

## **Electronic Supplementary Materials**

# **Conserving the functional and phylogenetic trees of life of European tetrapods**

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# Species list

Amphibians	Birds	Mammals	Squamates
<i>Alytes cisternasii</i>	<i>Accipiter brevipes</i>	<i>Acomys minous</i>	<i>Ablepharus budaki</i>
<i>Alytes dickhilleni</i>	<i>Accipiter gentilis</i>	<i>Acomys nesiotus</i>	<i>Ablepharus chernovi</i>
<i>Alytes muletensis</i>	<i>Accipiter nisus</i>	<i>Alces alces</i>	<i>Ablepharus kitaibelii</i>
<i>Alytes obstetricans</i>	<i>Acrocephalus agricola</i>	<i>Allactaga elater</i>	<i>Acanthodactylus boskianus</i>
<i>Bombina bombina</i>	<i>Acrocephalus arundinaceus</i>	<i>Allactaga euphratica</i>	<i>Acanthodactylus erythrurus</i>
<i>Bombina pachypus</i>	<i>Acrocephalus dumetorum</i>	<i>Allactaga major</i>	<i>Acanthodactylus grandis</i>
<i>Bombina variegata</i>	<i>Acrocephalus melanopogon</i>	<i>Allactaga sibirica</i>	<i>Acanthodactylus schreiberi</i>
<i>Bufo balearicus</i>	<i>Acrocephalus paludicola</i>	<i>Allactaga williamsi</i>	<i>Algyroides fitzingeri</i>
<i>Bufo boulengeri</i>	<i>Acrocephalus palustris</i>	<i>Allocricetulus eversmanni</i>	<i>Algyroides marchi</i>
<i>Bufo bufo</i>	<i>Acrocephalus schoenobaenus</i>	<i>Apodemus agrarius</i>	<i>Algyroides moreoticus</i>
<i>Bufo calamita</i>	<i>Acrocephalus scirpaceus</i>	<i>Apodemus alpicola</i>	<i>Algyroides nigropunctatus</i>
<i>Bufo siculus</i>	<i>Actitis hypoleucos</i>	<i>Apodemus flavicollis</i>	<i>Alsophylax pipiens</i>
<i>Bufo variabilis</i>	<i>Aegithalos caedatus</i>	<i>Apodemus hyrcanicus</i>	<i>Anatololacerta anatolica</i>
<i>Bufo verrucosissimus</i>	<i>Aegolius funereus</i>	<i>Apodemus mystacinus</i>	<i>Anatololacerta danfordi</i>
<i>Bufo viridis</i>	<i>Aegyptus monachus</i>	<i>Apodemus ponticus</i>	<i>Anatololacerta oertzeni</i>
<i>Calotriton arnoldi</i>	<i>Alauda arvensis</i>	<i>Apodemus sylvaticus</i>	<i>Anguis cephalonica</i>
<i>Calotriton asper</i>	<i>Alcedo atthis</i>	<i>Apodemus uralensis</i>	<i>Anguis fragilis</i>
<i>Chioglossa lusitanica</i>	<i>Alectoris barbara</i>	<i>Apodemus witherbyi</i>	<i>Apathya cappadocica</i>
<i>Discoglossus galganoi</i>	<i>Alectoris chukar</i>	<i>Arvicola amphibius</i>	<i>Archaeolacerta bedriagae</i>
<i>Discoglossus jeanneae</i>	<i>Alectoris graeca</i>	<i>Arvicola sapidus</i>	<i>Asaccus ellisae</i>
<i>Discoglossus montalentii</i>	<i>Alectoris rufa</i>	<i>Arvicola scherman</i>	<i>Blanus cinereus</i>
<i>Discoglossus pictus</i>	<i>Anas acuta</i>	<i>Atelerix algirus</i>	<i>Blanus strauchi</i>
<i>Discoglossus sardus</i>	<i>Anas clypeata</i>	<i>Barbastella barbastellus</i>	<i>Chalcides bedriagai</i>
<i>Euproctus montanus</i>	<i>Anas crecca</i>	<i>Barbastella leucomelas</i>	<i>Chalcides bistriatus</i>
<i>Euproctus platycephalus</i>	<i>Anas platyrhynchos</i>	<i>Bison bonasus</i>	<i>Chalcides chalcides</i>
<i>Hydromantes ambrosii</i>	<i>Anas querquedula</i>	<i>Calomyscus urartensis</i>	<i>Chalcides ocellatus</i>
<i>Hydromantes flavus</i>	<i>Anser anser</i>	<i>Canis aureus</i>	<i>Chalcides sexlineatus</i>
<i>Hydromantes geni</i>	<i>Anser brachyrhynchus</i>	<i>Canis lupus</i>	<i>Chalcides simonyi</i>
<i>Hydromantes imperialis</i>	<i>Anser erythropus</i>	<i>Capra caucasica</i>	<i>Chalcides striatus</i>
<i>Hydromantes italicus</i>	<i>Anser fabalis</i>	<i>Capra ibex</i>	<i>Chalcides viridanus</i>
<i>Hydromantes sarrabusensis</i>	<i>Anthropoides virgo</i>	<i>Capra pyrenaica</i>	<i>Chamaeleo africanus</i>
<i>Hydromantes strinatii</i>	<i>Anthus berthelotii</i>	<i>Capreolus capreolus</i>	<i>Chamaeleo chamaeleon</i>
<i>Hydromantes supramontis</i>	<i>Anthus campestris</i>	<i>Capreolus pygargus</i>	<i>Coronella austriaca</i>
<i>Hyla arborea</i>	<i>Anthus cervinus</i>	<i>Castor fiber</i>	<i>Coronella girondica</i>
<i>Hyla intermedia</i>	<i>Anthus petrosus</i>	<i>Cervus elaphus</i>	<i>Cyrtopodion caspium</i>
<i>Hyla meridionalis</i>	<i>Anthus pratensis</i>	<i>Chionomys gud</i>	<i>Cyrtopodion heterocercum</i>
<i>Hyla sarda</i>	<i>Anthus spinoletta</i>	<i>Chionomys nivalis</i>	<i>Cyrtopodion kotschyi</i>
<i>Hyla savignyi</i>	<i>Anthus trivialis</i>	<i>Chionomys roberti</i>	<i>Cyrtopodion scabrum</i>
<i>Lissotriton boscai</i>	<i>Apus apus</i>	<i>Cricetulus migratorius</i>	<i>Dalmatolacerta oxycephala</i>
<i>Lissotriton helveticus</i>	<i>Apus caffer</i>	<i>Cricetus cricetus</i>	<i>Darevskia armeniaca</i>
<i>Lissotriton italicus</i>	<i>Apus melba</i>	<i>Crocidura canariensis</i>	<i>Darevskia bendimahiensis</i>
<i>Lissotriton montandoni</i>	<i>Apus pallidus</i>	<i>Crocidura leucodon</i>	<i>Darevskia clarkorum</i>
<i>Lissotriton vulgaris</i>	<i>Aquila chrysaetos</i>	<i>Crocidura russula</i>	<i>Darevskia dahl</i>
<i>Lyciasalamandra antalyana</i>	<i>Aquila clanga</i>	<i>Crocidura sicula</i>	<i>Darevskia derjugini</i>
<i>Lyciasalamandra atifi</i>	<i>Aquila heliaca</i>	<i>Crocidura suaveolens</i>	<i>Darevskia mixta</i>
<i>Lyciasalamandra billae</i>	<i>Aquila pomarina</i>	<i>Dama dama</i>	<i>Darevskia nairensis</i>
<i>Lyciasalamandra fazilae</i>	<i>Ardea cinerea</i>	<i>Desmana moschata</i>	<i>Darevskia parvula</i>
<i>Lyciasalamandra flavimembris</i>	<i>Ardea purpurea</i>	<i>Dicrostonyx torquatus</i>	<i>Darevskia portschinskii</i>
<i>Lyciasalamandra helverseni</i>	<i>Ardeola ralloides</i>	<i>Dinaromys bogdanovi</i>	<i>Darevskia praticola</i>
<i>Lyciasalamandra luschani</i>	<i>Arenaria interpres</i>	<i>Diplomesodon pulchellum</i>	<i>Darevskia raddei</i>
<i>Mertensiella caucasica</i>	<i>Asio flammeus</i>	<i>Dipus sagitta</i>	<i>Darevskia rostombekovi</i>
<i>Mesotriton alpestris</i>	<i>Asio otus</i>	<i>Dryomys laniger</i>	<i>Darevskia rudis</i>
<i>Neureergus crocatus</i>	<i>Athene noctua</i>	<i>Dryomys nitedula</i>	<i>Darevskia sapphirina</i>
<i>Neureergus strauchii</i>	<i>Aythya ferina</i>	<i>Eliomys melanurus</i>	<i>Darevskia unisexualis</i>
<i>Ommatotriton ophryticus</i>	<i>Aythya fuligula</i>	<i>Eliomys quercinus</i>	<i>Darevskia uzzelli</i>
<i>Ommatotriton vittatus</i>	<i>Aythya marila</i>	<i>Ellobius lutescens</i>	<i>Darevskia valentini</i>
<i>Pelobates cultripes</i>	<i>Aythya nyroca</i>	<i>Ellobius talpinus</i>	<i>Dinarolacerta montenegrina</i>
<i>Pelobates fuscus</i>	<i>Bombycilla garrulus</i>	<i>Eptesicus bottae</i>	<i>Dinarolacerta mosorensis</i>
<i>Pelobates syriacus</i>	<i>Bonasa bonasia</i>	<i>Eptesicus serotinus</i>	<i>Dolichophis caspius</i>
<i>Pelodytes caucasicus</i>	<i>Botaurus stellaris</i>	<i>Erinaceus concolor</i>	<i>Dolichophis cypriensis</i>
<i>Pelodytes ibericus</i>	<i>Branta leucopsis</i>	<i>Erinaceus europaeus</i>	<i>Dolichophis jugularis</i>
<i>Pelodytes punctatus</i>	<i>Bubo bubo</i>	<i>Erinaceus roumanicus</i>	<i>Dolichophis schmidt</i>
<i>Pleurodeles waltl</i>	<i>Bubulcus ibis</i>	<i>Felis chaus</i>	<i>Eirenis decemlineatus</i>
<i>Proteus anguinus</i>	<i>Bucanetes githagineus</i>	<i>Felis margarita</i>	<i>Eirenis levaninus</i>
<i>Rana arvalis</i>	<i>Bucephala clangula</i>	<i>Felis silvestris</i>	<i>Eirenis lineomaculatus</i>
<i>Rana bergeri</i>	<i>Burhinus oedicephalus</i>	<i>Galemys pyrenaicus</i>	<i>Eirenis modestus</i>
<i>Rana dalmatina</i>	<i>Buteo buteo</i>	<i>Gazella subgutturosa</i>	<i>Eirenis punctatolineatus</i>
<i>Rana esculenta</i>	<i>Buteo lagopus</i>	<i>Genetta genetta</i>	<i>Eirenis rothii</i>
<i>Rana graeca</i>	<i>Buteo rufinus</i>	<i>Glis glis</i>	<i>Elaphe dione</i>
<i>Rana iberica</i>	<i>Calandrella brachydactyla</i>	<i>Gulo gulo</i>	<i>Elaphe quatuorlineata</i>

<i>Rana italica</i>	<i>Calandrella cheleensis</i>	<i>Hemiechinus auritus</i>	<i>Elaphe sauromates</i>
<i>Rana kurtmuelleri</i>	<i>Calandrella rufescens</i>	<i>Herpestes ichneumon</i>	<i>Eremias arguta</i>
<i>Rana latastei</i>	<i>Calcarius lapponicus</i>	<i>Hyaena hyaena</i>	<i>Eremias persica</i>
<i>Rana lessonae</i>	<i>Calidris alpina</i>	<i>Hystrix cristata</i>	<i>Eremias pleskei</i>
<i>Rana perezi</i>	<i>Calidris maritima</i>	<i>Hystrix indica</i>	<i>Eremias strauchi</i>
<i>Rana pyrenaica</i>	<i>Calidris minuta</i>	<i>Lagurus lagurus</i>	<i>Eryx jaculus</i>
<i>Rana ridibunda</i>	<i>Calidris temminckii</i>	<i>Lemmus lemmus</i>	<i>Euleptes europaea</i>
<i>Rana temporaria</i>	<i>Caprimulgus europaeus</i>	<i>Lepus capensis</i>	<i>Eumeces schneideri</i>
<i>Salamandra atra</i>	<i>Caprimulgus ruficollis</i>	<i>Lepus castroviejoi</i>	<i>Gallotia atlantica</i>
<i>Salamandra corsica</i>	<i>Carduelis cannabina</i>	<i>Lepus corsicanus</i>	<i>Gallotia bravoana</i>
<i>Salamandra infraimmaculata</i>	<i>Carduelis flavirostris</i>	<i>Lepus europaeus</i>	<i>Gallotia caesaris</i>
<i>Salamandra lanzai</i>	<i>Carduelis chloris</i>	<i>Lepus granatensis</i>	<i>Gallotia galloti</i>
<i>Salamandra salamandra</i>	<i>Carduelis flammea</i>	<i>Lepus timidus</i>	<i>Gallotia intermedia</i>
<i>Salamandrella keyserlingii</i>	<i>Carduelis flavirostris</i>	<i>Lepus tolai</i>	<i>Gallotia simonyi</i>
<i>Salamandrina perspicillata</i>	<i>Carduelis hornemanni</i>	<i>Lutra lutra</i>	<i>Gallotia stehlini</i>
<i>Salamandrina terdigitata</i>	<i>Carduelis spinus</i>	<i>Lynx lynx</i>	<i>Hellenolacerta graeca</i>
<i>Triturus carnifex</i>	<i>Carpodacus erythrinus</i>	<i>Lynx pardinus</i>	<i>Hemidactylus turcicus</i>
<i>Triturus cristatus</i>	<i>Cercotrichas galactotes</i>	<i>Marmota baibacina</i>	<i>Hemorrhoids algirus</i>
<i>Triturus dobrogicus</i>	<i>Certhia brachydactyla</i>	<i>Marmota marmota</i>	<i>Hemorrhoids hippocrepis</i>
<i>Triturus karelinii</i>	<i>Certhia familiaris</i>	<i>Martes foina</i>	<i>Hemorrhoids nummifer</i>
<i>Triturus marmoratus</i>	<i>Celtia celti</i>	<i>Martes martes</i>	<i>Hemorrhoids ravergieri</i>
<i>Triturus pygmaeus</i>	<i>Charadrius alexandrinus</i>	<i>Martes zibellina</i>	<i>Hierophis gemonensis</i>
	<i>Charadrius asiaticus</i>	<i>Meles leucurus</i>	<i>Hierophis viridiflavus</i>
	<i>Charadrius dubius</i>	<i>Meles meles</i>	<i>Iberolacerta aranica</i>
	<i>Charadrius hiaticula</i>	<i>Meriones crassus</i>	<i>Iberolacerta aurelioi</i>
	<i>Charadrius morinellus</i>	<i>Meriones dahli</i>	<i>Iberolacerta bonnali</i>
	<i>Chersophilus duponti</i>	<i>Meriones libycus</i>	<i>Iberolacerta cyreni</i>
	<i>Chlidonias hybridus</i>	<i>Meriones meridianus</i>	<i>Iberolacerta galani</i>
	<i>Chlidonias leucopterus</i>	<i>Meriones persicus</i>	<i>Iberolacerta horvathi</i>
	<i>Chlidonias niger</i>	<i>Meriones tamariscinus</i>	<i>Iberolacerta martinezricai</i>
	<i>Ciconia ciconia</i>	<i>Meriones vinogradovi</i>	<i>Iberolacerta monticola</i>
	<i>Ciconia nigra</i>	<i>Mesocricetus auratus</i>	<i>Iranolacerta brandtii</i>
	<i>Cinclus cinclus</i>	<i>Mesocricetus brandtii</i>	<i>Lacerta agilis</i>
	<i>Circaetus gallicus</i>	<i>Mesocricetus newtoni</i>	<i>Lacerta bilineata</i>
	<i>Circus aeruginosus</i>	<i>Mesocricetus raddei</i>	<i>Lacerta media</i>
	<i>Circus cyaneus</i>	<i>Micromys minutus</i>	<i>Lacerta schreiberi</i>
	<i>Circus macrourus</i>	<i>Microtus agrestis</i>	<i>Lacerta strigata</i>
	<i>Circus pygargus</i>	<i>Microtus arvalis</i>	<i>Lacerta trilineata</i>
	<i>Cisticola juncidis</i>	<i>Microtus brachycercus</i>	<i>Lacerta viridis</i>
	<i>Clamator glandarius</i>	<i>Microtus cabrerae</i>	<i>Laudakia caucasia</i>
	<i>Clangula hyemalis</i>	<i>Microtus daghestanicus</i>	<i>Laudakia stellio</i>
	<i>Coccothraustes coccothraustes</i>	<i>Microtus duodecimcostatus</i>	<i>Leptotyphlops macrorhynchus</i>
	<i>Columba livia</i>	<i>Microtus gerbei</i>	<i>Macroprotodon brevis</i>
	<i>Columba oenas</i>	<i>Microtus gregalis</i>	<i>Macroprotodon cucullatus</i>
	<i>Columba palumbus</i>	<i>Microtus guentheri</i>	<i>Macroprotodon mauritanicus</i>
	<i>Coracias garrulus</i>	<i>Microtus levis</i>	<i>Macrovipera lebetina</i>
	<i>Corvus corax</i>	<i>Microtus lusitanicus</i>	<i>Macrovipera schweizeri</i>
	<i>Corvus corone</i>	<i>Microtus majori</i>	<i>Malpolon monspessulanus</i>
	<i>Corvus frugilegus</i>	<i>Microtus middendorffii</i>	<i>Mesalina brevirostris</i>
	<i>Corvus monedula</i>	<i>Microtus oeconomus</i>	<i>Montivipera raddei</i>
	<i>Coturnix coturnix</i>	<i>Microtus savii</i>	<i>Montivipera wagneri</i>
	<i>Crex crex</i>	<i>Microtus socialis</i>	<i>Montivipera xanthina</i>
	<i>Cuculus canorus</i>	<i>Microtus subterraneus</i>	<i>Natrix maura</i>
	<i>Cyanopica cyana (cyanus)</i>	<i>Microtus talricus</i>	<i>Natrix natrix</i>
	<i>Cygnus cygnus</i>	<i>Mus macedonicus</i>	<i>Natrix tessellata</i>
	<i>Cygnus olor</i>	<i>Mus musculus</i>	<i>Ophiomorus punctatissimus</i>
	<i>Delichon urbica</i>	<i>Mus spicilegus</i>	<i>Ophisops elegans</i>
	<i>Dendrocopos major</i>	<i>Mus spretus</i>	<i>Parvilacerta parva</i>
	<i>Dendrocopos medius</i>	<i>Muscardinus avellanarius</i>	<i>Phoenicolacerta laevis</i>
	<i>Dendrocopos minor</i>	<i>Mustela erminea</i>	<i>Phoenicolacerta troodica</i>
	<i>Dryocopus martius</i>	<i>Mustela eversmanii</i>	<i>Phrynocephalus helioscopus</i>
	<i>Egretta garzetta</i>	<i>Mustela lutreola</i>	<i>Phrynocephalus mystaceus</i>
	<i>Elanus caeruleus</i>	<i>Mustela nivalis</i>	<i>Phrynocephalus persicus</i>
	<i>Emberiza aureola</i>	<i>Mustela putorius</i>	<i>Platyceps collaris</i>
	<i>Emberiza caesia</i>	<i>Mustela sibirica</i>	<i>Platyceps najadum</i>
	<i>Emberiza cia</i>	<i>Myodes glareolus</i>	<i>Platyceps ventromaculatus</i>
	<i>Emberiza cirius</i>	<i>Myodes rufocanus</i>	<i>Podarcis atrata</i>
	<i>Emberiza citrinella</i>	<i>Myodes rutilus</i>	<i>Podarcis bocagei</i>
	<i>Emberiza hortulana</i>	<i>Myomimus roachi</i>	<i>Podarcis carbonelli</i>
	<i>Emberiza melanocephala</i>	<i>Myopus schisticolor</i>	<i>Podarcis erhardii</i>
	<i>Emberiza pusilla</i>	<i>Myotis bechsteinii</i>	<i>Podarcis filloensis</i>
	<i>Emberiza rustica</i>	<i>Myotis blythii</i>	<i>Podarcis gaigeae</i>
	<i>Emberiza schoeniclus</i>	<i>Myotis brandtii</i>	<i>Podarcis hispanica</i>
	<i>Eremophila alpestris</i>	<i>Myotis capaccinii</i>	<i>Podarcis lilfordi</i>
	<i>Erithacus rubecula</i>	<i>Myotis dasycneme</i>	<i>Podarcis melisellensis</i>
	<i>Falco biarmicus</i>	<i>Myotis daubentonii</i>	<i>Podarcis milensis</i>

*Falco cherrug*  
*Falco columbarius*  
*Falco eleonorae*  
*Falco naumanni*  
*Falco peregrinus*  
*Falco rusticolus*  
*Falco subbuteo*  
*Falco tinnunculus*  
*Falco vespertinus*  
*Ficedula albicollis*  
*Ficedula hypoleuca*  
*Ficedula parva*  
*Ficedula semitorquata*  
*Fringilla coelebs*  
*Fringilla montifringilla*  
*Fulica atra*  
*Fulica cristata*  
*Galerida cristata*  
*Galerida theklae*  
*Gallinago gallinago*  
*Gallinago media*  
*Gallinula chloropus*  
*Garrulus glandarius*  
*Gavia arctica*  
*Gavia immer*  
*Gavia stellata*  
*Gelochelidon nilotica*  
*Glareola nordmanni*  
*Glareola pratincola*  
*Glaucidium passerinum*  
*Grus grus*  
*Gypaetus barbatus*  
*Gyps fulvus*  
*Haematopus ostralegus*  
*Haliaeetus albicilla*  
*Hieraaetus fasciatus*  
*Hieraaetus pennatus*  
*Himantopus himantopus*  
*Hippolais icterina*  
*Hippolais olivetorum*  
*Hippolais pallida*  
*Hippolais polyglotta*  
*Hirundo daurica*  
*Hirundo rustica*  
*Ixobrychus minutus*  
*Jynx torquilla*  
*Lagopus lagopus*  
*Lagopus mutus*  
*Lanius collurio*  
*Lanius excubitor*  
*Lanius minor*  
*Lanius nubicus*  
*Lanius senator*  
*Larus argentatus*  
*Larus audouinii*  
*Larus canus*  
*Larus fuscus*  
*Larus hyperboreus*  
*Larus ichthyaetus*  
*Larus marinus*  
*Larus melanocephalus*  
*Larus minutus*  
*Larus ridibundus*  
*Limicola falcinellus*  
*Limosa lapponica*  
*Limosa limosa*  
*Locustella fluviatilis*  
*Locustella luscinioides*  
*Locustella naevia*  
*Loxia curvirostra*  
*Loxia pytyopsittacus*  
*Loxia scotica*  
*Lullula arborea*  
*Luscinia luscinia*  
*Luscinia megarhynchos*  
*Luscinia svecica*

*Myotis emarginatus*  
*Myotis myotis*  
*Myotis mystacinus*  
*Myotis nattereri*  
*Myotis nipalensis*  
*Myotis punicus*  
*Neomys anomalus*  
*Neomys fodiens*  
*Neomys teres*  
*Nyctalus azoreum*  
*Nyctalus lasiopterus*  
*Nyctalus leisleri*  
*Nyctalus noctula*  
*Ochotona hyperborea*  
*Ochotona pusilla*  
*Oryctolagus cuniculus*  
*Ovis aries*  
*Panthera pardus*  
*Pipistrellus kuhlii*  
*Pipistrellus maderensis*  
*Pipistrellus nathusii*  
*Pipistrellus pipistrellus*  
*Pipistrellus pygmaeus*  
*Plecotus auritus*  
*Plecotus austriacus*  
*Plecotus kolombatovici*  
*Plecotus teneriffae*  
*Prometheomys schaposchnikowi*  
*Pteromys volans*  
*Pygeretmus platyurus*  
*Pygeretmus pumilio*  
*Rangifer tarandus*  
*Rhinolophus blasii*  
*Rhinolophus euryale*  
*Rhinolophus ferrumequinum*  
*Rhinolophus hipposideros*  
*Rhinolophus mehelyi*  
*Rhombomys opimus*  
*Rousettus aegyptiacus*  
*Rupicapra pyrenaica*  
*Rupicapra rupicapra*  
*Saiga tatarica*  
*Sciurus anomalus*  
*Sciurus vulgaris*  
*Sicista armenica*  
*Sicista betulina*  
*Sicista caucasica*  
*Sicista kazbegica*  
*Sicista kluchorica*  
*Sicista severtzovi*  
*Sicista strandi*  
*Sicista subtilis*  
*Sorex alpinus*  
*Sorex antinorii*  
*Sorex araneus*  
*Sorex caecutiens*  
*Sorex coronatus*  
*Sorex granarius*  
*Sorex isodon*  
*Sorex minutissimus*  
*Sorex minutus*  
*Sorex raddei*  
*Sorex samniticus*  
*Sorex satunini*  
*Sorex tundrensis*  
*Sorex volnuchini*  
*Spalax arenarius*  
*Spalax ehrenbergi*  
*Spalax giganteus*  
*Spalax graecus*  
*Spalax leucodon*  
*Spalax nehringi*  
*Spalax uralensis*  
*Spalax zemni*  
*Spermophilus citellus*  
*Spermophilus fulvus*

*Podarcis muralis*  
*Podarcis peloponnesiaca*  
*Podarcis pityusensis*  
*Podarcis raffonei*  
*Podarcis sicula*  
*Podarcis taurica*  
*Podarcis tiliguerta*  
*Podarcis wagleriana*  
*Psammodromus algirus*  
*Psammodromus hispanicus*  
*Pseudocerastes persicus*  
*Pseudopus apodus*  
*Rhinechis scalaris*  
*Spalerosophis diadema*  
*Stenodactylus grandiceps*  
*Tarentola angustimentalis*  
*Tarentola bischoffi*  
*Tarentola boettgeri*  
*Tarentola delalandii*  
*Tarentola gomerensis*  
*Tarentola mauritanica*  
*Teira dugesii*  
*Telescopus fallax*  
*Timon lepidus*  
*Timon princeps*  
*Trachylepis aurata*  
*Trachylepis septemtaeniata*  
*Trachylepis vittata*  
*Trapelus agilis*  
*Typhlops vermicularis*  
*Varanus griseus*  
*Vipera ammodytes*  
*Vipera aspis*  
*Vipera berus*  
*Vipera dinniki*  
*Vipera eriwanensis*  
*Vipera kaznakovi*  
*Vipera latastei*  
*Vipera lotievi*  
*Vipera nikolskii*  
*Vipera renardi*  
*Vipera seoanei*  
*Vipera transcaucasiana*  
*Vipera ursinii*  
*Zamenis hohenackeri*  
*Zamenis lineatus*  
*Zamenis longissimus*  
*Zamenis persica*  
*Zamenis situla*  
*Zootoca vivipara*

<i>Lymnocyptes minimus</i>	<i>Spermophilus major</i>
<i>Marmaronetta angustirostris</i>	<i>Spermophilus musicus</i>
<i>Melanitta fusca</i>	<i>Spermophilus pygmaeus</i>
<i>Melanitta nigra</i>	<i>Spermophilus suslicus</i>
<i>Melanocorypha calandra</i>	<i>Spermophilus xanthopymnus</i>
<i>Mergus merganser</i>	<i>Suncus etruscus</i>
<i>Mergus serrator</i>	<i>Sus scrofa</i>
<i>Merops apiaster</i>	<i>Tadarida teniotis</i>
<i>Miliaria calandra</i>	<i>Talpa caeca</i>
<i>Milvus migrans</i>	<i>Talpa caucasica</i>
<i>Milvus milvus</i>	<i>Talpa davidiana</i>
<i>Monticola saxatilis</i>	<i>Talpa europaea</i>
<i>Monticola solitarius</i>	<i>Talpa levantis</i>
<i>Motacilla alba</i>	<i>Talpa occidentalis</i>
<i>Motacilla cinerea</i>	<i>Talpa romana</i>
<i>Motacilla citreola</i>	<i>Talpa stankovici</i>
<i>Motacilla flava</i>	<i>Tamias sibiricus</i>
<i>Muscicapa striata</i>	<i>Tatera indica</i>
<i>Neophron percnopterus</i>	<i>Ursus arctos</i>
<i>Netta rufina</i>	<i>Ursus maritimus</i>
<i>Nucifraga caryocatactes</i>	<i>Vespertilio murinus</i>
<i>Numenius arquata</i>	<i>Vormela peregusna</i>
<i>Numenius phaeopus</i>	<i>Vulpes corsac</i>
<i>Nyctea scandiaca</i>	<i>Vulpes vulpes</i>
<i>Nycticorax nycticorax</i>	
<i>Oenanthe hispanica</i>	
<i>Oenanthe isabellina</i>	
<i>Oenanthe oenanthe</i>	
<i>Oenanthe pleschanka</i>	
<i>Oriolus oriolus</i>	
<i>Otis tarda</i>	
<i>Otus scops</i>	
<i>Oxyura leucocephala</i>	
<i>Pandion haliaetus</i>	
<i>Panurus biarmicus</i>	
<i>Parus ater</i>	
<i>Parus caeruleus</i>	
<i>Parus cinctus</i>	
<i>Parus cristatus</i>	
<i>Parus cyanus</i>	
<i>Parus lugubris</i>	
<i>Parus major</i>	
<i>Parus montanus</i>	
<i>Parus palustris</i>	
<i>Passer domesticus</i>	
<i>Passer hispaniolensis</i>	
<i>Passer montanus</i>	
<i>Perdix perdix</i>	
<i>Perisoreus infaustus</i>	
<i>Pernis apivorus</i>	
<i>Petronia petronia</i>	
<i>Phalacrocorax carbo</i>	
<i>Phalaropus lobatus</i>	
<i>Phasianus colchicus</i>	
<i>Philomachus pugnax</i>	
<i>Phoenicurus ochruros</i>	
<i>Phoenicurus phoenicurus</i>	
<i>Phylloscopus bonelli</i>	
<i>Phylloscopus borealis</i>	
<i>Phylloscopus sibilatrix</i>	
<i>Phylloscopus trochiloides</i>	
<i>Phylloscopus trochilus</i>	
<i>Pica pica</i>	
<i>Picoides tridactylus</i>	
<i>Picus canus</i>	
<i>Picus viridis</i>	
<i>Pinicola enucleator</i>	
<i>Platalea leucorodia</i>	
<i>Plectrophenax nivalis</i>	
<i>Plegadis falcinellus</i>	
<i>Pluvialis apricaria</i>	
<i>Pluvialis squatarola</i>	
<i>Podiceps auritus</i>	
<i>Podiceps cristatus</i>	
<i>Podiceps grisegena</i>	
<i>Podiceps nigricollis</i>	

*Porphyrio porphyrio*  
*Porzana parva*  
*Porzana porzana*  
*Porzana pusilla*  
*Prunella collaris*  
*Prunella modularis*  
*Pterocles alchata*  
*Pterocles orientalis*  
*Ptyonoprogne rupestris*  
*Pyrrhonorax graculus*  
*Pyrrhonorax pyrrhonorax*  
*Pyrrhula pyrrhula*  
*Rallus aquaticus*  
*Recurvirostra avosetta*  
*Regulus ignicapillus*  
*Regulus regulus*  
*Remiz pendulinus*  
*Riparia riparia*  
*Rissa tridactyla*  
*Saxicola rubetra*  
*Saxicola torquata*  
*Scolopax rusticola*  
*Serinus citrinella*  
*Serinus serinus*  
*Sitta europaea*  
*Sitta krueperi*  
*Sitta neumayer*  
*Somateria mollissima*  
*Stercorarius longicaudus*  
*Stercorarius parasiticus*  
*Stercorarius pomarinus*  
*Stercorarius skua*  
*Sterna albifrons*  
*Sterna caspia*  
*Sterna dougallii*  
*Sterna hirundo*  
*Sterna paradisaea*  
*Sterna sandvicensis*  
*Streptopelia decaocto*  
*Streptopelia turtur*  
*Strix aluco*  
*Strix nebulosa*  
*Strix uralensis*  
*Sturnus roseus*  
*Sturnus unicolor*  
*Sturnus vulgaris*  
*Surnia ulula*  
*Sylvia atricapilla*  
*Sylvia borin*  
*Sylvia cantillans*  
*Sylvia communis*  
*Sylvia conspicillata*  
*Sylvia curruca*  
*Sylvia hortensis*  
*Sylvia melanocephala*  
*Sylvia rueppelli*  
*Sylvia sarda*  
*Sylvia undata*  
*Tachybaptus ruficollis*  
*Tadorna ferruginea*  
*Tadorna tadorna*  
*Tetrao tetrix*  
*Tetrao urogallus*  
*Tetrax tetrax*  
*Tichodroma muraria*  
*Tringa erythropus*  
*Tringa glareola*  
*Tringa nebularia*  
*Tringa ochropus*  
*Tringa stagnatilis*  
*Tringa totanus*  
*Troglodytes troglodytes*  
*Turdus iliacus*  
*Turdus merula*  
*Turdus philomelos*  
*Turdus pilaris*

<i>Turdus torquatus</i> <i>Turdus viscivorus</i> <i>Tyto alba</i> <i>Upupa epops</i> <i>Vanellus gregarius</i> <i>Vanellus vanellus</i> <i>Xenus cinereus</i>		
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## Functional trait database.

To make sure all analyses were comparable throughout the four groups, we selected similar or equivalent traits for the four groups. For instance, body mass was used for both birds and mammals while body length was used for amphibians and squamates.

We summarised below the different classes used for each group and for each traits and their meaning. We also added the list of publications where the data were gathered. For birds, most data were extracted from Pearman *et al.* [1].

### Diet traits.

- **Adult:** Mushrooms, mosses/lichens, seeds/nuts/grains, fruits/berries, vegetarian, invertebrates, fishes, small mammals, large mammals, herptiles, bird eggs, small birds, large birds, bones, carrion, coprofagus.
- **Larvae-juveniles (amphibians):** vegetarian, invertebrates, carrion, detritus

### Adult feeding behaviours

- **Adult:** Opportunistic, hunting, browser, grazer. For birds: pursuit/air/aquatic, sally, foliage gleaning, pounce, grazing, pick/peck/stab, dig, overturning objects, probe and filter.
- **Larvae-juveniles (amphibians):** Opportunistic, hunting.

### Reproduction site

- ground, artificial/building, elevated (tree/shrubs), underground water, cave/fissures/borrows, lodge, temporary water, brooks/springs/small rivers, rivers, puddles/ponds/pools/small lakes, lakes, brackish waters, sea.

### Activity

- Nocturnal, crepuscular, diurnal and arithmetic.

### Nesting location

- viviparous, ovoviviparous, elevated, tree hole/fissure in the bark, ground, rocks, building/artificial, underground water, cave/fissures/borrows, lodge, temporary water, brooks/springs/small rivers, puddles/ponds/pools/small lakes, brackish waters, parthenogenetic.



## **Additional references**

### **Amphibians**

- Baier F, Sparrow DJ, Wiedl HJ. 2013. The amphibians and reptiles of Cyprus. Chimaira Editions, Frankfurt, 362 pp.
- Gasc JP, Cabela A, Crnobrnja-Isailovic J, Dolmen D, Grossenbacher K, Haffner P, Lescure J, Martens H, Martínez Rica JP, Maurin H, Oliveira ME, Sofianidou TS, Veith M, Zuiderwijk A (Eds). 1997. Atlas of amphibians and reptiles in Europe. Collection Patrimoines Naturels, 29, Societas Europaea Herpetologica, Muséum National d'Histoire Naturelle & Service du Patrimoine Naturel, Paris, 496 pp.
- Golemanski V et al. 2007. Red data book of the Republic of Bulgaria. Volume 2 – Animals. <http://e-ecodb.bas.bg/rdb/en/vol2/>
- Lanza B, Andreone F, Bologna MA, Corti C, Razzetti E. (Eds). 2007. Fauna d'Italia Vol 42 – Amphibia. Calderini, Bologna.
- Segev O. 2009. Conservation and ecology of the endangered fire salamander (*Salamandra infraimmaculata*). PhD Dissertation. University of Haifa
- Sindaco R, Doria G, Razzetti E, Bernini F (Eds). 2006. Atlas of Italian amphibians and reptiles. Societas Herpetologica Italica, Edizioni Polistampa, Firenze, 792 pp.
- Valakos ED, Pafilis P, Sotiropoulos K, Lymberakis P, Maragou P, Foufopoulos J. 2008. The amphibians and reptiles of Greece. Chimaira Editions, Frankfurt, 563 pp.

### **Web Sites**

- [www.herpfrance.com](http://www.herpfrance.com)
- [www.arkive.org](http://www.arkive.org)
- [www.edgeofexistence.org/amphibians/](http://www.edgeofexistence.org/amphibians/)
- [www.iucnredlist.org](http://www.iucnredlist.org)
- <http://eol.org>
- [www.vertebradosiberico.org](http://www.vertebradosiberico.org)
- <http://www.demogr.mpg.de/cgi-bin/longevityrecords/entry.plx>
- <http://redbook-ua.org>

## Mammals

- Al-Agaili A. 2003. Bats of Saudi Arabia. Unpublished manuscript.
- Alves PC, Goncalves H, Santos M, Rocha A. 2002. Reproductive biology of the Iberian hare, *Lepus granatensis*, in Portugal. *Mammalian Biology* 67: 358-371.
- Amori G, Contoli L, Nappi A. 2008. Fauna d'Italia Vol. 44. Mammalia II. Erinaceomorpha, Soricomorpha, Lagomorpha, Rodentia. Calderini, Bologna.
- Angerbjorn A, Flux JEC. 1995. *Lepus timidus*. *Mammalian Species* 495: 1-11.
- Aulagnier S, Haffner P, Mitchell-Jones T., Moutou F, Zima J. 2011. Guide del mammifères d'Europe, d'Afrique du Nord et du Moyen-Orient. Delachaux & Niestlé SA, Paris.
- Baron B, Borg JJ. 2011. Evidence of niche expansion in the *Myotis punicus* (Mammalia Chiroptera) of the Maltese islands. *Naturalista Siciliano* 35: 407-417.
- Beuneux G. 2004. Morphometrics and ecology of *Myotis* cf. *punicus* (Chiroptera, Vespertilionidae) in Corsica. *Mammalia* 68: 269-273.
- Bogdanowicz W. 1994. *Myotis daubentonii*. *Mammalian Species* 475: 1-9.
- Boitani L, Lovari S, Vigna Taglianti A (eds). 2003. Fauna d'Italia Vol. 38. Mammalia III. Carnivora-Artiodactyla. Calderini, Bologna.
- Buruldag E, Kurtonur C. 2001. Hibernation and postnatal development of the mouse-tailed dormouse, *Myomimus roachi* reared outdoor's in a cage. *Trakya University Journal of Scientific Research Series B* 2: 179-186.
- Caroli L, Capizzi D, Luiselli L. 2000. Reproductive strategies and life-history traits of the Savi's pine vole, *Microtus savii*. *Zoological Science* 17: 209-216.
- Churchfield S, Rychlik L, Yavrouyan E, Turlejski K. 2006. First results on the feeding ecology of the Transcaucasian water shrew *Neomys teres* (Soricomorpha: Soricidae) from Armenia. *Canadian Journal of Zoology* 84: 1853-1858.
- Clark HO, Murdoch JD, Newman DP, Sillero-Zubiri C. 2009. *Vulpes corsac* (Carnivora: Canidae). *Mammalian Species* 832: 1-8.
- Colak E, Yigit N, Sozen M, Verimli R. 1999. A study on morphology and karyology of *Prometheomys schaposchnikowi* Satunin, 1901 (Mammalia: Rodentia) in Turkey. *Turkish Journal of Zoology* 23: 415-421.
- Coskun Y, Uluturk S. 2003. Observations of the mole vole, *Ellobius lutescens* Thomas 1897, (Mammalia: Rodentia) in Turkey. *Turkish Journal of Zoology* 27: 81-87.
- Danilkin AA. 1995. *Capreolus pygargus*. *Mammalian Species* 512: 1-7.
- Darvish J, Akbary Rad S, Siahsar-Vie R, Hosein Pour Feizi MA, Ghorbani F. 2010. New record of pigmy field mice (Genus *Apodemus*, Muridae, Rodentia) from northeastern

- Iran. *Hystrix* – Italian Journal of Mammalogy 21: 115-126.
- DeMaster DP, Stirling I. 1981. *Ursus maritimus*. Mammalian Species 145: 1-7.
- Feldhamer GA, Farris-Renner KC, Barker CM. 1988. *Dama dama*. Mammalian Species 317: 1-8.
- Feoktistova NY, Naidenko SV, Surov AV, Menchinskii EM. 2013. Ecological and physiological characteristics of seasonal biology of the Mongolian hamster, *Allocricetulus curtatus* Allan 1940 (Cricetinae, Rodentia). *Ekologiya* 1: 60-64.
- Franzmann AW. 1981. *Alces alces*. Mammalian Species 154: 1-7.
- Garcia-Perea R, Ventura J, Lopez-Fuster MJ, Gisbert J. 1997. *Sorex granarius*. Mammalian Species 554: 1-4.
- Ghorbani F, Darvish J, Gholi Kami H, Mirshamsi O. 2010. Rodent fauna of the western Golestan Province in northeast Iran. *Iranian Journal of Animal Biosystematics* 6: 37-48.
- Golemanski V et al. 2007. Red data book of the Republic of Bulgaria. Volume 2 – Animals. <http://e-ecodb.bas.bg/rdb/en/vol2/>
- Gorsuch WA, Larivière S. 2005. *Vormela peregusna*. Mammalian Species 779: 1-5.
- Irwin NR, Speakman JR. 2003. Azorean bats *Nyctalus azoreum*, cluster as they emerge from roots, despite the lack of avian predators. *Acta Chiropterologica* 5: 185-192.
- King CM. 1983. *Mustela erminea*. Mammalian Species 195: 1-8.
- Kingswood SC, Blank DA. 1996. *Gazella subgutturosa*. Mammalian Species 518: 1-10.
- Kivanc E, Mutlu Eyison H, Kiralp S, Ekim O. 2013. Reproductive biology of *Acomys cilicicus* Spitzenberger, 1978 (Rodentia: Muridae) in Turkey. *Turkish Journal of Zoology* 37: 133-142.
- Koffler BR. 1972. *Meriones crassus*. Mammalian Species 9: 1-4.
- Kwiecinski GG, Griffiths TA. 1999. *Rousettus egyptiacus*. Mammalian Species 611: 1-9.
- Krystufek B. 2008. *Glis glis* (Rodentia: Gliridae). Mammalian Species 42: 195-206.
- Lanza B. 2012. Fauna d'Italia Vol. 47. Mammalia V. Chiroptera. Calderini, Bologna.
- Larivière S, Pasitschniak-Arts M. 1996. *Vulpes vulpes*. Mammalian Species 537: 1-11.
- Lopez-Fuster MJ, Ventura J. 1996. A morphometrical review of the *Sorex araneus-arcticus* species group from the Iberian peninsula (Insectivora, Soricidae). *Bonner zoologische Beitrage* 46: 327-337.
- Lyman CP, O'Brien R, Green GC, Papafrangos ED. 1981. Hibernation and longevity in the Turkish hamster *Mesocricetus brandi*. *Science* 212: 668-670.
- Macdonald DW, Barrett P. 2001. Mammals of Europe.
- Metch LD. 1974. *Canis lupus*. Mammalian Species 37: 1-6.

- Mitchell-Jones AJ et al. 1999. The atlas of European mammals. T & AD Poyser, London.
- Ognev SI. 1950. Mammals of the USSR and adjacent countries. Vol. II Rodents. Izdatel'stvo Akedemii Nauk SSSR, Mvovska-Leningrad.
- Ozkurt S, Yigit N. 2005. Observations on the ecology, reproduction and behavior of *Spermophilus* Bennett, 1835 (Mammalia: Rodentia) in Turkey. Turkish Journal of Zoology 29: 91-99.
- Palmeirim JM, Hoffmann RS. 1983. *Galemys pyrenaicus*. Mammalian Species 207: 1-5.
- Palomo LJ. 2008. Atlas y libro rojo de los mamíferos terrestres de España. ICONA (Organismo Autónomo Parques Nacionales), Madrid.
- Palomo LJ, Justo ER, Vargas JM. 2009. *Mus spretus* (Rodentia: Muridae). Mammalian Species 840: 1-10.
- Parrini F, Cain JW, Krausman PR. 2009. *Capra ibex* (Artiodactyla: Bovidae). Mammalian Species 830: 1-12.
- Pasitschaniak-Arts M. 1993. *Ursus arctos*. Mammalian Species 439: 1-10.
- Pasitschaniak-Arts M, Larivière S. 1995. *Gulo gulo*. Mammalian Species 499: 1-10.
- Rieger I. 1981. *Hyaena hyaena*. Mammalian Species 150: 1-5.
- Rogovin KA. 1992. Habitat use by two species of Mongolian marmots (*Marmota sibirica* and *M. baibacina*) in a zone of sympatry. Acta Theriologica 37: 345-350.
- Rydell J. 1989. Feeding activity of the northern bat *Eptesicus nilssonii* during pregnancy and lactation. Oecologia 80: 562-565.
- Rydell J. 1993. *Eptesicus nilssonii*. Mammalian Species 430: 1-7.
- Rydell J, Bogdanowicz W. 1997. *Barbastella barbastellus*. Mammalian Species 557: 1-8.
- Sanchez-Garcia C, Alonso ME, Bartolomé DJ, Pérez JA, Larsen RT, Gaudioso VR. 2012. Survival, home range patterns, probable causes of mortality, and den-site selection of the Iberian hare (*Lepus*, Leporidae, Mammalia) on arable farmland in north-west Spain. Italian Journal of Zoology 79: 590-597.
- Sempéré AJ, Sokolov VE, Danilkin AA. 1996. *Capreolus capreolus*. Mammalian Species 538: 1-9.
- Sheffield SR, King CM. 1994. *Mustela nivalis*. Mammalian Species 454: 1-10.
- Simeonovska-Nikolova DM. 2000. Strategies in open field behaviour of *Mus spicilegus* and *Mus musculus musculus*. Belgian Journal of Zoology 130: 115-120.
- Simeonovska-Nikolova DM, Mehmed S. 2009. Behavior of mound-building mouse, *Mus spicilegus* during autumn-winter period in captivity. Biotechnology & Biotechnological Equipment 23 (special edition online): 180-183.

- Sokolov VE. 1974. *Saiga tatarica*. Mammalian Species 38: 1-4.
- Sokolov VE, Kotenkova EV, Michailenko AG. 1998. *Mus spicilegus*. Mammalian Species 592: 1-6.
- Spagnesi M, De Marinis AM (eds). 2002. Mammiferi d'Italia. Quaderni di Conservazione della Natura 14. Ministero dell'Ambiente – Istituto Nazionale della Fauna Selvatica.
- Spitzenberger F. 1978. Die stachelmaus von Kleinasien, *Acomys cilicicus* n. sp. (Rodentia, Muridae). Annalen des Naturhistorischen Museums in Wien 81: 433-446.
- Tchabovsky A, Bazykin G. 2004. Females delay dispersal and breeding in a solitary gerbil, *Meriones tamariscinus*. Journal of Mammalogy 85: 105-112.
- Tinnin DS, Dunnum JL, Salazar-Bravo J, Batsaikhan N, Burt MS, Gardner SL, Yates TL. 2002. Contributions to the mammalogy of Mongolia, with a checklist of the species of the country. Faculty Publications from the Harold W. Manter Laboratory of Parasitology. Paper 36. <http://digitalcommons.unl.edu/parasitologyfacputs/36>
- Ushakova MV, Feoktistova NY, Petrovskii DV, Gureeva AV, Naidenko SV, Surov AV. 2010. Hibernation in the Eversman hamster (*Allocricetulus evermanni* Brandt, 1859) from the Saratov trans-Volga region. Povolzhskii Ekologicheskii Zhurnal 4: 415-422.
- Vohralik V, Sofianidou TS, Frynta D. 1998. Reproduction in *Mus macedonicus* (Mammalia: Rodentia) in the Balkans. Bonner zoologische Beiträge 47: 283-292.
- Wilson DE, Mittermeier RA (eds). 2009. Handbook of the mammals of the world. Volume 1. Carnivores. Lynx Edition, Barcelona.
- Wilson DE, Mittermeier RA (eds). 2011. Handbook of the mammals of the world. Volume 2. Hoofed mammals. Lynx Edition, Barcelona.
- Yavuz M, Oz M, Albayrak I. 2011. Karyological and some biological features of the *Microtus levis* (Miller, 1908) (Mammalia: Rodentia) at the eleven new localities on Taurus, West Mediterranean region in Turkey. Journal of Applied Biological Sciences 5: 23-28.
- Yigit N, Colak E. 1998. Contribution to the geographic distribution of rodent species and ecological analyses of their habitat in Asiatic Turkey. Turkish Journal of Biology 22: 435-446.
- Yigit N, Colak E, Colak R, Ozkan B, Ozkurt S. 2003. On the Turkish populations of *Dryomys nitedula* (Pallas, 1779) and *Dryomys laniger* Felten and Storch, 1968 (Mammalia: Rodentia). Acta Zoologica Academiae Scientiarum Hungaricae 49: 147-158.
- Yigit N, Colak E, Gattermann R, Neumann K, Ozkurt S, Gharkheloo MM, Fritzsche P, Colak R. 2006. Morphological and biometrical comparisons of *Mesocricetus* Nehring, 1898 (Mammalia: Rodentia) species distributed in the Palearctic region. Turkish Journal of

Zoology 30: 291-299.

- Yigit N, Kankilic T, Colak E. 2007. Reproductive biology and postnatal development of *Microtus rossiaemeridionalis* Ognev, 1924 (Mammalia: Rodentia) distributed in Turkey. Turkish Journal of Zoology 31: 287-294.
- Yigit N, Markov G, Colak E, Kocheva M, Saygili F, Yuce D, Cam P. 2012. Phenotypic features of the 'Guentheri' group vole (Mammalia: Rodentia) in Turkey and Southeast Bulgaria: evidence for its taxonomic detachment. Acta Zoologica Bulgarica 64: 23-32.
- Youngman PM. 1990. *Mustela lutreola*. Mammalian Species 362: 1-3.

### Web sites

<http://www.ultimateungulate.com/Artiodactyla>  
[www.iucnredlist.org](http://www.iucnredlist.org)  
<http://eol.org>  
[www.arkive.org](http://www.arkive.org)  
[www.vertebradosiberico.org](http://www.vertebradosiberico.org)  
<http://www.demogr.mpg.de/cgi-bin/longevityrecords/entry.plx>  
[www.gerbil.info](http://www.gerbil.info)  
[www.agroatlas.ru](http://www.agroatlas.ru)  
<http://redbook-ua.org>

### Reptiles

- Arakelyan M S, Dalielyan F D, Corti C, Sindaco R, Leviton A E 2011. Herpetofauna of Armenia and Nagorno-Karabakh. Society for the Study of Amphibians and Reptiles, Ithaca, New York, USA.
- Baier F, Sparrow DJ, Wiedl HJ. 2013. The amphibians and reptiles of Cyprus. Chimaira Editions, Frankfurt, 362 pp.
- Baran, I. and Atatür, M. K. 1998. Turkish Herpetofauna: Amphibians and Reptiles. Ministry of Environment of Turkey. .
- Corti C, Capula M, Luiselli L, Sindaco R, Razzetti E (Eds.). 2011. Fauna d'Italia, vol. 45, Reptilia. Calderini, Bologna, 869 pp.
- David P, Vogel G. 2010. Venemous snakes of Europe, Northern, Central, and Western Asia. Chimaira Editions, Frankfurt, 160 pp.
- Disi AM, Modry D, Necas P, Rifai L. 2001. Amphibians and reptiles of the Hashemite Kingdom of Jordan. Chimaira Editions, Frankfurt, 408 pp.
- El-Oran RM, Al-Melhem WN, Amr ZS. 1994. Snakes of southern Jordan. Italian Journal of Zoology 61: 359-367.

- Gasc JP, Cabela A, Crnobrnja-Isailovic J, Dolmen D, Grossenbacher K, Haffner P, Lescure J, Martens H, Martínez Rica JP, Maurin H, Oliveira ME, Sofianidou TS, Veith M, Zuiderwijk A (Eds). 1997. Atlas of amphibians and reptiles in Europe. Collection Patrimoines Naturels, 29, Societas Europaea Herpetologica, Muséum National d'Histoire Naturelle & Service du Patrimoine Naturel, Paris, 496 pp.
- Golemanski V et al. 2007. Red data book of the Republic of Bulgaria. Volume 2 – Animals. <http://e-ecodb.bas.bg/rdb/en/vol2/>
- Khan MS 2006. Amphibians and reptiles of Pakistan. Krieger Publishing Company, Malabar, Florida.
- Kreiner G. 2007. The snakes of Europe: all species from west of the Caucasus mountains. Chimaira Editions, Frankfurt, 317 pp.
- Murphy R W, Fu J, Macculloch R D, Darevsky I S, Kupriyanova L A 2000. A fine line between sex and unisexuality: the phylogenetic constraints on parthenogenesis in lacertid lizards. Zoological Journal of the Linnean Society 130: 527-549.
- Phelps T. 2010. Old world vipers: a natural history of the Azemiopinae and Viperinae. Chimaira Editions, Frankfurt, 558 pp.
- Schleich HH, Kästle W, Kabish K 1996. Amphibians and reptiles of North Africa. Koeltz, Koenigstein, Germany.
- Sindaco R, Doria G, Razzetti E, Bernini F (Eds). 2006. Atlas of Italian amphibians and reptiles. Societas Herpetologica Italica, Edizioni Polistampa, Firenze, 792 pp.
- Valakos ED, Pafilis P, Sotiropoulos K, Lymberakis P, Maragou P, Foufopoulos J. 2008. The amphibians and reptiles of Greece. Chimaira Editions, Frankfurt, 563 pp.

### **Web Sites**

[www.herpfrance.com](http://www.herpfrance.com)

[www.arkive.org](http://www.arkive.org)

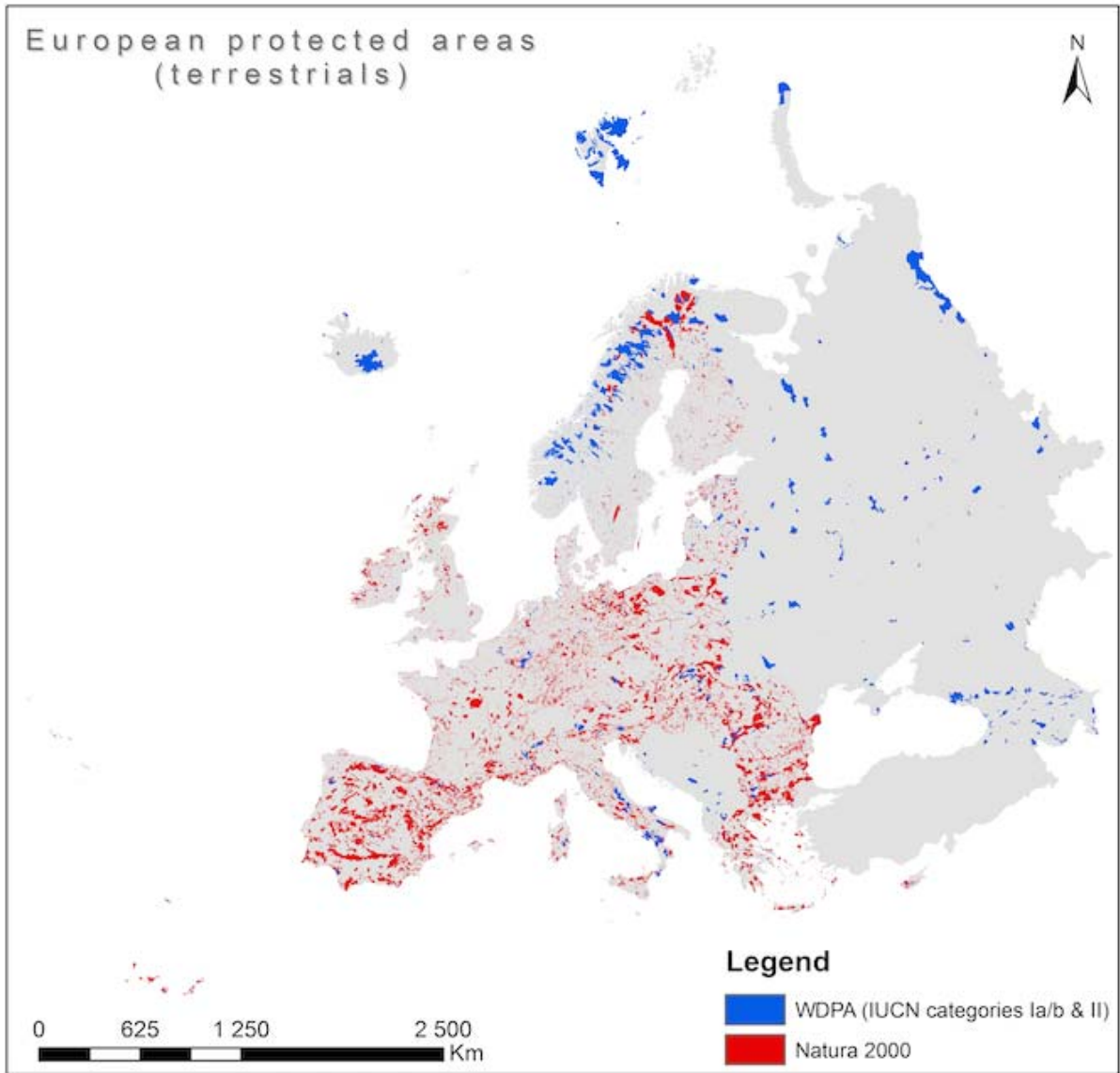
[www.iucnredlist.org](http://www.iucnredlist.org)

<http://eol.org>

[www.vertebradosiberico.org](http://www.vertebradosiberico.org)

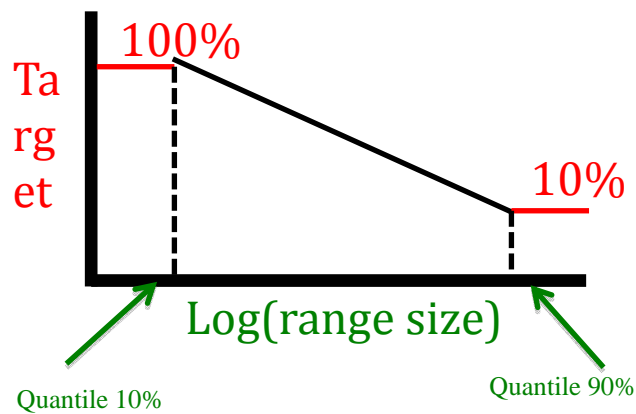
<http://www.demogr.mpg.de/cgi-bin/longevityrecords/entry.plx>

<http://redbook-ua.org>

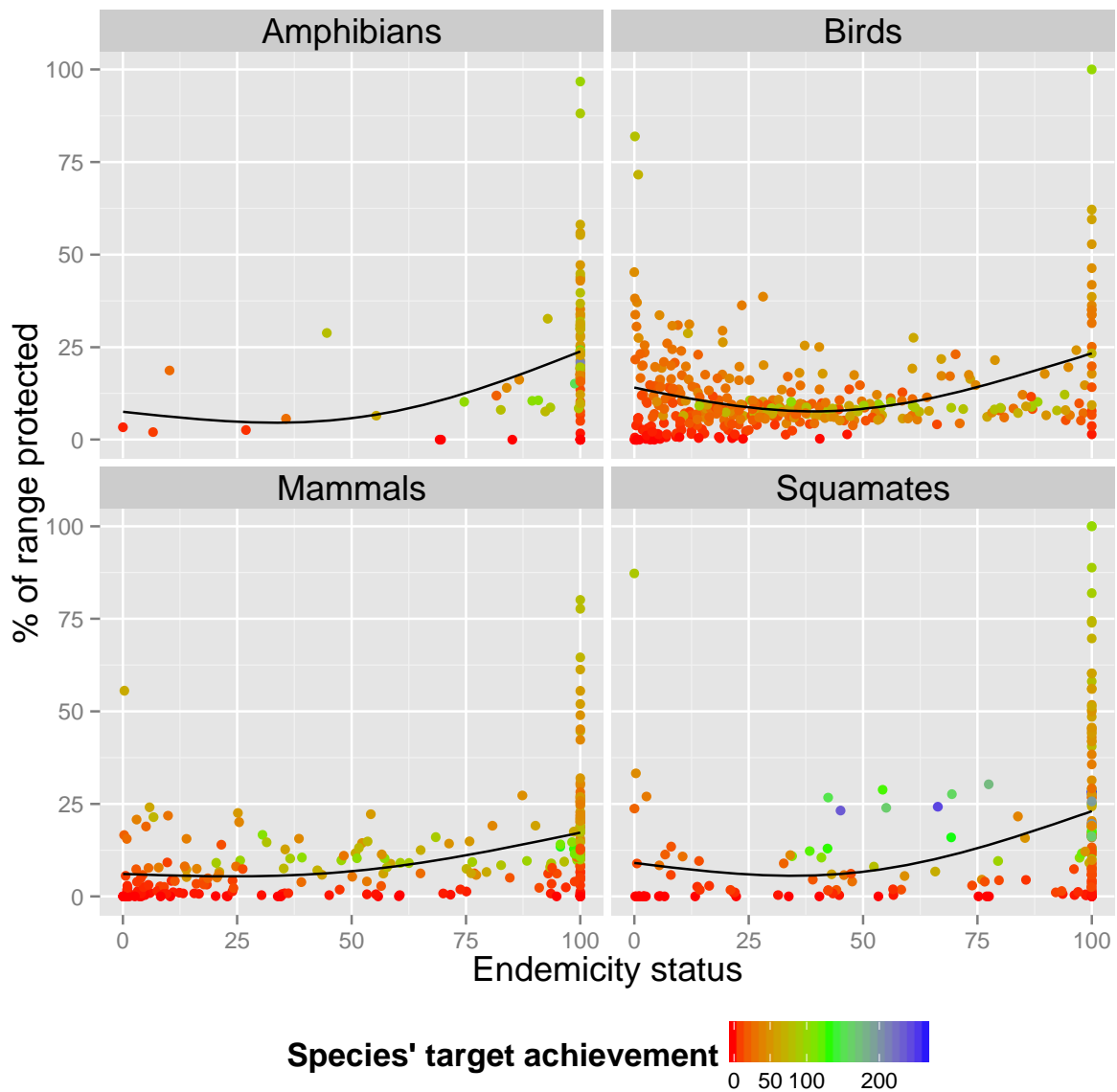


**Figure S1. Distribution of protected areas in Europe.** Only the protected areas considered in the study are mapped. They are represented in blue by PAs belonging to IUCN category I and II from the World Database on Protected Area (WDPAs, <http://protectedplanet.net/>) and in red by the complete Natura 2000 areas (<http://www.eea.europa.eu/>) for the EU28 belonging to the entire European sub-continent.





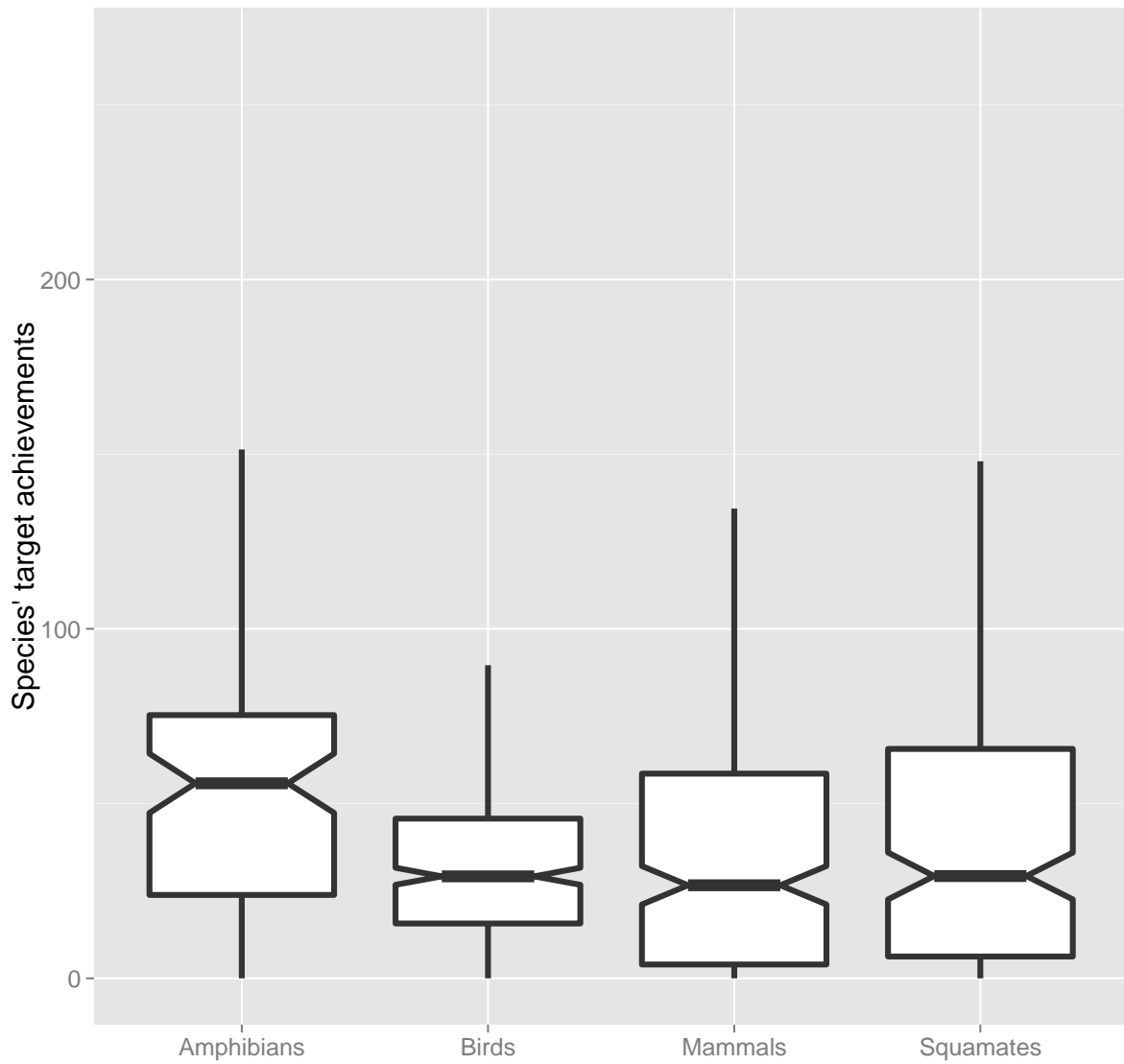
**Figure S2 Target definition for the four groups.** For each group, we extracted the species for which species range size belonged to the top 10 and 90% quantiles. For those species, the target was fixed to 100% and to 10%. In other words, a target of 100% was set for the 10% rarest species of each group, and the target of 10% was set for the 10% most common species. For the remaining species, a regression was fitted between the coordinates (10,100) and (90,10) to define their respective targets. Species target achievement was then measured at the ratio between the percentage of range actually covered by the PA system and the target.



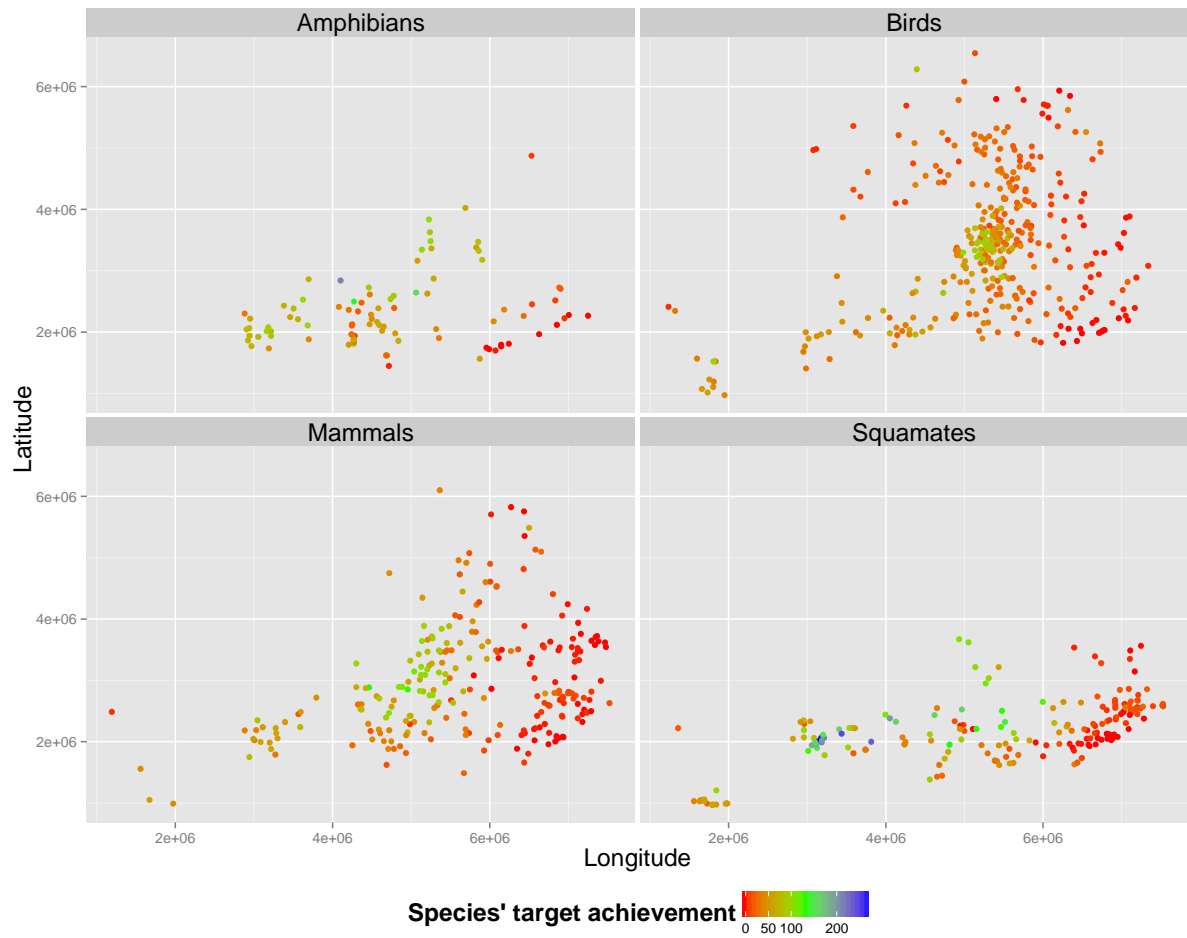
**Figure S3 Percentage of range of protected in Europe in function of the endemism status** (% of global range encapsulated in the European region under study). Species' target achievement is also indicated using a colour gradient from red to blue (low to high). When endemism equals to 100%, it means the species is a strict endemic of the European region under study.



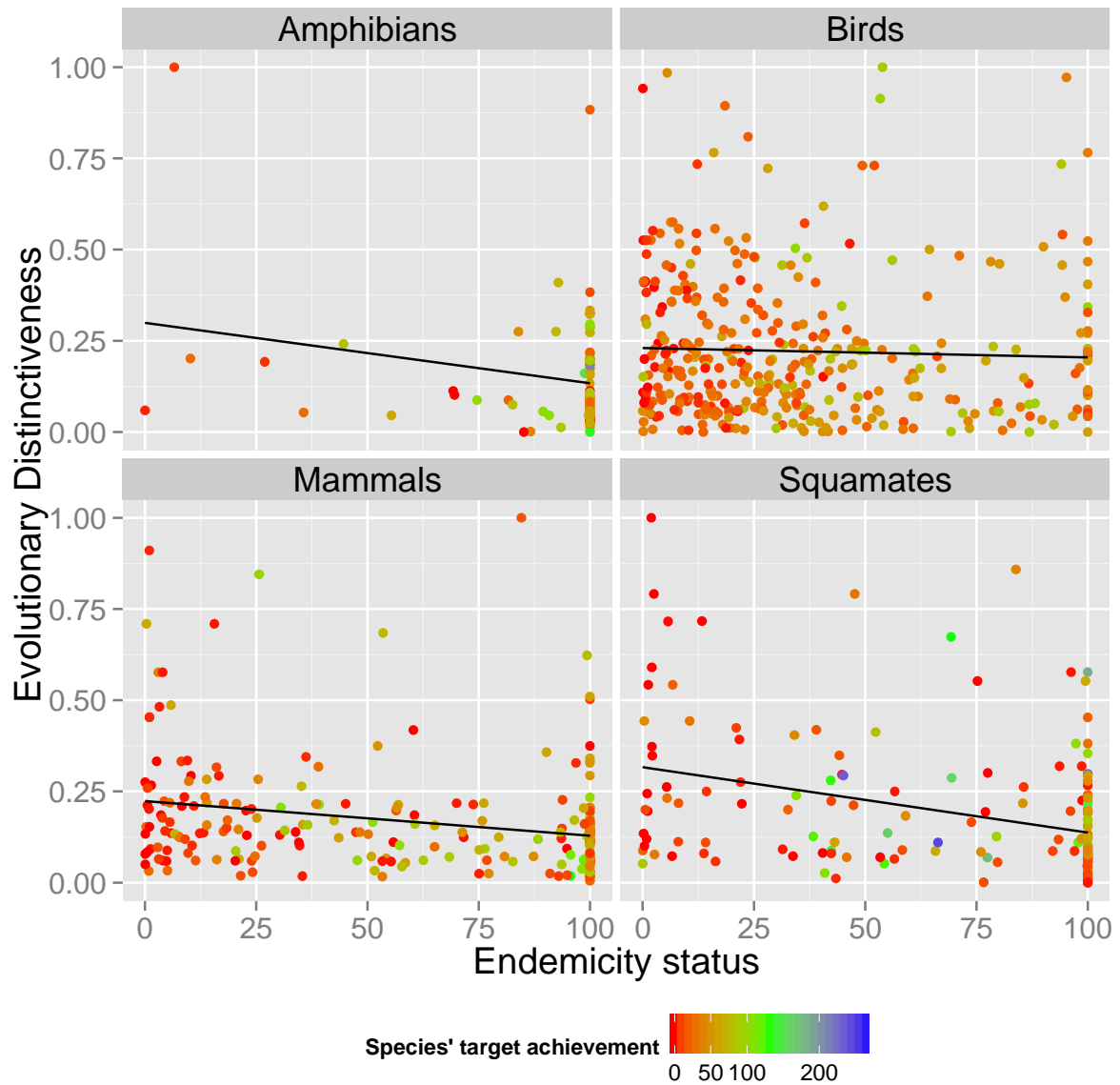
**Figure S4. Percentage of range protected for endemic species in Europe.** The Y-axis represents a number of species (over a total of 280 species) and X-axis the percentage of range currently protected in Europe. The filled bars represent the species' target achievements in three classes, namely low, medium and high, when species' target achievement was lower than 25%, between 25 and 75% and higher than 75%, respectively.



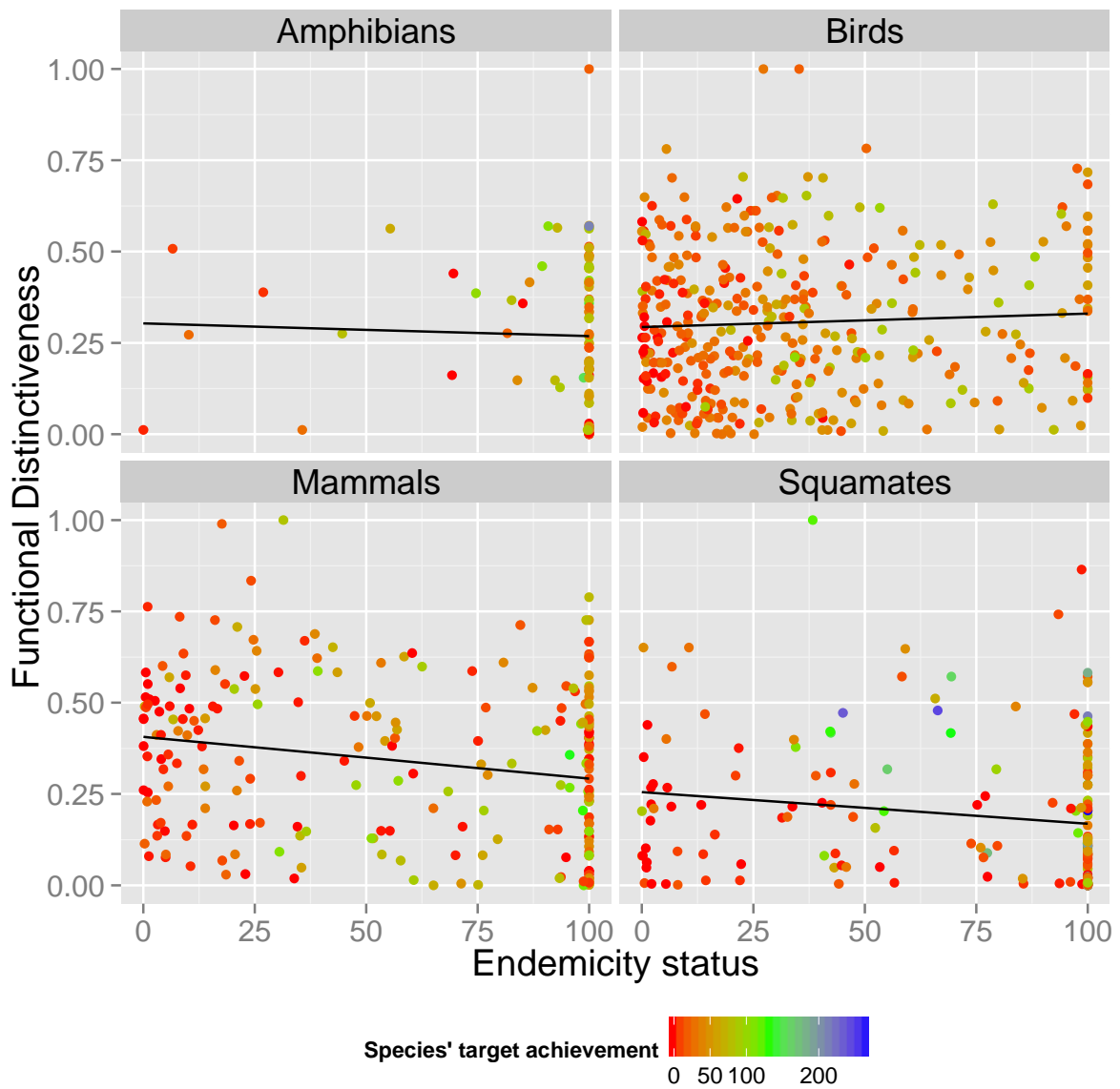
**Figure S5. Species' target achievement across the four groups.** The outliers are not displayed. The upper and lower "hinges" correspond to the first and third quartiles (the 25th and 75th percentiles). The notches give a roughly 95 interval for comparing medians. Amphibians have significantly higher species' target achievements that the other three groups.



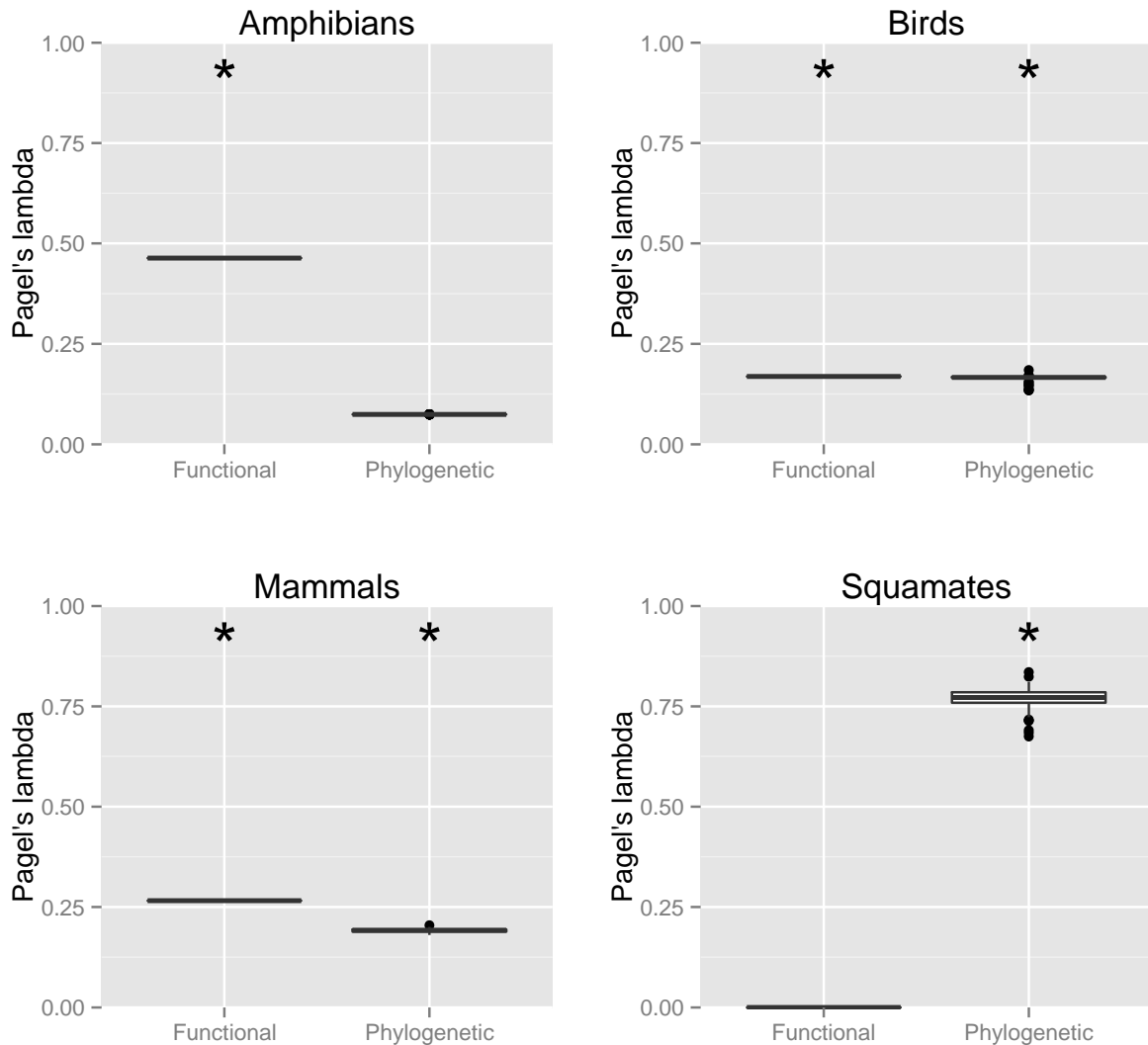
**Figure S6 Mean latitude and longitude of all species in function of species' target achievement.**



**Figure S7. Evolutionary distinctiveness in function of endemism status (% of global range encapsulated in the European region under study).** When endemism equals to 100%, it means the species is a strict endemic of the European region under study.



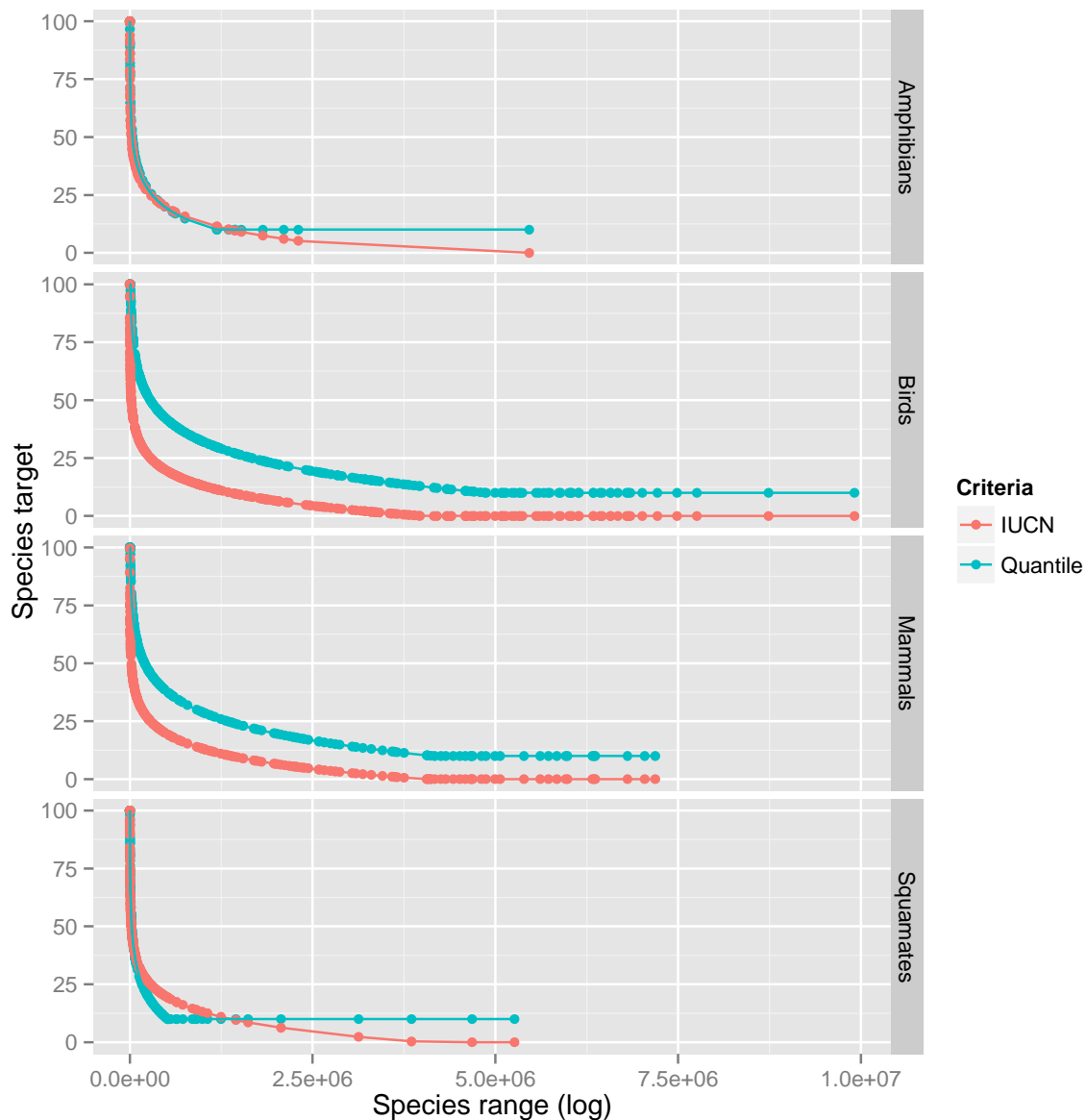
**Figure S7. Functional distinctiveness (Y-axis) in function of percentage of global range encapsulated in Europe (endemicity status, X-axis).** When endemicity equals to 100%, it means the species is a strict endemic of the European region under study.



**Figure S9. Phylogenetic and functional signals of species' target achievement.** We used a maximum-likelihood based measurement of phylogenetic/functional signal, namely lambda model, as developed by [2]. This metric corresponds to a tree transformation parameter, which gradually eliminates phylogenetic/functional structure when varying from 1 to 0. Lambda transformation is performed by multiplying the off-diagonal elements of the variance/covariance matrix describing the tree topology and branch lengths. Lambda values of 1 correspond to a Brownian evolution, whereas at the other extreme a lambda value of 0 corresponds with the complete absence of phylogenetic/functional structure (star-like phylogeny). The estimated lambda can be compared to zero by computing a likelihood ratio and comparing it to a chi-square distribution with one degree of freedom. Hence testing for a significant phylogenetic signal, relative to phylogenetically unstructured data. The stars on the top of each barplot correspond to a signal significantly different from 0. For the phylogenetic



signal, we use False Discovery Rate to estimate the phylogenetic signal across the 100 trees.



**Figure S10 Relationship between species’ targets and species ranges in function of the criteria used.** The “quantile” approach is the one used in the main text (Figure S1). The second one used IUCN categories. We used the criteria B1 based on species range to define critically endangered species, species with less than 100km<sup>2</sup> range and vulnerable for species with less than 10,000km<sup>2</sup>. We arbitrarily set that critically endangered species should be protected at 100% and vulnerable at 50%. We then used a regression along these two points to set species targets for all species. Although the ICUN approach is not group-specific the species targets are pretty similar to the ones defined through the quantile approach. Only birds and mammals do differ meaning that our Quantile approach is more severe than the IUCN one (i.e. the quantile approach asks for larger targets meaning high species’ target achievement are more difficult to reach).

**Table S1.** *P-value* of the OLS regression lines of figure 2 and 3 and the associated r-squares of the regressions.

		Evolutionary distinctiveness	Functional distinctiveness
<b>Amphibian</b>	<i>p-value</i>	0.8	<b>0.01</b>
	R <sup>2</sup>	0.0007	0.066
<b>Birds</b>	<i>p-value</i>	0.79	0.29
	R <sup>2</sup>	0.0002	0.003
<b>Mammals</b>	<i>p-value</i>	0.46	0.27
	R <sup>2</sup>	0.002	0.004
<b>Squamates</b>	<i>p-value</i>	0.56	<b>0.049</b>
	R <sup>2</sup>	0.002	0.02

**Table S2.** Representation of the land cover types in Europe and their representation in the European protected area network. A pixel has a resolution of 300m. Only the total number of pixels of each land cover type is represented (No of pixels), as well as the number of pixels that fall within a protected area (No of pixels within PAs) and the associated percentage of protection (% in PA)

11	Post-flooding or irrigated croplands (or aquatic)	2782	59	2
13	Post-flooding or irrigated herbaceous crops	170896	10485	6
14	Rainfed croplands	16934587	746667	4
15	Rainfed herbaceous crops	199	31	16
16	Rainfed shrub or tree crops (cash crops, vineyards, olive tree, orchardsà)	23959	737	3
20	Mosaic cropland (50-70%) / vegetation (grassland/shrubland/forest) (20-50%)	17886778	740541	4
21	Mosaic cropland (50-70%) / grassland or shrubland (20-50%)	2093	42	2
30	Mosaic vegetation (grassland/shrubland/forest) (50-70%) / cropland (20-50%)	7894080	53178	1
32	Mosaic forest (50-70%) / cropland (20-50%)	6420	1273	20
40	Closed to open (>15%) broadleaved evergreen or semi-deciduous forest (>5m)	38	6	16
41	Closed (>40%) broadleaved deciduous forest (>5m)	1655	132	8
50	Closed (>40%) broadleaved deciduous forest (>5m)	21609742	1803096	8
60	Open (15-40%) broadleaved deciduous forest/woodland (>5m)	701	34	5
70	Closed (>40%) needleleaved evergreen forest (>5m)	3464303	791684	23
90	Open (15-40%) needleleaved deciduous or evergreen forest (>5m)	8819597	571849	6
91	Open (15-40%) needleleaved deciduous forest (>5m)	101	1	1
92	Open (15-40%) needleleaved evergreen forest (>5m)	6442376	461757	7
100	Closed to open (>15%) mixed broadleaved and needleleaved forest (>5m)	13182533	698442	5
101	Closed (>40%) mixed broadleaved and needleleaved forest (>5m)	18668	3418	18
110	Mosaic forest or shrubland (50-70%) / grassland (20-50%)	4677509	432529	9
120	Mosaic grassland (50-70%) / forest or shrubland (20-50%)	664653	87181	13
130	Closed to open (>15%) (broadleaved or needleleaved, evergreen or deciduous) shrubland (<5m)	1877892	339533	18
131	Closed to open (>15%) broadleaved or needleleaved evergreen shrubland (<5m)	9231	2611	28
134	Closed to open (>15%) broadleaved deciduous shrubland (<5m)	406326	40537	10
140	Closed to open (>15%) herbaceous vegetation (grassland, savannas or lichens/mosses)	669622	65468	10

141	Closed (>40%) grassland	2350065	148420	6
143	Open grassland	1853	148	8
150	Sparse (<15%) vegetation	21618525	2177227	10
151	Sparse (<15%) grassland	2049257	30026	1
152	Sparse (<15%) shrubland	802712	106979	13
180	Closed to open (>15%) grassland or woody vegetation on regularly flooded or waterlogged soil - Fresh, brackish or saline water	2848224	233475	8
190	Artificial surfaces and associated areas (Urban areas >50%)	1097134	27652	3
200	Bare areas	1239330	198848	16
201	Consolidated bare areas (hardpans, gravels, bare rock, stones, boulders)	13478	6146	46
202	Non-consolidated bare areas (sandy desert)	3548	2058	58
203	Salt hardpans	791	356	45
210	Water bodies	4302439	553591	13
220	Permanent snow and ice	5256077	1647068	31
230	No data (burnt areas...)	526	16	3
190	Artificial surfaces and associated areas (Urban areas >50%)	1097134	27652	3

[1] Pearman, P.B., Lavergne, S., Roquet, C., Wuest, R., Zimmerman, N.E. & Thuiller, W. 2014 Phylogenetic patterns of climatic, habitat and trophic niches in a European avian assemblage. *Global Ecology and Biogeography*.

[2] Pagel, M.D. 1997 Inferring evolutionary processes from phylogenies. *Zoologica Scripta* **26**, 331-348.