

## Effect of European Union BSE-related enactments on fledgling Eurasian Griffons *Gyps fulvus*

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**Abstract.** The effects of supplemental feeding on Eurasian Griffon range from increased survival and reproduction to population recoveries. In 2000, the appearance of Bovine Spongiform Encephalopathy (BSE) in Europe resulted in the implementation of the 1774/2002 regulation that required carcass removal and incineration at processing plants within the European Union and resulted in an immediate reduction of food availability for scavengers. We wished to evaluate the effect of the implementation of the reduced food availability on the scavenging Eurasian Griffon population. The study was conducted in La Rioja province (northern Spain). Eurasian Griffon fledglings are regularly brought to a rehabilitation center and can help evaluate the changes in nutritional condition before and after the enactment of the BSE regulations. A total of 47 first year griffons were sampled. Ptilochronology was applied to the rectrices, growth bars that are grown during the fledgling period were counted among nestlings before and after implementation of the EU-BSE directives. We found that the width of the growth bars, that represent the nutritional condition of the bird, showed significant differences over time. The growth bars before the implementation of the BSE EU-directives were significantly narrower than the subsequent period wherein carcasses were greatly reduced. The frequency of fault bars showed trends opposite to those of growth bars and there were significantly more fault bars in the pre-removal implementation period than the post-removal period. In conclusion, we consider this to be a result wherein the local adults with fidelity to their breeding colonies remained in the area while the non-breeding sub-adults and floaters have strayed in search of food. This has resulted in reduced inter- and intra-specific competition and only adults in good body condition breed resulting in healthier fledglings.

**Key words:** Eurasian Griffon, Vulture, *Gyps fulvus*, ptilochronology, tail feathers, growth rate, nestling condition

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## No evidence for offspring sex ratio adjustment in Marsh Tits *Poecile palustris* breeding in a primeval forest

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**Abstract.** When production costs or fitness returns vary between sons and daughters, selection is expected to favor females that adjust sex ratios accordingly. However, to what extent birds can do so remains debatable. Here we analyze the secondary offspring sex ratios in Marsh Tits *Poecile palustris* breeding in the primeval, strictly protected, part of Białowieża National Park (north-eastern Poland). We collected data on parent birds (age), their breeding performance (laying dates, clutch size, nesting success), and the offspring sex ratio in two types of old growth habitats over three years. The individual broods varied from all male to all female, but no significant deviation from parity was detected at the population level. The inter-brood variation could be accounted for neither by environmental (season, habitat) nor parental (female age, laying dates, clutch size, and brood size) variables analyzed. The primary sex ratios (at laying) did not differ from the secondary (brood) sex ratios. Thus, there was no indication of post-hatching sex ratio adjustments, either. Together, our results do not support the hypothesis of adaptive sex ratio adjustments in the studied Marsh Tit population. We suggest that possible fitness benefits could be insufficient to exceed the costs conferred by sex ratio manipulation in this species.

**Key words:** Marsh Tit, primeval forest, *Poecile palustris*, sex ratio, sex allocation

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## Is nestling growth affected by nest reuse and skin bacteria in Pied Flycatchers *Ficedula hypoleuca*?

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González-Braojos S., Vela A. I., Ruiz-de-Castañeda R., Briones V., Cantarero A., Moreno J. 2012. Is nestling growth affected by nest reuse and skin bacteria in Pied Flycatchers *Ficedula hypoleuca*? *Acta Ornithol.* 47: 119–127. DOI 10.3161/000164512X662223

**Abstract.** Bacteria may colonize avian nests with unknown repercussions on nestling growth and health, although bacteria on nest materials may easily colonize nestling skin and growing feathers. Cavity nesters may have to build their nests on top of used nest materials, given restrictions on cavity availability. Nest reuse may favour bacterial colonization of nest materials and nestling skin and thereby affect nestling feather growth. To test these possibilities, we conducted a study of Pied Flycatchers *Ficedula hypoleuca* breeding in nest-boxes in central Spain. We left a sample of nest-boxes without removing old nest materials in 2010 and compared bacterial loads of nest materials, control inert objects and nestling belly skin in reused nests with those in new nests in 2011. Nestlings raised in reused nests had higher bacterial loads on their belly skin than those in new nests, while no difference between nest types for nest materials and control inert objects were found. There was a marginally significant tendency for wing length before fledging to be lower in reused nests, but no trend for mass or tarsus length. The bacterial loads of nests showed a negative association with feather growth of nestlings as expressed through wing length but not with tarsus length or mass growth. These results indicate an association between nest reuse and bacterial growth on nestling skin not hitherto detected. They also suggest a possible impairment of flight capacity at fledging mediated by nest bacterial communities which are in direct contact with nestling skin and growing feathers.

**Key words:** nest bacterial load, skin bacterial load, microbe-host interaction, Pied Flycatchers, nestling condition, nest reuse, old nests

## Parallel variation in haemoglobin concentration in nestling-rearing Blue Tits *Cyanistes caeruleus* and Great Tits *Parus major*

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Kaliński A., Bańbura M., Skwarska J., Wawrzyniak J., Zieliński P., Gładalski M., Markowski M., Bańbura J. 2012. Parallel variation in haemoglobin concentration in nestling-rearing Blue Tits *Cyanistes caeruleus* and Great Tits *Parus major*. *Acta Ornithol.* 47: 129–136. DOI 10.3161/000164512X662232

**Abstract.** High metabolic rates of birds demand an efficient oxygen transport system; this is ultimately based on the oxygen carrying capacity of haemoglobin. Therefore patterns of variation in blood haemoglobin content of wild birds are an important aspect of functional ecology. In this paper we report results concerning variation in haemoglobin concentration in the blood of adult Blue Tits *Cyanistes caeruleus* and Great Tits *Parus major* during the nestling rearing period (days 7–15 of nestlings life) of first broods in central Poland in 2003–2009. The most important findings of this study are: (i) average haemoglobin concentration in blood differs between Blue Tits and Great Tits, with higher values in Blue Tits; (ii) males differ from females in both these species, with higher values in females, and (iii) there is also significant variation among years, with parallel tendencies for both species. We explain the patterns of haemoglobin content variation in adult tits by differences in metabolic demands for oxygen transported by blood. The demands are higher for the smaller-bodied species (Blue Tits), heavier working sex (females) and in years with worse physical and trophic conditions, though only non-significant relationships with weather conditions (temperature and rainfall) or food availability (measured by frassfall) were found during our long-term study.

**Key words:** passerines, free-living populations, haemoglobin concentration, interspecies variation, sex differences, annual variation, metabolic rates

## Nest survival, predators and breeding performance of Booted Warblers *Iduna caligata* in the abandoned fields of the North of European Russia

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Shitikov D. A., Fedotova S. E., Gagieva V. A. 2012. Nest survival, predator composition and breeding performance of Booted Warblers *Iduna caligata* in the abandoned fields of the North of European Russia. *Acta Ornithol.* 47: 137–146. DOI 10.3161/000164512X662241

**Abstract.** We examined breeding performance and the nest survival of Booted Warbler *Iduna caligata* on abandoned fields in Vologda region, Russia. We modelled daily survival rates (DSR) using data on 250 nests found in 2002–2011. We compared relative effects of year, nest age, date, weather conditions and nest placement characteristics. Clutch size did not vary over the study period and was on average  $5.69 \pm 0.04$  eggs. Inter-seasonal variability was the most important component of DSR variation. The top model included a year effect, a quadratic nest age term and an interaction between year and quadratic age. Overall nest success varied greatly from 0.03 in 2008 to 0.7 in 2007. Nest height was an important nest placement covariate, nest remoteness from villages and roads were not influential. We detected the species composition of predators by watching nests of Booted Warblers and other grassland passerines as well as by observing the artificial nests. The main predators were carnivorous mammals, Common Viper *Vipera berus*, Harriers and corvids. Predator pressure was the main factor that determined nest success of Booted Warblers. Intra- and inter-annual fluctuations in the activity of predators may cause corresponding changes in nest success of Booted Warbler.

**Key words:** Booted Warbler, *Iduna caligata*, nest survival, predation, abandoned fields

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## Variation in the abundance and reproductive characteristics of Great Tits *Parus major* in forest and monoculture plantations

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Da Silva L. P., Alves J., Da Silva A. A., Ramos J. A., Fonseca C. 2012. Variation in the abundance and reproductive characteristics of Great Tits *Parus major* in forest and monoculture plantations. *Acta Ornithol.* 47: 147–155. DOI 10.3161/000164512X662250

**Abstract.** Natural forests have been progressively replaced by other forest types, mainly monoculture plantations. We compared the abundance of Great Tits and its main food competitors, the Chaffinch *Fringilla coelebs* and other tits species (Blue Tit *Cyanistes caeruleus*, Coal Tit *Periparus ater* and Crested Tit *Lophophanes cristatus*), and breeding parameters of Great Tits in four forest types: a mixed forest, a native broadleaf forest, a Maritime Pine *Pinus pinaster* plantation and a Blue Gum *Eucalyptus globulus* plantation in Central Portugal. The breeding parameters (laying date, clutch size, egg volume, hatching success, fledging success and chick body mass) were collected from nest boxes placed in the four forest types. The censuses indicated a higher abundance index of Great Tit and its food competitors in the mixed and broadleaf forest, when compared to the monoculture plantations. Occupancy rate of nest boxes was not directly related with tit abundance due to differences in the availability of natural nest cavities among forest types, and differences in preference for nesting cavities among tit species. However, a Great Tit abundance index gave similar results to the densities described in the literature, except for the Great Tit in the *Eucalyptus* plantations where the placement of the nest boxes should explain our value of 2.1 birds ha<sup>-1</sup>, which is four times higher than that reported for other *Eucalyptus* plantations. Egg volume differed significantly among forest types; it was higher in the pine plantations and lower in the *Eucalyptus* plantations. Surprisingly, all other breeding parameters (laying date, clutch size, chick body mass, hatching and fledgling success) were similar among forest types and between years. On the other hand the number of eggs, hatchlings and fledglings were lower than those obtained in other studies in the Iberian Peninsula. Our results suggest that Great Tits have a high plasticity that enables them to adjust their breeding strategies even to forest plantations, if nest sites are available.

**Key words:** bird abundance, breeding parameters, egg size, food competition, forest management, *Parus major*

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# Factors limiting reproductive performance and nestling sex ratio in the Lesser Spotted Eagle *Aquila pomarina* at the northern limit of its range: the impact of weather and prey abundance

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Väli Ü. 2012. Factors limiting reproductive performance and nestling sex ratio in the Lesser Spotted Eagle *Aquila pomarina* at the northern limit of its range: the impact of weather and prey abundance. *Acta Ornithol.* 47: 157–168. DOI 10.3161/000164512X662269

**Abstract.** Weather conditions and prey abundance impact many birds, but the influence differs between species and regions. I used 18-year data from Estonia, north-eastern Europe, in order to analyse the comparative effects of these factors on the breeding performance and nestling sex ratio in the Lesser Spotted Eagle. All studied reproductive parameters showed strong inter-annual fluctuations but no significant trends. Breeding frequency (proportion of pairs laying) was positively influenced by a warm pre-laying period (temperature in April) and a wet preceding season. These factors are probably associated with the higher occurrence and activity of amphibians that constituted important prey of the Lesser Spotted Eagle in spring. Breeding success (proportion of successful breeders) was determined mostly by the abundance of voles. Productivity (number of fledglings per nest) depended additively both on the spring temperature and abundance of voles in the breeding season; fledging of two nestlings was recorded regularly, mostly in years with high vole abundance. The total offspring sex ratio was slightly, though non-significantly, female-biased. Annual proportion of female nestlings was positively correlated with reproductive parameters and associated with rain in the preceding season, suggesting determination of fledgling sex ratio prior egg-laying. The results help to explain fluctuations in the reproductive performance of the Lesser Spotted Eagle and should be taken into account when monitoring and managing for conservation of this species.

**Key words:** fecundity, productivity, reproductive success, raptor, birds of prey, temperature, precipitation

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## Fish prey selection by the Common Kingfisher *Alcedo atthis* in Northern Iberia

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Vilches A., Miranda R., Arizaga J. 2012. Fish prey selection by the Common Kingfisher *Alcedo atthis* in Northern Iberia. *Acta Ornithol.* 47: 169–177. DOI 10.3161/000164512X662278

**Abstract.** The Common Kingfisher *Alcedo atthis* is a fish-eating predatory bird that is reported to prey mainly on pelagic, benthic, or both types of fish prey. It still remains unclear whether the species has the capacity to prey indistinctly on all types of fish, regardless of their position within the water column. The aim of our study was to test if kingfishers are able to select particular fish prey or if, by contrast, they feed on the most abundant and accessible fish. We identified the fish prey consumed by kingfishers at 14 nests in total, and also sampled, using electrofishing surveys, fish prey availability on the river stretches where the nests were located. We used Savage's index in order to check whether there was prey selection. Overall, kingfishers preyed upon eight fish species: Bermejuela *Acondrostoma arcasii*, Bleak *Alburnus alburnus*, Pyrenean Stone Loach *Barbatula quignardi*, Ebro Barbel *Luciobarbus graellsii*, Pyrenean Gudgeon *Gobio lozanoi*, Ebro Nase *Parachondrostoma miegii*, Pyrenean Minnow *Phoxinus phoxinus*, and Brown Trout *Salmo trutta*. The most consumed prey were pelagic species (Pyrenean Minnow and Brown Trout). These results suggest that the Kingfisher preys on pelagic species because of their accessibility and avoids bottom-dwelling species, which may remain hidden from this predator. Kingfishers preyed mostly on fish of 50 to 60 mm in length, but mean size values varied prey-specifically, possibly because of the vertical specific distribution in relation to the fish age and species and, finally, prey availability.

**Key words:** freshwater fish, prey, Navarra, Spain, rivers, foraging strategy

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## Micro-habitat use by Bramblings *Fringilla montifringilla* within a winter roosting site: influence of microclimate and human disturbance

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Zabala J., Zuberogoitia I., Belamendia G., Arizaga J. 2012. Micro-habitat use by Bramblings *Fringilla montifringilla* within a winter roosting site: influence of microclimate and human disturbance. *Acta Ornithol.* 47: 179–184. DOI 10.3161/000164512X662287

**Abstract.** Communal roosting is known to decrease predation risk and thermoregulatory costs, and to increase foraging efficiency or both. While the advantages associated with roost site selection compared to nearby areas have been studied, the factors ruling the selection of roosts within a roosting site remain largely unknown. We investigated what factors affect the preference for roosts within a winter roosting site of Brambling *Fringilla montifringilla*. Type of vegetation, microclimate, topography and sources of disturbance were considered as possible variables affecting site selection and thus the density of birds. The density of droppings estimated at each of 300 sampling plots was used as an index of density of birds within the roosting site. We modeled density of birds using Generalized Additive Models with different explanatory variable combinations. Results show that factors shaping site selection are similar to those affecting habitat use at other scales, with Brambling resting in higher densities in warmer areas. This can be explained by the protection from winds and radiative heat loss during night, in accordance with results of previous studies at broader scales. In addition, we found a negative impact by human activities, Brambling avoided areas close to roads and forest tracks, possibly as a consequence of local traffic but also the of the affluence of people to watch the birds. Results suggest that site selection is best explained by the interaction between variables rather than by individual variables.

**Key words:** Brambling, *Fringilla montifringilla*, mass roost, roosting site selection, microclimate, microhabitat use, human disturbance

## Reproductive performance and changes in relative species abundance in a mixed colony of Herring and Caspian Gulls, *Larus argentatus* and *Larus cachinnans*

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Zagalska-Neubauer M., Neubauer G. 2012. Reproductive performance and changes in relative species abundance in a mixed colony of Herring and Caspian Gulls, *Larus argentatus* and *Larus cachinnans*. *Acta Ornithol.* 47: 185–194. DOI 3161/000164512X662296

**Abstract.** Following range expansion and colonization, hybridization between Herring and Caspian Gulls, *Larus argentatus* and *L. cachinnans*, takes place in central and eastern Europe. To examine how hybrid zone is affected by the abundance dynamics of these species and their reproductive performance, we studied a mixed colony at Włocławek Reservoir, central Poland, for over 7 years, from 2002 to 2009, and included data from the species monitoring from 1990 to 2001. To evaluate the species abundance dynamics and possible mechanisms of reproductive isolation, breeders (n = 226 individual birds) were trapped on nests and colour-ringed; breeding performance was studied in detail for 202 breeding pairs with both mates known. Between 2002 and 2009 the proportion of Caspian Gulls among breeders had strongly increased (from 14% to 42%), whereas the proportion of Herring Gulls had declined (from 70% to 35%). The frequency of hybrids varied a little with no clear trend (mean 20%, range 15–28%). The colony size during that time was approximately stable, with 125–135 breeding pairs. 32 individuals originating from outside the zone, ringed as nestlings in the core range of either species, were recorded as breeders at the study site, documenting dispersal of parental species into the zone. The immigration of the two parental species showed contrasting temporal patterns in the two compared decades, 1990–1999 vs. 2000–2009. The immigration of Herring Gulls as measured by the reencounter probability declined nearly three times, while approximately twofold increase was seen in Caspian Gulls. Birds tended to choose phenotypically similar mates, so that there were fewer heterospecific pairs than expected under random mating. Numbers of homospecific, heterospecific and mixed pairs were similar during 7 years. On average, males of Caspian Gulls were significantly heavier than males of Herring Gulls. Caspian Gull pairs bred on average 7 days earlier than pairs of Herring Gulls. No differences in clutch size, clutch volume or hatching success among pairs of different composition were found, indicating weak postzygotic isolation. Current abundance of species in the hybrid zone is changing dynamically and is primarily driven by the strength of immigration from outside the zone.

**Key words:** gulls, hybridization, hybrid zone, immigration, reproductive performance, native invader

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## Ranging behaviour of Eleonora's Falcons *Falco eleonora* during chick-rearing

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**Mellone U., Urios V., Rguiibi-Idrisi H., Limiñana R., Benhoussa A., López-López P. 2012. Ranging behaviour of Eleonora's Falcons *Falco eleonora* during chick-rearing. Acta Ornithol. 47: 195–198. DOI 10.3161/000164512X662313**

**Abstract.** The Eleonora's Falcon is a cliff-nesting raptor that breeds on isolated small islands adjusting its breeding season to coincide with the post-breeding autumn migration of its small passerine prey migrating over the sea, between late August and early October. Two adult female Eleonora's Falcons were equipped with Argos satellite transmitters during the chick-rearing period in Morocco giving the opportunity to study the ranging behaviour of the species during at least a part of the breeding season. Results showed that the falcons spent most of the time at sea during mornings, stayed mainly inland during afternoons, and rested in the colony during nights. Interestingly, although most distances were recorded shorter than 50 km away from the colony, movements took also place to areas located more than 100 km away. Locating and protecting these inland areas used for resting and foraging may be of interest for the conservation of the species in order to avoid perturbations such as poisoning and habitat destruction.

**Key words:** raptors, time budget, conservation, satellite telemetry, Argos, Morocco

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## Population decline of Capercaillies *Tetrao urogallus* in the Augustów Forest (NE Poland)

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Zawadzki J., Zawadzka D. 2012. Population decline of Capercaillies *Tetrao urogallus* in the Augustów Forest (NE Poland). *Acta Ornithol.* 47: 199–204. DOI 10.3161/000164512X662322

**Abstract.** We estimated Capercaillie *Tetrao urogallus* population dynamics in Augustów Forest (NE Poland) based on spring counts of males on leks. During the 15-year study, the number of active leks decreased from 12 to 6 only, despite establishing 4 new leks. In 1996, the mean Nearest Neighbor Distance between leks was 4.06 km and varied from 0.95 to 9.25 km, and in 2010, the NND increased to 7.51 km (range 2.60–18.30). In 1996–1998, the number of males (cocks) per lek varied from 1 to 16. In 2010, the number of displaying cocks declined to 1–5 per lek. The mean number of cocks per lek declined from 4.9 in 1996 to 2.7 in 2010. Our censuses recorded a decline in the total numbers of displaying males from 59 in 1996 to 16 in 2010. During the study, the mean rate of extinction was 3.14 males per year. Historical data about population dynamic and causes of bird mortality is also discussed.

**Key words:** Capercaillie *Tetrao urogallus*, lek distribution, population decline, Augustów Forest

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