

Appendix

We present range maps for the heliconiines below. We applied a revised version of the taxonomy presented by Lamas (2004); table 1 shows the cases where our taxonomy differs from the latter. Unless a reference is given which provides evidence in support of our adopted taxonomy, we treated names as synonyms where we found wing pattern characters to be too variable to permit putative taxa to be consistently distinguished. However, since this is not intended to be a taxonomic revision, we do not make formal taxonomic changes here. Table 2 shows the altitudinal bounds used to clip species ranges. Maps represent species' native ranges, with two exceptions; *Dryadula phaetusa* and *Agraulis vanillae incarnata* have been introduced to southern Florida and the Hawaiian archipelago, respectively (Waage, Smiley, & L. E. Gilbert, 1981). Consequently, their presence in these regions was ignored when conducting the analyses presented in this paper.

Table 1. Nomenclature where different from (Lamas, 2004).

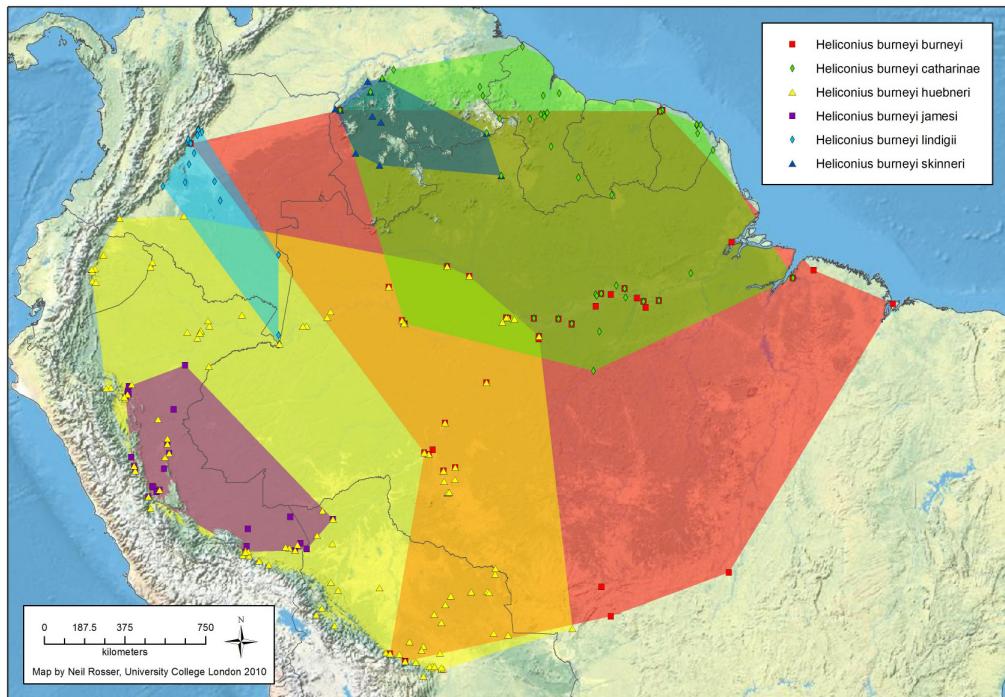
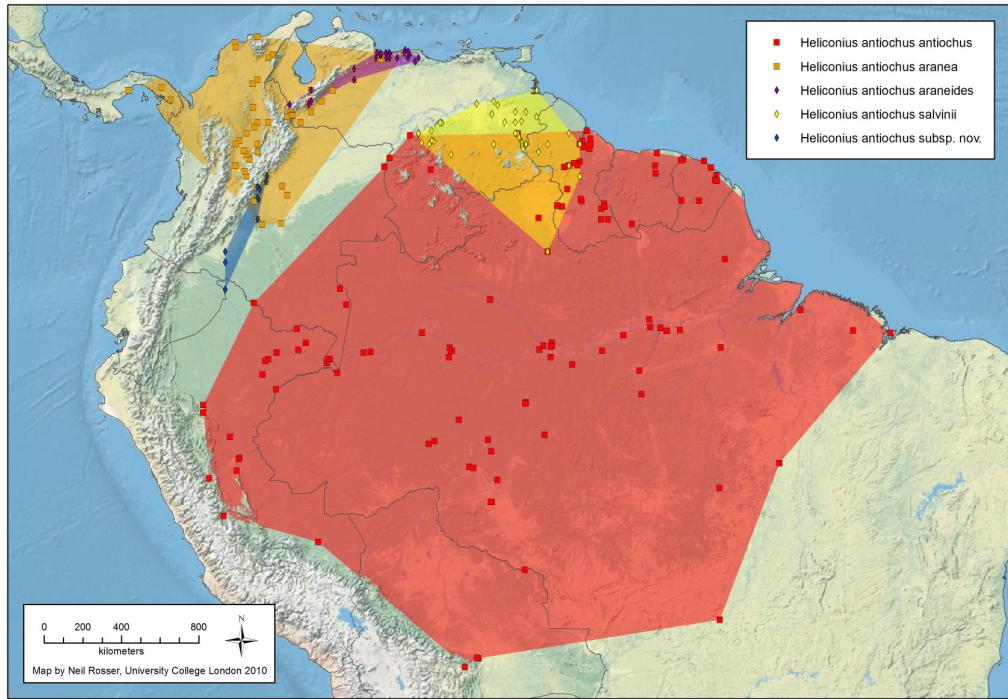
<u>Adopted taxonomy</u>	<u>Former taxonomy or names treated as synonyms</u>	<u>Reference</u>
<i>Eueides heliconioides eanes</i> W.C. Hewitson 1861	<i>Eueides heliconioides koenigi</i> H. Holzinger & R. Holzinger 1993	
<i>Eueides lampeto acacetes</i> W.C. Hewitson 1869	<i>Eueides lampeto concisa</i> G. Lamas 1985	
<i>Eueides tales</i> subsp. nov. (Brazil, Rondônia)	-	Brown (1979)
<i>Eueides tales</i> subsp. nov. (Colombia)	-	LeCrom (pers. comm.).
<i>Heliconius burneyi huebneri</i> O. Staudinger 1897	<i>Heliconius burneyi ada</i> H. Neustetter 1925	
<i>Heliconius burneyi huebneri</i> O. Staudinger 1897	<i>Heliconius burneyi anjae</i> W.M. Neukirchen 1995	
<i>Heliconius burneyi huebneri</i> O. Staudinger 1897	<i>Heliconius burneyi boliviensis</i> W.M. Neukirchen 1995	
<i>Heliconius burneyi huebneri</i> O. Staudinger 1897	<i>Heliconius burneyi koenigi</i> W.M. Neukirchen 1995	
<i>Heliconius chestertonii</i> (W.C. Hewitson, 1872)	<i>Heliconius erato chestertonii</i> (W.C. Hewitson, 1872)	Arias et al. (2008)
<i>Heliconius demeter demeter</i> O. Staudinger 1897	<i>Heliconius demeter angeli</i> W.M. Neukirchen 1997	
<i>Heliconius demeter demeter</i> O. Staudinger 1897	<i>Heliconius demeter</i> subsp. nov. Peru	
<i>Heliconius egeria egerides</i> O. Staudinger 1897	<i>Heliconius egeria christiani</i> W.M. Neukirchen 1997	
<i>Heliconius egeria hyas</i> G. Weymer 1883	<i>Heliconius egeria mariasibyllae</i> W.M. Neukirchen 1991	

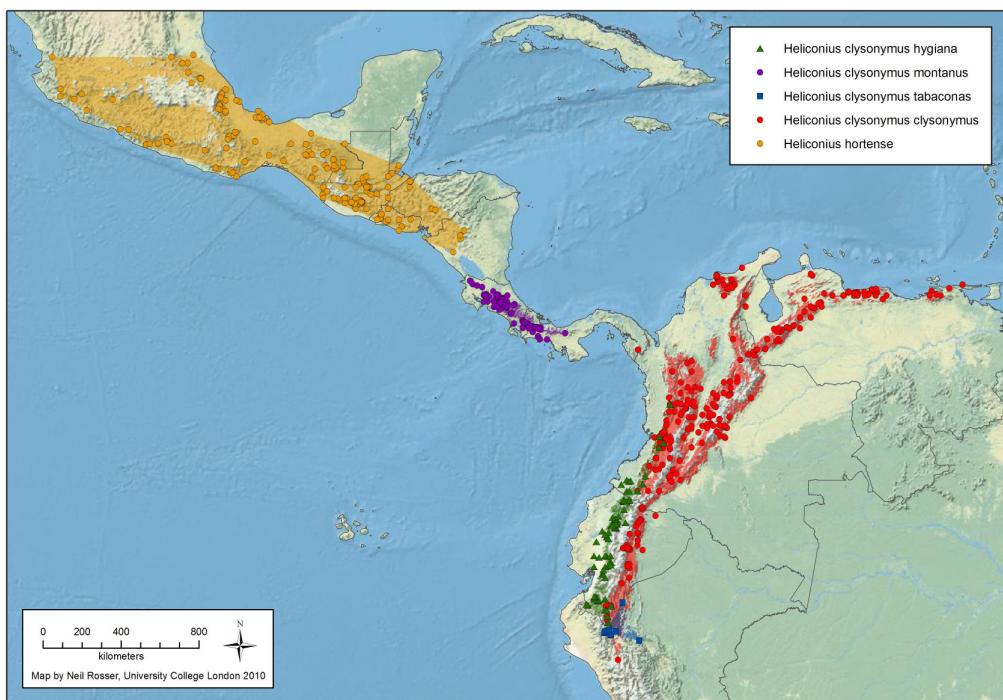
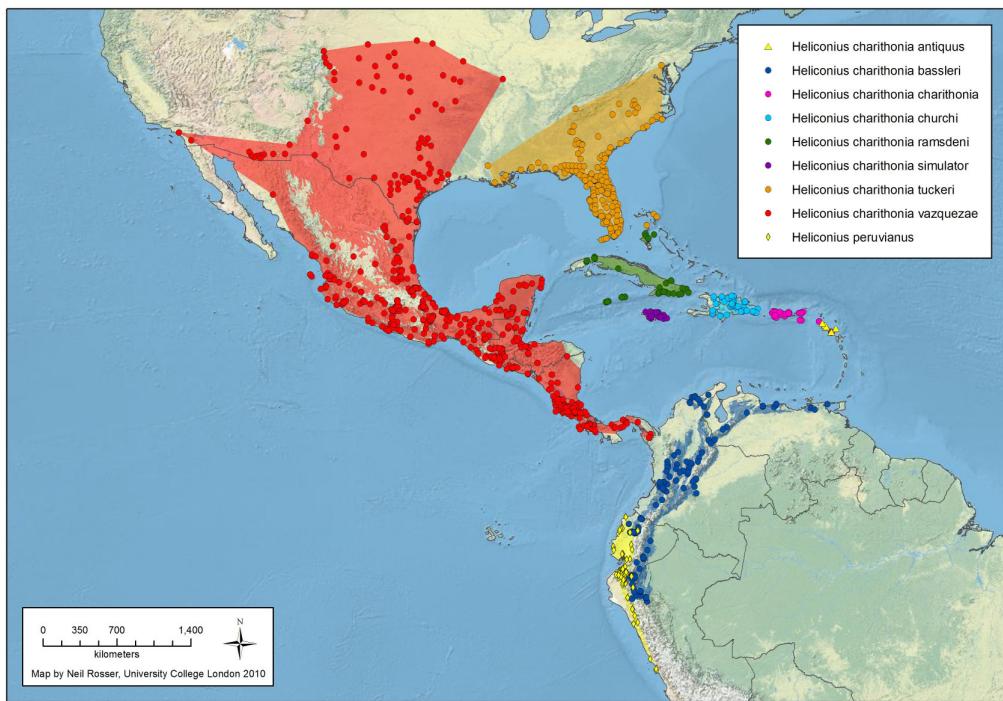
<i>Heliconius elevatus elevatus</i> E. Nöldner 1901	<i>Heliconius elevatus willmotti</i> W.M. Neukirchen 1997	
<i>Heliconius elevatus tumatumari</i> W.J. Kaye 1906	<i>Heliconius elevatus sonjae</i> W.M. Neukirchen 1997	
<i>Heliconius eratosignis</i> <i>eratosignis</i> (J.J. Joicey & G. Talbot 1925)	<i>Heliconius demeter eratosignis</i> (J.J. Joicey & G. Talbot 1925)	Mallet et al. unpub. data
<i>Heliconius eratosignis tambopata</i> G. Lamas 1985	<i>Heliconius demeter tambopata</i> G. Lamas 1985	Mallet et al. unpub. data
<i>Heliconius eratosignis</i> <i>ucayalensis</i> H. Holzinger & R. Holzinger 1975	<i>Heliconius demeter ucayalensis</i> H. Holzinger & R. Holzinger 1975	Mallet et al. unpub. data
<i>Heliconius eratosignis ulysses</i> K.S. Brown & W.W. Benson 1975	<i>Heliconius demeter ulysses</i> K.S. Brown & W.W. Benson 1975	Mallet et al. unpub. data
<i>Heliconius hecale felix</i> G. Weymer 1894	<i>Heliconius hecale zeus</i> W.M. Neukirchen 1995	
<i>Heliconius hecale vetustus</i> A.G. Butler 1873	<i>Heliconius hecale naxos</i> W.M. Neukirchen 1998	
<i>Heliconius hecuba choarina</i> (W.C. Hewitson 1872)	<i>Heliconius hecuba bonplandi</i> W.M. Neukirchen 1991	
<i>Heliconius hecuba choarina</i> (W.C. Hewitson 1872)	<i>Heliconius hecuba lamasi</i> W.M. Neukirchen 1991	
<i>Heliconius hecuba crispus</i> O. Staudinger 1885	<i>Heliconius hecuba salazari</i> W.M. Neukirchen 1993	
<i>Heliconius hecuba crispus</i> O. Staudinger 1885	<i>Heliconius hecuba walteri</i> J.A. Salazar 1998	
<i>Heliconius leucadia pseudorhoa</i> O. Staudinger 1897	<i>Heliconius leucadia andromeda</i> W.M. Neukirchen 1996	
<i>Heliconius leucadia pseudorhoa</i> O. Staudinger 1897	<i>Heliconius leucadia birgitae</i> W.M. Neukirchen 1996	
<i>Heliconius pachinus</i> O. Salvin 1871	<i>Heliconius cydno pachinus</i> O. Salvin 1871	
<i>Heliconius hewitsoni</i> (W.C. Hewitson 1875)	<i>Heliconius sapho hewitsoni</i> (W.C. Hewitson 1875)	
<i>Heliconius telesiphe</i> subsp. nov. Ecuador	-	Brown (1979)
<i>Heliconius timareta</i> subsp. nov. Colombia	-	Giraldo et al. (2008)
<i>Heliconius timareta</i> subsp. nov. Ecuador	-	Brown (1979)
<i>Heliconius timareta</i> subsp. nov. Peru	-	Mallet (2009)
<i>Neruda aoede bartletti</i> (H. Druce 1876)	<i>Neruda aoede auca</i> W.M. Neukirchen 1997	

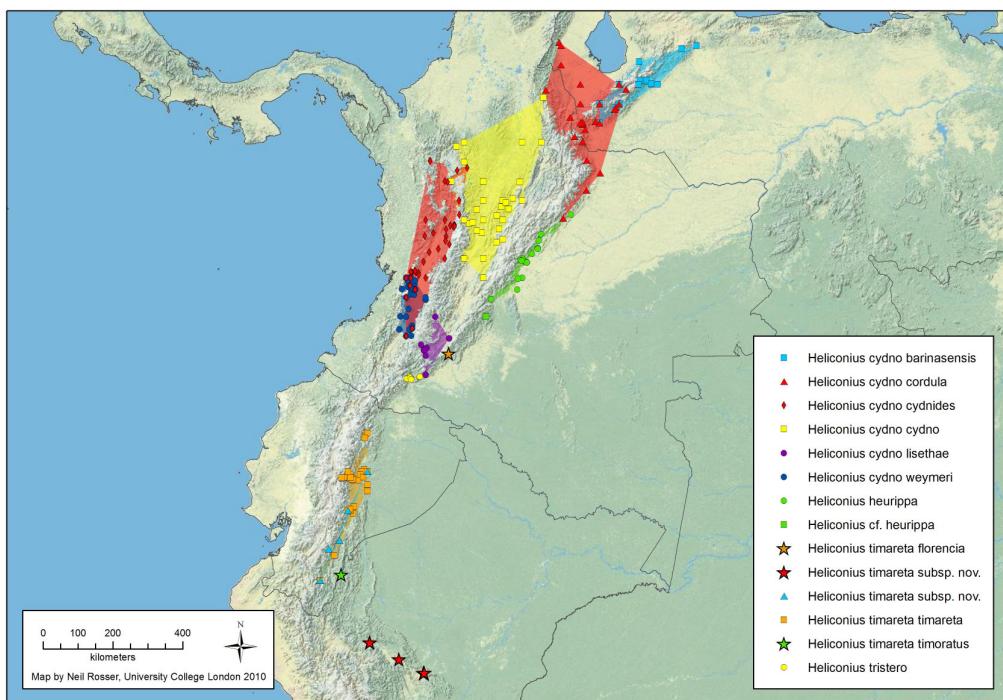
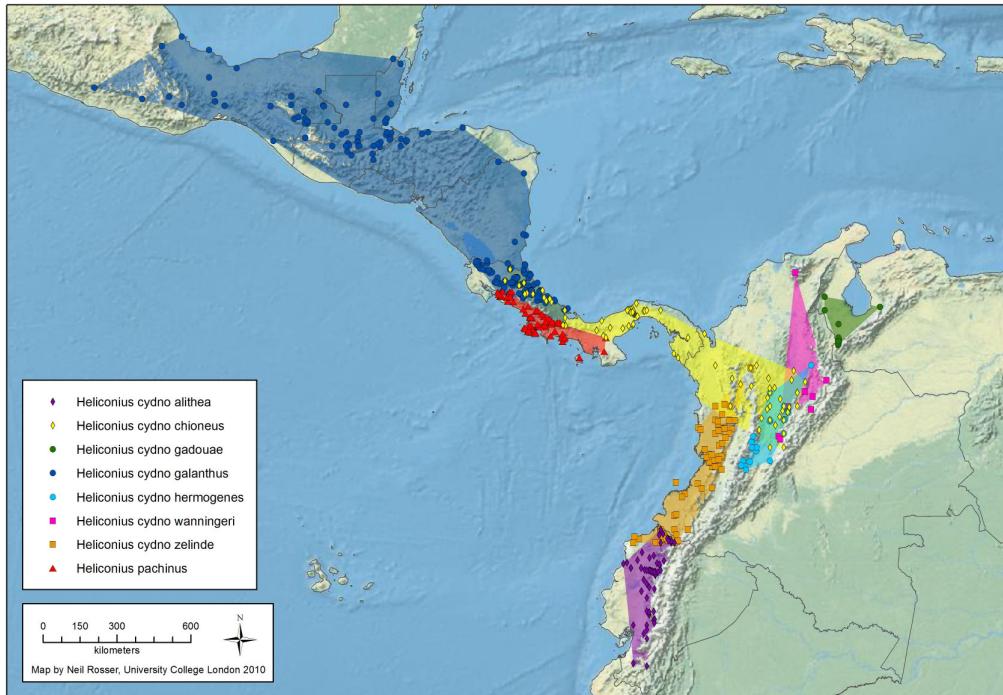
Table 2 – Altitudinal bounds used to clip species ranges (in metres). For sources used see methods. * indicates that species range was not clipped due to lack of information on elevational range.

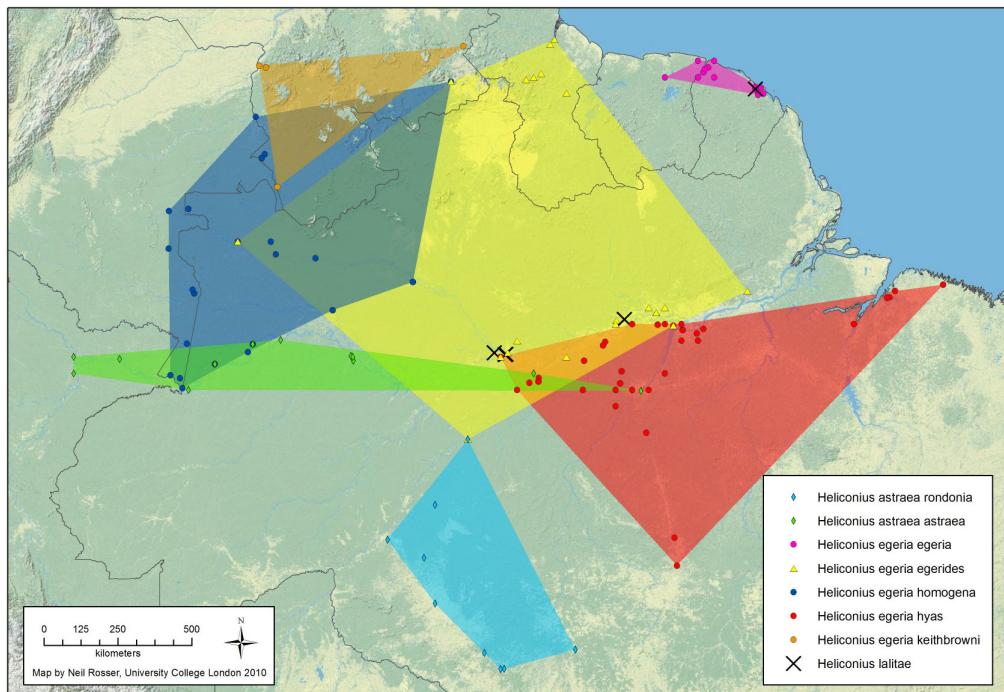
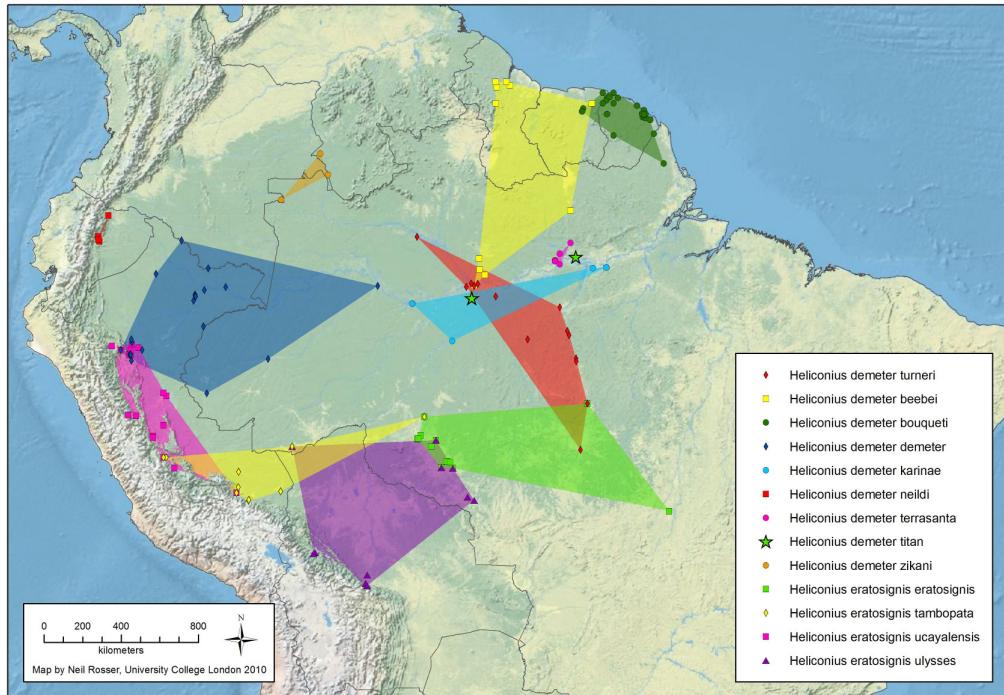
Taxon	lower bound	upper bound
<i>Agraulis n. sp.</i>	0	3100
<i>Agraulis vanillae</i>	0	3100
<i>Dione glycera</i>	1000	3650
<i>Dione juno</i>	0	3000
<i>Dione moneta butleri / Dione moneta poeyii</i>	500	3500
<i>Dione moneta moneta</i>	0	3500
<i>Dryadula phaetusa</i>	0	1550
<i>Dryas iulia</i>	0	2000
<i>Eueides aliphera</i>	0	1800
<i>Eueides emsleyi</i>	0	1200
<i>Eueides heliconioides</i>	0	1800
<i>Eueides isabella</i>	0	1500
<i>Eueides lampeto</i>	0	1700
<i>Eueides libitina</i>	*	*
<i>Eueides lineata</i>	0	1850
<i>Eueides lybia</i>	0	1200
<i>Eueides pavana</i>	0	1600
<i>Eueides procula</i>	0	2000
<i>Eueides tales</i>	0	1500
<i>Eueides vibilia</i>	0	1500
<i>Heliconius antiochus</i>	0	1200
<i>Heliconius astrea</i>	0	1200
<i>Heliconius atthis</i>	0	1900
<i>Heliconius besckei</i>	0	2500
<i>Heliconius burneyi</i>	0	1000
<i>Heliconius charithonia</i>	0	2000
<i>Heliconius chestertonii</i>	0	2200
<i>Heliconius clysonymus</i>	800	2500
<i>Heliconius congener</i>	500	2100
<i>Heliconius cydno</i>	0	2100
<i>Heliconius demeter</i>	0	1100
<i>Heliconius egeria</i>	0	1200
<i>Heliconius eleuchia</i>	0	2000
<i>Heliconius elevatus</i>	0	2000
<i>Heliconius erato</i>	0	2200
<i>Heliconius eratognis</i>	0	1100
<i>Heliconius ethilla</i>	0	2000
<i>Heliconius hecale</i>	0	1900
<i>Heliconius hecalesia</i>	0	1800
<i>Heliconius hecuba</i>	900	2400
<i>Heliconius hermathena</i>	*	*

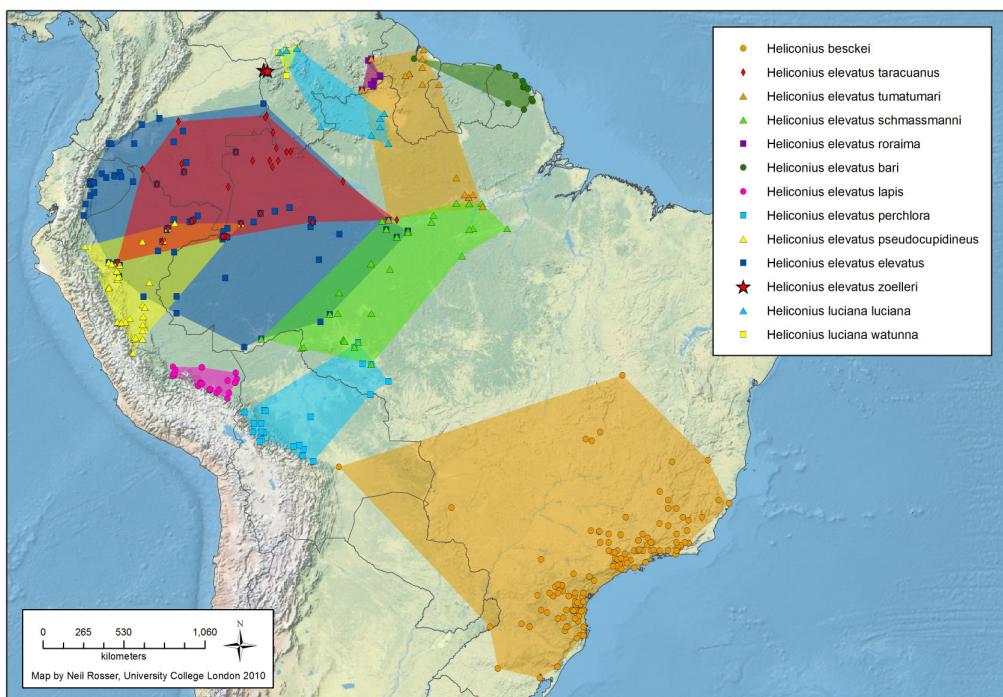
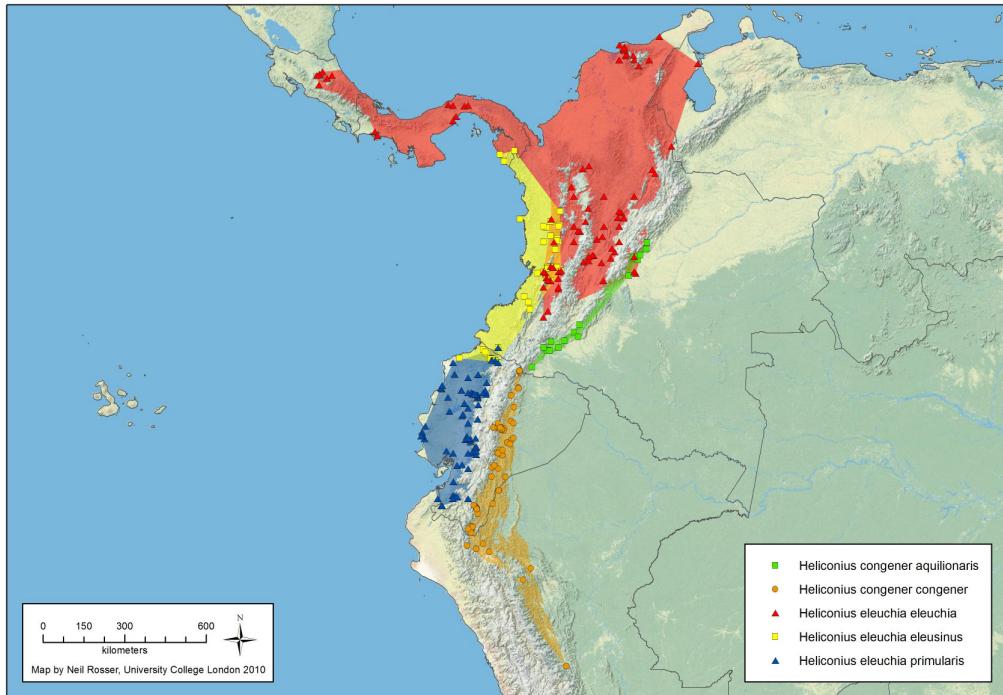
<i>Heliconius heurippa</i>	800	1800
<i>Heliconius hewitsoni</i>	0	1400
<i>Heliconius hierax</i>	400	2000
<i>Heliconius himera</i>	400	2500
<i>Heliconius hortense</i>	0	2200
<i>Heliconius ismenius</i>	0	1500
<i>Heliconius lalitae</i>	*	*
<i>Heliconius leucadia</i>	0	1000
<i>Heliconius luciana</i>	0	1600
<i>Heliconius melpomene</i>	0	1800
<i>Heliconius nattereri</i>	0	1300
<i>Heliconius numata</i>	0	1800
<i>Heliconius pachinus</i>	0	1600
<i>Heliconius pardalinus</i>	0	1200
<i>Heliconius peruvianus</i>	0	2000
<i>Heliconius ricini</i>	*	*
<i>Heliconius sapho</i>	0	1700
<i>Heliconius sara</i>	0	1300
<i>Heliconius telesiphe</i>	600	2500
<i>Heliconius timareta</i>	800	1800
<i>Heliconius tristero</i>	*	*
<i>Heliconius wallacei</i>	0	1200
<i>Heliconius xanthocles</i>	0	1500
<i>Laparus doris</i>	0	1500
<i>Neruda aoede</i>	0	1350
<i>Neruda godmani</i>	0	1200
<i>Neruda metharme</i>	0	1300
<i>Neruda metis</i>	*	*
<i>Podotricha judith</i>	1000	2600
<i>Podotricha telesiphe</i>	800	2500

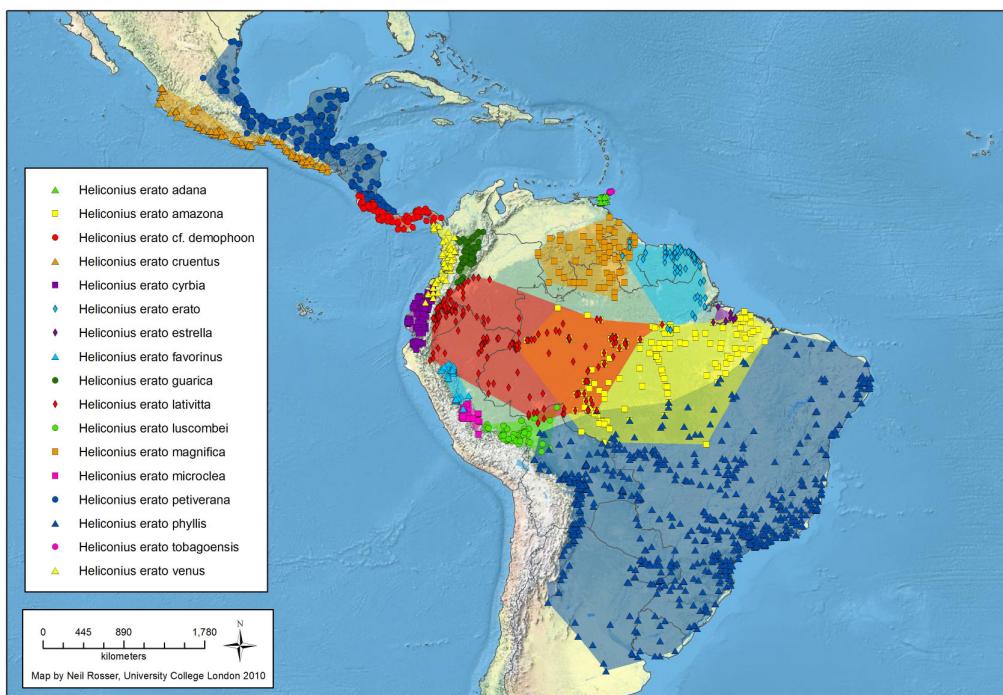
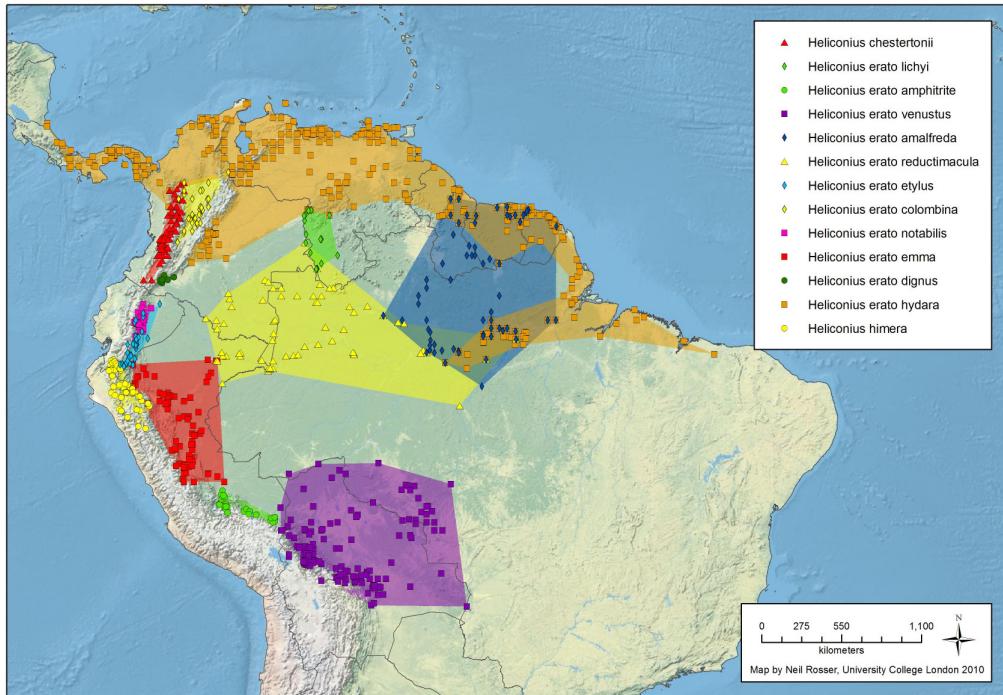


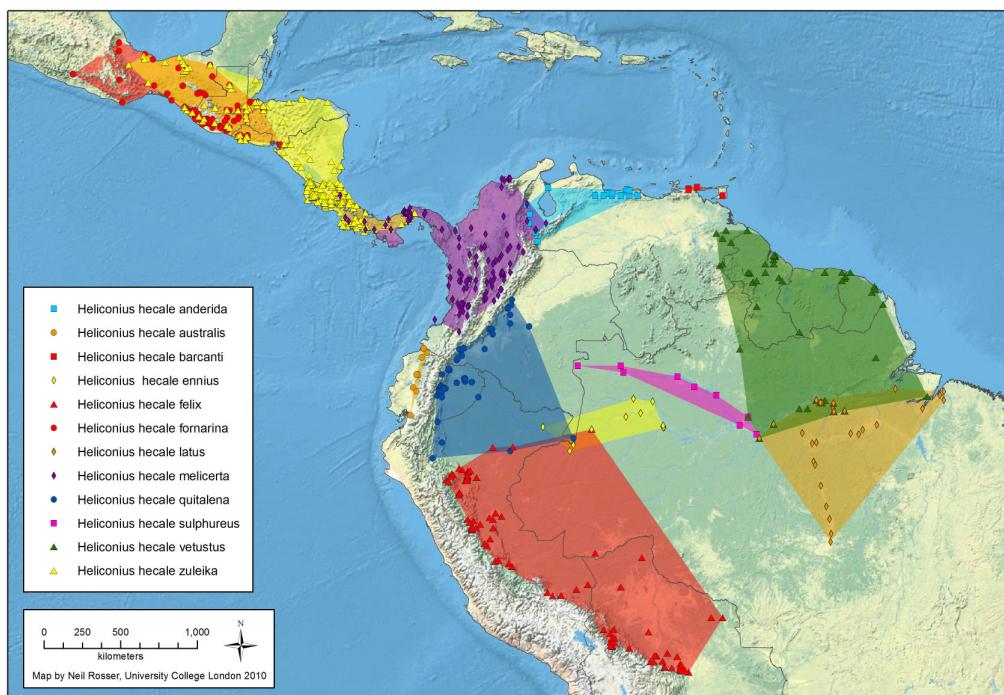
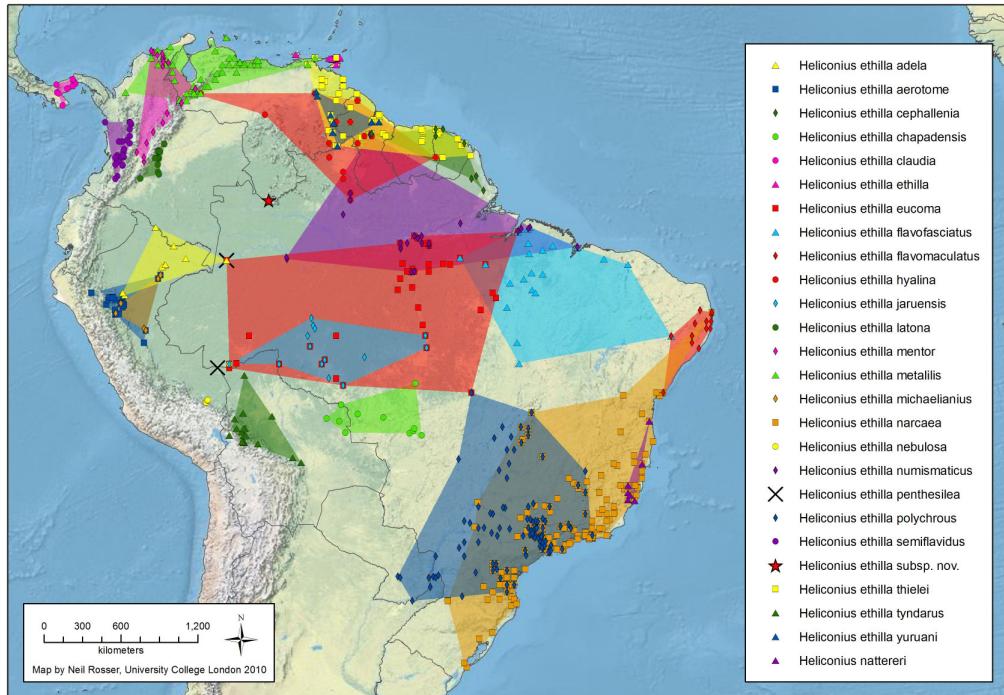


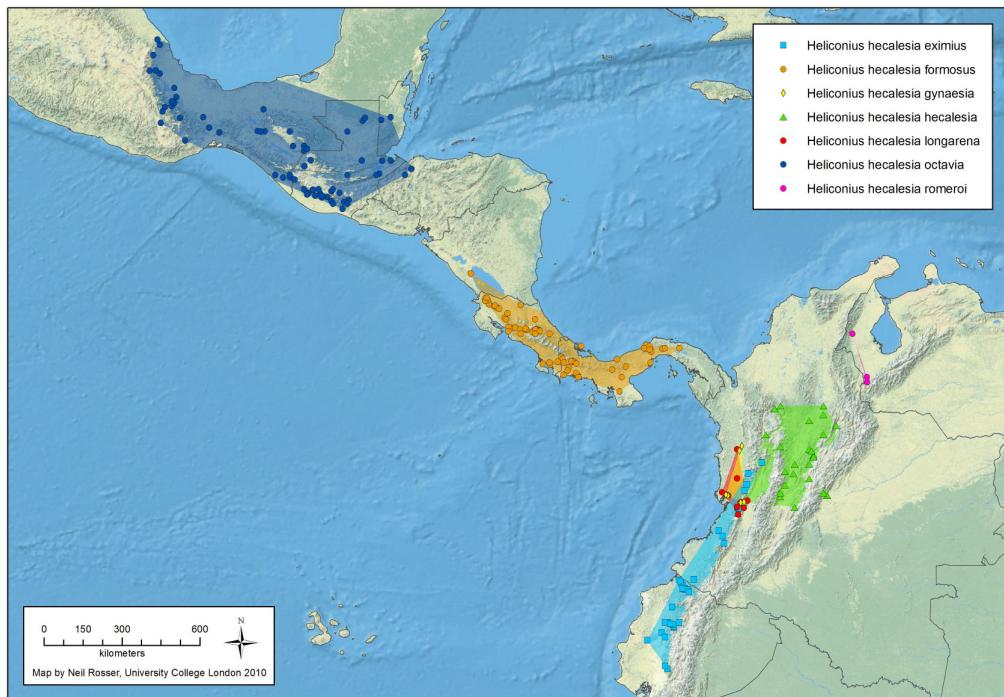
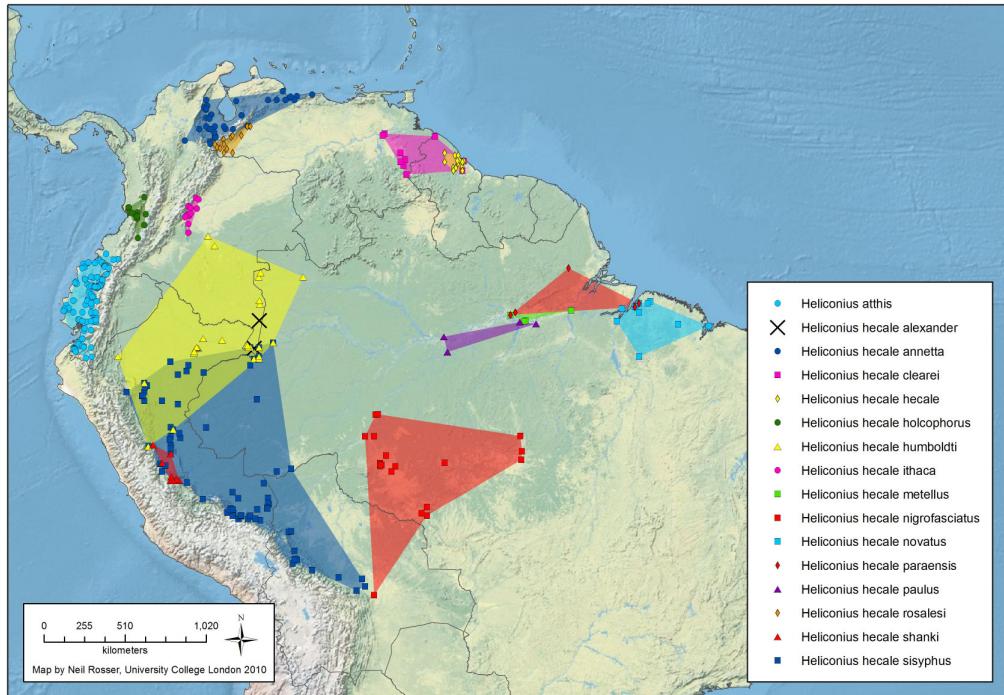


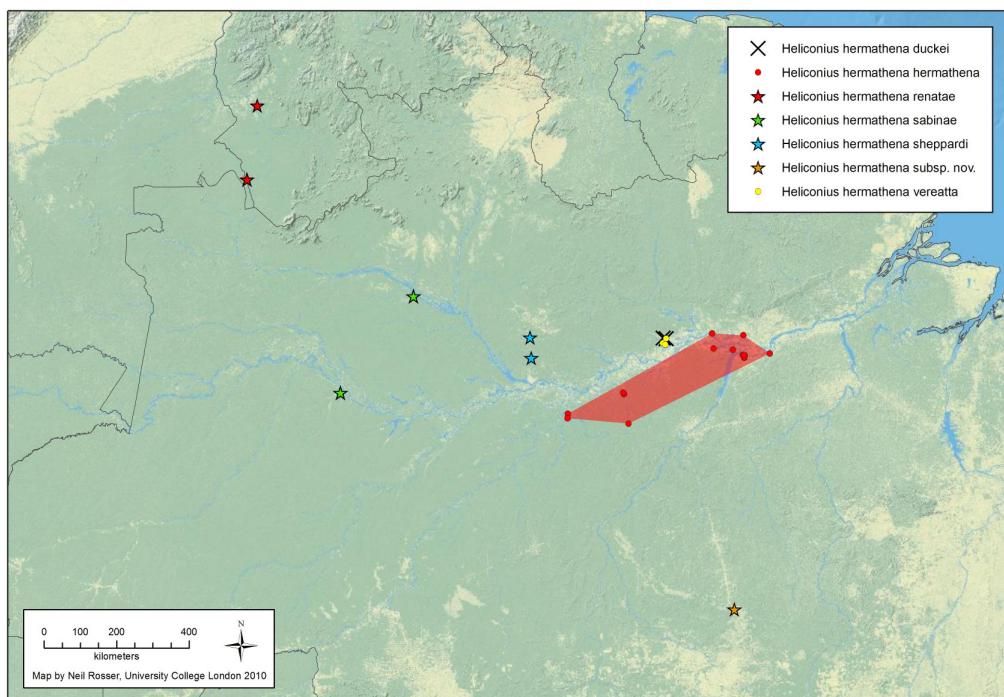
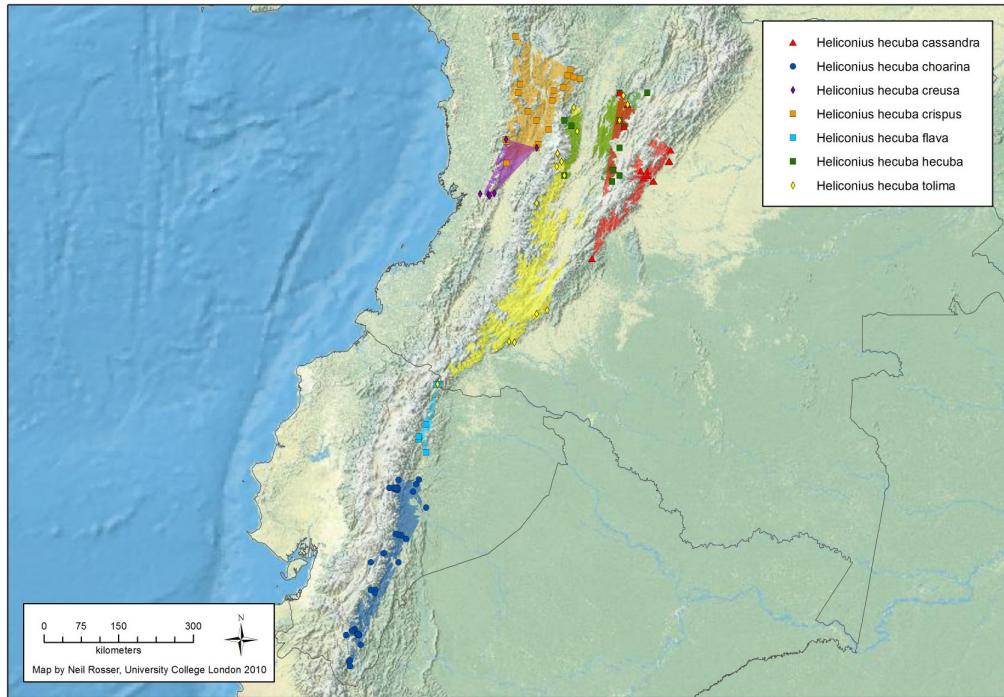


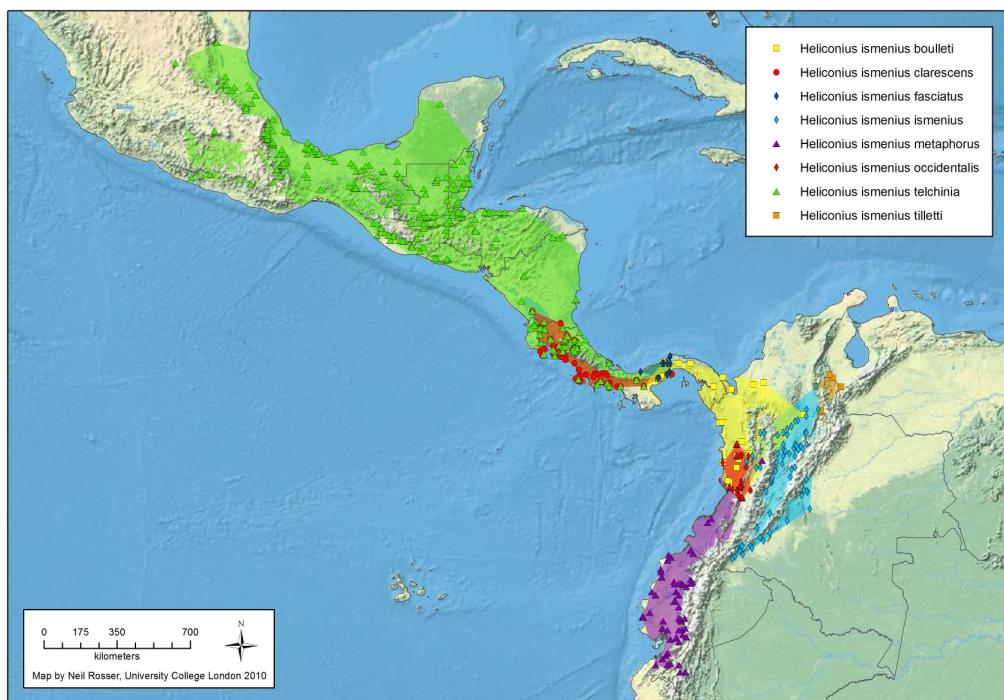
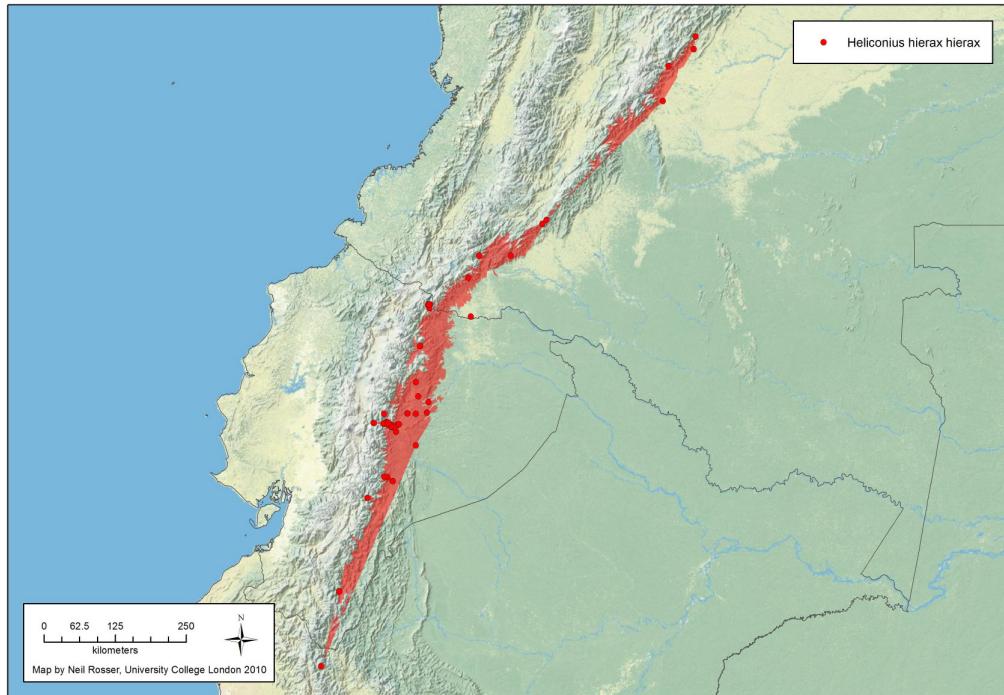


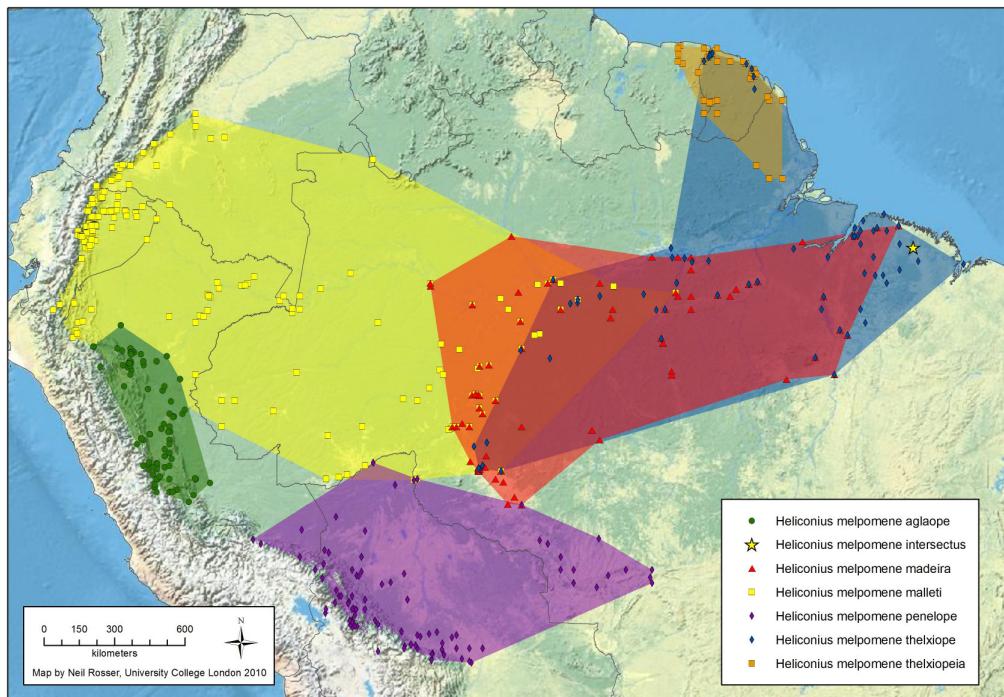
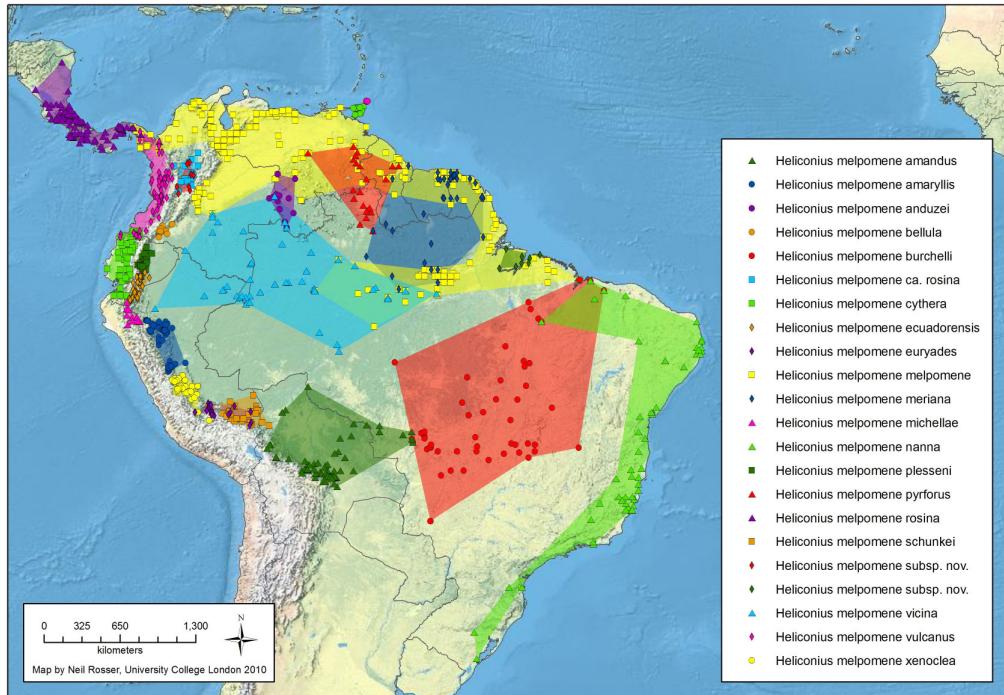


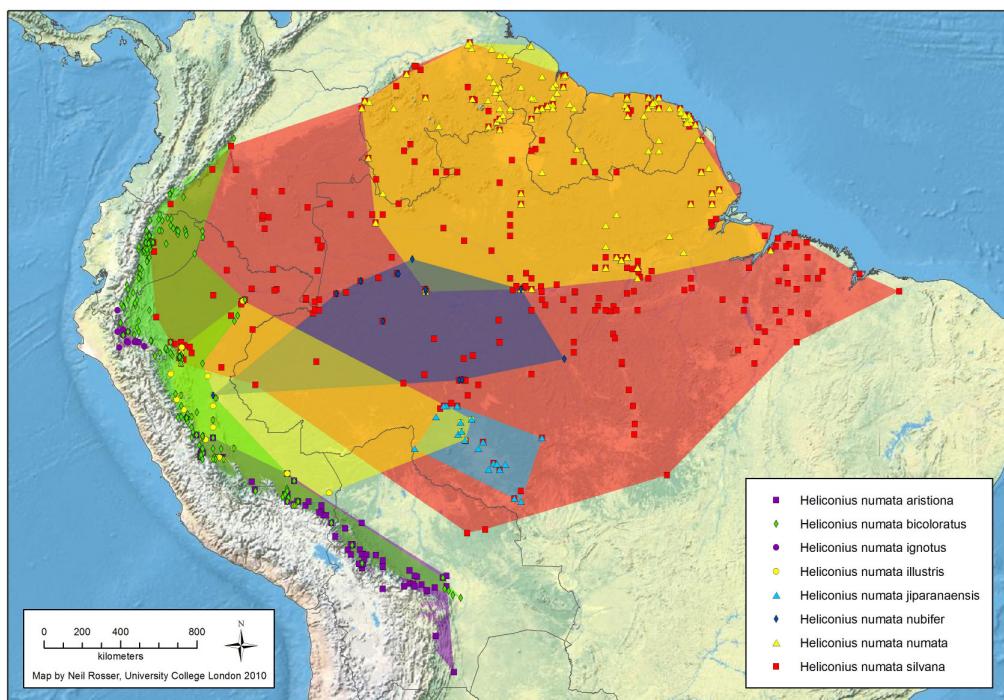
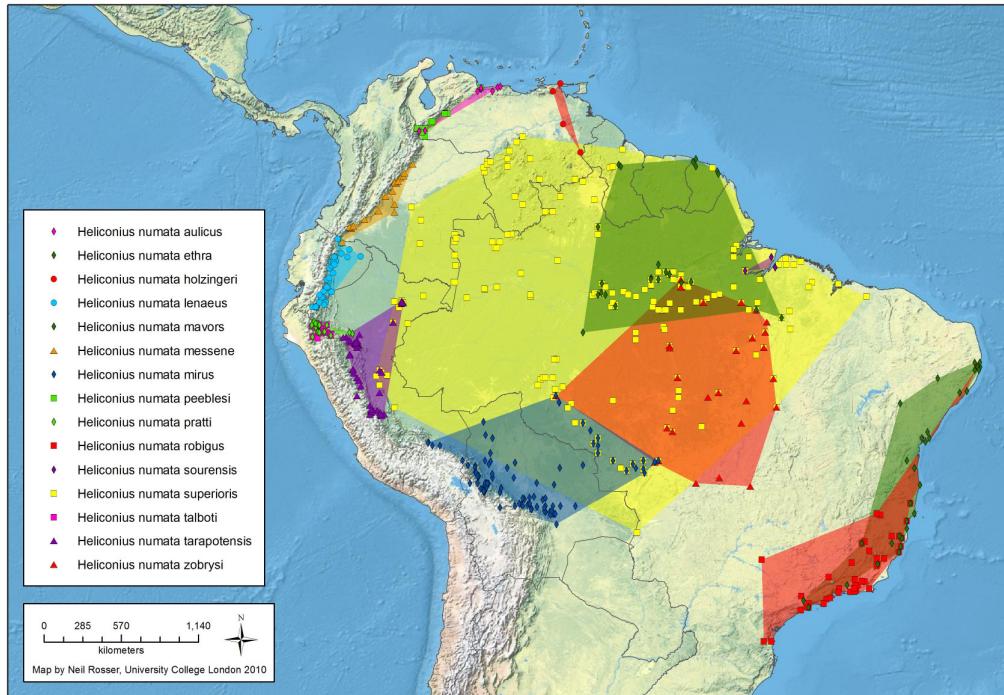


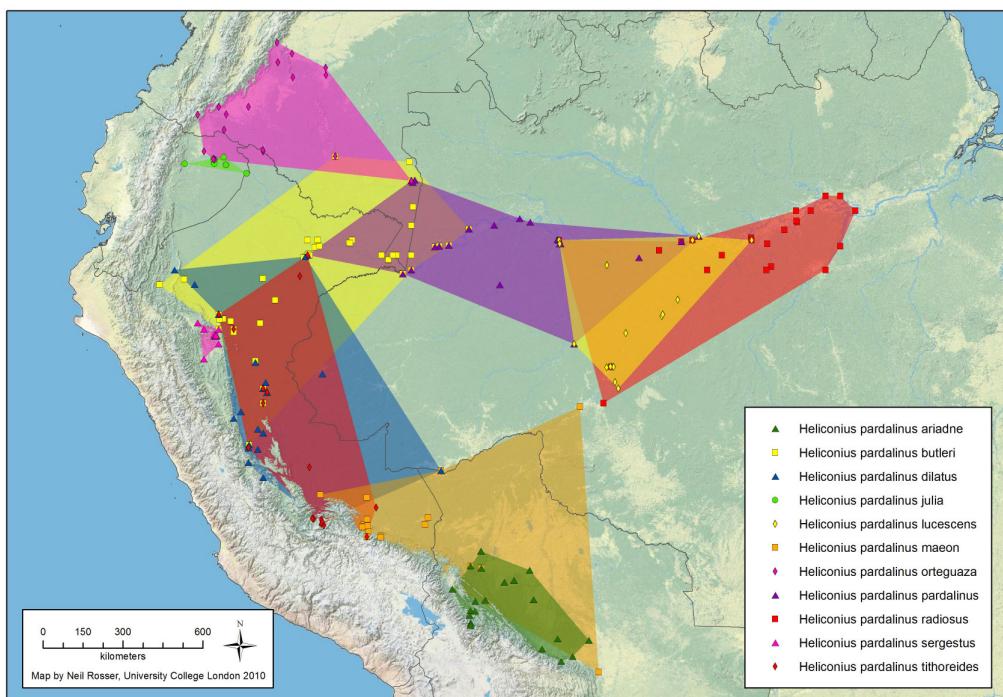
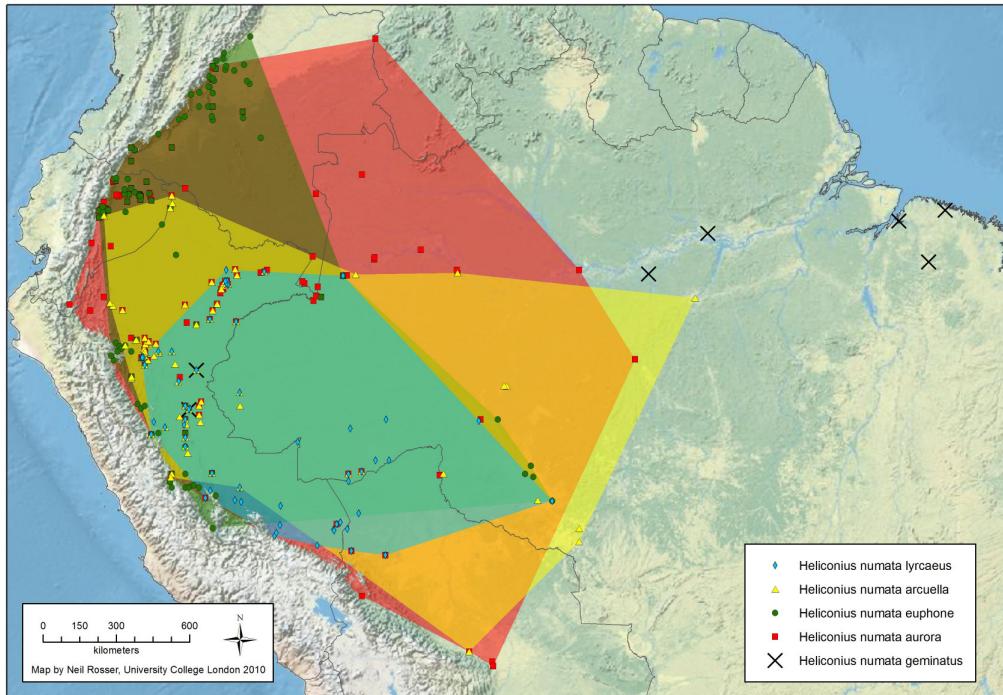


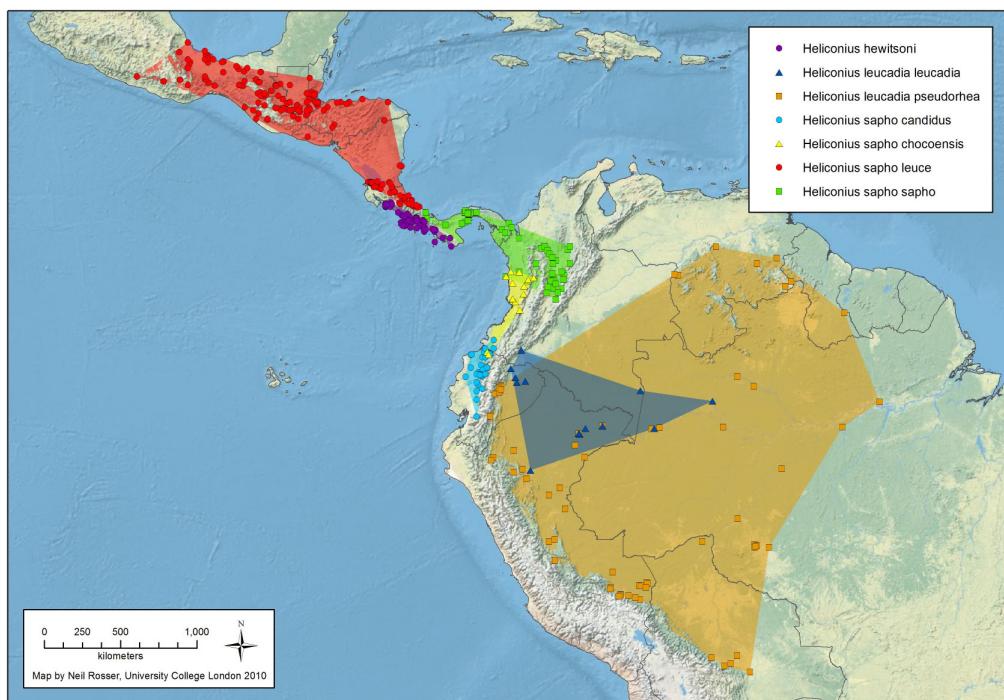
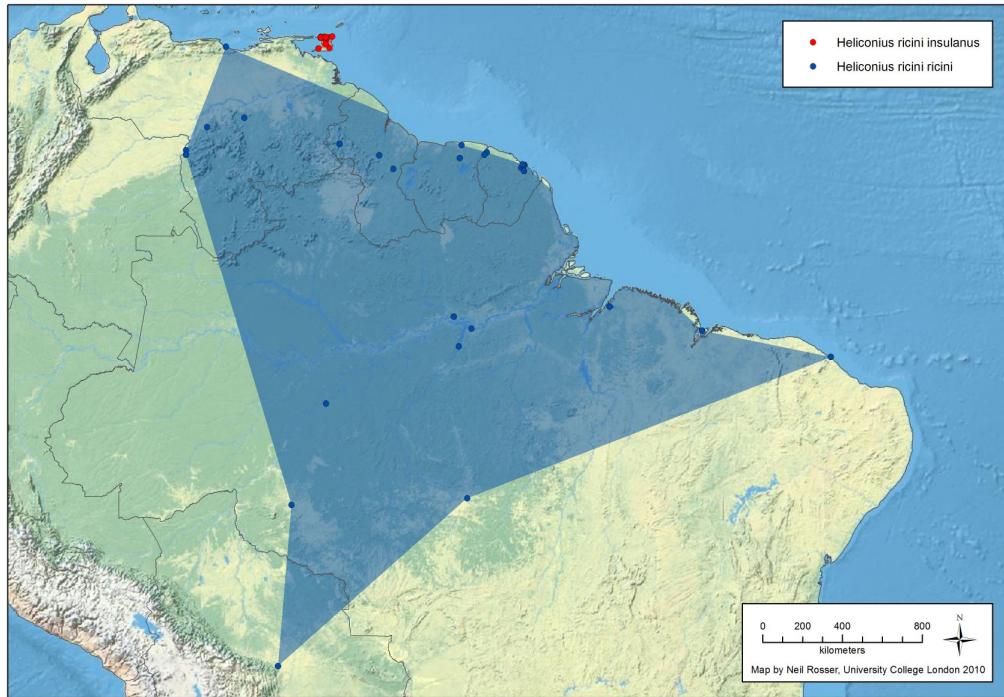


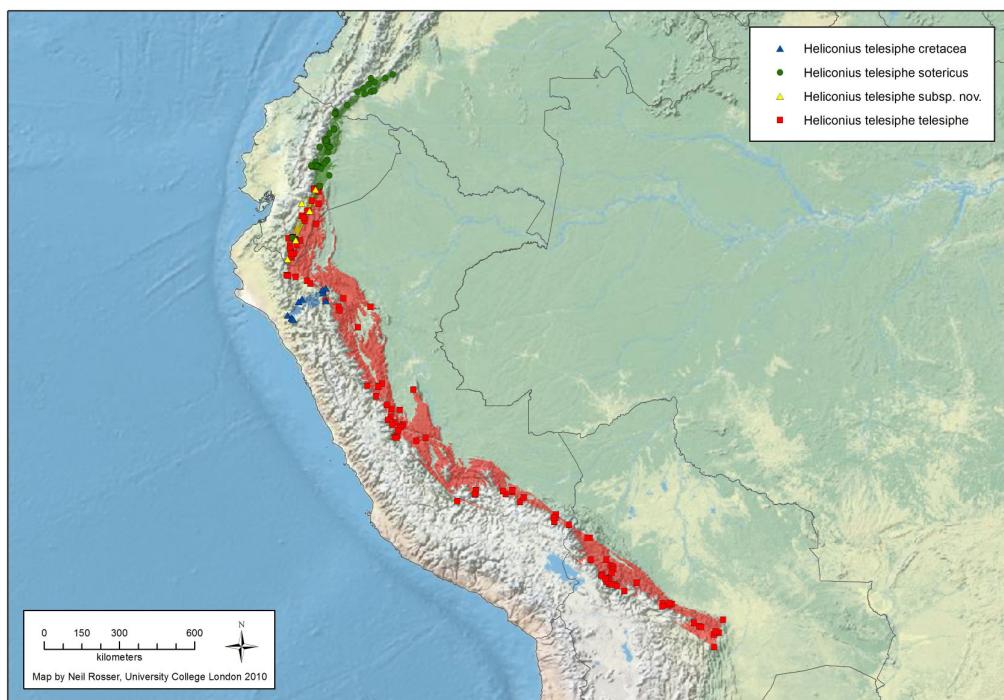
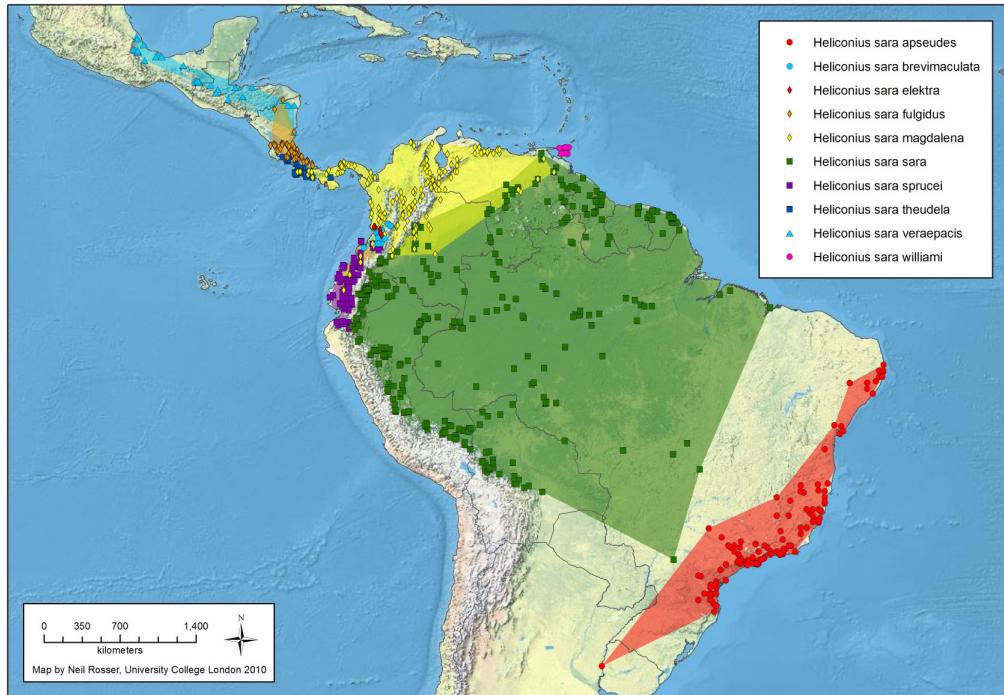


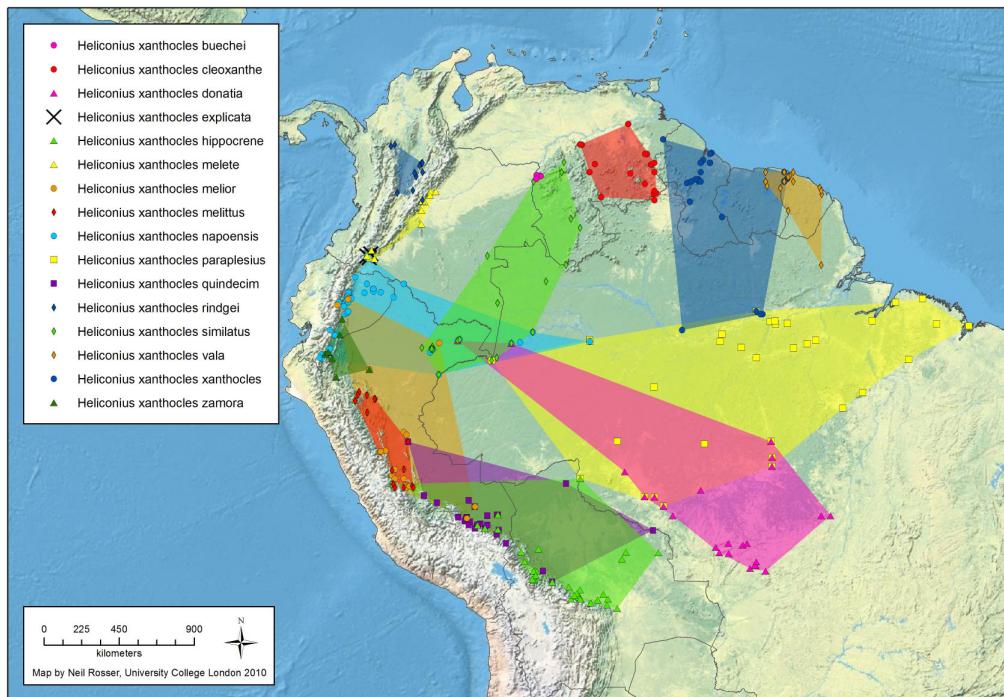
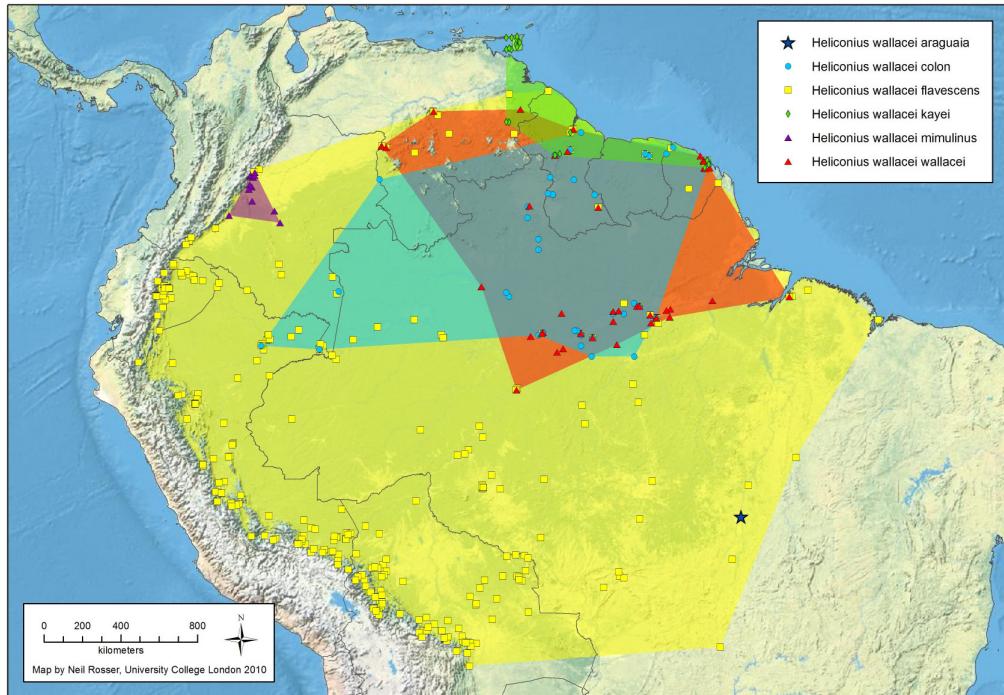


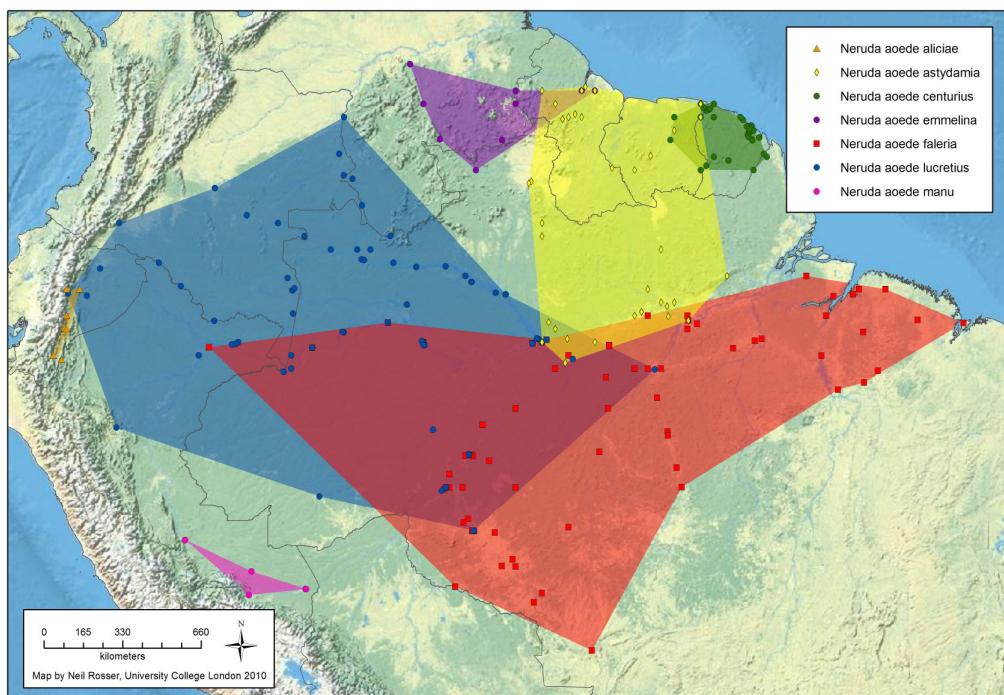
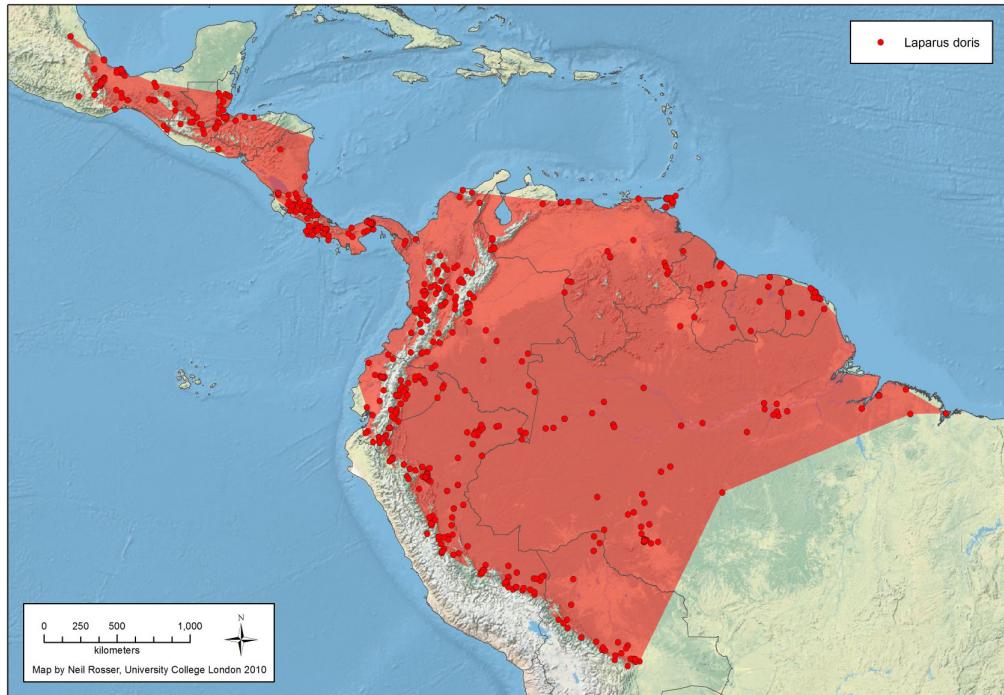


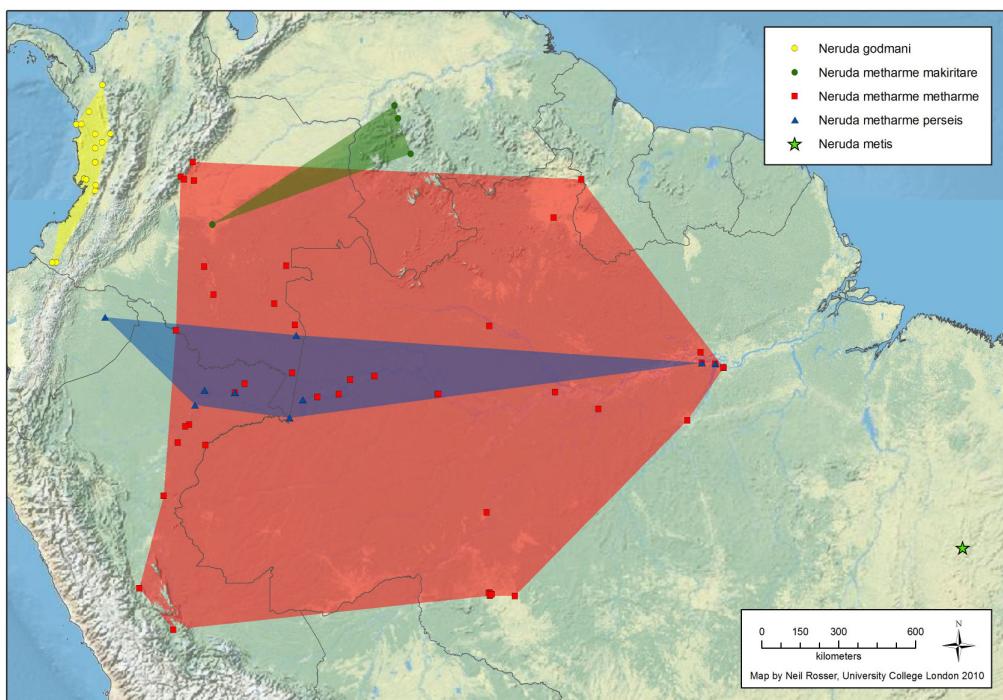
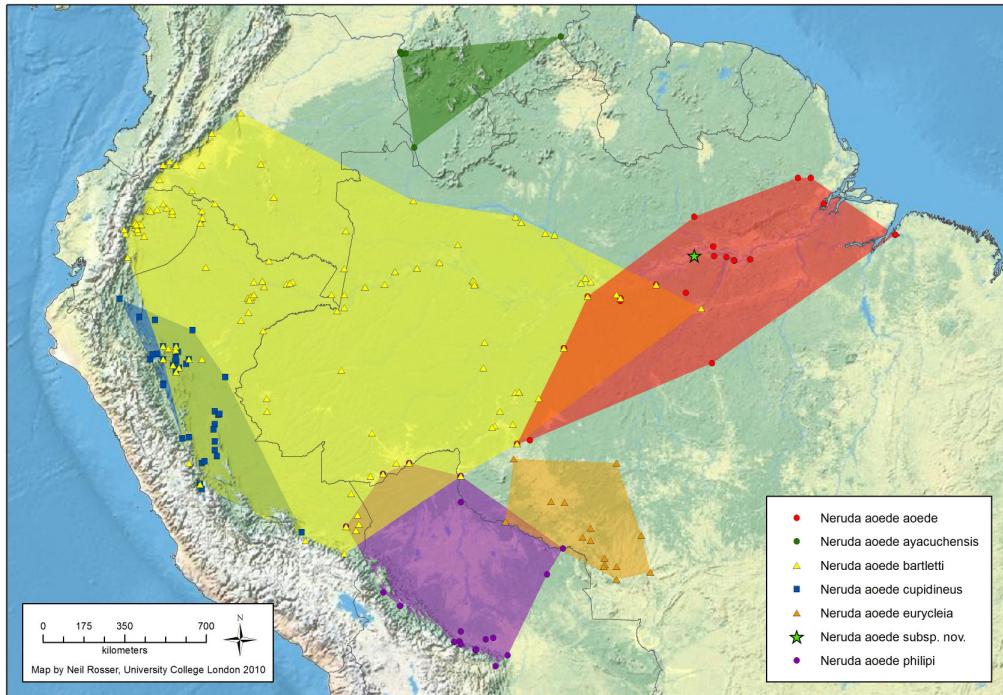


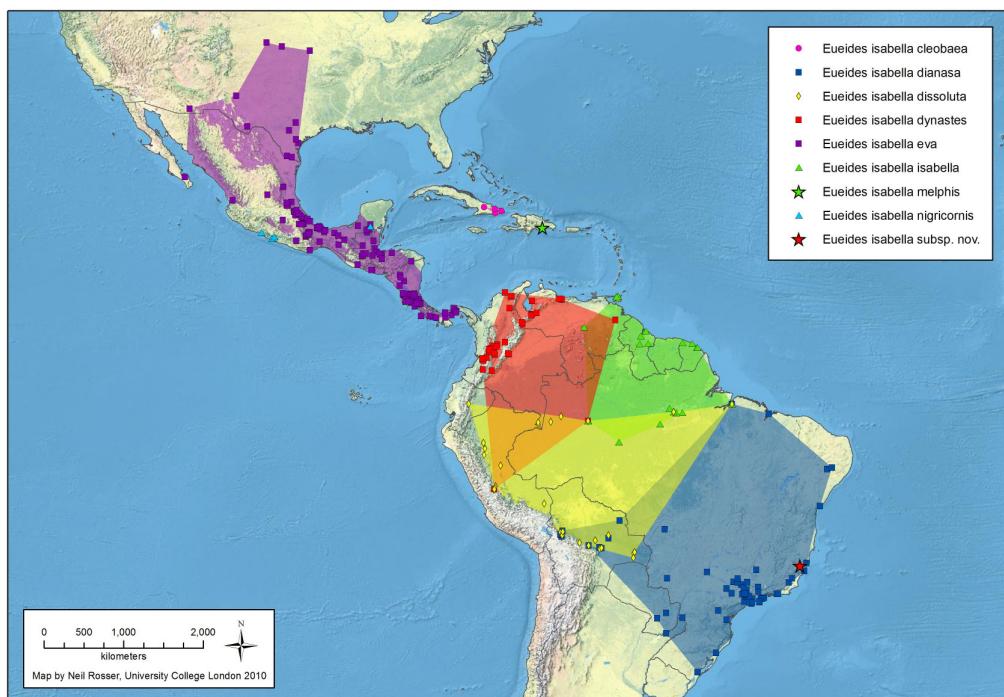
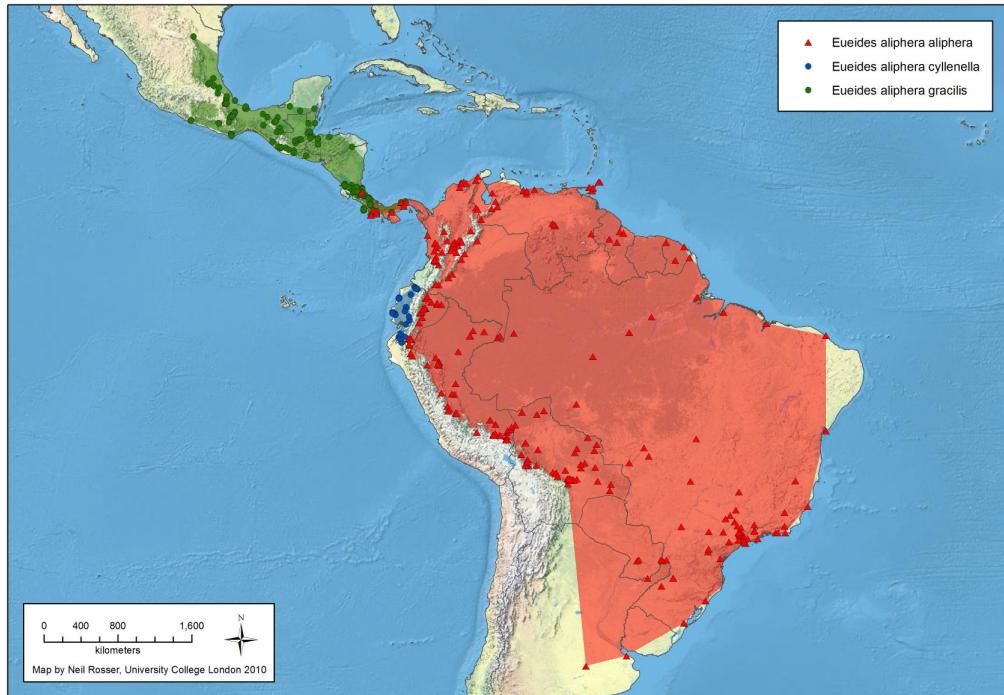


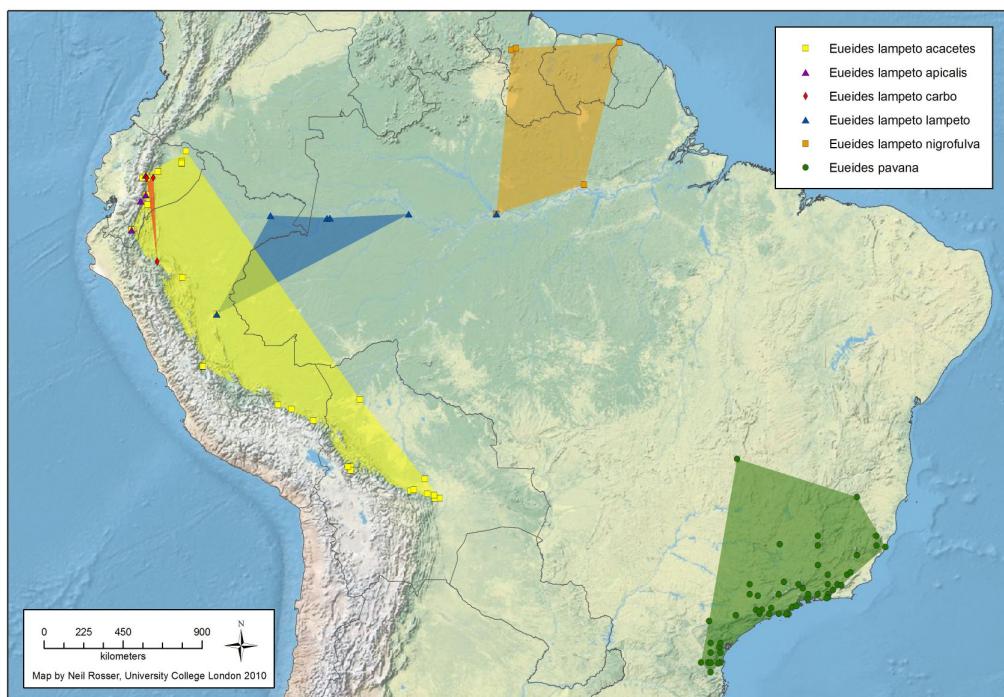
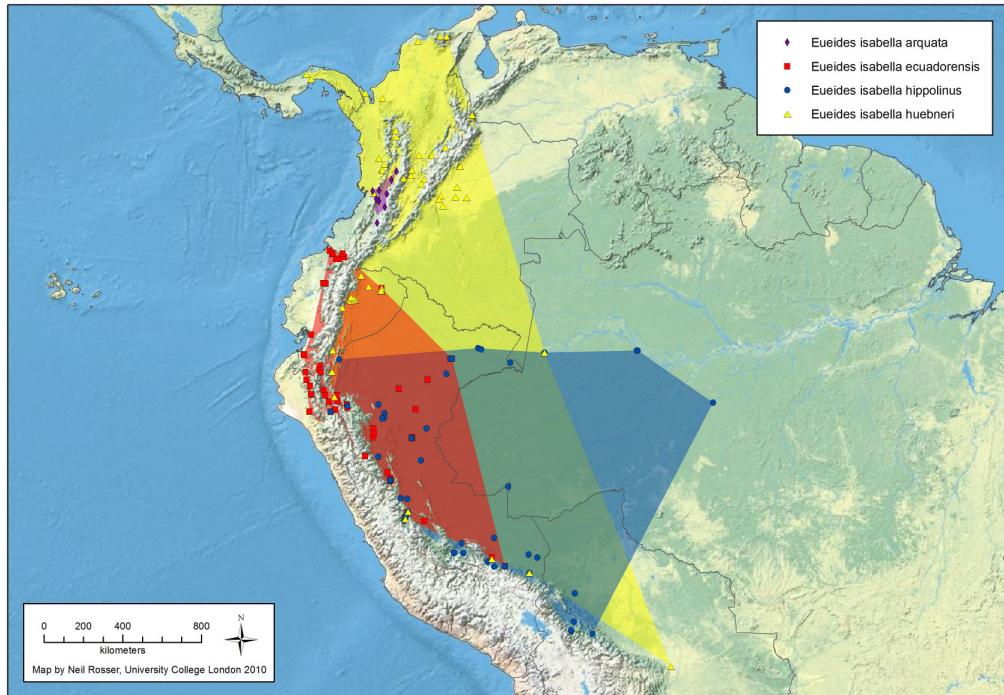


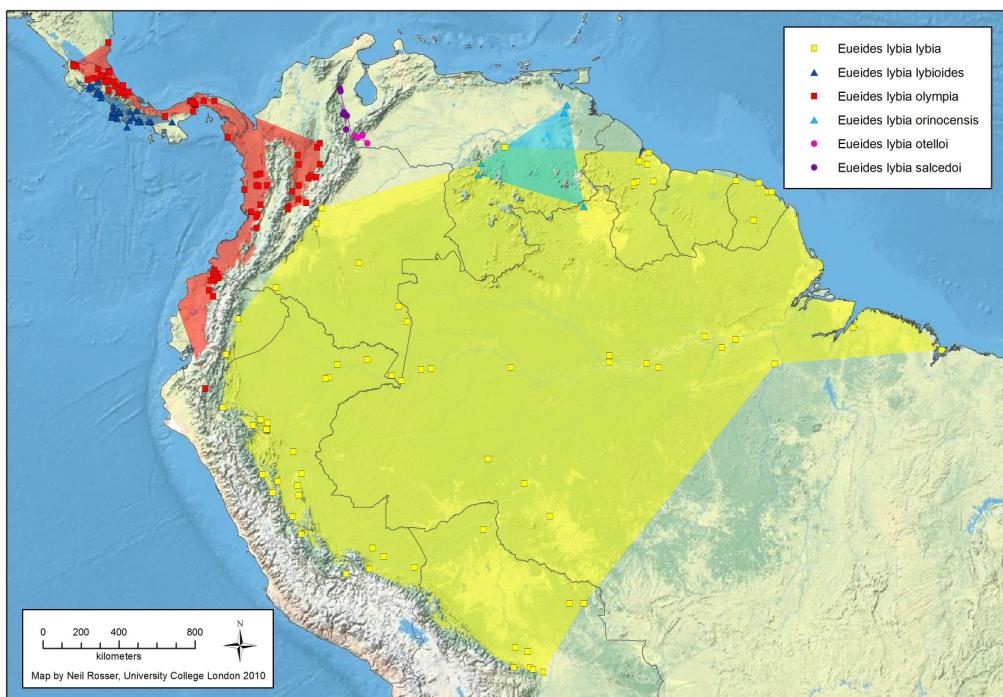
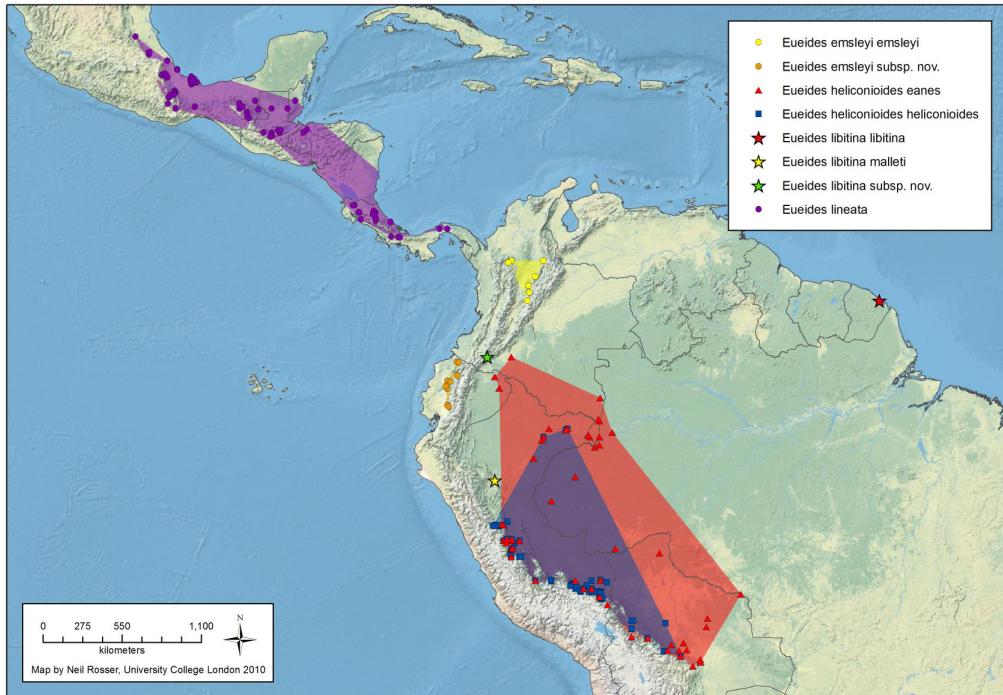


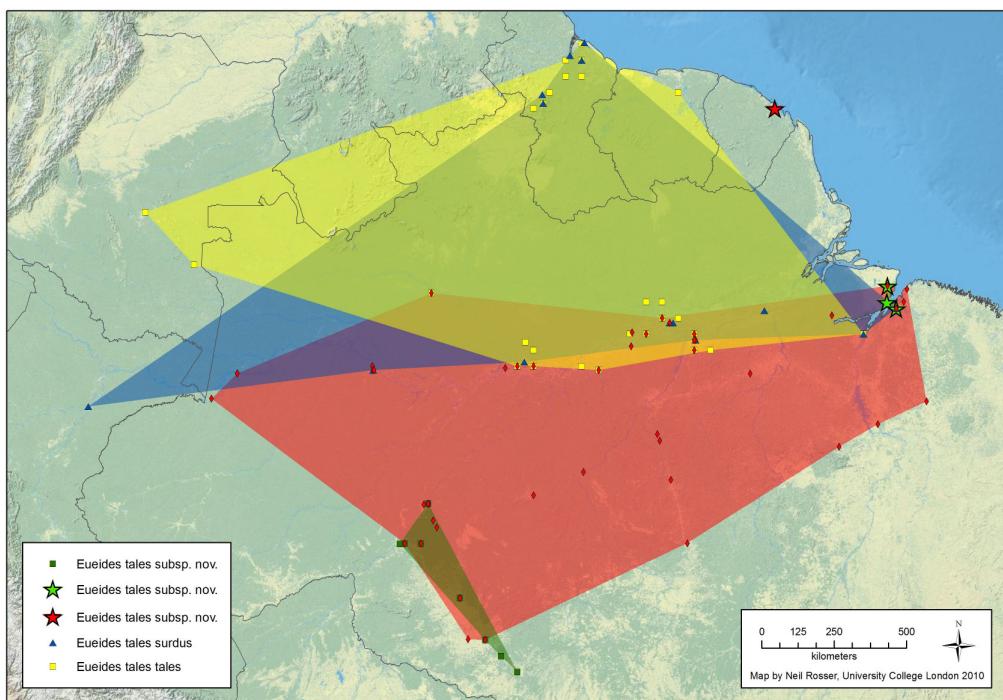
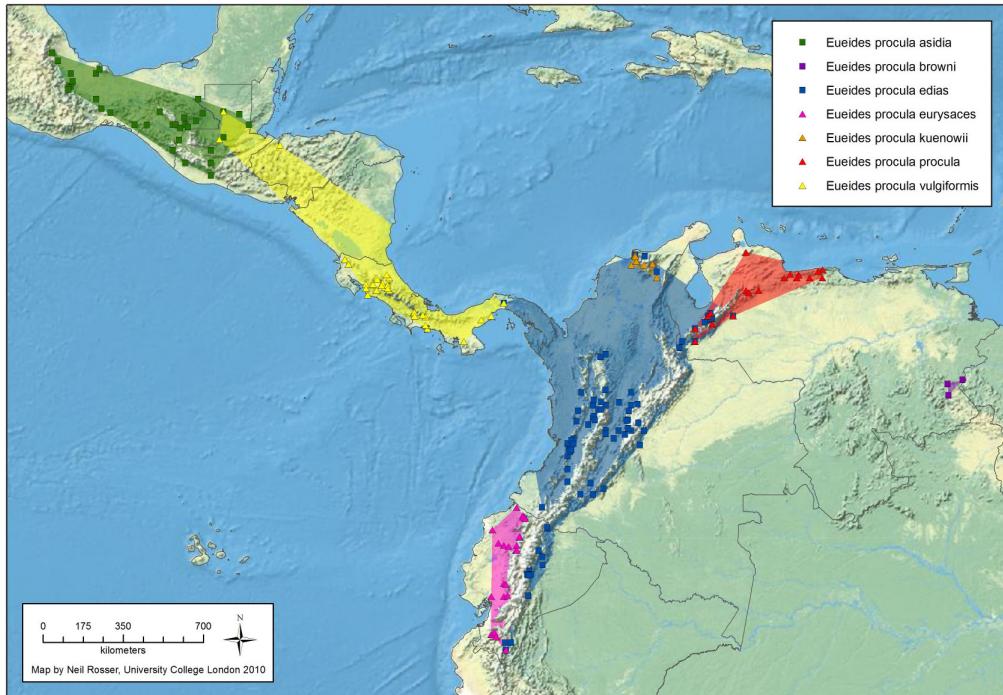


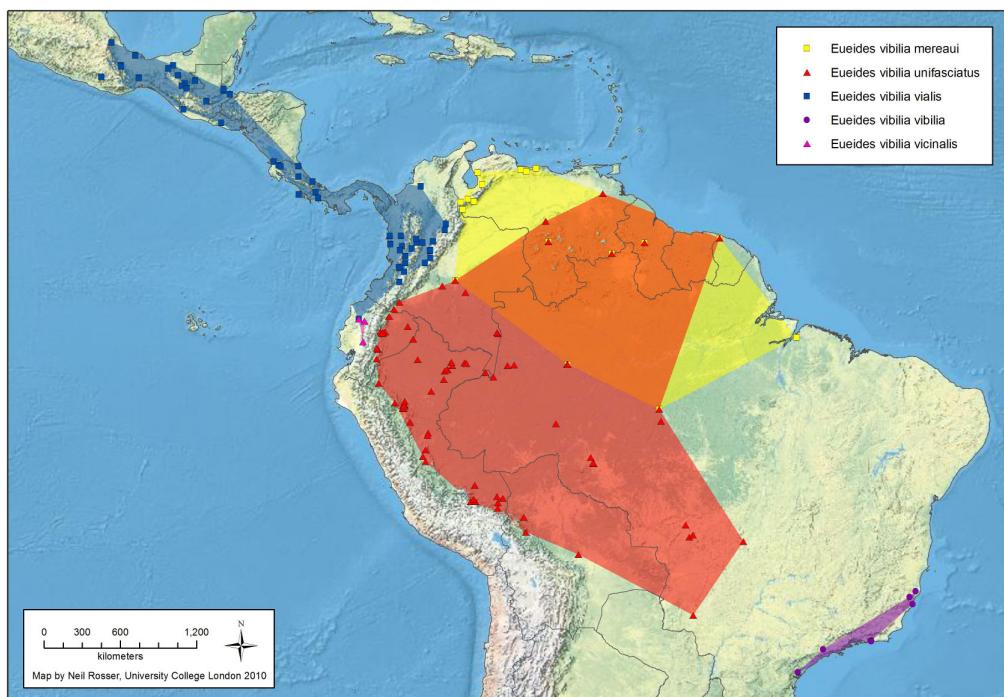
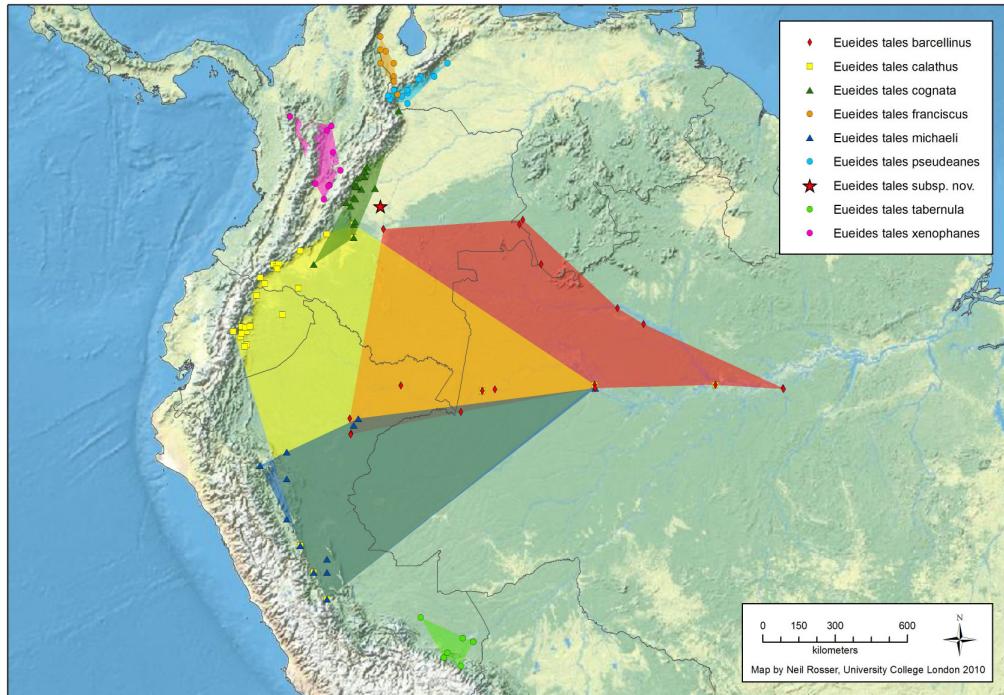


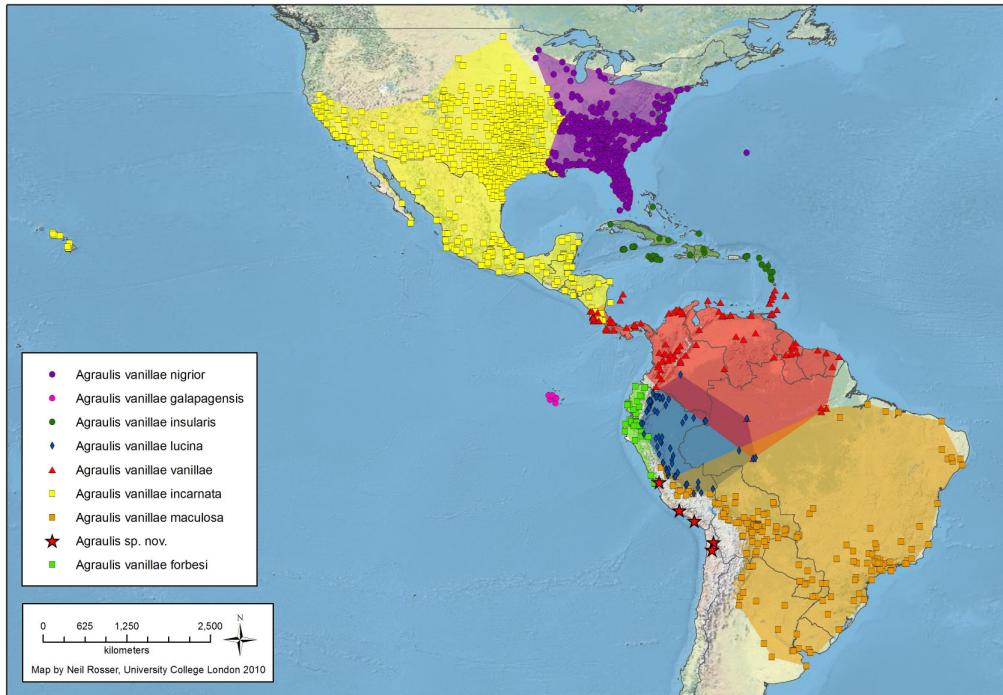


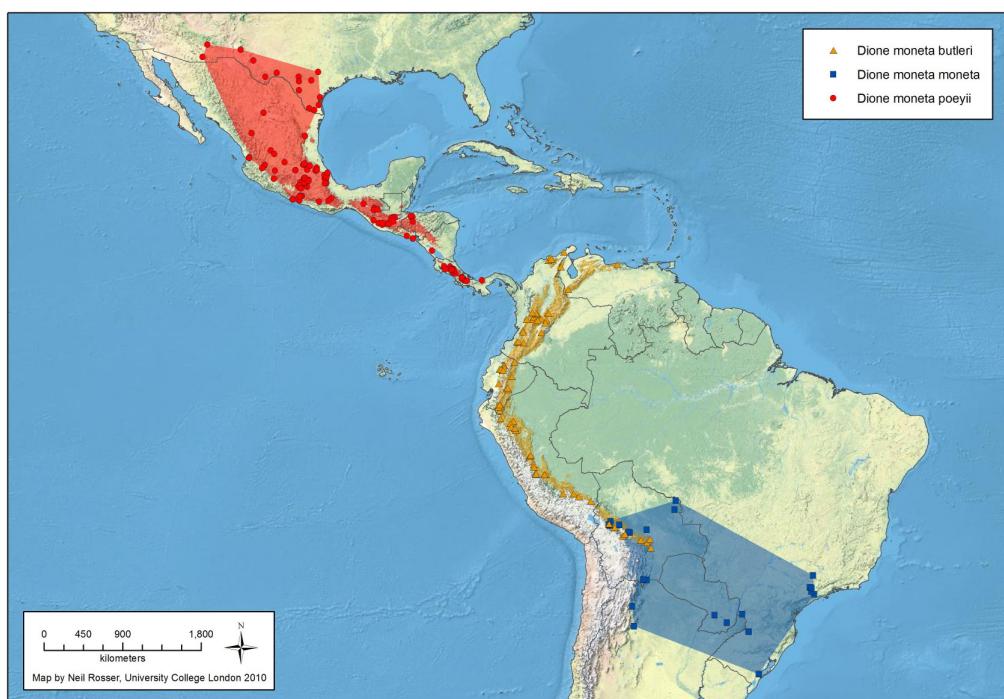
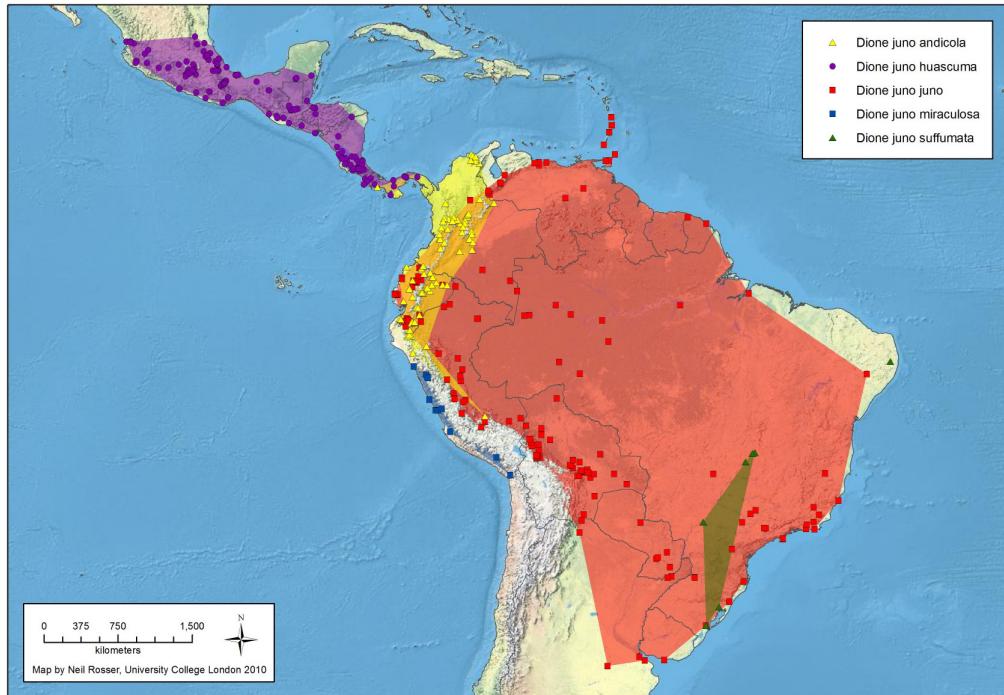


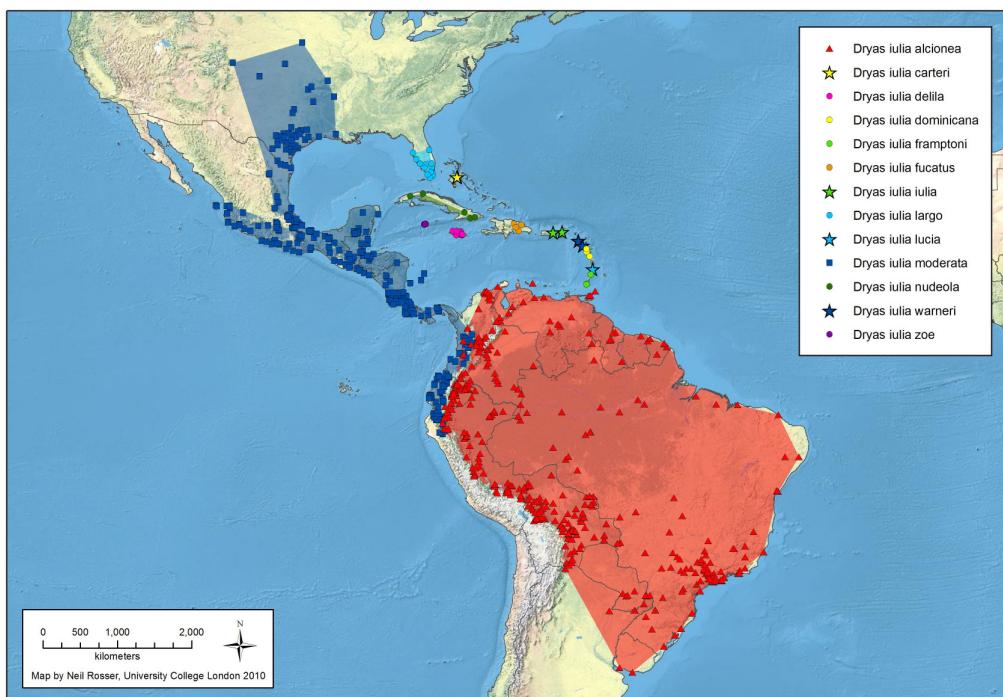
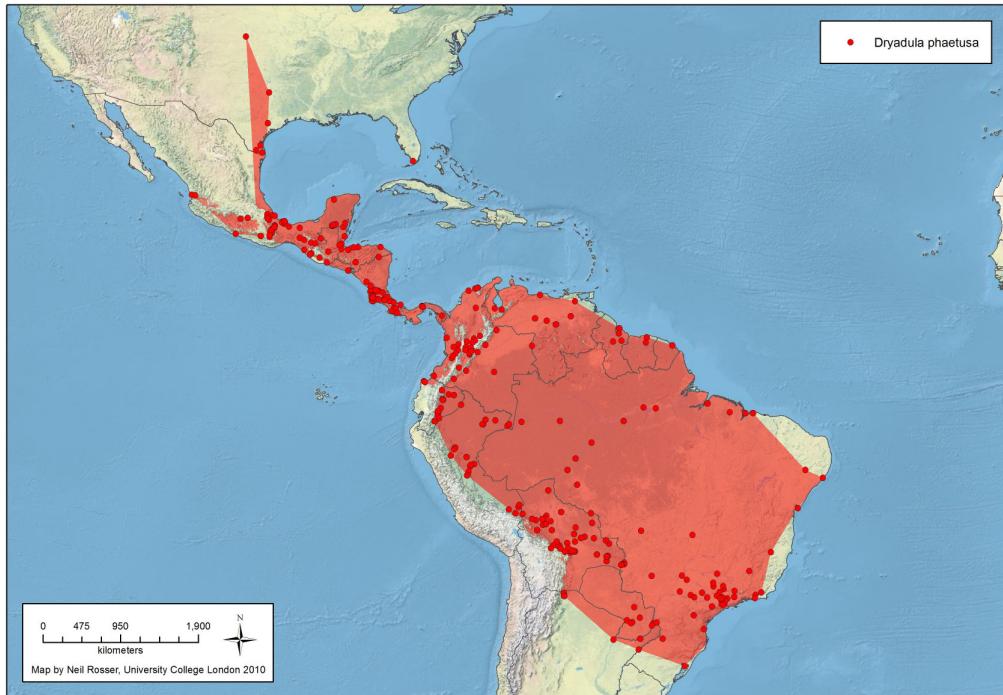


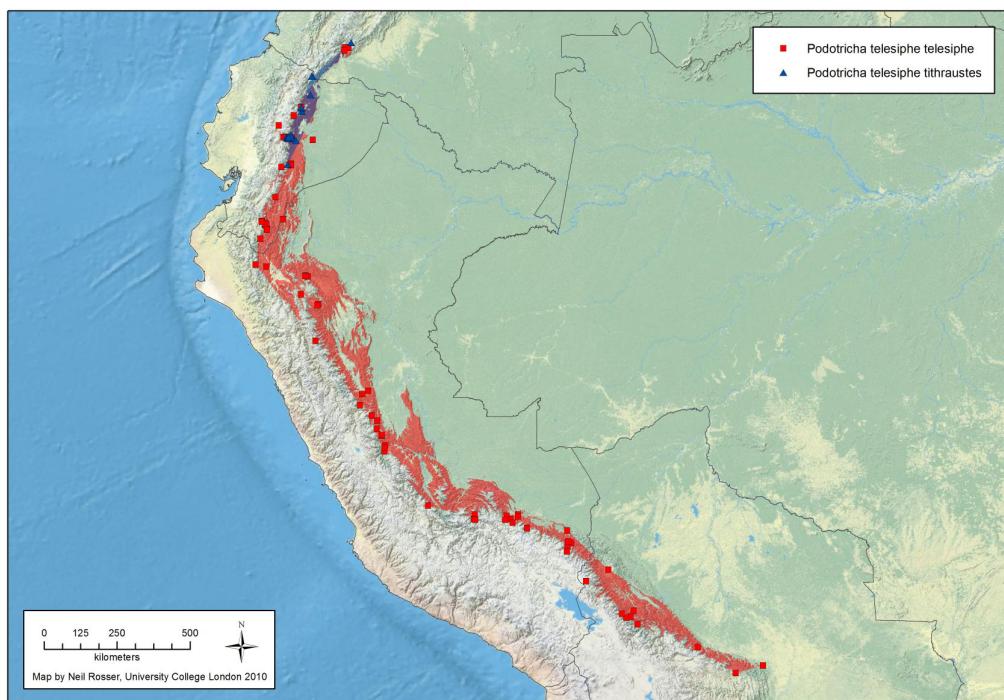
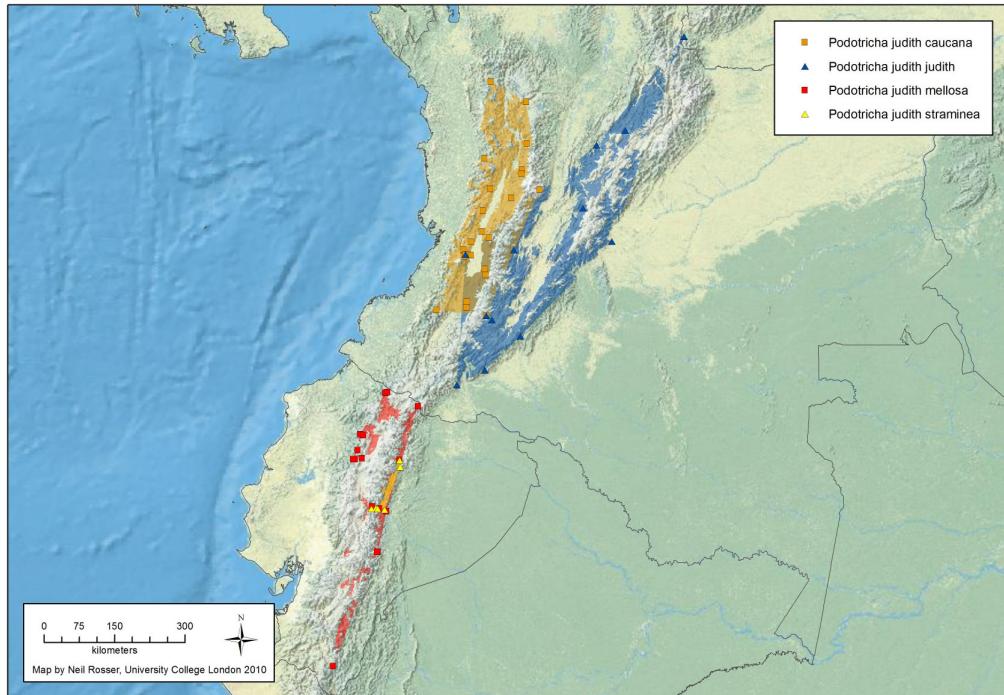












References

- Arias CF, Muñoz AG, Jiggins CD, Mavárez J, Bermingham E. & Linares M. 2008. A hybrid zone provides evidence for incipient ecological speciation in *Heliconius* butterflies. *Molecular Ecology* 17: 4699-4712.
- Brown KS. 1979. *Ecologia Geográfica e Evolução nas Florestas Neotropicais*, Universidade Estadual de Campinas, Campinas, Brazil.
- Gilbert LE. 2003. *Adaptive Novelty through Introgression in Heliconius Wing Patterns: Evidence for a Shared Genetic “Toolbox” from Synthetic Hybrid Zones and a Theory of Diversification*. *Ecology and Evolution Taking Flight: Butterflies as Model Systems* (ed. by C.L. Boggs, W.B. Watt, and P.R. Ehrlich), pp. 281–318. University of Chicago Press, Chicago.
- Giraldo N, Salazar C, Jiggins C, Bermingham Eldredge & Linares Mauricio. 2008. Two sisters in the same dress: *Heliconius* cryptic species. *BMC Evolutionary Biology* 8: 324.
- Lamas G. 2004. *Atlas of Neotropical Lepidoptera. Checklist: Part 4A. Hesperioidae—Papilioidea*, (ed. by J.B. Heppner) Association for Tropical Lepidoptera/Scientific Publishers, Gainesville, Florida.
- Mallet J. 2009. *Rapid speciation, hybridization and adaptive radiation in the Heliconius melpomene group*. *Speciation and Patterns of Diversity*. (ed. by R.K. Butlin, J. Bridle, and D. Schutler), Cambridge University Press.
- Moreira GRP & Mielke CGC. 2010. A new species of Neruda Turner, 1976 from northeast Brazil (Lepidoptera: Nymphalidae, Heliconiinae, Heliconiini). *Nachrichten des entomologischen Vereins Apollo, N.F.* 31: 85-91.
- Waage JK, Smiley JT & Gilbert L. E. 1981. The Passiflora problem in Hawaii; prospects and problems of controlling the forest weedP. Mollissima [Passifloraceae] with heliconiine butterflies. *Entomophaga* 26: 275-284.