

**“The Art of Saving Endangered Species”**  
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**The Promise and Peril**

By the end of January, 2008, just short of its 70<sup>th</sup> anniversary, the U.S. Fish & Wildlife Service (USFWS) which is charged with proposing candidates for, and listing threatened and endangered species within the United States, had so designated 607 animal and 744 plant species. Another 4 animal species are currently under “proposed” status for the list, while an additional 142 animal and 139 plant species are now viewed as “candidates” for listing. The goal, of course, is not *merely* to place species on a list. From its beginnings, the USFWS was conceived as both a last chance, as well as a pragmatic, proactive mechanism for mitigating future threats to precious wildlife. Today, the Service has Habitat Conservation Plans in place for 730 species, and “approved recovery plans” for an additional 1116 species.<sup>1</sup>

Each one of these numbers is more than mere cold calculus. Each has an amazing, mysterious face, incalculable biography, dazzling life history, a primeval context that is local, regional, and global. And each one of these listed creatures harbors a common denominator: they are all in dire jeopardy, usually as a result of actions by our own species, whose mixed record of regard for creatures other than ourselves has vacillated. We have manifested actions and feelings ranging from the passion and enchantment of artists, scientists and philosophers, the reverence expressed by spiritual traditions and natural history enthusiasts, and the unconditional love of those who simply “get it”; to far less flattering intentions and behaviors.

Given the extreme mood swings of the human animal, whose footprints are inordinately represented across the landscape, we are confronted with that all too familiar spectacle of ourselves: ungainly beasts in an innocent garden, with capacities that both recommend, and condemn all that we are in the context of biological history. It is a daunting predicament, made more alarming, if interesting, by our dual instincts for survival, and for kindness; selfish genes versus biophilia (interspecies altruism); faith in nature, but possibly less belief in our own species to collectively do the right thing.

Forces we have helped unleash with alarming acceleration, like Global Warming, and what is generally termed the “sixth spasm of extinctions” in the history of life on this planet, are solely our responsibility to rectify and mend, if possible.

Art, the aesthetic conscience, our ability to celebrate and revere nature, as so lovingly exemplified by this exhibition of the Wildling Art Museum, has been deeply woven throughout our evolution, and today helps champion that healing and mending. Enshrouding the exuberant world of wildlife art are the statistics which are undeniably shattering: estimates from countless sources which declare unambiguously that at current trends as much as 40 to 60% of all life forms on Earth could vanish by the 22<sup>nd</sup> century.<sup>2</sup>

Some species are more at risk than others. A third of all amphibians are classified as “Threatened” by the World Conservation Union (IUCN), which has also pointed to the 180 additional creatures identified as being on the brink of extinction, just since 2006, putting the global total of all known creatures at risk at 41,415. Bryophytes, non-flowering plants, are scarcely considered in this estimate, though moss and ferns are multitudinous and hugely vulnerable. Species whose precarious futures exceed “risk,” namely, Rare, Threatened, Endangered and Critically Endangered, numbered 16,116 as of 2006.<sup>3</sup> In that same year, as but one example, the state of California saw the numbers of migrating butterflies, particularly the *Vanessa cardui*, or painted ladies, drop from an observed number of “four per second” (at one site) to four per month.<sup>4</sup> Among the so called “evolutionarily distinct and globally endangered” amphibians, 85% “are receiving little or no conservation attention and will become extinct if action is not taken.”<sup>5</sup>

Yet, even while we are only too reminded of the devastation occurring in what has been, until quite recently, an unabashed Garden of Eden, as painted by Brueghel the Elder and thousands of other landscape artists throughout time, it is imperative to focus on what *works* to restore that paradise, or portions of it, all around us. When the U.S. Senate declared May 11, 2006 “Endangered Species Day”<sup>6</sup> it was done expressly to “encourage the people of the United States to become educated about, and aware of, threats to species, success stories in species recovery, and the opportunity to promote species conservation worldwide.”<sup>7</sup> Among the 100 success stories reported by the Senate, in assessing the efficacy of the 1973 Endangered Species Act (“ESA”), was the marked increase in individuals of Bald Eagle, Whooping Crane, Kirtland’s Warbler, Peregrine Falcon, Gray Whale, Hawaiian Goose, Virginia Big-eared Bat, and the small Texas freshwater vertebrate, the Big Bend Gambusia.

Other listed species have not fared so well. For every success, there are many more declines, including the North Atlantic Right Whale, the Indiana Bat, Eastern Cougar – presumed extinct, Red-cockaded Woodpecker, Atlantic Loggerhead Sea Turtle, Puritan Tiger Beetle, Seabeach Amaranth, Sandplain Gerardia, American Hart’s Tongue, and Northeastern Bulrush.

When the landmark ESA was enacted 35 years ago, there were 78 species placed on the list. By the Act’s 30<sup>th</sup> anniversary, that number had increased to 1,267, and a mere 13 of those species had recovered sufficiently to be removed from the list.<sup>8</sup>

Even without the human presence, all species go extinct, eventually. When we see it happening in our lifetime, however, it is astonishing, at least to those who care. The last known Thylacine, or Tasmanian Tiger, *Thylacinus cynocephalus*, died in the Hobart Zoo on July 9<sup>th</sup>, 1936, though was not declared extinct officially for another 50 years. In painter/naturalist John Gould’s **Mammals of Australia** (1863) he both rendered a magnificent portrait of the Thylacine, whilst predicting the benighted creature’s extinction. Tasmania, he said, was a small island, and people were arriving in droves.<sup>9</sup> The two were incompatible. In the case of the honeyeaters of Hawaii (the Meliphagidae family) we have seen several go extinct, and one of them, the black face po’ouli, *Melamprosops phaeosoma*, is now considered the “most endangered bird in the world”

with three known individuals remaining.<sup>10</sup> The Hawaiian Crow is in a similarly desperate situation. Endemic to Hawaii for at least several hundred thousand years, and still occupying its historical range as recently as 1890, the Crow, or Alala –an icon of Hawaiian indigenous spirituality- presently has no more individuals in the wild, but rather several dozen birds in captivity on two islands, Hawaii and Maui.<sup>11</sup> The last wild pair disappeared, apparently, in 2002, victims of habitat loss, particularly koa wood extraction, non-native fountain grass wildfires in the Alala's dry forest domains, domestic cattle grazing, and the predatory habits of numerous non-native mammals, including the mongoose, dogs and feral cats; all that in addition to hunters taking advantage of the bird's extreme tameness or naivety, introduced diseases like malaria and pox. Such human-induced woes are certainly not unique to this crow species.<sup>12</sup> Of the 71 endemic Hawaiian bird taxa, 23 are extinct, and the 30 remaining are endangered or threatened.<sup>13</sup>

While scientists, government authorities, and citizens who care are struggling to save those threatened and endangered species ("T & E's") that still remain, the very techniques themselves, necessarily involving the continued intervention and monitoring by humans, has called into question what it is we are really accomplishing by some of the more intrusive, redemptive endeavors. A senior representative of one of the Hawaiian indigenous land trusts told me recently that it would be better to let these endangered animals die out, sparing them the indignity of continued heavy human manipulation. Zoologist Richard Dawkins has suggested that natural selection has no foresight when it comes to human-induced events, suggesting that our recent penchant for manipulation may have so called "chosen benefits" that are "counter to genetic benefit(s)."<sup>14</sup>

Sometimes, human activities leave no options whatsoever for species. In 2005 a newly-build Chilean pulp mill annihilated the largest black necked swan population in all of South America.<sup>15</sup>

### **Costs and Complexities**

Humans play God, whether in the form of a pulp mill, or by their decision to eradicate the smallpox virus (other than in two laboratories), euthanize dogs and cats (or other humans), go to war, or let tigers go extinct in increments. Yet, when we give voice to our virtuous propensities, we have demonstrated the ability to resurrect a creature like the California Condor, *Gymnogyps californianus*<sup>16</sup> or American Prairie Bison, *Bison bison* b., both of whose populations had crashed to near extinction. Condor numbers have gone from near twenty, to over 150. Bison, from about two dozen, to over 400,000. Both comebacks are testimony to the power of empathy, and to well conceived conservation plans. Refreshingly, no financial profit was to be entailed by these respective rejuvenations. Instead, some part of our own fragile experience had been spoken to, and the conscience had replied. That is the essence of both conservation biology, and philanthropy. With people doing the right thing, farmers caring for their land, ranchers respecting carrying capacity, volunteers rolling up their sleeves, much can happen at low cost. Moreover, nature's services which are free to all living creatures have been translated into human monetary value of US\$50 trillion per year, at the very minimum. Conservation is the very best investment any society can make.

Which puts necessary expenditures to save species in a proper context. Take, for example, the morning of April 28<sup>th</sup> 2005 when the existence of a single Ivory-Billed Woodpecker, *Campephilus principalis*, presumed extinct for many decades, was reported by scientists in the Arkansas Cache River Wildlife Refuge. The USFWS was prompted to commit US\$5.2 million for a population survey, \$3.4 million for a habitat inventory, and \$16 million should the survival of a single Ivory-Billed Woodpecker be confirmed. This is serious money in the context of the U.S. Government budget for conservation. Of the 547 National Wildlife Refuges throughout America on more than 96 million acres, at least 200 of them have no line items for staffing. Overall, the USFWS has something like a \$2.5 billion budget shortfall.<sup>17</sup> But in the context of the true value of nature, we can not begin to ascertain the monetary value of a species. A tiger, an elephant, a whale, a woodpecker, a human being, a cancer-combating *Catharanthus roseus* (Madagascar Periwinkle) or *Taxus baccata* (English Yew Tree) –these creatures, each and every one are priceless.

In Morocco's Atlas Mountains, recognizing potential eco-tourist revenues from an endangered species, that government has already pre-selected a 40,000 hectare release sight should the supposedly extinct Barbary Lion who turned up at the Hoedspruit Research and Breeding Centre for Endangered Species in South Africa (following his sad career in a bankrupt circus in Mozambique), turn out to be proved genetically distinct.<sup>18</sup> The Moroccan government is gearing up for a rare comeback of an otherwise lost species. The trillion dollar plus- global eco-tourist industry is driven, at least in part, by the desire of people to see rare species before it's too late. But as writer Scott Weidensaul points out, it might be easier to rescue a creature from extinction, than guaranteeing his/her safety back out in the wild, if the prior sojourn amongst humans has undermined the requisite learned behavior necessary for survival away from humans. Or, as in the case of the Gir Lion of India, there is no more wilderness left in which to translocate such creatures in dire straights.

A host of ethical and scientific debates further complicate the status and prospects of endangered species. In Texas and Florida, authorities charged with saving the Florida panther from extinction opted to breed it with members of a sub-species, the Texas Cougar, despite the concerns by many taxonomists that this could set a dangerous precedent, the diffusion of true pedigree species. Others feel we can ill-afford such purist approaches to ecological restoration in the 21<sup>st</sup> century. In any case, numbers of *Felis concolor*, also known as the mountain lion or puma, have resurged from around 30 to well over 90 in less than a decade following the Texas/Florida endeavor.<sup>19</sup>

Recognizing that most T & E's in America actually occur on private lands, a critical element of the panther's recovery, as outlined in the Multi-Species Recovery Plan for South Florida, is a set of strong incentive programs for landowners. But without a turnaround in the public's appreciation of large native predators, and hence a strong educational and artistic outreach component, that animal's future remains in doubt.

Ultimately, it is habitat protection itself that can best ensure protection, whether one is speaking of the few thousand remaining Kittlitz Murrelets (*Brachyramphus brevirostris*) in Alaska –one of North America’s most endangered seabird- or the 86 remaining Kakapo (*Strigops habroptilus*), New Zealand’s endemic flightless parrot. As of 2007, there were 114,007 protected areas on Earth encompassing approximately 4.7 billion acres, or twelve percent of the terrestrial planet.<sup>20</sup> That may not seem like a lot, in global, relative terms, but in just five of those acres, at Yasuni National Park in Ecuador, for example, more than 700 tree species were discovered. Moreover, in the same park, Terry Erwin, a Smithsonian Institution entomologist, with his colleague Jonathan Coddington found so vast an assemblage of invertebrates as to extrapolate Amazonian insect and spider biodiversity per hectare (2.4 acres): an astonishing 60,000 species.<sup>21</sup> This is the kind of data that has pushed the number of estimated species on Earth to nearly 100 million.<sup>22</sup> The number may go higher, following biodiversity surveys of new habitats in the Antarctic, and far more work to be done to understand and protect the vast biological richness of the oceans. Such data translates into an even more impressive and urgent imperative: act now, for there is so *very much* to lose.

### **The Artist’s Critical Role**

Given such circumstances, 21<sup>st</sup> century artists have incredible opportunities like never before to make huge differences in our relationship to, and respect for life. They can wake people up in a way that all the scientific data cannot. Artists reach into the interpretive, subjective realms of emotion that transcends the strict logic of computational analysis. They reveal unprecedented perspectives, loyalty and insight that can help those who may not have the skills or interest to seek out and interpret genetic nuances, faunal assemblage quanta, aerial telemetry, or the physiological measurements of a Florida Panther or, for that matter, the Florida Scrub-Jay, also endangered, and making her appearance in this exhibition.

Artists remind us that such creatures as the remarkable Gila County, Arizona Sonoran Tiger Salamander and white-flowering Hawaiian *Hibiscus arnottianus* are gorgeous, special beings, and we who share the world with them have it in our power to advocate for their beauty, their uniqueness, before we lose them altogether.

In the past, whether speaking of Audubon and his followers, or New Zealand’s greatest chronicler of avifauna, Walter Henry Buller, artists (until quite recently) found themselves frequently painting dead animals, stuffed animals, birds deliberately killed for collections. When Buller’s first edition of **A History of The Birds of New Zealand** appeared in 1873 with hand-colored chromolithographs by the great painter/naturalist J.G.Keulemans, New Zealand had already become famed as a bird capital of extinctions. Fourteen species of ground-dwelling moa (*Dinornis* genus), some weighing probably 500 pounds and numbering in the millions of individuals, had been exterminated. Like the Mauritius extinction of dodos, the killing of every last Great Auk in the North Atlantic, and the loss of America’s two known native parrots species,<sup>23</sup> works like those of Buller and Keulemans underscore the evolution of a sensibility that would look back in its own time with wonder at the rapidity with which creatures could disappear.

Audubon himself was often featured with his rifle in hand and by his own admission thought nothing of shooting a hundred birds in a day. He once declared that there was no way the Passenger Pigeon (*Ectopistes migratorius*) would ever be endangered, given what he rightly perceived to be the most numerous avian to probably ever grace the skies of North America. In fact, A. W. Schorger, a leading specialist on the pigeon, believed it may have accounted for up to 40 percent of all terrestrial birds in the U.S.<sup>24</sup> John Muir, who personally witnessed the horrific slaughter of these birds, was less confident when he wrote, “When the pigeon hunters attack the breeding-places they sometimes cut the timber from thousands of acres. Millions are caught in nets...are taken to New York, where they are sold for a cent apiece.”<sup>25</sup> Those are the ones that survived. Most did not, and by 1914 when Martha, the last known Passenger Pigeon, died in the Cincinnati Zoo, America was focused on a different war, one just beginning.

And while Americans, like most people who encounter another avian icon, the parrots of the world, would favor them as pets, and painters interpret all of nature’s own great works onto the canvas, Errol Fuller in his brilliant and heartbreaking book **Extinct Birds** points out, “Parrots are probably the most popular of all birds. Yet, human interest and favour do not seem to have done them very much good.”<sup>26</sup>

And it’s mostly true. But there *has* been a sea change. Most artists, and those who celebrate art, prefer to observe without intrusion. More and more scientists are finding non-lethal ways to study life. The days of seeking stuffed collections are nearly over. Artists and scientists working together can reach the public and advocate for change. For New Zealand’s endemic huia (*Heteralocha acutirostris*) Buller himself pushed for successful legal protections in 1892. Keulemans had beautifully painted the birds, with the male and female revealing their totally different beaks (the female’s beak is hooked like that of a nectar feeder). But it was too late. The last known huia would die in 1907.<sup>27</sup>

### **An Inspirational Challenge: It’s Never Too Late**

For the millions of remaining species on this precious planet, it is not too late. In the California Floristic Province, one of 35 terrestrial hotspots (those areas with the largest aggregates of native flowering plants, but 70% of them already gone), of the original 293,804 km<sup>2</sup>, only 73,451 km<sup>2</sup> of that habitat remains undisturbed.<sup>28</sup> That is still a large amount of territory. And it does not begin to account for lands and waterways which can yet be restored, providing those who care, and/or are duly charged with enforcing the conservation laws of the United States, act responsibly to help engender life, to assiduously respect and protect the bounty we have all been blessed with.

Santa Barbara County, in which the Wildling Art Museum is located, has at least ten threatened and endangered species.<sup>29</sup> Residents must make choices about their future, and that of their children. Will they do nothing to stand in the way of future extinctions, thus ushering in what has also been perceived as “the extinction of experience”<sup>30</sup> or embrace that which E.O. Wilson has characterized as nothing more complicated than “a love of the Creation”<sup>31</sup> Will people help to nurture and protect the biological miracles of their

neighborhoods, or give up, turn away, and ignore that which is most meaningful in our lives: life itself?

The issues swirling around this nation's precious biodiversity should be simple, but, alas, are not. For just one of the endangered species within the Santa Barbara region, the (SB) California Tiger Salamander (*Ambystoma californiense*), cost estimates to protect its habitat have (not without debate) ranged from between "\$106 million and \$418 million over the next 25 years".<sup>32</sup> But there are many ways that people can work effectively to help the Tiger Salamander. Joining organizations such as The Land Trust for Santa Barbara County<sup>33</sup> which has protected well over 13,000 acres, is one option. Taking inspiration from the Wildling Art Museum exhibition, another.

The artists represented in this exhibition "Endangered Species: Flora and Fauna In Peril" have dreamt, felt, and provocatively observed, assuming their place in a history of other naturalist artists who have engaged, rather than retreating from, the world. That said, never have the stakes been so intense, with so much life hanging in the balance of what it is we, as a species, chose to do with our gifts, our power, and our conscience.

When Katharine Lee Bates wrote the words "America the beautiful," back in 1893, from a mountaintop in Colorado; and when, in 1876, seated along the banks of Beaver Creek, in Kansas, Dr. Brewster Higley imagined a place in which "the buffalo roam, where the deer and the antelope play; where never is heard a discouraging word" they were dreaming in an era of much greater innocence; a century that had not yet heard about the possibility of 50% or more of all life on Earth going extinct.

Today's artists are confronted with a chilling context in which to work; one that lends extraordinary importance to their poetic truths and sobering insights, as it does to those many emotional responses that viewers of their work will inevitably come away with.

#### **Endnotes:**

\*1 See TESS, USFWS Threatened and Endangered Species System, [http://ecos.fws.gov/tess\\_public/SummaryStatistics.do](http://ecos.fws.gov/tess_public/SummaryStatistics.do)

\*2 Mass Extinction Underway, Majority of Biologists Say," by Joby Warrick, Washington Post, April 21, 1998: "A majority of the nation's biologists are convinced that a 'mass extinction' of plants and animals is underway that poses a major threat to humans in the next century, yet most Americans are only dimly aware of the problem, a poll says, quotes Warrick. See <http://www.well.com/~davidu/extinction.htm>

\*3 See [www.iucn.org/themes/ssc/redlist2006/redlist2006.htm](http://www.iucn.org/themes/ssc/redlist2006/redlist2006.htm)

\*4 "California sees fewest butterflies in 40 years," The Associated Press, May 10, 2006, <http://msnbc.msn.com/id/12720318/print/1/displaymode/1098/>

\*5 See “‘Weirdos’ are close to dying,” January 23, 2008, na., The New Zealand Herald, [www.nzherald.co.nz/category/story.cfm?c\\_id=39&objectid=10488166](http://www.nzherald.co.nz/category/story.cfm?c_id=39&objectid=10488166). See also, **Conservation of Rare or Little-Known Species –Biological, Social, and Economic Considerations**, ed. By Martin G. Raphael and Randy Molina, Foreword by Nancy Molina, Island Press, Washington D.C., 2007.

\*6 See 109<sup>th</sup> Congress 2d Session, O:\bag\BAG06249.xml

\*7 See “The Road to Recovery,” [www.esasuccess.org/reports/main](http://www.esasuccess.org/reports/main) 1.html

\*8 See **The Endangered Species Act At Thirty – Conserving Biodiversity in Human-Dominated Landscapes**, Volume 2, Ed. By J.Michael Scott, Dale D. Goble, and Frank W. Davis, from the Introduction, p.3.

\*9 See [www.dpiw.tas.gov.au/inter.nsf/WebPages/BHAN-53777B](http://www.dpiw.tas.gov.au/inter.nsf/WebPages/BHAN-53777B)

\*10 See **No Turning Back –The Life And Death Of Animal Species**, by Richard Ellis, HarperPerennial, 2005, p.153.

\*11 See “Draft Revised Recovery Plan for the Alala (*Corvus hawaiiensis*),” U.S. Fish and Wildlife Service, Portland, October 2003.

\*12 See “Translocations in a Global Context,” by Michael Tobias, DSF, “DSF/Maungatautari Translocation Workshop,” November, 2006.

\*13 See “Hawaii’s Endemic Birds,” by James D. Jacobi and Carter T. Atkinson, <http://biology.usgs.gov/s+t/noframe/t018.htm>.

\*14 See \*p.10, “California Wild,” The Magazine of the California Academy of Sciences, Winter 1998, Vol. 51:1, p.10, [www.calacademy.org/calwild/1998Winter/stories/Darwin.html](http://www.calacademy.org/calwild/1998Winter/stories/Darwin.html)). See also “Conservation units and translocations: strategies for conserving evolutionary processes,” Craig Mortiz, *Hereditas* 130: 217-228 [1999], p.224.

\*15 See [www.worldwildlife.org/news/displayPR.cfm?prID=221](http://www.worldwildlife.org/news/displayPR.cfm?prID=221)

\*16 See [www.esasuccess.org/reports/profile\\_pages/CaliforniaCondor.html](http://www.esasuccess.org/reports/profile_pages/CaliforniaCondor.html)

\*17 See “Federal law works, but program is underfunded,” by Josh Pollock, Conservation Director, Center for Native Ecosystems, “Perspective,” The Denver Post, April 1, 2007, p.E1.

\*18 See “The Last Gladiators,” by Scott Weidensaul, *Conservation Magazine*, Vol. 8, No.3, July-Sept., 2007, pp.19-21.

\*19 See Captive Propagation, Introduction, and Translocation Programs for Wildlife Vertebrates, by Joshua Dein, Kathryn Converse, and Christy Wolf,” Journal of Zoo and Wildlife Medicine, 24:265-270, <http://biology.usgs.gov/s+t/noframe/u219.html>. See also, “Genetic Data and the Listing of Species Under the U.S. Endangered Species Act,” by Sylvia M. Fallon, Conservation Biology Volume 21, No.5, pp.1186-1195. As Fallon points out, at least 38 decisions by the USFWS to list a species as Endangered, between February 1996 and February 2006 were predicated on genetic data, including the listing of the Santa Barbara California tiger salamander, discussed elsewhere in this essay.

\*20 See **Sanctuary –Global Oases of Innocence**, by Michael Tobias and Jane Gray Morrison, A Dancing Star Foundation Book, Council Oak Books, San Francisco and Tulsa, 2008, from the “Introduction”.

\*21 “How did paradise begin?” by Bob Holmes and Gabrielle Walker, New Scientist, September 21, 1996, p.34.

\*22 See Terry L. Erwin, "The Tropical Forest Canopy: The Heart of Biotic Diversity," in E.O.Wilson, ed., **Biodiversity**, National Academy Press, Washington, D.C., 1988, pp.123-129; See also, Terry Erwin, "Biodiversity at Its utmost: Tropical Forest Beetles, In **Biodiversity II**, ed. by M.L.Reaka-Kudla, D.E. Wilson, and E.O.Wilson, Joseph Henry Press, Washington, D.C., pp.27-40.

\*23 The last wild Carolina Parakeet (*Conuropsis carolinensis*) was killed in Florida in 1904 and, as in the case of Martha, the last Passenger Pigeon, the Cincinnati Zoo again saw the last two captive Carolina Parakeets, Incas and his mate, Lady Jane, die in 1917 and 1918. But to this day, *Rhynchospitta pachyrhyncha*, the thick-billed parrot, can still be found in a few places in New Mexico in the wild. See Florence Merriam Bailey, **Birds of New Mexico**, New Mexico Department of Game and Fish, Albuquerque, 1928. See also “Thick-Billed Parrot Brings Birders to Engle,” New Mexico Wildlife, June, 2004, [www.wildlife.state.nm.us/recreation/birding/documents/Thick-billedParrotBringsBirdersToEngle.htm](http://www.wildlife.state.nm.us/recreation/birding/documents/Thick-billedParrotBringsBirdersToEngle.htm)

\*24 See **Extinct Birds**, by Errol Fuller, Oxford University Press, Tunbridge Wells, Kent, UK, 2000, p.188.

\*25 –See **Muir Among the Animals –The Wildlife Writings of John Muir**, Edited by Lisa Mighetto, Sierra Club Books, 1986, p.77.

\*26 op.cit., Fuller, p.208.

\*27 See **Paintings Of The Birds Of New Zealand – The Art of J. G. Keulemans**, With An Introduction by Ross Galbreath, A Random House Book, New Zealand, 2006, p.12.

\*28 See [www.biodiversityhotspots.org/xp/Hotspots/california\\_floristic/](http://www.biodiversityhotspots.org/xp/Hotspots/california_floristic/)

\*29 See “Threatened and Endangered Species,”

[www.redshift.com/~bigcreek/projects/natural\\_history/7th\\_meeting/Los%20Padres%20TES%20Species%20List.doc](http://www.redshift.com/~bigcreek/projects/natural_history/7th_meeting/Los%20Padres%20TES%20Species%20List.doc)

\*30 See “The Extinction of Experience: A Threat to Insect Conservation? By Oliver D. Cheesman and Roger S. Key, in **Insect Conservation Biology –Proceedings of the Royal Entomological Society’s 23<sup>rd</sup> Symposium**, Ed. By A.J.A.Stewart, T.R.New, and O.T.Lewis, CAB International, Cambridge Massachusetts, 2007, pp.322-348.

\*31 See **The Creation – An Appeal To Save Life On Earth**, Edward O. Wilson, W.W.Norton & Company, New York, p.168.

\*32 See “Costs of Conservation Actions for Santa Barbara County Population of California Tiger Salamander Released,” October 7, 2004, U.S.Fish & Wildlife Service News Release.

\*33 See [www.sblandtrust.org/membership.html](http://www.sblandtrust.org/membership.html)