm petrel	Procellariiformes	Partial	Roberts 1978
<i>Hydrobates pelagicus</i>	European storm-petrel	Procellariiformes	Partial	Arbona et al. 1996
<i>Hydrobatidae sp.</i>	Storm petrel	Procellariiformes	Partial	Sultana 1991
<i>Bulweria bulwerii</i>	Bulwer's petrel	Procellariiformes	Partial	Moore 1990
<i>Calonectris diomedea</i>	Cory's shearwater	Procellariiformes	Partial	Ristow and Witte 2004
<i>Macronectes giganteus</i>	Giant fulmar	Procellariiformes	Partial	Ross 1963
<i>Puffinus griseus</i>	Sooty shearwater	Procellariiformes	Partial	Ross 1963
<i>Puffinus opisthomelas</i>	Black-vented shearwater	Procellariiformes	Leucistic	Garrett 1990
<i>Puffinus puffinus</i>	Manx shearwater	Procellariiformes	Partial	Elkins and Flumm 1990
<i>Conuropsis carolinensis</i>	Carolina parakeet	Psittaciformes	Albino	Ross 1963
<i>Okamejei kenojei</i>	Skate	Rajiformes	Albino	Sandoval-Castillo et al. 2006
<i>Raja batis</i>	Skate	Rajiformes	Albino	Sandoval-Castillo et al. 2006
<i>Raja clavata</i>	Thornback ray	Rajiformes	Albino	Sandoval-Castillo et al. 2006
<i>Raja naevus</i>	Cuckoo ray	Rajiformes	Albino	Sandoval-Castillo et al. 2006
<i>Castor canadensis</i>	Beaver	Rodentia	Partial	Lovallo and Suzuki 1993
<i>Clethrionomys gapperi</i>	Red-backed vole	Rodentia	Partial	Bowman and Curran 2000
<i>Micritus pinetorum</i>	Vole	Rodentia	Albino	Peles et al. 1995

<i>Microtus montanus</i>	Montane vole	Rodentia	Albino	Peles et al. 1995
<i>Microtus ochrogaster</i>	Vole	Rodentia	Albino	Peles et al. 1995
<i>Microtus pennsylvanicus</i>	Meadow vole	Rodentia	Partial	Parsons and Bondrup-Nielsen 1995
<i>Mictorus pennsylvanicus</i>	Meadow vole	Rodentia	Albino	Peles et al. 1995
<i>Mictorus pennsylvanicus</i>	Meadow vole	Rodentia	Albino	Brewer et al. 1993
<i>Myodes rutilus</i>	Northern red-backed vole	Rodentia	Albino	Whitman 2009
<i>Ondatra zibethicus</i>	Muskrat	Rodentia	Albino	Benton 1953
<i>Reithrodontomys megalotis</i>	Western harvest mouse	Rodentia	Albino	Egoscue 1958
<i>Perognathus baileyi</i>	Bailey's pocket mouse	Rodentia	Albino	Egoscue and Lewis 1968
<i>Perognathus formosus</i>	Long-tailed pocket mouse	Rodentia	Leucistic	Egoscue and Lewis 1968
<i>Mus musculus</i>	House mouse	Rodentia	Albino	Winston and Lindzey 1964
<i>Otomys tropicalis</i>	Tropical rat	Rodentia	Albino	Pirlot 1958
<i>Rattus rattus</i>	Barn rat	Rodentia	Albino	El-Bakry 2010
<i>Ammospermophilus harrisi</i>	Harris ground squirrel	Rodentia	Albino	Neal 1964
<i>Citellus tereticaudus</i>	Round-tailed ground squirrel	Rodentia	Albino	Turkowski and Parker 1967
<i>Funambulus pennanti</i>	Five-striped palm squirrel	Rodentia	Albino	Mahabal et al. 2005
<i>Sciurus carolinensis</i>	Grey squirrel	Rodentia	Albino	Esteve and Jeffery 1997
<i>Sciurus vulgaris</i>	Red squirrel	Rodentia	Partial	Hoekstra 2004
<i>Tamias striatus</i>	Chipmunk	Rodentia	Albino	Guiles 1997
<i>Tamias striatus</i>	Chipmunk	Rodentia	Partial	Guiles 1997
<i>Blarina brevicauda</i>	Northern short-tailed shrew	Soricomorpha	Partial	Moncrief and Anderson 1997
<i>Sorex araneus</i>	Common shrew	Soricomorpha	Partial	Gelling 2003
<i>Sorex cinereus</i>	Masked shrew	Soricomorpha	Partial	Long and Gehring 1995
<i>Aptenodytes patagonicus</i>	King penguin	Sphenisciformes	Albino	Voisin et al. 2002
<i>Aptenodytes patagonicus</i>	King penguin	Sphenisciformes	Leucistic	Forrest and Naveen 2000
<i>Eudyptes schlegeli</i>	Royal penguin	Sphenisciformes	Leucistic	Forrest and Naveen 2000
<i>Pygocelid adeliae</i>	Adelie penguin	Sphenisciformes	Leucistic	Forrest and Naveen 2000

<i>Pygocelid antarcticus</i>	Chinstrap penguin	Sphenisciformes	Leucistic	Forrest and Naveen 2000
<i>Pygocelid papua</i>	Gentoo penguin	Sphenisciformes	Leucistic	Forrest and Naveen 2000
<i>Squalus acanthias</i>	Spiny dogfish	Squaliformes	Albino	Sandoval-Castillo et al. 2006
<i>Achalinus spinalis</i>	Odd-scaled snake	Squamata	Albino	Arao and Ishida 2005
<i>Diadophis punctatus</i>	Northern ringneck snake	Squamata	Leucistic	Gilhen 1999
<i>Elaphe obsoleta</i>	Rat snake	Squamata	Albino	Bechtel and Bechtel 1981
<i>Heterodon nasicus</i>	Western hognose snake	Squamata	Albino	Bumgardner 2010
<i>Lampropeltis calligaster</i>	Prairie kingsnake	Squamata	Leucistic	Pisani 2003
<i>Lampropeltis holbrooki</i>	Speckled kingsnake	Squamata	Albino	Applegate 1987
<i>Lampropeltis triangulum</i>	Coastal plains milk snake	Squamata	Partial	Harris 2006
<i>Natrix maura</i>	Water snake	Squamata	Albino	Perez 1975
<i>Natrix natrix</i>	Grass snake	Squamata	Albino	Baker 2003
<i>Storeria occipitomaculata</i>	Red-bellied snake	Squamata	Partial	Watkins-Colwell 2002
<i>Tantilla hobartsmithi</i>	Southwest black-headed snake	Squamata	Albino	Painter et al. 1997
<i>Tantilla nigriceps</i>	Plains black-headed snake	Squamata	Albino	Painter et al. 1997
<i>Thamnophis sauritus</i>	Ribbon snake	Squamata	Albino	Rose 1959
<i>Thamnophis sitalis</i>	Garter snake	Squamata	Albino	Coad et al. 1989
<i>Thamnophis sitalis</i>	Garter snake	Squamata	Albino	Smith and Kyle 1992
<i>Hemachatus hemachatus</i>	Rinkhals	Squamata	Leucistic	Schmidt 1999
<i>Liasis olivaceus</i>	Olive python	Squamata	Albino	Bedford 1993
<i>Crotalus viridis</i>	Prairie rattlesnake	Squamata	Albino	Chace and Smith 1968
<i>Crotalus horridus</i>	Timber rattlesnake	Squamata	Partial	Smith and Scott 1990
<i>Viperinae</i> sp.	Viper	Squamata	All types	Krecsak 2008
<i>Aegolius funereus</i>	Tengmalm's owl	Strigiformes	Partial	Sorbi 1996
<i>Asio flammeus</i>	Short-eared owl	Strigiformes	Albino	Ross 1963
<i>Bubo virginianus</i>	Great horned owl	Strigiformes	Albino	Ross 1963
<i>Megascops asio</i>	Eastern screech owl	Strigiformes	Albino	Holt et al. 1995

<i>Strix nebulosa</i>	Great grey owl	Strigiformes	Albino	Hertzel 2006
<i>Strix nebulosa</i>	Great grey owl	Strigiformes	Partial	Alaja and Mikkola 1997
<i>Strix nebulosa</i>	Great grey owl	Strigiformes	Leucistic	Lehto and Henry 1995
<i>Strix varia</i>	Barred owl	Strigiformes	Leucistic	Grosshuesch 2006
<i>Strix varia</i>	Barred owl	Strigiformes	Albino	Ross 1963
<i>Struthio camelus</i>	Ostrich	Struthioniformes	Albino	Weird Science 2008
<i>Chelydra serpentina</i>	Snapping turtle	Testudines	Albino	Williams and Arnold 1992
<i>Chelydra serpentina</i>	Snapping turtle	Testudines	Albino	Saumure and Rodriguez 1998
<i>Chrysemys picta</i>	Painted turtle	Testudines	Albino	Norden 1996
<i>Trachemys scripta</i>	Red eared slider	Testudines	Albino	Weird Science 2008
<i>Lissemys punctata</i>	Spitted flap-shell turtle	Testudines	Albino	Hossain and Sarker 1999
<i>Narcine entemedor</i>	Electric ray	Torpediniformes	Albino	Sandoval-Castillo et al. 2006
<i>Torpedo torpedo</i>	Common torpedo	Torpediniformes	Albino	Sandoval-Castillo et al. 2006
<i>Narcine entemedor</i>	Giant electric ray	Torpeniniformes	Partial	Sandoval-Castillo et al. 2006

APPENDIX II

COMPILATION OF NORTH AMERICAN ALBINO BIRD SPECIES BY FAMILY (GROSS 1965)

Family	# of Species	# of Individuals	Family	# of Species	# of Individuals
Gaviidae	2	5	Strigidae	5	9
Podicipedidae	5	11	Caprimulgidae	2	5
Procellariidae	3	7	Apodidae	1	6
Sulidae	1	1	Trochilidae	4	16
Phalacrocoracidae	2	4	Trogonidae	1	1
Ardeidae	6	12	Alcedinidae	1	3
Threskiornithidae	2	5	Picidae	10	48
Anatidae	35	155	Tyrannidae	11	30
Cathartidae	2	12	Alaudidae	2	5
Accipitridae	10	48	Hirundinidae	8	67
Falconidae	4	5	Corvidae	11	116
Tetraonidae	6	32	Paridae	3	16
Phasianidae	8	99	Sittidae	2	6
Meleagrididae	1	8	Troglodytidae	3	6
Gruidae	1	2	Mimidae	4	73
Rallidae	5	19	Turdidae	14	214
Haematopodidae	1	1	Sylviidae	1	6
Charadriidae	2	4	Motacillidae	3	9
Scolopacidae	17	39	Bombcylidae	2	8
Recurvirostridae	2	2	Laniidae	1	1
Phalaropodidae	1	1	Sturnidae	1	12
Stercorariidae	1	3	Vireonidae	1	1
Laridae	10	33	Parulidae	11	31
Alcidae	7	27	Ploceidae	2	109
Columbidae	2	5	Icteridae	16	188
Psittacidae	1	1	Thraupidae	2	15
Cuculidae	3	9	Fringillidae	42	296

APPENDIX III

COMPILATION OF BRITISH ALBINO BIRD SPECIES BY FAMILY (SAGE 1963)

Family	# of Species	# of Individuals	Family	# of Species	# of Individuals
Colymbidae	1	1	Caprimulgidae	1	10
Podicipidae	2	6	Apodidae	1	15
Procellariidae	1	6	Picidae	4	4
Sulidae	1	1	Alaudidae	3	64
Phalacrocoracidae	2	11	Hirundinidae	3	233
Ardeidae	2	10	Corvidae	6	356
Anatidae	16	69	Paridae	5	14
Falconidae	9	38	Sittidae	1	1
Tetraonidae	3	23	Certhiidae	1	1
Phasianidae	2	97	Troglodytidae	1	12
Rallidae	4	70	Cinclidae	1	2
Haematopodidae	1	38	Turdidae	12	902
Charadriidae	5	96	Sylviidae	7	28
Scolopackidae	14	137	Regulidae	1	2
Burhinidae	1	1	Muscicapidae	1	9
Stercorariidae	1	1	Prunellidae	1	65
Laridae	11	34	Montacillidae	5	51
Alceidae	3	19	Laniidae	2	4
Columbidae	4	40	Sturnidae	1	216
Cuculidae	1	5	Fringillidae	15	203
Strigidae	3	6	Passeridae	2	233

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VITA

Hayley McCardle was born in Garland, Texas on June 29, 1983, the daughter of John and Mary McCardle. After completing her degree at Leander High School in 2001, she began at Texas A&M University in College Station, Texas. She received her Bachelor of Science degree in Wildlife and Fisheries in May 2006. During the next three years she worked as Animal Care Manager at Wildlife Rescue, Inc. and as a veterinary technician at Emancipet in Austin, Texas. In January 2009, she entered Texas State University-San Marcos to start work on her Master of Science degree in Wildlife Ecology.

Permanent E-mail: hmccardle@gmail.com

This thesis was typed by Hayley McCardle.