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CDF Checklist of Galapagos Introduced Vertebrates

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Abstract

This Checklist of Galapagos Introduced Vertebrates includes a total of all 36 taxa reported from the Galapagos Islands.

For each name, detailed information is provided: its Galapagos distribution in islands groups or bioregions generated from the specimen records, comments about the taxonomy (especially synonyms), the origin (native and introduced), taxon status (accepted vs. rejected records) and relevant literature references.

Introduction

This publication lists all species of Galapagos Introduced Vertebrates currently known.

Relatively few vertebrate species are known to be introduced to Galapagos. The large majority of vertebrates were brought to Galapagos on purpose. They were introduced for human benefit, such as horses, donkeys, goats, pigs, cattle, dogs and cats. Others, like mice and rats, arrived unintentionally as soon as the first humans explored this archipelago.

Although the checklist of introduced vertebrates is quite short and relatively few species were introduced, vertebrates continue to be among the most damaging invaders of the Galapagos natural ecosystems.

Among the worst species are the Norwegian Rat (*Rattus norvegicus*) and the House or Black Rat (*Rattus rattus*); both not only cause economic damage, but they are also effective predators of native species. On many islands introduced rats have caused the extinction of endemic rice rat species.

The damage caused by invasive vertebrate species is especially great on the inhabited islands. Cats (*Felis catus*) continue to represent a huge threat to native and endemic bird populations. Feral pigs (*Sus scrofa*) and donkeys (*Equus asinus*) disturb regeneration of natural vegetation, and for many years goats (*Capra hircus*) completely devastated the natural vegetation on most Galapagos Islands.

Introduced already by whalers and pirates, the first human visitors to the Galapagos, the eradication of goats began relatively late. Between 1954 and 1959 goats were first successfully eradicated from Pinta and subsequently on a few of the smaller islands.

In 1998, a large-scale eradication project began on the islands of Isabela (Volcán Alcedo) and Santiago. During this Isabela Project, the Charles Darwin Foundation and the Galapagos National Park jointly targeted feral goats with an array of different hunting techniques: using specially trained dogs, small teams of park rangers hunting on foot, tracing sterilized “Judas” goats equipped with radio collars, helped by helicopter hunts and aerial surveys.

Eight years later, in 2006 the project concluded successfully, reporting that all goats had been eradicated from

two islands of unprecedented size.

This success clearly demonstrates that eradication of vertebrate species is feasible. Unlike invertebrates, which are very difficult to target because of their enormous quantities and effective reproduction strategies and unlike plants, which survive most eradication efforts because of their seed banks, the eradication of vertebrates does not represent such a huge challenge.

Larger animals can be hunted successfully and smaller ones are typically targeted quite effectively with venom. Large scale application of poisoned bait, however, is not without risk for non target species and in 2010/2011 trial eradications of the two introduced rat species are under way for the smaller islands Bartolomé and Rabida.

Methods

This checklist of all known Galapagos Introduced Vertebrates is automatically generated using the online database of the Charles Darwin Foundation Galapagos Species Checklist.

All CDF Galapagos Species Checklists represent the synthesis of many different records: literature citations, data from previously unpublished reports (grey literature), specimen records of natural history collections located in Galapagos and all over the world. To the best of their knowledge authors of the individual checklists revised all available data. When new information becomes available, the taxonomy of a group changes or new species are discovered, the CDF online database and thus this publication becomes updated.

For many poorly known species groups the higher taxonomic classification still regularly changes according to how our knowledge about species being related changes. In many well known groups the phylogeny is somewhat stable, but to avoid confusion, in particular for groups where taxonomic changes are frequent, all checklists presented here are sorted alphabetical according to genus name and specific epithet. Please refer to the website for the currently accepted taxonomic hierarchy of each group.

Please be aware that the distribution presented here is automatically generated from specimen records and does not always accurately reflect the known distribution for all species.

For marine species, the distribution generally refers to the five main bioregions of the archipelago (Far Northern, Northern, Western, South Eastern and the Elisabeth Bay Bioregion). For the terrestrial species more than 120 islands, islets and small rocks have been aggregated into Islands Groups, thus, for example, the island group "Santa Cruz" includes smaller islands like Santa Fé, Plaza Norte, Plaza Sur, Baltra, Daphne Mayor, Daphne Minor, and others.

IUCN red-list assessments presented here may deviate from the global IUCN list for the following reasons:

- for well known species groups like vascular plants or vertebrates updates proposed to the IUCN are shown instead of the outdated, but currently accepted status;
- for poorly known species groups (e.g., lichenized fungi) a general assessment is currently not possible and the list presented here is a regional red-list list for Galapagos archipelago.

Numbers of the species included in this list are auto-generated. Adding up the number of species in each category will not always equal the total number indicated. Some species have insufficient data to be categorized while others (e.g., category eradicated) will not be included in the total.

Results

Names of taxa included in this checklist: 36 (35 accepted), 1 rejected.

Origin of the taxa included: 16 accidental, 7 cultivated, 1 eradicated, 7 escaped, 5 intercepted.

1. ***Anas platyrhynchos*** Linnaeus, 1758
   Taxon status: Accepted name; taxon occurs in Galapagos.
   Origin: Introduced, Cultivated.
   Galapagos Distribution: Isabela, San Cristóbal, Santa Cruz.
   References: Jiménez-Uzcátegui, G. et al. (2007), Meyer De Schauensee, R.M. et al. (1966).

2. ***Anser anser*** Linnaeus, 1758
   Taxon status: Accepted name; taxon occurs in Galapagos.
   Origin: Introduced, Cultivated.
   Galapagos Distribution: San Cristóbal, Santa Cruz.
   References: Jiménez-Uzcátegui, G. et al. (2007).

3. ***Aratinga erythrogenys*** Lesson, 1844
   Taxon status: Accepted name; taxon occurs in Galapagos.
   Origin: Introduced, Accidental.
   Galapagos Distribution: San Cristóbal.
   References: Jiménez-Uzcátegui, G. et al. (2007), Vargas, H. et al. (1996), Wiedenfeld, D.A. et al. (2006).

4. ***Bos taurus*** Linnaeus, 1758
   Taxon status: Accepted name; taxon occurs in Galapagos.
   Origin: Introduced, Escaped.
   Galapagos Distribution: Floreana, Isabela, San Cristóbal, Santa Cruz.
   References: Hoeck, H.N. et al. (1984), Jiménez-Uzcátegui, G. et al. (2007), Wolf, T. et al. (1892).

5. ***Bubulcus ibis*** Linnaeus, 1758
   Taxon status: Accepted name; taxon occurs in Galapagos.
   Origin: Introduced, Accidental.
   Galapagos Distribution: Floreana, Isabela, San Cristóbal, Santa Cruz.
   References: Hickin, N. et al. (1979), Jiménez-Uzcátegui, G. et al. (2008), Jiménez-Uzcátegui, G. et al. (2007), Lévêque, R. et al. (1966), Pérez, S. et al. (1987), Swash, A. et al. (2000), Wiedenfeld, D.A. et al. (2006).

6. ***Canis lupus familiaris*** Linnaeus, 1758
   Taxon status: Accepted name; taxon occurs in Galapagos.
   Origin: Introduced, Escaped.
   Galapagos Distribution: Floreana, Isabela, San Cristóbal, Santa Cruz.
   References: Barnett, B.D. et al. (1986), Gingrich, E.N. et al. (2010), Heyerdahl, T. et al. (1956), Hickin, N. et al. (1979), Hoeck, H.N. et al. (1984), Jiménez-Uzcátegui, G. et al. (2007), Levy, J.K. et al. (2008), Tapia, W. et al. (2000).

7. ***Capra hircus*** Linnaeus, 1758
   Taxon status: Accepted name; taxon occurs in Galapagos.
   Origin: Introduced, Escaped.
   Galapagos Distribution: Española, Floreana, Isabela, Marchena, Pinta, San Cristóbal, Santa Cruz, Santa Fé, Santiago.
   References: Black, J. et al. (1973), Campbell, K. et al. (2004), Hamann, O. et al. (1975), Heyerdahl, T. et al. (1956), Hickin, N. et al. (1979), Hoeck, H.N. et al. (1984), Jiménez-Uzcátegui, G. et al. (2007).

8. ***Cavia porcellus*** Linnaeus, 1758
   Taxon status: Accepted name; taxon occurs in Galapagos.
   Origin: Introduced, Accidental.

Galapagos Distribution: Isabela, San Cristóbal, Santa Cruz.
References: Hoeck, H.N. et al. (1984), Jiménez-Uzcátegui, G. et al. (2007), Patry, M. et al. (2002).

9. ***Columba livia*** Gmelin, 1789
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Introduced, Eradicated.
Galapagos Distribution: Isabela, San Cristóbal, Santa Cruz.
References: Harmon, W.M. et al. (1987), Jiménez-Uzcátegui, G. et al. (2007), Padilla, L.R. et al. (2004), Parker, P.G. et al. (2006), Wiedenfeld, D.A. et al. (2006).

10. ***Coturnix coturnix*** Linnaeus, 1758
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Introduced, Accidental.
Galapagos Distribution: Santa Cruz.
References: Jiménez-Uzcátegui, G. et al. (2007).

11. ***Crotophaga ani*** Linnaeus, 1758
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Introduced, Escaped.
Galapagos Distribution: Fernandina, Floreana, Genovesa, Isabela, Marchena, Pinta, Pinzón, San Cristóbal, Santa Cruz, Santiago.
References: Fessl, B. et al. (2002), Harris, M.P. et al. (1973), Jiménez-Uzcátegui, G. et al. (2008), Jiménez-Uzcátegui, G. et al. (2007), Patry, M. et al. (2002), Tapia, W. et al. (2000), Wiedenfeld, D.A. et al. (2006).

12. ***Equus asinus*** Linnaeus, 1758
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Introduced, Escaped.
Galapagos Distribution: Floreana, Isabela, San Cristóbal, Santa Cruz, Santiago.
References: Carrión, V. et al. (2006), Coulter, J. et al. (1845), Jácome, M. et al. (1989), Jiménez-Uzcátegui, G. et al. (2007).

13. ***Equus caballus*** Linnaeus, 1758
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Introduced, Accidental.
Galapagos Distribution: Floreana, Isabela, San Cristóbal, Santa Cruz.
References: Carrión, V. et al. (2006), Coulter, J. et al. (1845), Jácome, M. et al. (1989), Jiménez-Uzcátegui, G. et al. (2007).

14. ***Felis catus*** (Schreber, 1775)
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Introduced, Escaped.
Galapagos Distribution: Fernandina, Floreana, Isabela, San Cristóbal, Santa Cruz.
References: Jácome, M. et al. (1989), Jiménez-Uzcátegui, G. et al. (2007), Levy, J.K. et al. (2008), MacDonald, I. A. W. et al. (1987), Naveda, B. et al. (1949), Salvin, O. et al. (1876).

15. ***Gallus gallus*** Linnaeus, 1758
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Introduced, Cultivated.
Galapagos Distribution: Floreana, Isabela, San Cristóbal, Santa Cruz.
References: Gottdenker, N.L. et al. (2005), Jiménez-Uzcátegui, G. et al. (2007), Parker, P.G. et al. (2006), Soos, C. et al. (2008), Thiel, T. et al. (2005), Wiedenfeld, D.A. et al. (2006).

16. ***Gonatodes caudiscutatus*** Günther, 1859
Taxon status: Accepted name; taxon occurs in Galapagos.
Syn.: Gonatodes collaris Garman, 1892.
Origin: Introduced, Accidental.
Galapagos Distribution: San Cristóbal, Santa Cruz.
References: Jiménez-Uzcátegui, G. et al. (2007), Olmedo, L.J. et al. (1994), Olmedo, L.J. et al. (1994), Van Denburgh, J. et al. (1912), Vanzolini, P.E. et al. (1965).

17. ***Homo sapiens sapiens*** Linnaeus, 1758
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Introduced, Cultivated.
Galapagos Distribution: Floreana, Isabela, San Cristóbal, Santa Cruz, Santiago.

18. ***Iguana iguana*** Linnaeus, 1758
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Introduced, Intercepted.
Galapagos Distribution: Isabela, San Cristóbal, Santa Cruz.
References: Jiménez-Uzcátegui, G. et al. (2007).

19. ***Lepidodactylus lugubris*** Duméril & Bibron, 1836
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Introduced, Accidental.
Galapagos Distribution: Isabela, Marchena, San Cristóbal, Santa Cruz.
References: Carrillo, E. et al. (2005), Jiménez-Uzcátegui, G. et al. (2007), Olmedo, L.J. et al. (1994), Olmedo, L.J. et al. (1994), Wright, J.W. et al. (1983).

20. ***Meleagris gallopavo*** Linnaeus, 1758
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Introduced, Cultivated.
Galapagos Distribution: Isabela, Santa Cruz.
References: Jiménez-Uzcátegui, G. et al. (2007).

21. ***Mus musculus*** (Linnaeus, 1758)
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Introduced, Accidental.
Galapagos Distribution: Floreana, Isabela, San Cristóbal, Santa Cruz, Santiago.
References: Harris, D.B. et al. (2006), Hickin, N. et al. (1979), Jácome, M. et al. (1989), Jiménez-Uzcátegui, G. et al. (2007), Patry, M. et al. (2002).

22. ***Numida meleagris*** Linnaeus, 1758
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Introduced, Accidental.
Galapagos Distribution: Isabela, San Cristóbal, Santa Cruz.
References: Jiménez-Uzcátegui, G. et al. (2007).

23. ***Oreochromis niloticus*** (Linnaeus, 1758)
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Introduced, Accidental.
Galapagos Distribution: Santa Cruz.
References: Appeltans, W. et al. (2010), Jiménez-Uzcátegui, G. et al. (2007), Toral, V. et al. (2006).

24. ***Oryctolagus cuniculus*** Linnaeus, 1758
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Introduced, Cultivated.
Galapagos Distribution: San Cristóbal, Santa Cruz.
References: Jácome, M. et al. (1989), Jiménez-Uzcátegui, G. et al. (2007).

25. ***Ovis aries*** Linnaeus, 1758
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Introduced, Cultivated.
Galapagos Distribution: Santa Cruz.
References: Hoeck, H.N. et al. (1984), Jiménez-Uzcátegui, G. et al. (2007), Patry, M. et al. (2002).

26. ***Pavo muticus*** Linnaeus, 1766
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Introduced, Accidental.
Galapagos Distribution: San Cristóbal, Santa Cruz.
References: Jiménez-Uzcátegui, G. et al. (2007).

27. ***Phyllodactylus reissii*** Peters, 1862
Taxon status: Accepted name; taxon occurs in Galapagos.
formerly in CDF Checklist as Phyllodactylus reissi but the name was published by Peters (1869) as P. reissii
Origin: Introduced, Accidental.
Galapagos Distribution: San Cristóbal, Santa Cruz.
References: Carrillo, E. et al. (2005), Garman, S. et al. (1892), Jiménez-Uzcátegui, G. et al. (2007), Olmedo, L.J. et al. (1994), Olmedo, L.J. et al. (1994), Peters, W.C.H. et al. (1862), Slevin, J.R. et al. (1935), Uetz, P. et al. (2013).

28. ***Podocnemis unifilis*** Troschel, 1848
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Introduced, Intercepted.
IUCN Red List: Vulnerable.
Galapagos Distribution: San Cristóbal.
References: Jiménez-Uzcátegui, G. et al. (2007).

29. ***Rattus norvegicus*** Berkenhout, 1769

Taxon status: Accepted name; taxon occurs in Galapagos.

Origin: Introduced, Accidental.

Galapagos Distribution: Floreana, Isabela, San Cristóbal, Santa Cruz, Santiago.

References: Harris, D.B. et al. (2006), Jácome, M. et al. (1989), Jiménez-Uzcátegui, G. et al. (2007).

30. ***Rattus rattus*** Linnaeus, 1758

Taxon status: Accepted name; taxon occurs in Galapagos.

Origin: Introduced, Accidental.

Galapagos Distribution: Fernandina, Floreana, Isabela, Marchena, Pinzón, San Cristóbal, Santa Cruz, Santiago.

References: Harris, D.B. et al. (2006), Hickin, N. et al. (1979), Jácome, M. et al. (1989), Jiménez-Uzcátegui, G. et al. (2007).

31. ***Rhinella marina*** (Linnaeus, 1758)

Taxon status: Accepted name; taxon occurs in Galapagos.

Syn.: Bufo sp.; Rana marina, Linnaeus, 1758; Bufo marinus (Linnaeus, 1758), Rhinella marinus (Linnaeus, 1758); Bufo brasiliensis Laurenti, 1768; Bufo horridus Daudin, 1803; , Bombinator maculatus Merrem, 1820; Bufo albicans Spix, 1824; Bufo lazarus Spix, 1824; Bufo horribilis Wiegmann, 1833; Bufo pithecodactylus Werner, 1899; Bufo angustipes Taylor & Smith, 1945; Bufo pythecodactylus Werner, 1961

Origin: Introduced, Intercepted.

Galapagos Distribution: San Cristóbal.

References: Jiménez-Uzcátegui, G. et al. (2007).

32. ***Saguinus oedipus*** Linnaeus, 1758

Taxon status: Accepted name; taxon occurs in Galapagos.

Origin: Introduced, Intercepted.

Galapagos Distribution: San Cristóbal.

References: Jiménez-Uzcátegui, G. et al. (2007).

33. ***Scinax quinquefasciatus*** Fowler, 1913

Taxon status: Accepted name; taxon occurs in Galapagos.

Origin: Introduced, Accidental.

Galapagos Distribution: Isabela, San Cristóbal, Santa Cruz.

References: Jiménez-Uzcátegui, G. et al. (2007), Patry, M. et al. (2002), Snell, H.L. et al. (1999), Tapia, W. et al. (2000), Vintimilla, J.E. et al. (2005).

34. ***Sus scrofa*** Linnaeus, 1758

Taxon status: Accepted name; taxon occurs in Galapagos.

Origin: Introduced, Escaped.

Galapagos Distribution: Floreana, Isabela, San Cristóbal, Santa Cruz.

References: Cruz, F. et al. (2005), Hickin, N. et al. (1979), Hoeck, H.N. et al. (1984), Jácome, M. et al. (1989), Jiménez-Uzcátegui, G. et al. (2007), Wolf, T. et al. (1892).

35. ***Trachemys scripta*** (Schoepff, 1792)
Taxon status: Accepted name; taxon occurs in Galapagos.
Syn.: Chrysemys scripta (Schoepff, 1792), Trachemys scripta Schoepff, 1792
Origin: Introduced, Intercepted.
IUCN Red List: Least Concern.
Galapagos Distribution: San Cristóbal, Santa Cruz.
References: Jiménez-Uzcátegui, G. et al. (2007).

Rejected taxa

1. *Phyllodactylus tuberculosus* Wiegmann, 1835
Two specimens collected from San Cristobal in 1888 by J.R. Slevin (see Van Denburgh, 1912), and it had a mistake in the identification (see Taylor 1942). Also, J. Olmedo collected on the same Island a juvenile specimen (?) in 1992, but it was a bad identification (Olmedo`s thesis did`t present this record).

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References

1. Appeltans, W., Bouchet, P., Boxshall, G.A., Fauchald, K., Gordon, D.P., Hoeksema, B.W., Poore, G.C.B., van Soest, R.W.M., Stöhr, S., Walter, T.C., Costello, M.J. (eds.) (2010) *World Register of Marine Species (WoRMS).* Available online at http://www.marinespecies.org.

2. Barnett, B.D. (1986) *Eradication and control of feral and free ranking dogs in the Galápagos Islands.* Proc. Vertebr. Pest Conf. 12: 358-368.

3. Black, J. (1973) *Galápagos. Archipiélago del Ecuador.* Imp. Europa (CDF & WWF), Quito, 1-138.

4. Campbell, K., Donlan, J., Cruz, F. & Carrión, V. (2004) *Eradication of Feral Goats Capra hircus from Pinta Island, Galápagos, Ecuador.* Oryx 38(3): 328-333.

5. Carrillo, E., Aldás, S., Altamirano, M.A., Ayala-Varela, F., Cisneros-Heredia, D.F., Endara, A., Márquez, C., Morales, M., Nogales-Sornosa, F., Salvador, P., Torres, M.L., Valencia, J., Villamarín-Jurado, F., Yánez-Muñoz, M.H. & Zárate, P. (2005) *Lista Roja de los Reptiles del Ecuador.* Fundación Novum Milenium, UICN-Sur, UICN-Comité Ecuatoriano, Ministerio de Educación y Cultura, Serie Proyecto PEEPE. Quito, 46 pp.

6. Carrión, V., Donlan, J., Campbell, K., Lavoie, C. & Cruz, F. (2006) *Feral Donkey (Equus asinus) Eradications in the Galápagos.* Biod. and Cons. DOI 10.1007/s10531-005-5825-7.

7. Coulter, J. (1845) *Adventures in the Pacific; with observations on the natural productions, manners and customs of the natives of the various islands; together with remarks on missionaries, British and other residents, etc.* William Curry, Jun. and Co., Dublin, 290 pp.

8. Cruz, F., Donlan, C.J., Campbell, K., Lavoie, C. & V. Carrión (2005) *Conservation action in the Galapagos: feral pig Sus scrofa eradication from Santiago Island* Biol. Conserv. 121: 473-478.

9. Fessl, B., Tebbich, S. (2002) *Philornis downsi - a recently discovered parasite on the Galápagos archipelago - a threat to Darwin's finches?* Ibis 144: 445-451.

10. Garman, S. (1892) *The reptiles of the Galapagos Islands. From the collections of Dr. George Baur.* Bulletin Essex Inst. 24: 73-87.

11. Gingrich, E.N., Scorza, A.V., Clifford, E.L., Olea-Popelka, F.J., & Lappin, M.R. (2010) *Intestinal parasites of dogs on the Galapagos Islands.* Veterinary Parasitology, 169(3-4): 404-407.

12. Gottdenker, N.L., Walsh, T., Vargas, H., Merkel, J., Jiménez-Uzcátegui, G., J., Miller, R.E., Dailey, M. & Parker, P. (2005) *Assessing the risks of introduced chickens and their pathogens to native birds in the Galápagos Archipelago.* Biological Conservation 126: 429–439.

13. Hamann, O. (1975) *Vegetational changes in the Galapagos Islands during the period 1966-1973.* Biol. Conserv. 7(1): 37-59.

14. Harmon, W.M., Clark, W.A., Hawbecker, A.C. & Stafford, M. (1987) *Trichomonas gallinae in columbiform birds from the Galápagos Islands.* Journal of Wildlife Diseases 23(3): 492-494.

15. Harris, D.B. (2006) *Introduced black rats abd endemic Galapagos rice rats: competition, coexistence and conservation.* A thesis submitted for the degree of Doctor of Philosophy. Linacre College, Oxford.

16. Harris, M.P. (1973) *The Galápagos avifauna.* Condor 75(3): 265-278.

17. Heyerdahl, T., Skolsvod, A. (1956) *Archeologycal evidence of pre-Spanish visit to the Galápagos Island.* American Antq. 22: 1-71.

18. Hickin, N. (1979) *Animal life of the Galapagos.* Ferundune Books, Faringdon, U.K., 236 pp.

19. Hoeck, H.N. (1984) *Introduced fauna. In: Perry, R. (ed.): Key environments: Galápagos.* Pergamon Press, Oxford, p. 233-246.

20. Jiménez-Uzcátegui, G., Carrión, V., Zabala, J., Buitrón, P. & Milstead, B. (2007) *Status of introduced vertebrates in Galapagos.* Galapagos Report 2006–2007. Charles Darwin Foundation, Puerto Ayora, p. 136–141.

21. Jiménez-Uzcátegui, G., Milstead, B., Márquez, C., Zabala, J., Buitrón, P., Llerena, A., et al. (2007) *Galapagos vertebrates: endangered status and conservation actions.* Galapagos Report 2006–2007. Charles Darwin Foundation, Puerto Ayora, p. 104–110.

22. Jiménez-Uzcátegui, G., Betancourt, F. (2008) *Avifauna vs automotores.* Informe Galápagos 2007-2008. FCD, PNG & INGALA. Puerto Ayora, Ecuador. p. 111–114.

23. Jácome, M. (1989) *Mamíferos introducidos en Galápagos.* Informe técnico para la Fundación Charles Darwin y Servicio Parque Nacional. Galápagos. Puerto Ayora, Ecuador. 33 pp.

24. Levy, J.K., Crawford, C., Lappin, M.R., Dubovi, E.J,. Levy, M.G., Alleman, R., Tucker, S.J. & Clifford, E.L. (2008) *Infectious diseases of dogs and cats on Isabela island, Galapagos.* Journal of Veterinary Internal Medicine 22: 60-65.

25. Lévêque, R., Bowman, R.I. & Billeb, S.L.. (1966) *Migrants in the Galapagos area.* Condor 68(1): 81-101.

26. MacDonald, I. A. W. (1987) *Estrategias para limitar la invasión de organismos introducidos a las áreas protegidas* Memorias. Investigación Botánica y Manejo en Galápagos. Pg.210-223

27. Meyer De Schauensee, R.M. (1966) *The Species of Birds of South America and their Distribution.* Academy of Natural Sciences of Philadelphia. Pennsylvania.

28. Naveda, B. (1949) *Galápagos a la vista.* Ediciones Últimas Noticias, Quito, Ecuador.

29. Olmedo, L.J., Cayot, L.J. (1994) *Introduced geckos in the towns of Santa Cruz, San Cristobal and Isabela.* Noticias de Galapagos 53: 7-12.

30. Olmedo, L.J. (1994) *Salamanquesas endémicas e introducidas en las islas pobladas de Galápagos.* Tesis de grado previa a la obtención del título de Biología. Facultad de Filosofía Letras y Ciencias de la Educación. Universidad Central del Ecuador. Quito, Ecuador, 110 pp.

31. Padilla, L.R., Santiago-Alarcon, D., Merkel, J., Miller, R.E. & Parker, P.G. (2004) *Survey for Haemoproteus spp., Trichomonas gallinae, Chlamydophila psittaci, and Salmonella spp. in Galapagos Islands Columbiformes.* Journal of Zoo and Wildlife Medicine 35(1): 60–64.

32. Parker, P.G., Whiteman, N.K., & Miller, R.E. (2006) *Conservation medicine on the Galápagos Islands: partnerships among behavioral, population, and veterinarian scientists.* The Auk 123(3): 625-638.

33. Patry, M. (2002) *Estatus de vertebrados introducidos en las islas mayores de Galápagos y estrategias de manejo.* En: Fundación Natura: Informe Galápagos 2001-2002. Quito, Ecuador.

34. Peters, W.C.H. (1862) *Über einen neuen Phyllodactylus aus Guayaquil* Monatsber. königl. Akad. Wiss. Berlin. 1862 (November): 626-627

35. Pérez, S., Nowak, J.B. (1987) *¿Por primera vez anida la Garza Bueyera en Galápagos?* Carta Informativa CDRS 20: 4.

36. Salvin, O. (1876) *On the avifauna of the Galápagos Archipelago.* Transactions of the Zoological Society of London 9: 447-510.

37. Slevin, J.R. (1935) *An account of the reptiles inhabiting the Galápagos Islands.* Bulletin New York Zoological Society 38: 1-24.

38. Snell, H.L., Márquez, C. (1999) *A new class of vertebrates established in Galápagos.* Distributed by e-mail and trough the internet.

39. Soos, C., Padilla, L., Iglesias, A., Gottdenker, N., Cruz Bedon, M., Rios, A. & Parker, P.G. (2008) *Comparison of pathogens in broiler and backyard chickens on the Galapagos Islands: implications for transmission to wildlife.* The Auk 125(2): 445-455.

40. Swash, A., Still, R. (2000) *Birds, mammals, and reptiles of the Galapagos Islands, an identification guide.* Yale University Press, New Haven, Connecticut, USA, 168 pp.

41. Tapia, W., Patry, M., Snell, H. & Carrión, V. (2000) *Estado actual de los vertebrados introducidos a las islas Galápagos.* Fundación Natura: Informe Galápagos 1999-2000. Quito, Ecuador.

42. Thiel, T., Whiteman, N.K., Tirapé, A., Baquero, M. I., Cedeño, V., Walsh, T., Jiménez-Uzcátegui, G. & Parker, P.G. (2005) *Characterization of canary pox-like viruses infecting endemic birds in the Galapagos Islands.* Journal of Wildlife Diseases 41(2): 342-353.

43. Toral, V., Poulsom, T. (2006) *La tilapia Oreochromis niloticus en la Laguna de El Junco, San Cristóbal.* Informe técnico para la Fundación Charles Darwin y Servicio Parque Nacional Galápagos. Puerto Ayora, Ecuador. 5 pp.

44. Uetz, P., Hošek, J. (eds.) (2013) *The Reptile Database* available from http://www.reptile-database.org

45. Van Denburgh, J. (1912) *The geckos of the Galapagos Archipelago. Expedition of the California Academy Sciences to the Galapagos Island 1905-1906.* Proceedings of the California Academy Sciences, fourth series 1: 405-430.

46. Vanzolini, P.E. (1965) *On the gonatodes of the Galapagos Islands (Sauria, Gekkonidae).* Papéis Avulsos de Zoologia 17(2): 17-19.

47. Vargas, H. (1996) *What is happening with the avifauna of San Cristóbal?* Noticias Galápagos 57: 23-24.

48. Vintimilla, J.E. (2005) *Estudios para el control y disminución de ranas Scinax quinquefasciatus, con impactos minimos en los Humedales de Isabela Sur (Islas Galapagos).* Tesis previa la obtención del titulo de Ingeniero Agrónomo. Universidad de Cuenca. Cuenca, Ecuador, 71pp.

49. Wiedenfeld, D.A. (2006) *Aves, the Galapagos Islands, Ecuador.* Check List 2006 2(2): 1-27.

50. Wolf, T. (1892) *Geografía y Geología del Ecuador.* Publicada Orden Supremo Gobierno Repúblia. Leipzig, Quito, (Part 5, El Archipiélago de Galápagos) p. 469-493.

51. Wright, J.W. (1983) *The distribution and status of Gonatodes collaris in the Galápagos Archipelago.* Herpetological Review 14(1): 32.
